HUDSON BAY MINING & SMELTING CO. LTD.

NAMEW LAKE MINE/MILL - A REVIEW

REPORT OF HEARING BY
THE CLEAN ENVIRONMENT COMMISSION
May 23, 1991

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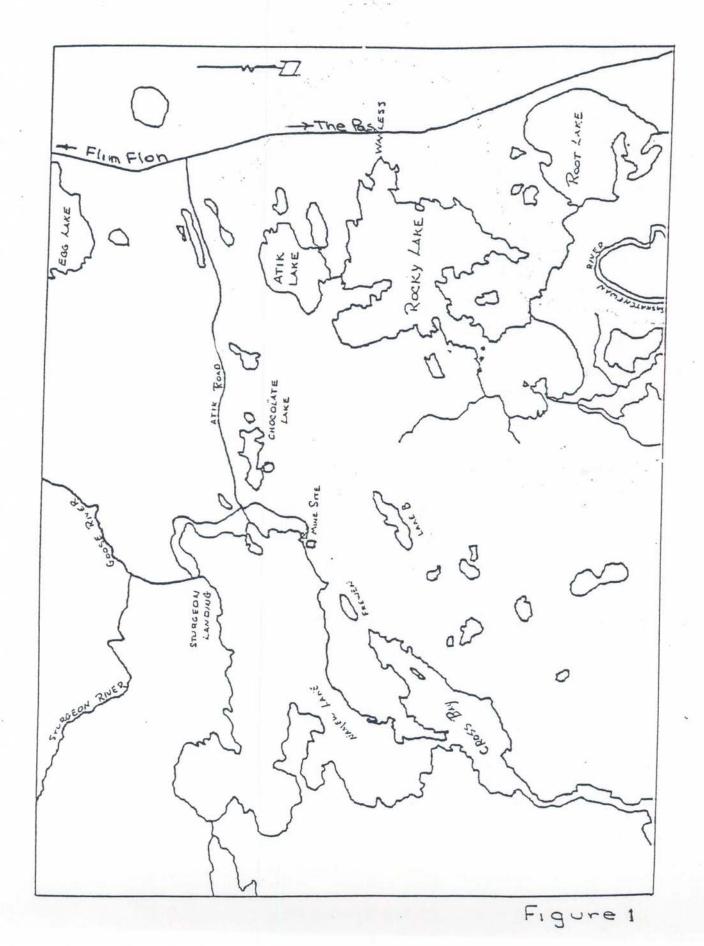
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BACKGROUND

On July 8, 1987, the Hudson Bay Mining and Smelting Co. Ltd. (HBM&S) registered a proposal under the Clean Environment Act with respect to a proposed mine and mill operation for the development of a nickel/copper ore body lying beneath Namew Lake 64 km south of Flin Flon and 1.6 km east of the Manitoba/Saskatchewan boundary (Figure 1). Following the registration of the proposal under this former legislation, construction could begin before an environmental licence was issued. On April 3, 1989, a second proposal was filed under the new Environment Act which detailed a depressurizing/dewatering operation requirement which had not been anticipated prior to the original mine/mill development proposal and which necessitated the disposal of much more mine water than previously forecasted with a poorer mineral quality than had originally been expected.

As a result of concerns about this new condition from both Manitoba and Saskatchewan, the Manitoba Minister of Environment requested that a public hearing on the proposal should be held by the Clean Environment Commission in Saskatchewan as well as Manitoba. A hearing was scheduled for The Pas on June 1, 1989 with a reconvention at Cumberland House, Saskatchewan on June 15, 1989.

The Commission subsequently filed a preliminary set of recommendations for a licence to operate the mine and mill to the Minister of Environment on July 28, 1989. The Commission recommended that a temporary licence be issued to the Company permitting the Company to discharge depressurizing water into a small lake, known as Chocolate Lake, located within the watershed of Namew Lake. The Commission's recommendation to utilize the Namew Lake watershed for effluent discharge rather than the Rocky Lake watershed allayed the concerns of Manitoba residents located in cottage lot subdivisions on Rocky Lake. A Stage 1 Environmental Licence was issued allowing the discharge to Chocolate Lake from the Namew Lake Mine/Mill



operation. The Commission completed its final report with recommendations on September 12, 1989 and a Stage II Environmental Licence was issued to the Company on October 12, 1989.

In this final report, the Commission's licencing recommendations included a range of limits, terms and conditions dealing with effluent and monitoring programs, as well as with operational matters such as a mill water supply reclamation project utilizing water from the tailings residue pond. Because of the absence of a complete data base, and hence some uncertainty as to impacts from the operation, the Commission recommended the formation of a liaison or coordinating committee with stakeholders from appropriate Manitoba and Saskatchewan Government Departments and the communities of Sturgeon Landing and Cumberland House, Saskatchewan. The intention was that this Committee would collaborate with the Company in the design of a monitoring program, limnological surveys of Chocolate and Namew Lakes, and a tailings pond rehabilitation program. It was further recommended that the Commission convene a hearing on or about July 1, 1990 to determine any further mitigative measures that might be desirable based on the results of studies undertaken by the Company on behalf of the Committee.

The Stage 2 Environmental Licence issued by the Department incorporated most of the recommendations of the Commission, including those related to the formation and dynamics of the Liaison Committee. A requirement for the Licence to come under review on or before December 31, 1990 was also specified.

A request to hold this review hearing was received from the Manitoba Minister of Environment on December 17, 1990.

Hearings were held on February 25, 1991 at The Pas, Manitoba and February 27, 1991 in Cumberland House, Saskatchewan. (Delay in the scheduling of the hearing was necessary to permit the Liaison Committee time to complete its report and allow the Company to assemble additional data and reports.)

Approximately 15 people were in attendance at The Pas hearing and over 40 people attended the hearing at Cumberland House. Commissioners present at the hearing were Mr. S. Eagleton, Chairman and Mr. L. Flett, Mrs. J. Vestby and Mr. B. Webster, Commissioners.

REVIEW OF THE OPERATION

Hudson Bay Mining & Smelting Co. Ltd.

A general review of the operation was presented by Mr. W. Fraser, Director of Environment for Hudson Bay Mining & Smelting Co. Ltd.

At the current rate of production, 8,000,000 kg of nickel and 2,700,000 kg of copper are being produced each year. The Company are spending \$35,000,000 annually on payroll services and material. The operation employs 174 Company staff and 28 contractors. In view of the reduced price of metals ore reserves have been written down to 1,500,000 tonnes which would result in the closing of the operation in 1994 rather than in 1995 as originally forecasted. However, the hope and expectation of the Company is that additional ore reserves will be discovered that will extend the life of the operation.

At the outset of the operation it was not known whether sodium cyanide would be required in the mill to assist in the separation of copper and nickel. Under actual operating conditions it was determined that sodium cyanide was not required in the mill process.

Tailings from the mill are discharged to a tailings residue pond where the solids settle and the effluent is decanted to a reclaim pond for re-use in the mill. The Environmental Licence requires that at least 80% of the tailings effluent be reclaimed for use in the mill. Efforts by the Company to date have resulted in a reclamation of at least 85% of these wastes for re-use in the mill. Samples collected to determine the acid generating

potential of the tailings residue pond demonstrate that most of them have a positive neutralizing potential. If this trend continues, the tailings pond should not result in the generation of acid.

Three wastewater streams leave the mine and mill property. One is depressurizing water from the mine, which is brackish to saline in quality. Freshwater is added to reduce the dissolved solids level of the depressurizing water, which is then moved through a pipeline to Chocolate Lake. Mine water, which consists of seepage and cooling water from the drilling operation, is pumped to a wastewater pond along with a portion of process water from the mill, which is highly alkaline. This portion of mill water cannot be reused in the mill since it would upset the metallurgy of the metal extraction and collection process. Its presence in the wastewater pond contributes to the precipitation of metals which subsequently settle in the pond. Excess effluent from the wastewater pond is pumped into the pipeline discharging to Chocolate Lake.

The monitoring of both the quality and the quantity of the effluent flow has been undertaken on the following basis:

Weekly

- mine water discharge to surface
- mill process water
- depressurizing water prior to mixing
- depressurizing water and make-up water mixture
- wastewater storage pond
- discharge from Chocolate Lake

Bi-weekly

- discharge to Chocolate Lake
- tailings pond discharge to reclaim water reservoir
- reclaim water to mill
- Namew Lake raw water

Monthly/Seasonal

- tailings pond influent
- water in waste disposal ground area
- pit between the reclaim reservoir and Namew Lake
- natural pond south west of the waterwater storage pond
- natural springs at the end of Namew Lake Road

The receiving water bodies are also monitored for any effect on quality and for the determination of limnological trends.

The Environmental Licence prescribes limits on a number of pollutants, principally heavy metals in the effluent from the wastewater storage pond. These limits have been met. There is also a limit on the flow and the dissolved solid content of water from the mine depressurizing program. Actual performance has been below these limits. Flows from the depressurizing program have also been well below those anticipated from the underground formation (approximately 20% of that anticipated).

As a result of the depressurizing program, groundwater levels have receded 1.5 metres. At the outset of operations, this groundwater level was higher than the level of Namew Lake. In this regard, it was theorized that, before depressurization, water from underground might have been discharging to the Lake system whereas now, with the recession in the groundwater level, Lake water could be entering the groundwater formation.

The discharge of wastewater to Chocolate Lake began in late 1989. Discharge from Chocolate Lake to Namew Lake began in April, 1990.

Since the initial hearing in 1989, 170,000 trout fingerlings have been added to Chocolate Lake. Although test netting will not take place until the spring of this year indications are that the fingerlings are alive and well. It is expected that the Lake will be turned over to the Department of Natural Resources to be managed as a public fishery.

Based on input from the Liaison Committee, the Company prepared a preliminary decommissioning and rehabilitation plan for the Namew Lake property. In broad principles, the plan was designed to present a fail safe and maintenance free condition with no continuing significant environmental impact. The decommissioning plan is based on shutdown after currently known ore reserves are exhausted.

Following the removal of the equipment and the buildings, footings and foundations will be flattened, shafts and openings plugged, streams and ponds restored to the original levels and courses, waste dumps covered and growth media (with fertilizer additions as needed) will be spread and contoured over the disturbed area. Grasses and cover crops will be planted to encourage revegetation by native species. Within 2 years of closure a sampling program will be undertaken on deposited tailings to determine acid generating potential. Any amendments required to promote vegetation growth will be determined. During this period, observation wells will be constructed to allow groundwater flows to be studied. Monitoring of ponds, streams and wells will continue for at least 5 years, following shutdown, at a frequency and in such number as determined through negotiations with the Liaison Committee.

Pre development aerial photography is available of the Namew Lake operational area. A second photographic flight is scheduled for this summer.

It was the Company's belief that the Liaison Committee has functioned in a useful manner and its continuation was endorsed.

Mr. Fraser was questioned about the quality of some of the analytical data submitted as part of the monitoring program or as a result of the limnological survey. He agreed that data handling and quality assurance left something to be desired at times; however, improvements are being made in both areas. There was also a question concerning the availability of the data to the general public and the ability of concerned local citizens to understand and use this information without further explanation. Mr. Fraser indicated that the primary intent had been that members of the Liaison Committee would use the data for their own purposes.

Environmental Liaison-Committee

The report of this Committee was presented by the Chairman, <u>Mr. Doug</u>

<u>Peterson</u>, an Environmental Engineer with the Environmental Control Branch, of the Manitoba Environment Department.

Mr. Peterson reported that the during the period December 12, 1989 to November 19, 1990 the Environmental Liaison Committee, established by the Department as per recommendations contained in the 1989 Commission Report, held a series of 5 meetings at The Pas or the mine site.

Committee membership consisted of representatives from the Manitoba Departments of Environment and Natural Resources, Saskatchewan Departments of Environment and Parks and Renewable Resources, and the communities of Sturgeon Landing and Cumberland House. There was also a representative from the Hudson Bay Mining & Smelting Co. Ltd. As the Commission had not specifically recommended representation from the Peter Ballantyne and Cumberland House Indian Bands, there had been no representatives appointed from the Indian Bands, although the Bands did make a request to the Chairman, Mr. Peterson, that a member from each be considered. This request had not been granted; however, the Bands had been assured that the groups would be provided with all information exchanged at the meetings.

The Liaison Committee made recommendations to the Company concerning the monitoring of wastewater streams, including sampling locations, parameters and frequency. In addition to what might be thought of as normal sampling sites, the Committee recommended the sampling of a number of surface depressions located near the waste disposal ground area, the wastewater storage pond and the mill reclaim pond area.

Another recommendation concerned limnology studies on Namew Lake near the mine site and in the vicinity of the Chocolate Creek outlet. The sampling program was also to include studies to determine any tendency for the mine effluent to pool in the centre of Namew Lake.

The Committee had also been mandated to examine the use of an alternate drainage basin for effluent discharge, the question of pond management under conditions of record precipitation, the development of a rehabilitation plan to include the acid generating capacity of the tailings basin, and a hydrogeological assessment to review the transport of contaminants through the surface deposits.

The Committee had concluded that the data base could now be used to project the potential environmental impacts from the operation on Namew and Chocolate Lakes; however, there was a need to expand the quality control program for laboratory services.

The Committee recommended that monitoring should be continued over the life of the mine to identify and respond to impacts that should occur.

In the view of its members, the Committee served a useful purpose in providing a forum for discussion and the resolution of concerns. The Committee recommended that the group should be continued and expanded to include representatives from the Indian Bands. As well, the monitoring data,

information study results, and discussions and decisions of the Committee should be prepared in the form of minutes that are made availabe and are understandable to members of the general public. It was recommended that the term of the Committee would extend to cover the period of decommissioning and reclamation.

REPRESENTATIONS

Ms. Rose Dussion spoke on behalf of the Cumberland House and Peter Ballantyne Indian Bands as well as the Prince Albert Tribal Council.

She regretted that representatives from the native communities had not been invited to serve on the Liaison Committee. The native community have great concern about the impacts of wastewater effluent from the mining operations and would like to be kept informed about the project. They would like to participate in the program as members of the Liaison Committee.

Mr. Fosseneuve, a citizen and businessman from Cumberland House and Sturgeon Landing testified that, after listening to the evidence, he was satisfied that the necessary measures were being taken to protect the environment from the impacts of the mining operations.

Mr. McKay, Area Director for the Metis Society of Saskatchewan noted that he had been in correspondence several times with the Hudson Bay Mining Smelting Co. Ltd. to inquire about effluent wastewater discharge to Namew Lake from the mining operation. Mr. McKay also expressed concern that the mine/mill was already operating before the occasion of the original Commission hearings. He also had a series of questions pertaining to "meromyxis". (Both the Company and the Department had investigated "meromyxis" to determine whether the mine wastewater was accumulating in a deep portion in the main body of Namew Lake. If stratification of the wastewater in this deep portion of the Lake were taking place, the minerals from the wastewater could begin to cause stress to the aquatic life in that portion of the Lake. Later testimony at the hearing showed that a meromictic condition did not exist in the Lake.)

Mr. Morin, a resident of Sturgeon Landing, Saskatchewan, noted that he had been fishing and trapping in the area for 40 years. Mr. Morin stated that with the arrival of the mine and as a result of drilling and land clearing, his traplines (located in Saskatchewan but close up to the Manitoba boundary) had failed. He went on to add his opinion that drilling and underground blasting was adversely effecting the fishery compared to 10 years ago and earlier when fishing limits could be attained by Namew Lake fishermen.

Mr. L. Morin, Mayor of the Village of Cumberland House, Saskatchewan, and a member of the Liaison Committee drew attention to the cooperation among members of the Committee such that recommendations, that he brought to the Committee, were followed up and implemented. He re-iterated the concerns of the residents for the Village's water supply and the fishery because the community is located downstream from the mine wastewater discharge into the drainage basin. Although the water supply at Cumberland House is treated and distributed to households, there is a concern that the plant may not have the capability of removing contaminants added to Namew Lake from the wastewater of the mining complex. He noted that, as a result of an Order from the Minister of Environment, samples had been collected from the water system of the Village. He would, however, like to see the sampling frequency increased for both water supplies and the fishery to ensure early warning of any problems that might develop. He also expressed concerns about the assurance of the quality of data, the long period of time taken to report data, and the form of the reporting of data. He wanted assurance that data would be reported in a timely and understandable manner.

Mr. L. Cooper, representing Saskatchewan Department of Environment, reviewed briefly the presentation made by his Department at the 1989 Commission hearing addressing what his agency had considered to be shortfalls in the process. One of their major concerns was that much of the presently available data should have been collected and provided in the initial EIA. He

went on to add that the current data indicates that the effluent quality from the mine wastewater is very good and that no significant adverse direct impacts on aquatic life are anticipated in Namew Lake. He expressed satisfaction that the monitoring program, if continued, can provide an early indication of any problems. He would like to see additional items added to a contingency plan. The decommissioning plan should be revised and updated in response to changing conditions. He would like to see a review by the Hudson Bay Mining & Smelting Co. Ltd. of their quality assurance/quality control procedures. Mr. Cooper also requested that the Liaison Committee be continued and expanded to include members from both the Peter Ballantyne and Cumberland House Indian Bands.

Mr. R. Orr, a representative on the Liaison Committee from the Saskatchewan Department of Renewable Resources, was not able to be present at the hearing; however, he subsequently forwarded a recent fisheries management report on Namew Lake. The report indicated that there had been no significant changes in the abundance of any of the major species of fish in Namew Lake between 1958 and 1989. Further, there had been no significant changes in the size of walleye or pike during this time period. The only major change detected was a decrease in the size of whitefish. The probable cause of this decline was related to fishing effort and the effect on the biology and population dynamics of this species. Any relationship between mining activity and whitefish size up to 1989 would have been tenuous at best and most likely non-existent.

Mr. C. Moche, an Environmental Engineer, with the Manitoba Department of Environment, addressed the matter of Environment Licence enforcement. Data on the chemical parameters that are required to be met by the wastewater from the Namew Lake operation were presented. The data showed that the limits had been met. He also noted that the Company is not using cyanide in the mill process and on that basis he felt that the specified cyanide limit may be removed from the Licence for monitoring purposes. In terms of the Clause

referring to the recycling of mill tailings effluent, this limit had been met and exceeded. He recommended that when the preliminary rehabilitation scheme is approved by the Department, the Licence should incorporate these requirements.

Mr. A. Beck, of the Water Quality Management Section, of the Manitoba Department of Environment, reviewed the data presented by Hudson Bay Mining & Smelting Co. Ltd. In summary, he stated that the sampling program undertaken on Namew Lake did not offer any evidence that the water quality of Namew Lake had been compromised by operation of the mine and mill. He recommended that monitoring of the deep hole of Namew Lake be continued on an annual basis to assure that there is not an impact to the fishery from meromixis. With some qualifications, concerning one or two metals, the water chemistry in Chocolate Lake appeared adequate to support sensitive fish species such as rainbow trout. Because of an ambiguity in the results of arsenic in fish tissue, a split sampling program involving both the Company and the Department was recommended.

DISCUSSION

Namew Lake is located principally in Saskatchewan and in turn discharges to Cumberland Lake and the Saskatchewan River. The Lake has importance as both a sport and commercial fishery as well as being the drinking water source for the communities of Sturgeon Landing and Cumberland House and the Peter Ballantyne and Cumberland House Indian Bands. Cumberland House is the only community with a water treatment and distribution system. The other communities draw their water supply directly from the connecting rivers or lakes.

An overriding issue associated with environmental impacts from wastewater discharged to Namew Lake from the Namew Lake mine/mill complex was the fact that Saskatchewan would receive the wastewater without receiving much, if any, benefit from the operation.

Both the 1989 and the current set of hearings, held in The Pas, Manitoba and Cumberland House, Saskatchewan, focused on the impact of liquid effluent discharges from the mine/mill operation on the receiving water. The two major concerns were the possible adverse effect of the mine/mill effluent on the Namew Lake fishery (commercial, domestic, and sport) and the possible pollution of the domestic water supply of communities on both Namew and Cumberland Lakes.

In its first report to the Minister, in 1989, the Commission recommended the use of Namew Lake as a wastewater discharge route for the mine/mill complex. This recommendation had been predicated on the Company's testimony that the re-use of decant water from the tailings pond would be recycled in the mill to the extent of at least 80% of mill needs; on the fact that process wastewater from the mill would receive adequate treatment; and on the Company's proposal that Chocolate Lake would be utilized as a stabilizing basin before effluent reached Namew Lake; and that a healthy trout fishery would be maintained in Chocolate Lake as evidence of water quality.

Another key recommendation of the Commission was that the environmental licence should require as a condition the establishment of a liaison or coordinating committee to collaborate with the Company in a number of areas that would help identify wastewater monitoring programs, limnological surveys, prevention of accidental spills from ponds, a tailings pond rehabilitation program and an assessment of the hydrogeological effects of the

operation on the surrounding area. In order to keep all parties apprised of these matters, it was further recommended that the Committee include representatives from the Company, the Manitoba Department of Environment and Natural Resources, Saskatchewan Department of Environment and Renewable Resources as well as representatives from the communities of Sturgeon Landing and Cumberland House.

At the review hearings (required by the Stage II licence) it was reported that in 1990 the Liaison Committee had met on 5 occasions. Following advice provided by the Committee, the Company had improved the data base to the extent that a conclusion had been drawn that the wastewater discharge from the mine/mill had not resulted in significant adverse impacts to Namew Lake. Extensive sampling of the Lake had also shown that the wastewater was being mixed in the Lake and was not resulting in stratification in the deepest section.

There had been no good assurance, presented to the Committee or identified at the hearing, that the water supply of the communities and the Indian Bands were being examined with sufficient regularity to satisfy the concerns of the communities or that the results of the analysis of samples were being given to the communities on a timely basis.

Manitoba Department of Environment representatives reported that metal limits imposed on the effluent from the wastewater storage pond in the Licence had been met and that the depressurizing/dewatering mine water (with freshwater dilution) was well below the limit established for flow and mineral concentrations. A hydrogeological analysis by Company consultants projected that wastewater ponds would not impact the acquifer. Company studies also showed that there appeared to be no problem with potential acid generation from mill tailings residue. A preliminary rehabilitation plan had also been filed with the Department.

There was general agreement expressed at the hearing that the Liaison Committee should be continued; however, there was a request expressed by representatives of the Indian Bands for representation on the committee. There was also an expressed need that Liaison Committee meeting minutes, data analyses, or any condition associated with the mining operation that might be perceived to have a bearing on the communities around the Lake, should be presented to the community in an understandable form.

A number of other issues were raised about hunting and fishing and the impacts of the mining operation on these resources. There seemed to be agreement that if these impacts were connected to drilling and underground blasting operation that these would be temporary impacts. It would appear that clearing to establish roads, transmission and pipelines and the mine site itself could not have impacted registered traplines in Saskatchewan bordering on the mine site.

CONCLUSIONS

The Commission concludes that based on the presentations, evidence and argument received at its hearings on February 25 and 27, 1991 in The Pas, Manitoba and Cumberland House, Saskatchewan, that the Environment Licence issued to Hudson Bay Mining & Smelting Co. Ltd. for operation of the Namew Lake mine/mill has not resulted in significant impacts to the resources in the area.

The Commission further concludes that the Liaison Committee established under the Licence has served a useful purpose and should be continued. However, the need to introduce changes to Committee composition and terms of operation were identified. These would include a broadening of Committee membership to include representation from area Indian Bands and a provision whereby meeting minutes and related data analysis would be provided to the general public in a easily understood fashion. The Commission believes

also that the need to maintain continuity within the Committee requires that if a change in chairmanship occurs, a suitable transition period, during which time the present Chairman would remain a member of the Committee, should be provided.

RECOMMENDATIONS

The Commission recommends that a Stage 3 Environment Licence be issued to Hudson Bay Mining & Smelting Co. Ltd. for the operation of the Namew Lake mine/mill operation with changes to the limits terms and conditions of the Stage 2 Licence, as follows:

- (a) Remove reference to cyanide and its limits in Clause 9 a.
- (b) Remove reference to cyanide and frequency of sampling in Clause 10 a.
- (c) Revise Clause 17 to implement the following:

A Committee shall be maintained to provide an opportunity for continuing liaison between the Company, the Province of Saskatchewan, representatives of the Indian Bands and the general public in the area of the mine, and receiving waterway. A representative from the Manitoba Department of Environment should chair the meetings. In the event that the current Chairperson changes, he should work with the new Chairperson for a suitable transition period.

Minutes of the meetings shall be prepared and provided to each member of the Committee with copies of the

minutes made available to the interested public by the Committee members. The minutes should describe the content of discussions and decisions made at the Committee meetings. The minutes should be written in such a manner as to minimize technical language, so as be meaningful to and understandable by the general public.

The role of the Committee shall be to provide a forum for discussion between the public and the Company, to resolve concerns, for the Company to advise the public of activities at the mine site, to review and adjust the needs of the monitoring programs which will include the community drinking water supplies, and to review milestone dates of the decommissioning and rehabilitation plan.

(d) Insert a clause on rehabilitation which reflects the input and consideration of the Liaison Committee.

LIST OF EXHIBITS & PRESENTATIONS

- Honorable J. Glen Cummings, Minister of Environment; <u>Letter</u> of December 17, 1990 requesting that the Commission hold a hearing to review the Namew Lake Licence.
- Doug Peterson, Chair of the Namew Lake Mine Environmental Liaison Committee - Report to the Clean Environment Commission.
- Hudson Bay Mining & Smelting; <u>Presentation</u> to Clean Environment Commission, February, 1991 by W. Fraser.
- 4. Brief to Clean Environment Commission by Cumberland House Band, Peter Ballantyne, Cree Nation and Prince Albert Tribal Council respecting the proposed continued operation of the Hudson Bay Mining and Smelting Namew Lake Mine and Mill presented by Rose Dussion.
- 5. <u>Letters</u> from D. Peterson, Manitoba Environment to Peter Ballantyne and Cumberland House Indian Bands dated May 22, 1990 respecting participation on the Liaison Committee.
- 6. Verbal Presentations by H. Morin, W. McKay, C. Fosseneuve, L. Morin.
- 7. Water Analyses sampled August 29, 1980 by Leonard Morin one at a location described as Bigstone River, the other at Namew Lake Mine site.
- 8. Brief to Clean Environment Commission by Saskatchewan Environment and Public Safety dated February, 1991, respecting the continuing operation of Hudson Bay Mining and Smelting Namew Lake Mine and Mill presented by L. Cooper.
- 9. <u>Series of Analyses</u> presented to the hearing by C. Moche of Manitoba Environment Department concerning the operation of Namew Lake Mine and Mill.
- 10. Presentation to the hearing by A. Beck, Environment Department concerning the water quality data gathered by Hudson Bay Mining and Smelting.
- 11. <u>Letter</u> submission following hearing to Clean Environment Commission under date of March 1, 1991 from R. Orr, Saskatchewan Department of Renewable Resources with respect to Fisheries Management of Namew Lake.