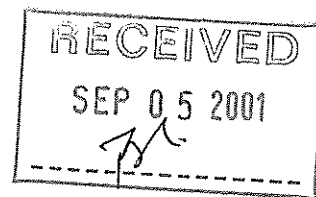




Parks
Canada

Parcs
Canada

Nahanni National Park Reserve
Box 348
Fort Simpson, NT
X0E 0N0



August 31, 2001

Luciano Azzolini
Environmental Assessment Officer
Mackenzie Valley Environmental Impact Review Board
Box 938
Yellowknife, NT
X1A 2N7

Dear Mr. Azzolini:

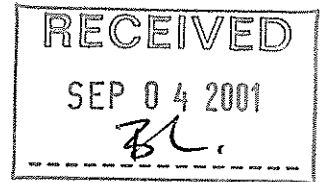
Enclosed are the attachments to the Parks Canada technical report on the review of the Canadian Zinc developments. This is to accompany the information sent to you through e-mail by Suzanne Richards.

If you have any questions you can contact our office.

Sincerely yours,

Jacky Demers
Operations Clerk

**Canadian Zinc Corporation
Prairie Creek Mine**



**Metallurgical Pilot Plan Project (MV2001L2-003)
Technical Report
by
Nahanni National Park Reserve
Parks Canada Agency**

31 August 2001

Parks Canada's legal mandate under the Canada National Parks Act is as follows

"4. (1) The national parks of Canada are hereby dedicated to the people of Canada for their benefit, education and enjoyment, subject to this Act and the regulations, and the parks shall be maintained and made use of so as to leave them unimpaired for the enjoyment of future generations."

On behalf of the people of Canada, Parks Canada is responsible for the protection and presentation of nationally significant examples of Canada's natural and cultural heritage and to foster public understanding, appreciation and enjoyment in ways that ensure their ecological and commemorative integrity for present and future generations.

The "*Nahanni National Park Reserve Management Plan*" further states that the "Nahanni wilderness will be maintained as an essentially unaltered, primitive, and unpolluted corridor, and will be sustained so that Nahanni will remain a superb wilderness representation of the Mackenzie Mountains Natural Region." Refer to the attached Management Plan, page 5, and Management Plan Amendments.

The focus of the technical report will be to identify issues from the proposed developments by Canadian Zinc Corporation at the Prairie Creek Mine Site that may threaten the ability of Parks Canada to carry out its mandate to maintain the ecological integrity of Nahanni National Park Reserve. In addition, the technical response will be developed in the context of preventing the foreclosure of options for the expansion of Nahanni National Park boundaries. The development under review is Canadian Zinc Corporation Metallurgical Pilot Plant Project (MV2001L2-003).

Issue 1: Accidental Releases of Petroleum Products

As Canadian Zinc has pointed out in their response to Information Request #1, the company will make use of the contents of the fuel storage facilities during the operation of the process equipment for the pilot plant. The use of existing facilities is therefore an integral part of operation of the pilot plant and should therefore be considered an interdependent and related project that is included in the environmental assessment.

In its response, CZN has stated that "As part of its redevelopment plans and prior to re-commencement of operations at the Prairie Creek Mine, CZN will engage the services of a qualified engineering firm to conduct the necessary non-destructive testing and upgrade the storage tank system to meet current requirements." CZN further commits to "continue to monitor the tank farm as part of its ongoing care and maintenance programs, and undertake such mitigative and preventative measures as necessary to ensure the integrity of the system."

Site Visit Concerns:

On August 28, 2001, a site visit and tour by CZN officials revealed that rainwater and snow melt which had been contained inside the berm surrounding the fuel oil storage area had been pumped into Harrison Creek, which drains immediately into Prairie Creek. There was evidence of petroleum product contamination on the side walls of the berm and on the ground, especially in the vicinity of the drum storage area and at the base of the fuel tank. According to company officials, the water that was pumped into Harrison Creek was not tested for petroleum product contamination prior to its release into the creek. Since petroleum products can have adverse impacts on aquatic biota, Parks Canada Agency is concerned that this practice could result in the release of petroleum products that could adversely affect fish and other aquatic life in the Prairie Creek and South Nahanni watersheds. Reference the report by Neil Mochnacz entitled "*Interim Report: Fisheries Survey of Prairie Creek Watershed*", which is attached as part of the submission.

Conclusions:

- Nahanni National Park Reserve recommends that Canadian Zinc be required to conduct testing of samples of the water collected in the berms prior to release to the settling pond, to Harrison Creek or to Prairie Creek. The water discharged from the bermed areas should not contain any levels of petroleum products to be acceptable for discharge to the surface waters. If the water collected inside the berms contains petroleum products, CZN should be required to undertake remedial work to clean the water before it is discharged to any surface water source.
- In the response to Information Request #1, CZN states that the tank farm does not comply with CCME Environmental Code of Practice for Aboveground Storage Tank Systems Containing Petroleum Products". Since the current proposal plans to make use of the petroleum products from the tank farm, CZN should address this deficiency to prevent any accidental releases of petroleum products. Considering the volume of diesel fuel and other petroleum products stored on site, an accidental release could result in the contamination of Harrison Creek, Prairie Creek and the South Nahanni River, significantly affecting the ecological integrity of Nahanni National Park Reserve. Site remediation should also include ensuring the integrity of the containment areas around the tanks.

Recommendations:

1. The Water Licence should require CZN to conduct testing of water collected inside the berms for petroleum product contamination, prior to discharge to any surface water. If the analysis shows that there are petroleum products in any amount, the licence should further require that CZN treat the contaminated water before discharge is approved.
2. The Water Licence should require that CZN upgrade the tank farm to meet current standards for petroleum product storage.

Issue 2: Cumulative Effects of Infrastructure Use

The cumulative effects of the use from the existing infrastructure at the Prairie Creek Mine site has the potential to result in adverse impacts to environmental components that could also impact on Parks Canada's mandate to protect the ecological integrity of Nahanni National Park. An increasing number of staff will be using the same facilities for accommodation and for access to the site.

Knowledge Gap 1:

The cumulative impact to the population of grizzly bears in the vicinity of the mine site from the combined processing activity and the use of the infrastructure for staff.

Site Visit Concerns:

In addition to the presence of Dall Sheep, CZN officials indicated the presence of a male grizzly bear, a sow and a cub. The frequency of visit from the male grizzly bear has created enough familiarity to name the animal. The grizzly bear population has been designated as a population of special concern under the Species at Risk program in several of its ranges, including the Northwest Territories and Yukon Territory. Transmitters tracking grizzly movements have shown that male grizzlies sometimes travel as far as 250 km, as the crow flies, over the course of a year. It is therefore probable that this population of grizzly bears would also include Nahanni National Park Reserve in its home range.

Conclusions:

The Minister of Canadian Heritage, also Minister for Parks Canada, is responsible for the Species at Risk Act jointly with the Minister of Environment and the Minister of Fisheries and Oceans. The Minister of Canadian Heritage is specifically responsible for the protection of species in national parks that are facing threats to their populations. Since the grizzly bear is listed as a species of special concern, Parks Canada recommends that CZN implement mitigation measures to prevent the grizzly bears in its vicinity from becoming habituated, creating a hazard for staff and requiring its destruction. Refuse handling practices should be clearly outlined in licence conditions. This would include no storage of any food waste in containers that are not bear-proof and incineration of this waste. In addition, a training program for staff on avoiding human/bear conflict should be implemented. These mitigative measures will help to prevent bear habituation and reduce the need for destruction of animals.

If these measures fail to prevent habituation of grizzly bears, a problem grizzly bear at the mine site has the potential to pose a danger to visitors of Nahanni NP camped in Deadman Valley. Nahanni NP recommends that CZN officials implement a procedure to consult and notify Nahanni NP staff of problem bear behaviour that could threaten the safety of park visitors.

Recommendations:

1. The Water Licence should require that CZN develop written procedures and training for staff on measures to prevent habituation of grizzly bears.
2. The Water Licence should require that CZN contact Nahanni National Park in the event that a grizzly bear becomes habituated and creates problem for CZN staff.

Knowledge Gap 2:

The cumulative impact of the loading to the South Nahanni Watershed from the combined operation of the Cantung Mine, the Prairie Creek Mine and the Howard's Pass Project.

Conclusions:

- A water quality monitoring program should be carried out to provide current data on water quality in the South Nahanni watershed before any operations begin. This will provide background information on current conditions, and provide data on incremental changes to water quality as additional operations start either at the CZN mine site or at other mine sites upstream. This information would enable CZN to take any corrective action required in the event that data indicates deterioration of water quality in the South Nahanni watershed as a result of their operations. The data could also be useful in demonstrating that changes originate upstream and not from CZN operations.

Nahanni NP conducted extensive baseline water, sediment and fish tissue quality data throughout the Park from 1988-91 and again from 1992-97. . Refer to attached reports entitled "*Protecting the Waters of Nahanni National Park Reserve, N.W.T.*" and "*Protecting the Aquatic Quality of Nahanni National Park Reserve, N.W.T.*". This information was used to develop site-specific short and long term water and sediment quality objectives to provide park managers with tools to assess any fluctuations in aquatic water quality beyond the limits of natural variability.

The most serious threat to water quality in Nahanni NP comes from mining interest and development in the area around the Park. The Park water and suspended sediment is currently of high quality and is pristine overall. Certain levels of metals are naturally elevated in Nahanni NP waters, suspended sediments and fish tissue due to high local geochemical and biochemical backgrounds. Zinc, cadmium, copper and iron appear to be naturally elevated. Future monitoring programs must be implemented to measure the effects of mining developments on the aquatic ecosystem. It is recommended that Canadian Zinc Corporation work in cooperation with Parks Canada, Environment Canada and other mining interests to develop a water quality monitoring program in order to prevent degradation of Nahanni NP

water quality as a result of cumulative impacts from mining development. For CZN, this would involve identifying water sampling locations both upstream and downstream of the Prairie Creek mine site, determining a sampling frequency and testing for the list of parameters as outlined in the short and long-term water quality objectives for the park. Refer to the report entitled "*Protecting the Aquatic Quality of Nahanni National Park Reserve, N.W.T.*", Environment Canada, December 1998, page 71, for the list of water quality parameters and established objectives. The testing should also include mercury and antimony which are associated with zinc extraction. Testing will also need to be conducted at the reference site located at the mouth of Prairie Creek. This data will confirm that the mining activity has not adversely impacted on Prairie Creek water quality as it enters the South Nahanni River and Nahanni NP. This testing will need to be conducted both prior to the issuance of the water licence and during the period of the water licence.

Recommendations:

1. The Water Licence should require CZN to establish a water quality monitoring program jointly with Parks Canada and Environment Canada for water quality.

Issue 3: Condition of the Tailings Containment Area

Knowledge Gap:

The total volume of water to be discharged to the tailings pond.

In the environmental assessment, the only discussion of water to be discharged to the tailings pond is the process water from the pilot plant operation. The amount to be discharged is approximately 4000 m³, which would increase the level in the tailings pond by about 4 cm. The environmental assessment for the underground decline development and exploration drilling states that mine water will be discharged to a sump prior to its release to Harrison Creek. There is no discussion of disposing this water to the tailings pond. However, in the response to Information Request #2 for RWED and in correspondence between BGC Engineering Inc. and Canadian Zinc Corporation dated August 16, 2001, there is a discussion of the possible discharge of combined process and mine water to the tailings pond in the amount of 70,000 m³, raising the current level by 70 cm.

An additional concern with the increased level of discharge is the difference of the tailings pond to provide a 50 to 1 dilution factor as stated in the response to Information Request #3 for RWED. The 50 to 1 dilution available in the impoundment to lower the effluent levels to a point below discharge standards only applies if 4 000 m³ of process water is discharged to the tailings pond. If 70 000 m³ of combined process and mine water is discharged to the pond, the dilution factor is reduced to approximately 3 to 1.

Site Visit Concerns:

The tailings containment area is located immediately adjacent to Prairie Creek. Apparently, the impoundment dams were designed to withstand maximum flood based on only 5 years of data.

Conclusions:

- Water Survey of Canada should be contacted to confirm the suitability of the design to withstand maximum flood levels based on stream flow measurements in Prairie Creek over a longer time frame.
- CZN needs to confirm the actual volume of water to be discharged to the tailings pond. Will the volume discharged to the pond be 4 000 m³ or 70 000 m³?
- In the correspondence from BGC Engineering Inc. to Canadian Zinc Corporation, Dr. Savigny states that he is "satisfied ... that the geotechnical stability of the tailings pond containment structures is adequate for the proposed use provided levels do not rise more than about 1 m above the 1994 level under the proposed use." CZN needs to determine whether the 1994 level is the same level as currently, which is stated to be at an elevation of 868 m. If current levels differ from 1994 (June measurement?), then CZN will need to determine whether the tailings pond has the geotechnical stability to hold an additional volume of water from the combined process and mine water operation. This is of particular concern to Nahanni NP since any breach of the tailings pond could result in the discharge of the contents to Prairie Creek and result in adverse impact to the water quality in Prairie Creek and the South Nahanni watershed. This is particularly significant when flows in Prairie Creek are low in July and August, limiting the ability of the creek to dilute mining waste discharges.
- If the volume of combined process and mine water discharged to the tailings pond is 70 000 m³, CZN will need to re-examine the toxicity of the pond water using a dilution factor of 3 to 1 rather than 50 to 1.
- Considering the current location of the tailings pond immediately adjacent to Prairie Creek, flooding in the valley at the Prairie Creek Mine site could cause breaching in the impoundment dams if the flood levels exceed the probable maximum based on only 5 years of data. Breaching of the dams would result in the release of the entire contents of the tailings pond into Prairie Creek and could cause significant adverse effects to the ecological integrity of the South Nahanni watershed and Nahanni National Park.

Recommendations:

1. Before a Water Licence is issued, CZN needs to update their calculations for flood elevations using longer term data from Water Survey of Canada.
2. Before a Water Licence is issued, CZN needs to confirm the actual amount of water to be discharged to the tailings pond.
3. Before a Water Licence is issued, CZN needs to conduct testing to determine the geotechnical stability of the pond based on flood levels using long term data from Water Survey of Canada. If the pond design is insufficient to handle 1:100 flood event, the Water Licence should be issued conditional to rehabilitation for hydrotechnical stability required for its location in close proximity to Prairie Creek as outlined in the BGC Engineering Inc. report dated December 18, 2000.

Documents Submitted to the Mackenzie Valley Environmental Impact Review Board

1. Environment Canada, "*Protecting the Waters of Nahanni National Park Reserve, N.W.T.*", C&P-IWD-NWT-91-002, TR91-1/NAH, December 1991.
2. Environment Canada, "*Protecting the Aquatic Quality of Nahanni National Park Reserve, N.W.T.*", Yellowknife, NWT, December 1998.
3. Environment Canada Parks, "*Nahanni National Park Reserve Management Plan*", 1987.(previously submitted to MVEIB)
4. Canadian Heritage Parks Canada. "*Nahanni National Park Reserve Management Plan Amendments*", December 1994. (previously submitted to MVEIB)
5. Mochnacz, Neil J., Natural Resources Institute, "*Interim Report: Fisheries Survey of Prairie Creek Watershed*", Winnipeg, Manitoba, August 30, 2001.