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May 4, 2021

Mackenzie Valley Land and Water Board 7th Floor – 4922 48th Street P.O. Box 2130 Yellowknife, NT X1A 2P6

Attention: Jacqueline Ho (jho@mvlwb.com)

Re: Deninu Kue First Nation – Intervention for the Pine Point Mining Limited – Confirmation and Exploration Program Applications for Water Licence MV2020L8-0012 and Land Use Permit MV2020C0017

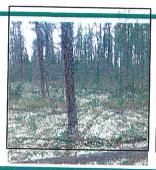
The Deninu Kue First Nation (DKFN) is pleased to provide the enclosed technical report, prepared by LGL Limited, as our intervention for the Pine Point Mining Limited – Confirmation and Exploration Program Applications for Water Licence MV2020L8-0012 and Land Use Permit MV2020C0017. The DKFN looks forward to further engagement with the MVLWB and Pine Point Mining Limited. on this file.

Sincerely,

Chief Louis Balsille

cc. Richard Simon, DKFN Resource Management Coordinator (ima@dkfn.ca)
Dr. Marc d'Entremont, DKFN Technical Advisor (mdentremont@lgl.com)

Pine Point Mining Limited – Confirmation and Exploration Program Applications for Water Licence MV2020L8-0012 and Land Use Permit MV2020C0017







Intervention

Prepared for



Deninu Kue First Nation Fort Resolution, NT

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04 May 2021



Suggested Citation:

d'Entremont, M.V. 2021. Pine Point Mining Limited – Confirmation and Exploration Program Applications for Water Licence MV2020L8-0012 and Land Use Permit MV2020C0017. Intervention prepared for the Deninu Kue First Nation. Unpublished report by LGL Limited environmental research associates, Sidney, B.C. 11 pp

Cover photos:

From left to right: boreal caribou (*Rangifer tarandus*) habitat in the Pine Point area, Pit X-15; wood frog (*Lithobates sylvaticus*) near Pine Point. All photos © Marc d'Entremont.



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1. Introduction

Pine Point Mining Limited (PPML), a wholly owned subsidiary of Osisko Metals Incorporated (Osisko Metals), is investigating the historic Pine Point Mine area with the objective of recommencing mining of the lead and zinc deposits in the area. Osisko Metals head office is located at 1100 Ave Des Canadiens de Montreal, Bureau 300, Montreal, Quebec, H3B 2S2.

PPML is preparing to undertake a Confirmation and Exploration Program (CEP) to obtain information for ongoing engineering studies. The CEP will cover mineral leases and claims between Hay River and Fort Resolution, NWT. The CEP is situated about 10 km south of the Great Slave Lake. Access to the claims and leases is mainly via existing roads and trails that can be accessed from the public highway. The mineral leases are situated mostly north of the Territorial Highways 5 and 6 that connects Hay River to the west of the former Pine Point town and Highway 6 which continues eastward towards the Hamlet of Fort Resolution.

PPML is currently permitted for mineral exploration, use of heavy machinery and vehicles, use and storage of fuel, and construction and maintenance of trails and access roads for PPML's Pine Point property. Mineral exploration at PPML's Pine Point property is currently authorized by the following:

- Type B Water Licence MV2020L2-0003, expiring 8 October 2022.
- Type A Land Use Permit MV2018C0005, expiring 19 September 2022.
- Type A Land Use Permit MV2017C0024, expiring 19 July 2022.

In December 2020, PPML submitted an application for a new Type A Water Licence and Type A Land Use Permit for its Confirmation and Exploration program in the Pine Point property to the Mackenzie Valley Land and Water Board (MVLWB). The CEP will consist of approximately 3,000 test drilling sites to determine the depth and thickness of mineralized zones, 200 to 300 sites around the Project area that will be used for test pitting and 20 separate sites are expected to be used for the bedrock / metallurgical sampling, and short-term groundwater tests to obtain hydrogeological parameters that will enable quantitative models of groundwater movement to be developed and flow rates for the aquifers to be determined. This information will be used in the development of the water management plan for the Pine Point Project.

The Deninu Kue First Nation (DKFN) of Fort Resolution has a keen interest in the project given the proximity of Pine Point to Fort Resolution, the fact that members of DKFN have used the Pine Point area for traditional practices since time immemorial and continue to use the area to practice its Aboriginal and Treaty Rights. This intervention outlines key concerns with the CEP application and provides recommendations for the MVLWB and PPML to consider that can assist in resolving these concerns.



2. Methods and Approach

This technical report (i.e., intervention) provides an evaluation of the information presented in PPML's water license and land use permit applications. The MVLWB and PPML have the responsibility to ensure that the DKFN fully understands the elements and impacts of the proposed development and PPML needs to work collaboratively with DKFN and its technical consultants to resolves issues related to the proposed development. The objectives of this technical report are to:

- Ensure that DKFN concerns are meaningfully addressed throughout the project planning and review process whilst also conducting a scientifically rigorous assessment of project documents and management plans.
- 2. Provide DKFN with the information it needs in order to make its own informed decisions that are in line with its vision of current and future resource and land uses in the Pine Point area.

Various sections of the application were assessed where the focus was on key valued components of concern to the DKFN. Information presented in the application was evaluated based on peer-reviewed literature of indicator species, status reports and First Nations reports, standard protocols for data collection and traditional use information. When evaluating the application materials, the following questions were used to provide guidance:

- Is the baseline information complete and up to date, or are there outstanding deficiencies, including incomplete use of the literature?
- Is the level of assessment commensurate with the potential for impacts arising from the proposed project?
- Are all valued components properly identified, and are potential impacts and effects accurately interpret?
- Is an appropriate suite of impact avoidance, mitigation, and compensation actions presented?
- Are there any deficiencies in the actions for monitoring the effectiveness of management plans?
- Are there any project risks that have not been adequately described or interpreted, but of which the DKFN should be aware?

Concurrent with this application review process, the DKFN has commenced its involvement in the environmental assessment for the proposed Pine Point mine initiated by the Mackenzie Valley Review Board. Initial tasks undertaken to date by the DKFN include the preliminary scoping of interests, values and concerns and the planning for a traditional land use study for the Pine Point area. In addition, DKFN has been engaging with Teck Metals Inc. on the closure and reclamation of the Pine Point tailings impoundment area. This technical report summarizes DKFN initial concerns, but it is anticipated that community-based knowledge gained from these initial tasks will inform DKFN's position on all



developments in the Pine Point area, which may be further developed as the CEP application review process proceeds.

3. Results & Discussion

To date, the DKFN has participated in this review process in good faith to engage in a constructive resolution process that identifies and addresses issues and concerns relating to the Confirmation and Exploration Program. General results in this intervention are presented in the sections below and are focused on some main themes including boreal caribou, traditional land use, water quality, closure and reclamation, and camp use.

3.1 Boreal Caribou

The DKFN has hunted boreal caribou in the Pine Point area for generations (d'Entremont 2017). More recently, DKFN has been involved in recovery planning for boreal caribou and has been a key participate in the range planning process being led by GNWT Environment and Natural Resources. To support this work, DKFN undertook a project to incorporate traditional knowledge and scientific information in the identification of core habitat areas for boreal caribou in the Pine Point area and surrounding landscape to ensure adequate amounts of undisturbed habitats are available for caribou recovery (d'Entremont 2017). From this previous work, suitable boreal caribou foraging habitat was modeled in the Pine Point area. Here, approximately 40% of the PPML mineral lease areas, which also corresponds to identified critical habitat for this species, were predicted to support biophysical conditions conducive to maintain boreal caribou forage.

Critical habitat for boreal caribou is defined as the habitat necessary to maintain or recover self-sustaining local populations throughout their distribution. In the NWT, the NT1 population is continuous with northern Alberta and British Columbia to the south and inhabits an extensive area of boreal forest east of the Mackenzie Mountains and extends as far north as Tuktoyaktuk. Between 6,000 and 7,000 boreal caribou are estimated within this range. The NT1 population was classified as likely self-sustaining based on the understanding of habitat conditions at the time (Environment Canada 2012), but there is evidence of population decline in the southern part of the range (Conference of Management Authorities 2017). The project area overlaps boreal caribou critical habitat, which is defined as:

- The area within the boundary of each boreal caribou range that provides an overall ecological condition that will allow for an ongoing recruitment and retirement cycle of habitat, which maintains a perpetual state of a minimum of 65% of the area as undisturbed habitat; and
- 2. Biophysical attributes required by boreal caribou to carry out life processes. At the broad scale, these biophysical attributes include mature forests (jack pine, spruce, and tamarack) of 100 years or older, and open coniferous habitat. Large areas of spruce peat land and muskeg with preference for bogs over fens and upland and lowland black spruce forests with abundant lichens, and sedge and moss availability.



These biophysical attributes for boreal caribou critical habitat are within the project area; therefore, the selection of drill and test locations and their associated access (e.g., trails) must consider direct impacts to these attributes. We recommend a reconnaissance of proposed investigation sites and access be conducted to confirm the presence of biophysical attributes important to boreal caribou. Where these are present, alternate investigation sites and/or access should be explored.

In the Pine Point area, the local population of boreal caribou has been relatively undisturbed since the closure of the mine in the 1980s. This local population is likely stable (ENR data), but the DKFN members have reported less caribou now compared to when their parents and grandparents were younger. Boreal caribou have been harder to hunt in recent years and most DKFN members prefer to actively hunt moose (*Alces americanus*) or bison (*Bison bison*) (d'Entremont 2017). Annual spring classification surveys of boreal caribou conducted between 2018 and 2020 have recorded 42 to 63 boreal caribou in the area. The GNWT suggested that a reasonable population estimate for boreal caribou in the Pine Point area may be 100 - 150 individuals. Likewise, boreal caribou movement data collected over the past five years (up to end of June 2020) indicated substantial use of PPML's CEP area, particularly to the west and south of the most heavily disturbed areas of the former Pine Point Mine site (GNWT 2021).

As mentioned, the GNWT is currently developing regional range plans for boreal caribou in the NWT (GNWT 2019). In this regard, mining activities must proceed with caution and be part of the range planning process. It is anticipated that general research and management approaches, identified in the recovery strategy for boreal caribou (Environment Canada 2012), will be included and applied in these range plans. Some of these approaches which require direct consideration for this project include:

- Maintenance of habitat and connectivity within and between boreal caribou ranges;
- Coordinated actions to reclaim boreal caribou habitat through restoration efforts (e.g., restore industrial landscape features such as roads, old seismic lines, temporary roads, cleared areas; reconnect fragmented ranges);
- Where ranges are highly disturbed, identify areas that will be prioritized for boreal caribou recovery and targeted for early habitat reclamation. Incorporate management guidelines and actions into permitting conditions for activities identified as affecting boreal caribou or their habitat;
- Encourage stewardship of boreal caribou habitat among industries, interest groups, and Aboriginal communities and organizations.

In its application materials, PPML emphasized the Pine Point area is a highly disturbed brownfield site and has reduced functionally as critical habitat for boreal caribou as a result of the historical mining operations; however, PPML has not included scientific evidence or traditional knowledge to support this assertion. It is clear from the recovery strategy documents (Conference of Management Authorities 2017, Environment Canada 2012) that the project area overlaps identified critical habitat for the species and should therefore be managed as such.

Project activities must proceed with a precautionary approach to ensure additional destruction of critical habitat is not realized. Activities that result in direct habitat loss and/or fragmentation of habitat, such as



industrial and infrastructure development, must be properly managed and quantified. An understanding of the structure and function of the local boreal caribou population is required before more habitat is altered by the proposed mine-related activities. The DKFN wants to ensure the conservation and management of resources in its territory and to develop good stewardship practices for boreal caribou. Building off the earlier work mentioned above on mapping boreal caribou habitat, the DKFN have been conducting a project to measure the recovery of boreal caribou habitat, particularly terrestrial lichens, after forest fires. This work commenced in 2018 and is ongoing. The study area for this project is within the Taiga Plains ecoregion between Buffalo River and Little Buffalo River and extends from the southern shore of Great Slave Lake to the northern boundary of Wood Buffalo National Park, which includes the Pine Point area. To date, data on lichen has been collected from 24 sampling locations in the Pine Point area, some of these being in areas that were impacted by recent forest fires and other areas where lichen has recovered after historic forest fires occurred. Preliminary analysis of this data suggests average terrestrial lichen abundance is 999.6 kg/ha (range 0 - 10,323.6 kg/ha; DKFN 2021). The relationship between caribou and lichen is well-established and there is general agreement that caribou rely on lichens to sustain their diets throughout the winter. However, grazing of lichens varies across the entire range of boreal caribou and previous studies have suggested 250 kg/ha to 1000 kg/ha of lichens are needed to sustain a herd of caribou throughout the winter (Gaare and Skogland, 1980; Kumpula et al., 2000).

It is evident that despite the historic mining activities, the Pine Point area supports boreal caribou critical habitat that must be managed to sustain the local population and DKFN stewardship initiatives. The ability to harvest boreal caribou on a regular basis is one goal of the DKFN and the long-term reclamation of the Pine Point area to support the expansion of the boreal caribou population will support this goal. The decisions made during this water license and land use permit review process will affect this vision.

3.2 Traditional Land Use

Land use of the area by the DKFN was substantial prior to the construction of the original Pine Point Mine in the 1960s; however, this was affected throughout the mine's lifespan and after its abandonment (LeClerc and Keeling 2015). Since the mine closure in the late 1980s, some DKFN members continued to use the lands in the Pine Point area for hunting, trapping and gathering throughout the year. Several have built cabins in the area and utilize the old mine infrastructure (roads) for accessing hunting areas.

The increase in exploration activity and potential new land disturbance has the potential to impact the DKFN's ability to access natural resources in the area, which is a potential infringement on the DKFN's Aboriginal and Treaty Rights. Of the 3,000 new drill holes, PPML anticipates that approximately 10% of these will be located in undisturbed areas and encompass approximately 36 ha of currently undisturbed lands (PPML response to IR-8 March 12, 2021). PPML was unable to provide specific details on the types of vegetation and ecosystems that will be affected since exact locations of drill sites were not provided. As such, potential impacts to DKFN use of the area cannot be determined.

Further discussion with the DKFN on the location and timing of planned activities, mentioned in the project description, is needed to ensure traditional use of the area is not impacted. Likewise, the planned



activities (e.g., movement of large equipment, blasting) should be communicated with DKFN to ensure these do not pose a risk to traditional use activities and land users.

3.3 Water

The DKFN is concerned about potential impacts to the quality of water in the project area. In the Water Withdrawal Plan that was included with the Applications, PPML indicated that water for the Project will be withdrawn for camp use, exploration drilling, dust control, and aquifer testing. DKFN wants to ensure both the quality and quantity of water in the area is maintained for natural resources in the area (e.g., wildlife).

PPML has identified over 4,000 potential water sources in the project area (not including old pits and Great Slave Lake) and included several assumptions in its Water Withdrawal Plan, including:

- Withdrawal from a waterbody be limited to 10% of the under-ice volume of a lake, following guidance from Fisheries and Oceans Canada (DFO 2010). If bathymetry is not available or this is not known, the limit is determined by the multiplication of the surface area (m²) by 0.1 m.
- The daily drill water withdrawal is estimated at an average of 33 cubic metres (m³) per drill per day (/d). More than one drill may withdraw from a water source at any one time, but the daily Water Licence limit and the annual withdrawal limit for any water source will not be exceeded.
- For watercourses, the withdrawal rate is limited to 10% of the instantaneous flow rate (DFO 2013). Prior to withdrawal from watercourses, the instantaneous flow rate will be measured and used to determine appropriate withdrawal limits each week.
- Maximum expected ice thickness during the winter is assumed to be 1.0 m (DFO 2010). The
 approach used in the Water Withdrawal Plan accounted for ice cover, as no water withdrawal will
 take place for ice-covered water sources with a field verified depth less than 3.0 m.
- PPML will not exceed the Water Licence daily limits.

As mentioned above, the exact location of drill sites is not known therefore the waterbodies that will be impacted is also not confirmed at this time. The 4,000+ waterbodies identified by PPML range in estimated volume between $1,000 \, \text{m}^3$ to $559,000 \, \text{m}^3$. Accurate bathymetric data was not collected for each potential water source, so volumes are estimates only.

In addition to the assumptions above, additional restrictions should be in place to determine if it is appropriate to extract water from a candidate source. These could include the timing of the work (i.e., seasonality restrictions), the ecological function of the water source (e.g., is it part of a wetland complex?), or the avoidance of smaller waterbodies.

Finally, PPML has stated it will visually monitor nearby waterbodies during aquifer testing (lakes, swamps, and streams) where they exist in reasonable proximity to the test site for changes in surface level (Review



Comment Table - Responses to IRs, GNWT, comment 14). It is unclear how this visual monitoring will be conducted and what criteria will be used to determine the reasonable proximity to test sites.

3.3.1 Sumps and potential impacts to groundwater

The quantity of drilling locations (i.e., 3,000) and associated sumps for containing drilling waste has raised concerns regarding the potential for groundwater quality to be impacted when drill cuttings, sludges and returned water are deposited into sumps. According to PPML, drill cuttings will be placed in the nearest natural sump, existing human-made depression or pit, interred in a completed drill hole within the overburden zone and/or above a plugged/cemented casing. If necessary, a shallow sump may be required, located near the drill site, and will be prepared using earth moving equipment to create a sump approximately 1 m wide, 2 m long and up to 1 m deep. The disposal location will be at least 100 m from any natural waterbody or watercourse – note that 4,000+ water bodies have been identified in the Pine Point area. If a sump is constructed, the sump will be covered back over with the set aside overburden when drilling is completed at each site.

PPML has developed a Groundwater Management Plan Framework to describe the approach to groundwater monitoring during the aquifer testing while acknowledging that the specific details of the aquifer testing and groundwater monitoring are still being determined. Also, PPML's application does not address best practices for sump selection, construction and monitoring. Sumps should only be constructed where suitable soils are free of hydraulic defects, such as gravel lenses, silt lenses, sand lenses, cracks, fissures and root channels that would impact the fluid containment capabilities of the sump. The post-construction tracking of sumps should be implemented that includes accurately describe the location of the sump and type of drilling waste stored in the sump. Sumps should be clearly identified in the field until the site has been decommissioned.

3.4 Camp Use and Management

In response to IR 4 from the technical session, PPML clarified that there are three options under consideration for camp wastewater, including: installation of a modular wastewater treatment plant; construction and operation of a sewage lagoon; or construction and operation of septic system with a dispersal field. Further details on the option that will be used is required.

In addition to the management of wastewater from the camp, DKFN is concerned with the increase in camp population and the potential direct and indirect effects this may have, including:

- Health considerations, particularly in light of the current coronavirus pandemic;
- Transportation of camp staff to and from the work site long Highway 6. An increase in road travel
 can increase the wear and tear on the road surface, which impacts all Fort Resolution residents
 that use this road; and
- Management of solid waste from the camp.



Prior to issuing a water license and land use permit, PPML confirm its plans for camp wastewater management. An updated health and safety management plan is required for the larger camp; this plan must address community safety concerns.

3.5 Closure and Reclamation

The closure principles outlined by PPML are appropriate and the DKFN would like to work with PPML to ensure these principles and the closure goals are met. These principles include:

- The site is physically and chemically stable.
- No long-term active care is required.
- Closure will consider future land use.

Where areas of the Project have been previously disturbed through historical mining activities, PPML has stated the goal is to return the areas of the site affected by the Project to at least an equivalent environmental state that they were left by the Government of Canada prior to the Project. Clarity is required from PPML to confirm that this means previously disturbed sites will be returned to their previously disturbed state.

It is acknowledged that previously undisturbed areas, if impacted will be reclaimed to viable and, wherever practicable, self-sustaining ecosystems that are compatible with a healthy environment and human activities. This component may be challenging given the extent of disturbance in the Pine Point area. It is also unclear how PPML will coordinate its closure and reclamation activities with:

- Teck Metals Inc, who is reclaiming the Pine Point tailings impoundment area;
- the Government of Canada, who is conducting remediation and risk management along the Pine Point railbed; and
- The potential full mine build out proposed by PPML.

As mentioned above, the DKFN is interested in working with PPML on the closure principles. One option for immediate consideration is the boreal caribou forage lichen restoration study that DKFN is initiating later this year. The objectives of this study are: 1) to enhance boreal caribou winter forage in the areas that were impacted by natural (fire) and human (industrial) disturbances; and 2) to evaluate techniques to establish terrestrial lichen (*Cladonia* sub-genus *Cladina*) within disturbed areas. Sites within the Pine Point area, both historically disturbed and new sites under this project, could be candidate locations to support this study.

4. Recommendations

As mentioned above, PPML considers the project area to be a brownfield site, but to the DKFN the Pine Point area was and currently is a traditional land use area that is accessed by several members throughout the year. Likewise, it is expected that this area will be used by future generations, so the effective planning



and management of mining activities is critical to ensuring the long-term capability of the land. In summary we offer the following recommendation for consideration by the MVLWB and PPML.

4.1 Boreal Caribou

- 1. MVLWB to incorporate management guidelines and actions into permitting conditions for activities identified as affecting boreal caribou or their habitat.
- 2. PPML, MVLWB, GNWT, DKFN and other Indigenous groups work together to understand the structure and function of the local boreal caribou population before more habitat is altered by the proposed mine-related activities.
- 3. PPML, in collaboration with DKFN, conduct a reconnaissance of proposed investigation sites and access to confirm the presence of biophysical attributes important to boreal caribou. Where these are present, alternate investigation sites and/or access should be explored.
- 4. PPML has stated "Cautionary Zones" will be used around sites of the exploration activity to limit effects on boreal caribou. Additional information is required on what these zones are and where they will be used.
- 5. PPML to provide an updated version of the Wildlife Protection Plan/Wildlife Management and Monitoring Plan prior to the water license and land use permit being issued.
- 6. Environment and Climate Change Canada has informed the MVLWB that PPML must apply for a permit under section 73 of the Species at Risk Act (SARA) for the Project. Details on what species are covered under this permit is required.

4.2 Traditional Land Use

7. PPML to coordinate exploration activities with DKFN land users.

4.3 Water

- 8. PPML prepare additional criteria, in collaboration with DKFN, on the selection of suitable waterbodies to be used for water extraction.
- 9. PPML only construct sumps where suitable soils are present.
- 10. PPML implement the post-construction tracking of sumps that includes accurate descriptions of the sump location, soil conditions and type of drilling waste stored in the sump.
- 11. PPML to clearly identify sumps should in the field until the site has been decommissioned.

4.4 Camp Use and Management

- 12. PPML to provide specific plans for wastewater management.
- 13. PPML to update its health and safety management plan for the larger camp.



4.5 Closure and Reclamation

- 14. PPML to describe how residual impacts of the project will be assessed following closure activities.
- 15. PPML to confirm that previously disturbed areas will not be reclaimed to a natural state.
- 16. PPML to present criteria that will be used to determine how reclaimed areas, which were previous undisturbed, are compatible with a healthy environment and human activities.



5. References

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