To: Colin Benner

From: Larry Connell

Date: July 14,1994

Subject: **Meeting with NWT Renewable Resources on Giant Roaster Stack Emissions - July 14,1994 at the Giant Minesite**

On July 04th we received a notice by mail indicating that the Minister of Renewable Resources for the Northwest Territories (Silas Arngna'naaq) had on June 24th approved a guideline establishing a maximum desirable standard for ambient concentrations of Sulphur Dioxide and Total Suspended Particulates within the Northwest Territories. A copy of the notice and the guideline is attached.

By way of the same notice the Director of the Environmental Protection Division of the Department of Renewable Resources requested a meeting with Royal Oak to discuss compliance with the guideline at the Giant Mine.

The requested meeting was held on Thursday, July 14th at the Giant mine. In attendance were the following:

Emery Paquin - Director Environmental Protection, NWT Renewable Resources
Jim Sparling - Air Quality Specialist, NWT Renewable Resources
Dave Anthony
Larry Connell

Emery Paquin indicated that he had two items which he would like to discuss:

- Reduction of Sulphur Dioxide Emissions from the Giant roaster stack.
- Results of the 1994 winter snow core survey for arsenic deposition in the Yellowknife area.

A) Reduction of Sulphur Dioxide Emissions from the Giant roaster stack

Emery Paquin informed us that the guidelines establishing maximum desireable ambient concentrations for sulphur dioxide and total suspended particulate had been put into force under the Northwest Territories Environmental Protection Act.

The Department continues to operate a continuous sulphur dioxide monitor set up on the Yellowknife city hall roof. The second monitor has not yet been installed on Latham Island. The one hour guideline is exceeded slightly less than 1% of the time principally when prevailing winds are from the north (winter). Renewable Resources point to their previous monitoring study which indicates that vegetation is being damaged as a result of high sulphur dioxide concentrations at groundlevel to the north of the Giant roaster stack. Emery Paquin indicated that without some voluntary movement or committment from the company the Minister of Renewable Resources would be under strong pressure to legislate a regulation establishing a maximum emission rate from the Giant roaster stack. The numeric standard would be based on an emission level that would ensure compliance with the new ambient air guideline. Best available dispersion knowledge would be used by the Department of Renewable Resources to establish this level.

After some discussion we agreed to persue management approval to participate in a study that would model the sulphur dioxide dispersion characteristics of the Giant roaster stack. The model would be used to evaluate the effect of increased air dilution rates, a higher stack height and any other variables that could aid in meeting the new desireable guidelines for ambient air anywhere within the stack are of influence. The study would be jointly managed by both the NWT Department of Renewable Resources and Royal Oak with the cost shared on a 50-50 basis. A consulting group with specific experience in modelling stack dispersion patterns would be employed for the study. The objective of the study would be to have both parties come to a mutual agreement on what quantitative emission level would have to be met at the point of discharge to meet the territorial guideline.

The timing for the study would be as follows:

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| July - August/94 | Set up Mutually Agreeable Terms of Reference for the Study and Send Out to Approved Consultants to Solicit Proposals. |
| September - October/94 | Review Proposals and seek Management Approvals for Expenditure. Award Study to Consultant. |
| November - January/95 | Carry out Study and Create Dispersion Model. |
| February/95 | Review Draft Report |
| March/95 | Final Report |

Renewable Resources asked us to reconsider the installation of a continuous sulphur dioxide monitor at the stack to generate accurate data to enable the validity of the dispersion model to be checked using actual data. They estimate the cost to be in the order of $100,000.

While not directly stated, cooperation between the two parties on these issues would show the public some movement towards the future reduction of emissions and would provide the NWT Department of Renewable Resources the scientific data on which to base future emission standards. It was restated by Emery Paquin that the department was sensitive to the economics involved and to the possible impact on the employment levels at the mine. The department does not rule out achieving the guidelines by increasing the stack height to achieve the required dispersion patterns.

I would recommend that we persue participation in this joint study and investigate the cost involved in installing a continuous sulphur dioxide monitor early in our 1995 capital year. This will at least stretch out the time period at which new emission standards specific to our stack would be expected and provide us with data on how we can achieve the guideline through improved dispersion of the roaster off gas.

B) Results of the 1994 Winter Snow Core Survey for Arsenic Deposition in the Yelowknife Area

Emery Paquin presented us with a copy of a report prepared by Ferguson, Simek, Clark on a 1994 winter snow core survey carried out in the Yellowknife area under contract to the NWT Department of Renewable Resources (approximate study cost - $15,000). Mr. Paquin stated that the survey implied arsenic deposition rates during the winter of 1994 that were about 250% of the mean measured during the last survey conducted in 1986 by Environment Canada. The Department is preparing to make the report public sometime in the near future (next week) and wanted to present us with the data in advance of the release. The report has been submitted to the NWT Department of Health for a health risk assessment.

Mr. Paquin advised us that the procedures and analytical techniques used during this study are some what different than those used in 1986 reflecting more modern and theoretically more accurate analytical procedures. This complicates direct comparison of the results.

Mr. Paquin indicated that this data is not fully confirmed by the continuous air monitoring data collected in Yellowknife which indicated a small increase in the 1993 ambient arsenic air levels. The 1993 levels were however below the concentrations measured in 1985, 86, 87 and 88.

We asked whether the report had to be released next week or whether it could be delayed so that it did not have any impact on Royal Oak's current negotiations to purchase the shares of Lac Minerals, especially given the conflicting indications. They were not in a position to respond to our request but did assure us that they would give us advance knowledge of the release of the report.

We should however recognize that many people already know of the existence of the study and are pressing for the results to be made public.

On a closing note, Mr. Paquin reported that the investigation under the NWT Environmental Rights Act regarding ammonia discharges into Back Bay has been closed. The Department is satisfied that the mine is in compliance with the regulatory requirements for ammonia discharge levels and has responded accordingly to the complainants.