Attachment # 2

Submission to Nunavut Water Board and Indian and Northern Affairs Canada

by Department of Sustainable Development

Paul Partridge, dated October 25, 2001

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Mr. Phillipe di Pizzo
Executive Director
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU
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Mr. Carl McLean
Manager, Land Administration
Indian and Northern Affairs Canada
P.O. Box 100
Iqaluit, NU
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Re: Comments on the Polaris Mine Decommissioning & Reclamation Plan

Dear Mr. Pizzo & Mr. McLean,

The Department of Sustainable Development has reviewed the proposed decommissioning and reclamation plan for the Polaris mine. In general the plan is found to be comprehensive and well thought out; however, a few points were identified that need to be addressed prior to acceptance and approval of the final plan. These points include permafrost encapsulation of waste material, hazardous materials management, and the SQRO study aspect of the plan, and are covered in more detail below.

Permafrost Encapsulation of Waste

Concerns were raised about the plan's proposal to encapsulate contaminated soil and material in permafrost under the assumption that permafrost is impermeable. This assumption may lead to serious errors in engineering designs and will reduce the overall effectiveness of the plan. Support for this is found in recent studies indicating that permafrost is not permeable and will allow the passage of contaminants through fissures, cracks, and other air voids and water within the frozen soil matrix. Further studies conducted in Alaska seem to indicate that contaminants, particularly hydrocarbons, have the ability to degrade permafrost. For this reason we are not convinced that permafrost

encapsulation will provide a long-term and environmentally acceptable solution to containing contaminants.

TeckCominco Response

- *Through Gartner Lee Ltd., Dr. Chris Burn was requested to respond to the above question. Dr. Burn's curriculum vitea and response is attached (Attachment #6).*
- *Mr. Partridge has forwarded the specific reports, which initiated his concerns. We requested that Dr. Burn review these documents in conjunction with the Closure Plan and subsequent information provided to him from the staff at Polaris.*
- *Dr. Burn recommends that the stope where the hydrocarbon contaminated soils are placed, have the floor wetted to ensure any voids in the rock are sealed by ice. This will be done.*
- *It is important to note that the hydrocarbon contamination that is to be stored underground* ***is not in the free fluid phase****. It is attached to fine soil particles and as such will not mobilize in the underground environment. Complete freezing of the contaminated soil in conjunction with an impermeable boundary of ice (as outlined above) will ensure containment. The papers referred to by Mr. Partridge deal will free flowing hydrocarbon contamination.*
- *The review by Dr. Burn also clearly shows that there is no issue of permafrost degradation at the depths that the contaminated soil will be stored in the mine.*
- *It is important to note that the hydrocarbons are encapsulated in a location remote from other mine workings. Access to the area is limited and as an additional measure of protection, the access tunnel will have a wetted earthen plug installed and allowed to freeze.*

In conjunction with the previous concern, questions have been raised as to whether BGC would be a suitable choice in assessing the competence of the proposed encapsulation method. These questions do not stem from BGC ability to do the work, but form the fact that they were solicited by Cominco, through Gartner Lee Limited, to assess the ability of the containment area to sustain permafrost conditions.

TeckCominco Response

- *Mr. W. Savigny of BGC participated in the development of permafrost aspects of the Closure Plan. Subsequent to the Closure Plan being submitted to the NWB, Mr. Hartmaier became associated with BGC and was contracted by the NWB to review the Closure Plan. Prior to Mr. Hartmaier submitting his comments to the NWB, TeckCominco contacted the NWB to ensure they were aware of the above facts.*
- *Dr. C. Burn was engaged to provide a second opinion on the permafrost encapsulation method proposed in the Closure Plan. His review has clearly demonstrated that this approach is technically sound and poses no risk to the environment over the short term or long term ("thousands of years")*

Hazardous Waste Management

Comments were made about the manner in which Cominco was going to dispose of the various types of material as listed in section 5.6 of the plan. In the past there have been instances where recipients have been unable to properly look after or dispose of certain materials when they

were no longer in use. The proponent is obligated to ensure that the recipient of any hazardous materials (including excess fuel) is a responsible party who is fully capable of handling the material; this includes dealing with spills and ensuring proper disposal.

Our Department would like clarification on the following points:

- The manner in which the di-electric fluids from non-PCB transformers will be disposed of.

TeckCominco Response

- *As reported in the Closure Plan, the di-electric fluids were sampled and confirmed that they do not contain PCB's.*
- *It will be up to the contractor selected for decommissioning to handle these fluids in one of three ways:*
  1. *Incinerate the oils as this is a permissible disposal method for mineral oils.*
  2. *Ship the oil to southern Canada as a waste product for disposal through a licenced disposal agent.*
  3. *Sell the oil with the transformers and ship it to the buyer as a product and not a waste.*

Details of the final decision will be provided to the NWB prior to the initiation of the disposal of transformers and/or the fluids contained in these transformers.

- The amount of freon that is expected to be recovered from the freezer units.

TeckCominco Response

- *There are 4 mine air refrigeration units in use. Each unit uses a maximum of 750 lbs. of R-22 freon for a up to total of 3000 lbs. if the units are fully charged. The freon will be pumped back into shipping bottles and returned to the original supplier for recycling or to an approved disposal company.*

- Whether there were any chlorinated solvents incinerated in the burning pit, and if so, an approximate amount.

TeckCominco Response

- *There have been no chlorinated solvents incinerated in the burning pit.*

- Is there a marker indicating the fact that there is buried asbestos on site, and has the site been catalogued as such by the regulating authority.

TeckCominco Response

- *In 1993, asbestos from our MAK generators were removed, placed into 4 – 45 gallon steel drums and under an approval from Sylvester Wong of the NWT Mines Inspection Branch, entombed in backfill deep within the mine. It was placed in 760-202 Stope located at Nad83 UTM co-ordinates 8368650 N, 558625 E, -256 m elevation.*
- *There is no surface marker as the material is not buried near surface in the conventional manner so there is no risk of it ever being disturbed.*

- *There are no other asbestos related issues at the mine site that require attention in the closure and reclamation of the Polaris Mine.*

Soil Quality Remediation Objectives Study

The quality of Cantrox Environmental Inc., Human Health and Ecological Risk Assessment has generated concern about their findings. This question was raised because they consistently overlooked or dismissed rudimentary facts on wildlife such as the endangered status of the Peary Caribou, or that they made the broad assumption that muskox are just large caribou; failing to take into consideration the differences in niches, the fact that they are more sedentary then caribou, and their increased ability to forage in hard snow conditions. It appears that they failed to do more then give wildlife a superficial glance in determining the acceptable limits for the SQRO, as they fail to consider the influence of contaminants on anything but adult wildlife, which would be when wildlife is arguably the least susceptible to contaminants.

TeckCominco Response

- *CCME protocols provide for the use of site specific protocols to be used for sites with atypical characteristics.*
- *The assessment conducted by Cantox uses highly conservative assumptions and provides protection to both the Peary Caribou and muskox. The assessment also considers the most sensitive stages of the animal's life for determining acceptable exposures.*
- *Refer to Attachment #7 from Bart Koppe of Cantox Environmental who has provided a comprehensive response to this question.*

It is understood that the mine is located in an area of marginal habitat, and that areas where the mine contributed to significant concentrations of contaminants, as defined by the SQRO study, will be remediated. This, coupled with the fact that there were areas of high lead and zinc concentration exceeding these recommended limits prior to the mines inception, would support use of the values proposed by the study.

We trust that our comments will be of value in finalizing the plans for this project. If you have any questions or require clarification do not hesitate to get in touch with me.

Sincerely,

Paul Partridge
Coordinator, Claims Implementation & Land Use
Department of Sustainable Development, GN
CC. Earle Baddaloo - Director of Environmental Protection Service, GN