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December 20, 1995

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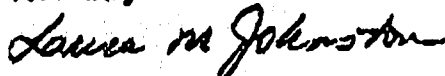
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Re: Arsenic Releases in the NWT

Dear Sir:

I have attached a copy of our December 15, 1995 draft report "Reducing Arsenic Releases to the Environment in the Northwest Territories, Action Plan to Develop Control Options". Environment Canada is seeking your advice on the adequacy of this action plan before it is finalized. We will contact you before January 12, 1996 to solicit your comments or to find out if you require more time to review the report. Thank you in advance for your input.

Yours truly



Laura M. Johnston  
 Division Manager

cc Ed Collins  
 Bill Howard  
 Tim Coleman

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# **REDUCING ARSENIC RELEASES TO THE ENVIRONMENT IN THE NORTHWEST TERRITORIES**

## **Action Plan to Develop Control Options**

**Draft for Consultation**

**December 15, 1995**

**Prepared By: Environmental Protection Branch  
Environment Canada**

## INTRODUCTION

Arsenic is a naturally occurring substance found most often in compounds with sulphur either alone or in combination with various metals. Arsenic is present in the environment because of natural processes, and human activities including metal processing, the use of arsenical pesticides, coal-fired power generation and the disposal of domestic and industrial waste materials.

Metal production facilities are the principal sources of arsenic released into the Canadian environment from human activities. Based on release data from the National Pollutant Release Inventory (NPRI) for 1993, 40 facilities reported arsenic releases totalling 23.7 tonnes to water and 71.6 tonnes to the air. The release figures from the NPRI report do not include data from Giant Mine in Yellowknife, which subsequently reported annual releases for 1993 of 0.6 tonnes to water and 3.0 tonnes to the air.

In 1994, "Arsenic and its Compounds (Priority Substances List Assessment Report)" was released. The report concluded that arsenic is toxic as interpreted under section 11 of the Canadian Environmental Protection Act (CEPA). This report states "This approach is consistent with the objective that exposure to non-threshold toxicants should be reduced, wherever possible, and obviates the need to establish an arbitrary *de minimis* level of risk for determination of "toxic" under the Act."

In June 1995, the Government of Canada released its "Toxic Substances Management Policy" which outlines the steps to be taken for the PSL substances that were assessed and found to be "toxic". According to this policy, arsenic is to be managed as a "Track 2" substance, with the goal of reducing releases to the environment to the greatest extent practicable.

Also in June 1995, the House of Commons Standing Committee on Environment and Sustainable Development released its report "It's About our Health! Towards Pollution Prevention". Chapter 13 of this report deals with "The North" and Recommendation No. 107 in this chapter states "The Committee recommends that the Minister of the Environment and the Minister of Health conclude their determination of the measures they plan to apply to arsenic by December 1995". While Recommendation No. 107 itself is quite broad, the information preceding the recommendation appear to restrict it to arsenic releases in the Northwest Territories.

The purpose of this paper is to describe the actions that have been taken and are being planned by the federal Departments of Environment and Health in response to the concern about arsenic releases in the Northwest Territories.

## SCOPE

The major sources of arsenic releases in the NWT are mines, mills and smelters. Although it is recognized that existing levels of arsenic in the environment may be due, in part, to historical release practices, this project will focus on releases resulting from the current daily operation of these facilities.

## OBJECTIVES

The objectives of the project described in this Action Plan are to:

1. Determine the effectiveness of the existing regulatory regime and control measures in reducing arsenic releases to the environment to the greatest extent practicable;
2. Determine if further reductions in arsenic releases should be recommended given current human exposure and/or release levels, and taking account of scientific, technological and socio-economic considerations;
3. If reductions are recommended, assess various management options for reducing arsenic releases; and
4. Recommend the most cost-effective and environmentally efficient option for implementation.

## TASKS

The tasks required to achieve the objectives can be categorized into the following areas:

- A. Existing Situation
- B. Control Technology Options
- C. Environmental Inputs
- D. Socio-economic Impacts
- E. Management Options
- F. Technical Report

### A. Existing Situation

Examination of the existing regulatory regime for the control of arsenic releases to the environment and determination of quantities of arsenic being released.

**B. Control Technology Options**

Identification and assessment of alternative technologies and their associated costs to determine whether arsenic releases can be reduced from present levels, and to what extent they can be reduced.

**C. Environmental Inputs**

Quantification of arsenic inputs to the environment based on the release reductions that are achievable using the alternative technologies identified above.

**D. Socio-economic Impacts**

Assessment of the costs and benefits associated with additional reductions in releases of arsenic to the environment.

**E. Management Options**

Assessment of all management options to ensure that the most cost-effective and environmentally efficient option is implemented.

**F. Technical Report**

Completion of a technical report summarizing all of the information gathered in the above tasks.

**PROGRESS TO DATE**

Environment Canada has assembled a task force with expertise in pollution control technology, environmental modelling and sampling, health issues, economics, and legal issues. The following outlines the accomplishments of the task force to date.

## **A. Existing Situation**

The following work has been completed to date.

### **a) Releases to Water**

- i** Environment Canada has examined arsenic releases to water for all mines operating in the Northwest Territories. This involved the determination of existing regulatory controls, research on actual releases to water from operating mines, and the determination of other initiatives that may be addressing this issue.
- ii** Releases to water are presently controlled through the Water Licensing process of the Northwest Territories Waters Act, the pollution prevention provisions of the Fisheries Act, or the Metal Mining Liquid Effluent Regulations (MMLER) of the Fisheries Act.
- iii** All mines generally comply with the existing requirements for allowable releases of arsenic to water.
- iv** Presently, the "AQUAMIN" Program is examining the adequacy of the release limits contained in the MMLER with a view toward amending the MMLER if the program finds that the existing limits do not adequately protect the environment. The final report from the AQUAMIN Program, expected in April, 1996, will address possible reductions of arsenic releases to water.
- v** Based upon the above findings, this project will not consider releases to water.

### **b) Releases to Air**

- i** There are presently no regulations controlling the release of arsenic to the air in the NWT, although the statutory authority exists in several pieces of legislation. Environment Canada's primary legislation for dealing with arsenic releases to the air is the Canadian Environmental Protection Act.
- ii** The only facility in the Northwest Territories releasing quantities of arsenic to the air is Royal Oak Mines Inc.'s Giant Mine in Yellowknife from the operation of its roaster.

- iii Under the "Strategic Options Process" (SOP), fourteen issues tables have been established to examine reductions of the releases of toxic substances to the environment. Four of these will be devoted to the reduction of arsenic emissions and other toxic substances from base metal smelters, coal-fuelled power plants, iron and steel plants, and wood preservation facilities.
- iv CEPA was not intended to be used to control activities on a site-specific basis. Therefore, the examination of options for the reduction of arsenic releases will consider releases on an industry-wide basis in Canada. Besides the gold roaster at Giant Mine, there is only one other gold roaster in Canada. It is located at Golden Bear Mine in British Columbia, and has been out of operation since 1994.
- v Staff of Environment Canada have met with management of Giant Mine to advise them of our plans, and to obtain information about the gold processing and pollution control technology at the mine. All of the requested information has been received and is being analyzed.
- vi Staff of Environment Canada have met with officials of the Territorial Department of Renewable Resources to advise them of our plans, and to ensure that efforts to control arsenic and sulphur dioxide releases at Giant are harmonized.

## NEW ACTIONS

Before finalizing the Action Plan, this draft will be submitted to interested parties, with an offer to consult in December, to gain additional input before submitting the final Action Plan to the Minister.

### A. Existing Situation

- a) The task force will continue to analyze information received to date regarding arsenic releases.
- b) The task force will obtain information regarding arsenic emissions at the presently mothballed Golden Bear Mine in British Columbia.
- c) The task force is collecting information on arsenic emission or ambient standards that are used in other parts of the world.

## **B Control Technology Options**

- a) Environment Canada has awarded a consultant contract for the identification and assessment of commercially available technology for controlling arsenic releases along with their associated costs. The final report from the consultant is due February 15, 1996.
- b) The task force is completing research to identify alternative technologies that may be used to process the types of gold-bearing ores that are presently being roasted.

## **C Environmental Inputs**

- a) Environment Canada is establishing an air sampling station in Ndilo to measure airborne arsenic concentrations. Environment Canada has commenced discussions with the Yellowknives Dene Band to reach an agreement on location and operation of the station, with the goal of having the Band operate and maintain the station.
- b) The task force will undertake Dispersion Modelling to predict ambient concentrations of arsenic based on various emission levels. This information will be used to validate the results of the air sampling station, and to estimate arsenic concentrations in other locations in the Yellowknife area.

## **D Socio-Economic Impacts**

- a) The task force will examine the costs and benefits of specific control options for arsenic releases to ensure that they are practicable. This will take into account the balance between health, scientific, technical, and socio-economic considerations.

**E Management Options**

- a) If further reductions in arsenic releases are recommended, the task force will identify and assess various management options to determine which will be the most cost-effective and environmentally efficient mechanism for controlling arsenic emissions to the air from gold roasters. Management Options could include:

- Guidelines;
- Codes of Practice;
- Economic Instruments;
- Voluntary Control Agreements; and
- Regulations.

**F Technical Reports**

- a) All of the technical information will be summarized in a comprehensive report. The draft of this report is scheduled for completion by the end of March 1996, and it will be distributed to interested parties and the general public for review upon completion.
- b) Public consultation will be done during a 60 day period following distribution of the draft report. The goal of the consultation is to achieve consensus on which management option(s) should be implemented. The consultation period is scheduled to end at the end of May 1996.
- c) The final report containing the information in the draft report and the results of the consultation is scheduled for completion by the end of July 1996, two months after the consultation has been completed.