September 5, 2003

Hi Stephanie,

Attached, please find Natural Resources Canada's (NRCan) comments on Cumberland Resources Ltd.'s Meadowbank Gold Property Project Description Report (March 2003). Our initial comments are relevant to surface hydrology, hydrogeology, permafrost, waste rock and tailings disposal, acid generating potential of the rocks, metal leaching from waste rock and from the tailings, effluent treatment, and open pit abandonment. We have also examined the proponent's requirements for explosives.

Given the nature of this proposal -- a gold mine with an estimated ore production capacity of 4,700t/d, NRCan believes that the proposal warrants a review under Part 5 or Part 6 (12.4.4 (b)) of the Nunavut Land Claims Agreement.

If you have any questions concerning our comments, or if I may be of further assistance, please call me at (613) 947-1591.

Sincerely,

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Natural Resources Canada Comments on Cumberland Resources Ltd.'s Meadowbank Gold Property Project Description Report – NIRB File # 03MN107

Natural Resources Canada (NRCan) has reviewed Cumberland Resources Ltd.'s Meadowbank Gold Property Project Description Report (March 2003) within the following areas of expertise: surface hydrology; hydrogeology (including groundwater flow); permafrost; the stability of earth and rock structures; effluent treatment; and explosives. NRCan has treated this as a document which provides general information on the project. A more thorough environmental impact assessment will require detailed information on the aspects noted below.

NRCan has also determined that it is a likely responsible authority (RA) under the *Canadian Environmental Assessment Act* (CEAA), because an explosives factory license will be required for the manufacture and storage of explosives (par. 7(1)(a) of the *Explosives Act*) to allow the proposal to be carried out.

The primary impacts on the environment during the operating life of the mine and afterwards will be associated with the waste rock and tailings disposal areas, and with the abandoned mine excavations. As the report indicates that sulphide minerals are associated with the ore zones, there is presumably an acid-producing potential for any waste materials associated with this activity. The following information on rock and tailings and their disposal, and on open pit abandonment will be necessary in order to evaluate the likely impact of these mine components:

1) Description of waste rock, ore and probable tailings mineralogy – The Project Description notes that the mine tailings are undergoing geochemical characterization. The quantity of different rock types and tailings should be noted along with their geochemical characterization. The EIS should also present data on the quantity and quality of ice, contained in mine rock, that could melt and be released from waste rock piles during the summer. This ice has been found to contain elevated total suspended solids (TDS) and metals at other mines in the Northwest Territories and runoff from waste rock piles could be a water quality issue even if the waste rock itself is not potentially acid generating.

2) Evaluation of the acid-producing potential for waste rock and tailings and the nature of contaminants that may be produced – The EIS should contain a thorough analysis of the potential for acid generation (PAG) and metal leaching from waste rock as well as from tailings. In particular, the EIS should detail the quantity and quality of runoff from PAG waste rock piles, and how this is to be treated. This information is required as a general indication of the long-term potential for contamination from acidified pore water and runoff. In addition, the anticipated fate of the reagents added during ore processing must be presented.

3*) Cyanide destruction* – The project proposes to use a well-established INCO type process for destruction of cyanide. However, by-products of cyanide use, such as thiocyanate, cyanate, and ammonia, may likely require additional treatment steps in order to address the treatment of cyanide by-products. Moreover, the proposed cyanide destruction method generates ammonia and cyanate that could potentially present toxicity issues depending upon concentration. Cyanide associated with the tailings will likely be destroyed by the INCO process. However, destruction should be further verified by monitoring.

4) Characterization of sites to be used for waste rock and tailings disposal, including but not limited to surficial materials, permafrost and hydrogeological conditions

5) Description of the structures/containment systems to be used for the disposal of waste rock and tailings – The success of long-term disposal of waste materials from this mine will depend on site conditions and the nature of the disposal facilities. The Project Description notes that disposal/storage techniques for mine tailings (including subaqueous disposal) will be further assessed and evaluated. Further information on underwater disposal plans as well as alternate disposal plans for tailings should be included in the EIS. It will be necessary to have information on the measures for retaining this water covering to determine if this condition can be maintained indefinitely. If indefinite cover is not planned, then what alternative is proposed?

It will be necessary to have information to assess the likelihood of tailings pore fluid escape (i.e. texture of enclosing sediments, distribution of permafrost, and likely changes in the distribution of permafrost during operations and after mine closure).

If contaminants are generated by any waste material, it will be necessary to determine how far those contaminants are likely to travel.

6) Evaluation of the long term environmental effects of the abandoned open pits – If the pits are allowed to fill with water, what is the potential for contamination of this water due to weathering of sulphide minerals made available to groundwater flow and oxidation? What will the potential be for contaminated water to move from pits into or over surrounding lands?

September 8, 2003

Hi Stephanie,

We have just received comments on the earthquake aspects of the Meadowbank Project. There are concerns, which do not appear to have been discussed in the Project Description. For this reason, please include the following comments with our submission of September 5.

Concern: The project would involve open pits up to 175 m deep (and underground mining below one pit), dug below the level of current lakes; the lake water will be held back by dykes. Dyke failure would represent a major safety concern to any miners in the pit. Earthquake shaking represents a process for the simultaneous catastrophic failure of the dykes.

Current knowledge: The 1995 version of the National Building Code of Canada (NBCC) is in effect. For a probability of 0.0021 per annum (475 year return period) the peak horizontal ground acceleration motions for the site are about or slightly higher than 4% g. This is the design level appropriate to common buildings, not dams or dykes which should be designed for a lower probability level.

2005 NBCC: Post-2005 buildings will be designed for a probability of 0.000404 per annum (2450 year return period). For Baker Lake the peak horizontal ground acceleration motions would be about 6% g on firm ground. Again, dams or dykes should be designed for a lower probability level.

Conclusions: Earthquake resistance of the dykes should be evaluated. Dykes should be constructed to resist earthquake ground motion without failure. The level of resistance should match the required safety goal of the project.

Notes:
1) These concerns are similar to those expressed for the Diavik retaining dykes.
2) Coordinates: 65.0N 96.0W

Thank you.

John Ramsey