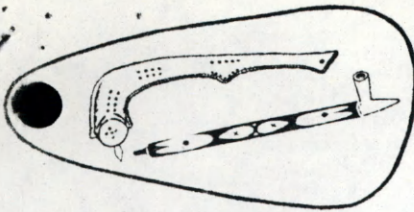


MINISTER'S CORRESPONDENCE



111 850-S-X757 60-7-1
NATIONAL INDIAN BROTHERHOOD

SUITE 1610, VARETTE BUILDING 130 ALBERT ST., OTTAWA, K1P 5G4 (613)236-0673

TELEX 053-3202

Dept. of National Health & Welfare
Minister's Office
RECEIVED

JUN 12 1975

Ministère de la Santé Nationale et
du bien être social, Cabinet du Ministre
REÇU

June 10, 1975

Hon. Minister Marc Lalonde
National Health & Welfare,
House of Commons,
OTTAWA, Ontario.
KIA OA6

Dear Sir:

The National Indian Brotherhood is sending your office copies of the material we are enclosing in our information package, which will go out to all persons who request backup information for our press release on our Arsenic Study of May, 1975.

1. N.I.B. press release June 2, 1975 - Human Arsenic Study
2. Memoranda to D. J. Emery concerning air emissions of Arsenic from Smelter in Yellowknife.
3. N.I.B. press release June 2, 1975 - Yellowknife snow samples for arsenic.
4. Memorandum from H. Veldhuizen to C. A. Lewis concerning a review of new information in relation to carcinogenic characteristics of arsenic.
5. Selection of general newspaper articles concerning the material.

Although the National Indian Brotherhood has done a survey on Arsenic using a small sample number, it is our opinion that the analytical procedures used on our hair sample (neutron activation at University of Toronto) was accurate, and our field staff took some interesting and appropriate factors into consideration during the sampling procedures. Dr. F. H. Hicks, of your Ministry, has a full understanding of these details.

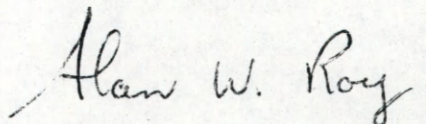
June 10, 1975

The National Indian Brotherhood was wondering if the Department of Indian Affairs had been contacted in order to facilitate obtaining samples from volunteers from the Indian Communities. The National Indian Brotherhood understands that sampling stations were set up by National Health and Welfare, and the Indians had to go to these to give samples. This is not appropriate for Indian adults or for Indian children—as officials of Indian Affairs might tell you. Also, only 8% of the 700 persons sampled in the National Health and Welfare survey were Indian and this, the National Indian Brotherhood feels, is not adequate.

The National Indian Brotherhood would also like to bring to the attention of yourself, and the other ministers involved, the memorandum from one official of Environment Canada, which reflects an attitude of secrecy when large corporations and human health surveys are involved. Possibly Minister J. Sauve could comment on why a review of carcinogenic characters should not be commented on publically by the government of Canada when Arsenic contamination in Yellowknife is so revelant at this time.

The National Indian Brotherhood would appreciate any comments made in relation to the above points.

Environmentally yours,



Alan W. Roy
Research Director
Mercury Study.

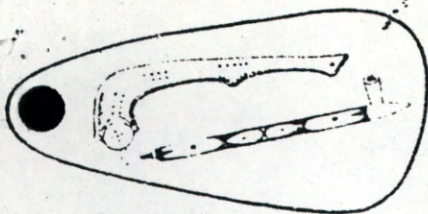
AWR/ms

Encls.

cc: President James Wah-Shee,
Indian Brotherhood of the N.W.T.

Minister Judd Buchanan,
Department of Indian Affairs and N.D.

Minister Jeanne Sauve,
Environment Canada.



NATIONAL INDIAN BROTHERHOOD

SUITE 1610, VARETTE BUILDING 130 ALBERT ST., OTTAWA, K1P 5G4 (613)236-0673

MERCURY PROJECT

TELEX 053-3202

2 June 1975

FOR IMMEDIATE RELEASE

ARSENIC IN YELLOWKNIFE: FEDERAL STUDY MISSES POISONED CHILDREN, IGNORES CANCER HAZARD

An independent survey of arsenic levels in the hair of Yellowknife residents, done in March 1975, shows that more than one-third of the individuals tested had levels that were unacceptably high. Furthermore, two children tested also showed dangerously elevated levels of mercury.

In February of this year, Health and Welfare Canada undertook another "public relations" survey in Yellowknife, and the results of that survey were released on May 27th with the statement: "It is not likely that arsenic poses a health hazard for residents of Yellowknife, other than mill or mine workers." But contradictory evidence--showing that Yellowknife residents, and particularly Indian people, are at risk--appears in a study undertaken jointly by the National Indian Brotherhood, the Indian Brotherhood of the Northwest Territories, and the University of Toronto's Institute of Environmental Sciences. The independent study was done just after the government study, and raises serious questions about the validity of Ottawa's conclusions.

In the NIB-IBNWT-UofT study, 18 Indian residents of the Detah and Latham Island communities were tested for arsenic and mercury in their hair. Five out of six children under the age of 13 had either an arsenic level higher than 5 ppm (the arbitrary level chosen by Ottawa as indicating "arsenic exposure") or had mercury levels higher than 60 ppm (Ottawa's "maximum safety level").

Why weren't these children found by Ottawa? How many more children with high levels like this live in Yellowknife--particularly in Indian communities? How long will they continue to be exposed to the cancer-causing effects of arsenic, while Ottawa insists that "it is not likely that arsenic poses a health hazard"?

If public health were really Ottawa's concern--instead of public relations--then a real attempt would have been made in Yellowknife to find people who were most at risk from arsenic poisoning. And a real attempt would be underway now to protect future generations by eliminating arsenic emissions from Giant Mines.

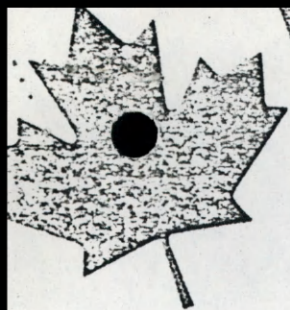
The National Indian Brotherhood-Indian Brotherhood of the Northwest Territories-University of Toronto results (in parts per million) from hair samples obtained in March 1975 are as follows:

Children				Teenage and Adults					
Age	Home*	Arsenic	Mercury	Age	Home*	Arsenic	Age	Home*	Arsenic
4	D	6.0		13	D	0.9	47	D	3.8
6	L	6.2	90	13	L	1.3	47	L	1.6
6	L	19.2		17	D	1.8	48	L	8.4
10	L	2.9	180	18	L	5.6	50	L	2.4
10	L	22.5		31 ⁺	L	0.45	68	D	3.6
12	L	3.7		38	D	3.0	75	D	4.8

+ Control sample from Latham Island resident who avoids fish and does not drink Bay water.

* L = Latham Island; D = Detah.

A copy of Health and Welfare Canada's news release on their 1975 study is attached for your information. (Copies of previous federal studies of 1955 and 1969, describing the arsenic hazard, may be available in Ottawa.)



news release

1975 - 86

May 27, 1975

YELLOWKNIFE ARSENIC STUDY RESULTS PUBLISHED

OTTAWA - Health and Welfare Minister Marc Lalonde today released the findings of the recent survey of arsenic levels in hair samples taken from residents of Yellowknife, N.W.T. The survey was conducted as a follow-up to a previous study on arsenic in the environment in Yellowknife. Arsenic levels in hair are not a measure of a degree of health risk since actual body levels may be substantially lower. They do however indicate the degree of exposure to arsenic and are therefore of value in determining whether individuals should be further examined for body levels.

Major findings of the survey are:

- individuals employed in specific mill occupations showed significantly higher levels than the population as a whole, and require further examination and investigation. Underground miners did not show significant levels
- over 90 per cent of the other Yellowknife residents tested had arsenic levels of less than 5 ppm in their hair
- there is no correlation between arsenic levels and drinking water sources in Yellowknife
- samples which were analysed for mercury contamination as well as arsenic all showed levels well within accepted norms.

...2



Health
and Welfare
Canada

Santé et
Bien-être social
Canada

The survey program was carried out in February, and consisted of the taking of hair samples from a large number of Yellowknife residents for the purpose of analysis for arsenic content. Hair sampling is the most rapid method of initial screening for a large number of people and provides a measure of the degree of exposure to arsenic of those tested. Persons who have no significant levels of arsenic in their hair will not have significant levels in their bodies. On the other hand, arsenic in hair may result from ingestion of arsenic or may merely represent arsenic deposited on the surface of the hair from fallout in the air, and significant levels in hair have often been found associated with insignificant levels in the body. For this reason, it was announced at the time of the survey that those persons whose hair samples revealed a significant degree of exposure would be asked to have a further investigation to determine if any risk to their health exists.

In assessing the results of the survey, Medical Services Branch officials emphasized that there are differences of opinion among scientists as to what constitutes an elevated arsenic level in hair. Levels up to 10 ppm have been found in populations with no known exposure to arsenic and this level is considered to be acceptable by some authorities. Others regard 5 ppm as a level that can be accepted as occurring in non-exposed populations.

A total of 700 persons volunteered to be tested. The survey findings for arsenic are as follows:

	<u>Under 5 ppm</u>		<u>5-10 ppm</u>		<u>Over 10 ppm</u>		<u>TOTAL TESTED</u>
	<u>No. of persons</u>	<u>% of total</u>	<u>No. of persons</u>	<u>% of total</u>	<u>No. of persons</u>	<u>% of total</u>	
Mine & mill workers	<u>61</u>	45.2	<u>30</u>	22.2	<u>44</u>	32.6	<u>135</u>
Other residents	<u>516</u>	91.3	<u>30</u>	5.3	<u>19</u>	3.4	<u>565</u>
All persons tested	<u>577</u>	82.4	<u>60</u>	8.6	<u>63</u>	9	<u>700</u>

In addition to testing all hair samples for arsenic, 20 per cent of the samples were also tested for mercury content, as an earlier study had indicated the possibility of mercury contamination also occurring as a result

of the processing of gold ore in the mill. All samples tested for mercury had levels of less than 10 ppm with one exception which was 25 ppm. Since the presently accepted maximum safety level for mercury is 60 ppm it is not considered necessary to do any follow-up studies on the mercury levels at this time. Furthermore, mercury has not been used in the processing of gold ore in Yellowknife since September 1968.

Clearly, the mine and mill workers as a group have a higher level of arsenic in hair than would be expected in a non-exposed population and follow-up action in respect of this group is necessary.

Although levels of arsenic in the vast majority of other Yellowknife citizens are below 5 ppm, and are therefore similar to levels for a non-exposed population, the levels of certain individuals in this group indicate the need for further investigation.

There was no correlation found in the survey between arsenic levels and drinking water sources. Particularly close attention was paid to any possible relationship between arsenic levels and drinking water sources in Yellowknife as a result of concerns which had been expressed in recent months. The study found no correlation between the two, and therefore corroborates the findings of the water testing program carried out earlier this year.

As a result of the survey, further work will be carried out as follows:

1. All persons found to have hair levels of arsenic greater than 10 ppm will be asked to undergo an investigation which will include a specially designed diagnostic questionnaire combined with a physical examination, including a 24-hour urine sample for arsenic levels.
2. Concurrent with the above, and in co-ordination with other agencies, the environment in the mine and mill will be examined to identify sources of arsenic pollution and to measure the concentration of arsenic to determine the extent of exposure and to recommend corrective measures if indicated.
3. If the results of the medical examinations of those people whose levels exceeded 10 ppm indicate the need, similar investigations of persons found to have arsenic levels in the hair of between 5 and 10 ppm will then be undertaken.

In summary, the results of the survey indicate:

- (a) a health hazard may exist for workers in specific jobs in the mill and mine.
- (b) it is not likely that arsenic poses a health hazard for residents other than mill or mine workers. A small number of individuals had levels of arsenic in hair higher than expected in a non-exposed population, and these persons need further examination.
- (c) there is no correlation between arsenic levels and the source of the water supply in Yellowknife.

Further work will be carried out to determine the risk to the health of individual persons and to assess whether the levels of exposure in the mill and mine need further control.

Letters have gone out to all persons who participated in the survey informing them of their individual results and advising them of the significance of those results and of the further planned investigation.

MEMORANDUM

D.J. Emery; c.c. A.K.C.

Date October 1st, 1974

H.E. Pawson

Ref. _____

Subject Stack Tests 1974 Series

Stack sampling tests conducted on June 10, 1974, June 17, 1974, July 25, 1974, and September 13, 1974 were performed incorrectly.

I became concerned after returning from vacation and discussed the test results with A.C. He was upset about the results but could offer no reason since he was doing the tests as he had been shown by M. Lane.

I contacted the mine inspector and asked if they had the talent available to check out our method. As a result, J. Knight of the Mines Branch at Elliot Lake arrived here in September in conjunction with some other studies.

He accompanied A.C. up the stack to check out our method. After a very short time he returned with the answer.

It would appear that an incorrect hook up on the draft gauge used in calculating gas velocity was the source of error. A.C.'s hook up was providing static pressure only which in turn gave an exceedingly high gas velocity. Mr. Knight claimed this would introduce a 50% error in the velocity.

If this is true, then it would be quite in order to assume another 1.5% collection efficiency conservatively speaking.

Thus, for the September 13, 1974 stack test total collection efficiency would be 95.59% rather than 94.09%.

Stack tests taken this year are generally low because of the numerous interruptions to operation experienced this year. It takes hours to get the Cottrell up to operating temperature after a shutdown and quite frequently operating temperature is not achieved before the next stoppage. Needless to say this affects stack emissions.

Something never before experienced has come to light this past year in the Baghouse. Orlon shrinkage has literally made all compartments terribly inefficient. This shrinkage is directly attributable to the stoppages.

This test is the last of the series unless weather improves.

D.J. Emery; A.K. Campbell; H.E. Pawson

June 12, 1974

A. Cheng

Date

From

ROASTER STACK FILTRATION TEST

Ref

Subject

Sampling Date: June 10, 1974

Gas Temperature: 170°F

Gas Velocity: 17.40 ft/sec.

Gas Volume: 65,146 c.f.m.

Weight of Arsenic lost to Atmosphere: 729.84 lbs/day

Arsenic in Roaster Feed 15,700 lbs

Arsenic in Roaster Calcine: 2,460 lbs.

Arsenic in Cottrell Dust: 560 lbs.

Arsenic to Baghouse: 12,680 lbs.

Baghouse Collection Efficiency: 94.24%

Total Dust Collection Efficiency: 94.49%

AC/svh

A.K. Cheng
A. Cheng
Mill Engineer

D.J. Emery; A.K. Campbell; H.E. Pawson

June 24, 1974

A. Cheng

Date

From ROASTER STACK FILTRATION TEST

Ref.

Subject Sampling Date: June 17, 1974

Gas Temperature

170°F

Gas Velocity

17.86 ft./sec.

Gas Volume

66,863 c.f.m.

Weight of Arsenic lost to Atmosphere

1032 lb/day

Arsenic in Roaster Feed

23,580 lbs.

Arsenic in Roaster Calcine

3,140 lbs.

Arsenic in Cottrell Dust

980 lbs.

Arsenic to Baghouse

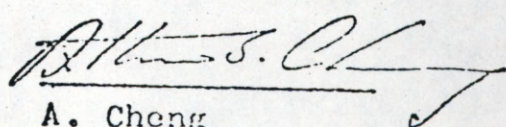
19,460 lbs.

Baghouse Collection Efficiency

94.70%

Total Collection Efficiency

94.95%


A. Cheng
Mill Engineer

D.J.E.; A.K.C.; H.E.P.;
From A. Cheng
Subject ROASTER STACK FILTRATION TEST

Date July 30, 1974

Ref.

Sampling Date: July 25, 1974

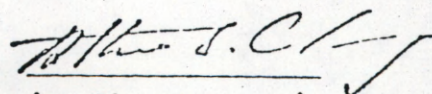
Gas Temperature	171°F
Gas Velocity	16.99 ft./sec.
Gas Volume	63,610.56 c.f.m.

<u>Weight of Arsenic lost to Atmosphere</u>	<u>983.47 lb/day</u>
---	----------------------

Arsenic in Roaster Feed	22,800 lbs.
Arsenic in Roaster Calcine	2,940 lbs.
Arsenic in Cottrell Dust	500 lbs.
Arsenic to Baghouse	19,360 lbs.

Baghouse Collection Efficiency = 94.92%

Total Collection Efficiency = 95.05%



A. Cheng
Mill Engineer

D. J. Emery, A. K. Campbell, H. E. Pawson ✓

Date September 19, 1974.

from A. Cheng.

Ref.

Subject ROASTER STACK FILTRATION TEST.

Sampling Date:	September 13, 1974
Gas Temperature:	163°F
Gas Velocity:	16.66 Ft./Sec.
Gas Volume:	62,375.04 c.f.m.
<u>Weight of Arsenic Lost to Atmosphere:</u>	<u>1,110.47 Lbs./Day</u>
Arsenic in Roaster Feed:	22,020 Lbs.
Arsenic in Roaster Calcine:	3,220 Lbs.
Arsenic in Cottrell Dust:	540 Lbs.
Arsenic in Baghouse:	18,260 Lbs.
Baghouse Collection Efficiency:	93.92%
Total Dust Collection Efficiency:	94.09%

W. H. S. C. /

MEMORANDUM

D.J. Emery; c.c. A.K.C.; H.E.P.

Date October 18, 1974

From R.J. Tucker

Re

Subject ROASTER STACK FILTRATION TEST

Sampling Date: October 11, 1974

Gas Temperature 150°F
Gas Velocity 9.69 ft/sec.
Gas Volume 36,261 c.f.m.

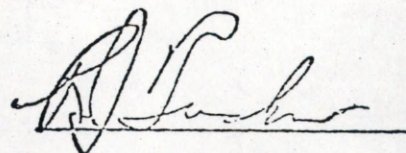
Weight of Arsenic Lost to Atmosphere 591 lb/day

Arsenic in Roaster Feed	21,680 lbs.
Arsenic in Roaster Calcine	3,180 lbs.
Arsenic in Cottrell Dust	480 lbs.
Arsenic to Baghouse	18,020 lbs.

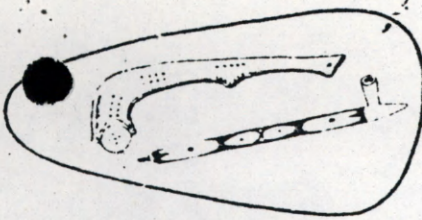
Baghouse Collection efficiency - 96.72%

Total Collection efficiency - 96.81%

RJT/svh



R.J. Tucker
Mill Metallurgist



NATIONAL INDIAN BROTHERHOOD

SUITE 1610, VARETTE BUILDING 130 ALBERT ST., OTTAWA, K1P 5G4 (613)236-0673

TELEX 053-3202

2 June 1975

FOR IMMEDIATE RELEASE

ARSENIC IN YELLOWKNIFE: SNOW SAMPLES SHOW "EMERGENCY" ARSENIC LEVELS

Results of a preliminary analysis of snow in the Yellowknife area, prepared on March 12, 1975, by the District Manager, Environmental Protection Service, Yellowknife, show that in 11 out of 12 samples the arsenic level exceeded "emergency" levels; in one case the sample contained 38 times the emergency level. In no sample was the arsenic level found to be "acceptable." This situation represents an extremely grave threat to public health. Measures to eliminate this threat must be given urgent priority.

A copy of the EPS analysis, previously unreleased, is attached.

Health and Welfare Canada's position on what constitutes an emergency level of arsenic may be found in "An Investigation of the Health Status of Inhabitants of Yellowknife, Northwest Territories" by A. J. de Villiers and P. H. Baker, 1969 (from the Environmental Health Directorate, Occupational Health Division, Ottawa). Two relevant pages from this study are attached.

March 12, 1975

C. A. Lewis
District Manager
Environmental Protection Service
Yellowknife, N.W.T.

4045-1/YE/ES

DISTRIBUTION

**RE: RESULTS OF PRELIMINARY ANALYSIS OF SNOW IN THE YELLOWKNIFE
AREA**

Please find attached the results of the analysis of twelve samples of snow collected on February 17, 1975 at the stations shown on the enclosed map.

Each sample was collected from about the top six inches of undisturbed snow using non-metallic containers. The samples were melted indoors, and pH was determined when the liquids reached room temperature. Arsenic, antimony and conductivity were measured by the water quality laboratory, Environment Canada, in Calgary, Alberta.

More intensive sampling is planned for the week of March 17 to 21.

For your information and comment.

C. A. Lewis
District Manager

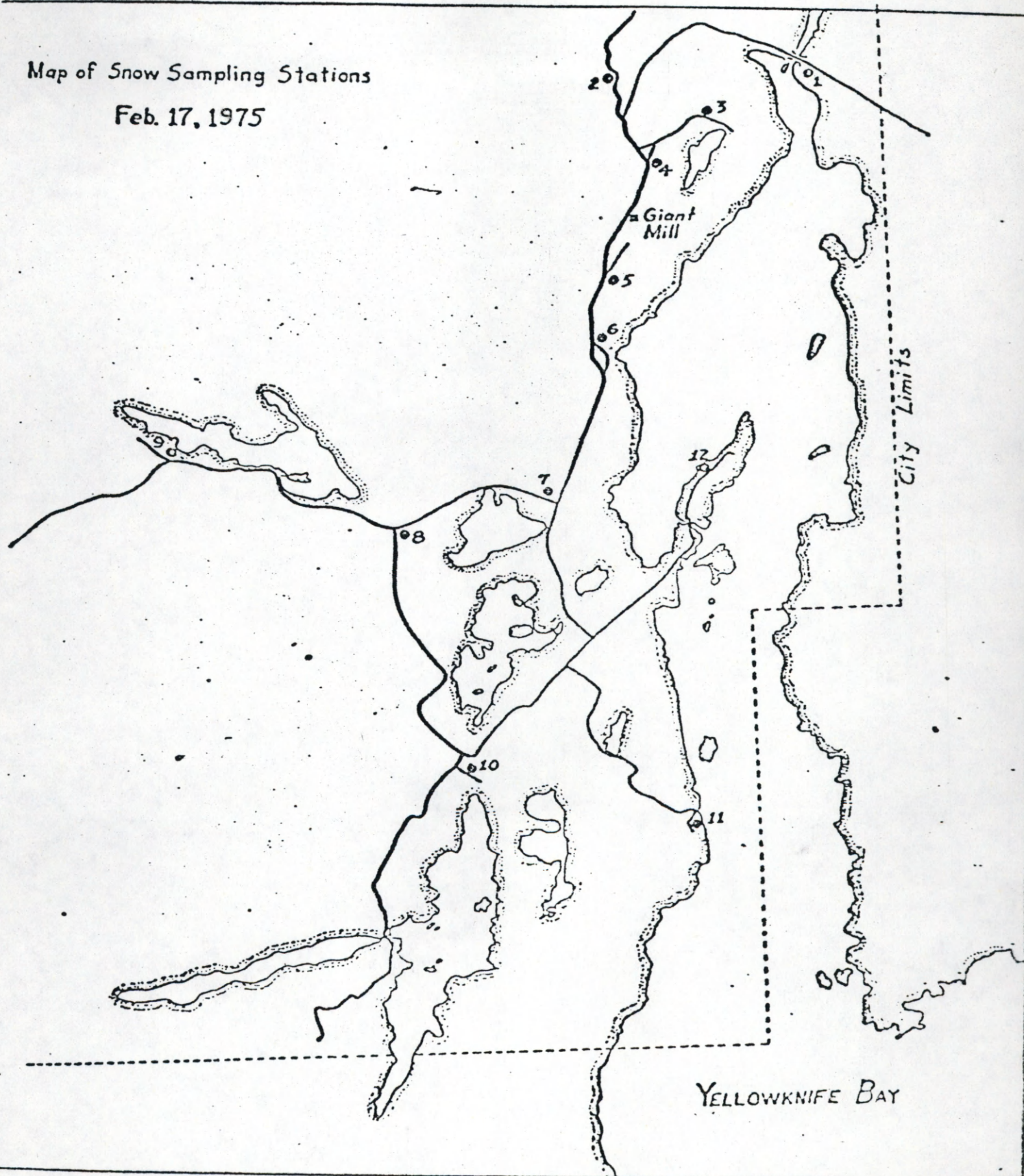
DISTRIBUTION:	D. Billing	A. O. Uygur
	R. D. P. Eaton	H. Veldhulzen
	H. J. Hardin	M. A. Forbes
	A. R. Pick	J. McLaren

CHEMICAL PROPERTIES OF SNOW SAMPLES COLLECTED NEAR
YELLOWKNIFE, N.W.T., ON FEBRUARY 17, 1975

STATION	pH	CONDUCTIVITY (umho/cm)	TOTAL ARSENIC (mg/l)	TOTAL ANTIMONY (mg/l).
1	3.4	190	0.46	0.0076
2	3.7	147	0.44	0.0052
3	3.9	70	0.48	0.0050
4	3.6	130	0.81	0.012
5	6.6	39	11.4	0.027
6	6.7	43	0.71	0.0082
7	4.4	54	9.1	0.017
8	4.4	34	1.3	0.0073
9	4.2	40	8.6	0.020
10	4.2	73	0.50	0.0032
11	4.2	23	0.027	<0.0015
12	3.6	49	2.3	0.017

Map of Snow Sampling Stations

Feb. 17, 1975



In examining Table A1.4, no trend in time is apparent either as regards the overall averages for the years or for the months within the years. There is, however, a sizeable variation by month, the arsenic concentration being considerably higher during the spring run-off period of May, June and July than in the remainder of the year.

Table A1.5 contains data illustrating the degree of contamination of the drinking water supply at the Consolidated Mining and Smelting Company of Canada Limited. The data here appears to be quite similar to that for the town supply in terms of the arsenic content, whereas the water supply at Giant Mines Limited, see Table A1.6, although based upon far fewer samples than either the Con or town water supplies, appears to have been more heavily contaminated with arsenic. The Giant Mines water intake is situated near the mouth of the heavily contaminated Baker Creek.

Table A1.7 gives the levels of arsenic concentrations in Frame Lake, a lake in the immediate vicinity of Yellowknife but differing hydrologically from Yellowknife Bay in that it is fed by local drainage rather than by a stream bearing water from further afield. Also, its waters are not subject to mixing with any other major body of water as is the case with Yellowknife Bay. In terms of arsenic concentrations, water from Frame Lake differs from the water drawn from Yellowknife Bay in that the arsenic levels appear to be at least ten times as high, and also there is a less pronounced seasonal variation. In fact, there does appear to be a reverse seasonal trend as compared to Yellowknife Bay in that the arsenic concentrations tend to be highest in the December to March period. In all probability, the levels of arsenic contamination in Frame Lake are typical of those in the many small lakes in the vicinity of Yellowknife.

The generally accepted limits for arsenic contamination of a water supply to be used for human consumption are as follows (16):

Acceptable	- less than 0.01 ppm
Maximum permissible	- 0.05 ppm
Emergency	- 0.3 ppm

On the assumption that during the period 1951-69, there was no trend, other than seasonal variations, in the degree of arsenic contamination of the town water supply, then it is possible to estimate from the data in Table 2 the proportion of the time during which

the levels of contamination in the town water supply were within the above-described limits. It is seen that the water supply was within acceptable limits less than 16% of the time; for almost 70% of the time, the level of contamination, while being higher than the accepted limit of 0.01 ppm, was less than the maximum permissible limit, 0.05 ppm. Approximately 15% of the time, the water supply is estimated to have been above the maximum permissible level of 0.05 ppm. On one day, June 20, 1966, the water contained 2.92 ppm arsenic, assuming no error in the laboratory determination or subsequent errors in typing, etc. This value is ten times greater than generally accepted emergency level of 0.3 ppm.

In the months of June and July, it may be seen from Table 2 that the water was of an acceptable quality only 1.3% of the time. In no one month could one estimate that the water would be of an acceptable standard for more than 30% of the time.

In the latter part of December 1969, the town and the community at Giant were connected up to a water supply derived from the Yellowknife River north of its confluence with Yellowknife Bay.

1.6.4 Sulphur Oxides and Particulates

Estimates of the amounts of sulphur dioxide in the atmosphere based on sulphation rates were obtained for a one-month period during the 1966 health survey. Particulate measurements obtained by high volume samplers are also available for a three-month period. The amount of arsenic present in the particulate material was not determined.

Because of the limited amount of information available, it is not possible to draw firm conclusions. The results given in Appendix Tables A1.8 and A1.9 suggest, however, that the particulate loading in the air of Yellowknife and the sulphation rates obtained for the Yellowknife and Giant Mines communities approached levels comparable with those generally observed in an average small to medium-sized industrial town or city.

1.7 Arsenic Toxicity

1.7.1 Review of Toxic Effects

Arsenic is ubiquitously distributed in the environment and in all animal tissues(6). It is used in pesticides, wood preservatives,

Pollution-Cancer Link Is Suggested

By Bill Richards

Washington Post Staff Writer

Federal cancer researchers said yesterday that a four-year effort to map areas of the U.S. that have the highest cancer rates suggests a strong link between some types of cancers and certain kinds of industrial pollution.

Among some of the findings of the mapping project are indications of high bladder cancer levels around areas of heavy auto production, indications of heavy bladder, lung and liver cancer levels around concentrations of chemical industries, and high lung cancer rates near copper and lead smelters, researchers said.

"What we have here," said Dr. Joseph F. Fraumeni, a member of the National Cancer Institute team that carried out the mapping project, "is a

whole new series of clues to the origins of cancer. The next step will have to be specific studies done in the field at these areas of concentration."

Fraumeni said some of the findings from the research team's cancer maps have already been turned over to health officials studying cancer levels in New Jersey, Michigan, Florida, New Orleans and northern New England.

The maps show that areas around Baltimore, Washington, Richmond and in scattered parts of northeast Maryland and that state's Eastern Shore have overall cancer levels that are in the top tenth of the nation.

Fraumeni said the research team had not studied these specific regions but that heavily urbanized areas such as the Baltimore-Washington corridor generally show higher levels of certain

types of cancer, such as lung cancer, which are related to smoking.

The maps, which are not scheduled to be published until next month, cover 34 different types of cancer found in white males and females throughout the U.S.

The researchers said they are currently working on a separate study on cancer concentrations among blacks. Because blacks are distributed more thinly than whites around much of the U.S. and may be showing some different types of cancer clusters, Fraumeni said the team will have to use a different mapping system to get any conclusive results.

The data for maps currently being prepared was gathered from death cer-

See **CANCER**, A6, Col. 1

Washington Post
April 24/75

Pollution-Cancer Link Suggested

CANCER. From A1

ificates for cancer victims in 3,036 counties or clusters of counties covering the entire continental U.S. between 1950 and 1969, the researchers said.

Speaking to a noontime meeting of employees from the National Institutes of Health in Bethesda yesterday, the research team said they had uncovered what they believed were significant links between high levels of certain types of cancer and industry, but that there were other areas with high cancer rates they could not explain.

"We found 64 counties with significantly high bladder cancer levels," said Dr. Robert Hoover, who like all the researchers is employed by the National Cancer Institute's epidemiological branch. "They appeared to be clustered around areas where automobiles were or are made and where two types of heavy machinery is manufactured."

Hoover said the researchers had found high bladder cancer rates in areas in the Northeast with heavy concentrations of chemical plants. In New Jersey, he said, every county scored in the top 10 per cent of the nation for bladder cancer.

Salem County, N.J., where 25 per cent of the males work in chemical plants, had the highest incidence of

bladder cancer in the country, Hoover said. "We felt fairly confident there was a link," he said.

The researchers said one chemical plant in New Jersey had 330 cases of bladder cancer among its workers in the last 50 years. "The company was quite aware of this but they didn't bother to tell anyone," Hoover said.

Dr. William J. Blot of the research group said they felt that high lung cancer rates around copper and lead smelters across the U.S. were due to arsenic emitted during the ore refining process.

Blot said levels of arsenic, a known cancer-causing agent, were high in men, women and children living around the smelters. "Our tentative conclusion," he said, "is there is a communitywide risk from arsenic emissions from these smelters."

The researchers said, however, that there were some findings on their cancer maps that they are not prepared to explain. One of the heaviest concentrations of lung cancer, they said, is found along the Gulf Coast from New Orleans west to Houston.

The high incidence of cancer in this area, said Fraumeni, "was one of the biggest surprises we encountered."

The researchers said they found that some cancers were apparently caused

by other factors than pollution. Stomach cancer, they said occurred most heavily among people of Scandinavian and German descent living in the Midwest.

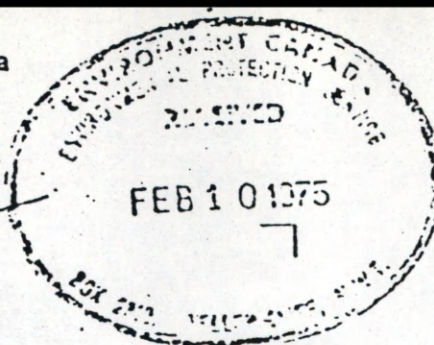
Other cancers, including that of the large intestine, may be due to eating habits and diet, the researchers suggested, since they occur with relatively equal frequency among males and females.

They said that melanoma, a skin cancer, shows up most often in Southern states where sunlight, which is believed to be a factor in the disease, is the strongest. Cervical cancer, the research team said, is found most often in the Northeast and Appalachia and may be linked to groups at the low end of the social order.

The researchers' findings are one of a group of reports released recently linking cancer with various environmental factors such as chemicals. Last week the U.S. Environmental Protection Agency said it had found chemical substances that could cause cancer in all 79 drinking water systems it had tested around the nation.

The EPA is currently starting a county-by-county environmental cancer study similar to the one that the National Cancer Institute researchers have finished to gain additional data.

MEMORANDUM NOTE DE SERVICE



DATE February 6, 1975

Grant yk file

FROM: Mr. H. Veldhuizen
DE: Head
Air Pollution Control Section
EPS, Northwest Region

Our file No. reference

4221-120/40 ✓

TO: Mr. C. A. Lewis
A: District Manager
Environmental Protection Service
Yellowknife

Your file No. reference

SUBJECT: Re: Industrial Hygiene Standard for Arsenic
SUJET:

I was advised yesterday afternoon that OSHA-NIOSH, the organization that sets industrial hygiene standards for in-plant environmental conditions, has recommended that the previous arsenic 8 hour exposure limit be reduced from 500 micrograms per cubic meter to 4 micrograms per cubic meter. This announcement has been made in the American Federal Register. Public hearings are expected to begin April 9, 1975.

This very dramatic change in the industrial hygiene standard³ resulted from the review of an old study upon which the 500 micrograms/m³ (μgm/m³) was based. The known carcinogenic characteristics of arsenic, confirmed in two recent studies, had prompted the review.

You may appreciate why I³ felt that the Ontario ambient air standard of 25 micrograms/m³ (μgm/m³) was not realistic.

You may wish to advise Allan Patrick, DINA, of this recommended change for industrial working environments.

* It would be advisable not to release this information to the public as it may cause undue concern at this time.

Mary Chertwell

for H. Veldhuizen

c.c. Dr. R.D.P. Eaton, Dept. of Health & Welfare, Edmonton
Mr. J. J. Eatock, Regional Director, EPS, Northwest Region



Indian and
Northern Affairs

Affaires indiennes
et du Nord

FROM
DU

Globe & Mail (Toronto)

DATE

June 3/75

Findings on arsenic challenged by Indians

An Indian group has announced its own study results to show there is an arsenic health hazard in Yellowknife.

Last week the federal Health and Welfare Department announced its tests had shown a health hazard was not likely except possibly to workers in the Giant Yellowknife Mines Ltd. gold mine and mill.

Yesterday the National Indian Brotherhood said its independent survey "shows more than one-third of the individuals tested had levels that were unacceptably high."

Both were testing levels of arsenic in hair samples, an accepted means of screening out those who may have high

arsenic levels in their bodies.

The Government study, done in February, noted that some authorities consider five parts per million to be an acceptable level while others accept 10 ppm.

It found 577 of the 700 people tested have levels less than five ppm, 60 had levels between five and 10 ppm, and 63, more than two-thirds of whom worked in the mine or mill, had levels higher than 10 ppm.

In a statement yesterday, the Indian group referred to five ppm as "the arbitrary level chosen by Ottawa as indicating arsenic exposure" and six of 13 people it tested, including four of six children under 13, were over this level.

C.P. WIRE SERVICE JUNE 3/75

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TOP OUT

Arsenic

TORONTO (CP) — The National Indian Brotherhood has announced results of studies which it says show an arsenic health hazard in Yellowknife.

Last week the federal health and welfare department announced its tests had shown a health hazard was unlikely except possibly to workers in the Giant Yellowknife Mines Ltd. gold mine and mill.

The brotherhood says its survey shows more than one-third of the individuals tested had levels that were unacceptably high.

Both the federal and Indian studies measured levels of arsenic in hair samples.

The government study noted some authorities consider five parts per million ppm to be acceptable while others accept 10 ppm.

It found 577 of the 700 people tested have levels less than five ppm, 60 had levels between 5 and 10 ppm, and 63, more than two-thirds of whom worked in the mine or mill, had levels higher than 10 ppm.

In a statement the Indian group referred to 5 ppm as the "arbitrary level" chosen by Ottawa as indicating arsenic exposure. Six of 13 persons it tested, including four of six children under 13, were above this level.

07-06-75 01.14001



Indian and
Northern Affairs

Affaires indiennes
et du Nord

FROM
DU

C.P. Wire Service

DATE

June 4/75

AG 064

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house-arsenic

OTTAWA CP - Health Minister Marc Lalonde said Tuesday that he wants to compare his department's study on the arsenic health hazard in Yellowknife, N.W.T., with one done independently by the National Indian Brotherhood.

The department study concluded there was no hazard to the general public in the territorial capital but wanted further tests done of certain gold mine and mill workers.

The brotherhood study said one-third of those tested had unacceptable arsenic levels hair samples.

Wally Firth NDP-Northwest Territories asked the minister whether the government would see that compensation was paid to those whose health was affected.

Mr. Lalonde said he wants to read the complete brotherhood report and study scientific base. He also wanted to await the outcome of further tests.

03-06-75 04.52ped



FROM
DU

Globe & Mail, Toronto

DATE

May 28/75

Miners, not other Yellowknife residents, face arsenic danger, health report shows

By W. CHEVELDAYOFF
Globe and Mail Reporter
OTTAWA — A health hazard due to arsenic may exist for certain gold mine and mill workers in Yellowknife but not for other Yellowknife residents, the Health and Welfare Department has found.

Tests of hair samples obtained from 700 Yellowknife residents in February show that 54.8 per cent of the mine and mill workers and 8.7 per cent of all other residents tested had above-normal arsenic levels, Health Minister Marc Lalonde said in a press release yesterday.

However, despite concerns expressed in recent months, the survey found no correlation between arsenic levels and drinking water sources. A test of 20 per cent of the hair samples for mercury contamination

showed levels well within accepted norms.

Clearly, the mine and mill workers as a group have a higher level of arsenic in hair than would be expected in a non-exposed population and follow-up action in respect of this group is necessary, Mr. Lalonde's statement said.

While the press release made no mention of the harmful effects of arsenic exposure, a World Health Organization report says it can produce lung and skin cancer and chronic poisoning leads to loss of appetite and weight, diarrhea alternating with constipation, gastro-intestinal disturbance and other problems.

Arsenic is found in the gold ore in Yellowknife and gets into the atmosphere through the roaster stack at the mill. It settles and is taken into the

water system, particularly during spring runoff.

Even though filters are now used on the stacks, more than 200 pounds of arsenic a day still escapes, according to Government officials in Yellowknife.

After the results of a 1969 federal study were relayed to Government officials, the federal Government helped pay for a water pipeline to bring in fresh water from upstream so that Yellowknife residents would not have to drink contaminated water from Yellowknife Bay. Some low-income people were still drinking bay water earlier this year because they could not afford to pay for fresh drinking water.

Mr. Lalonde said yesterday the people with hair containing more than 10 parts per million of arsenic will undergo further tests.

dergo further tests.

If results indicate the need, similar investigations of those with arsenic levels of between 5 and 10 parts per million will be undertaken.

Mr. Lalonde said there are differences of opinion among scientists as to what constitutes an elevated arsenic level in hair.

"Levels up to 10 parts per million have been found in populations with no known exposure to arsenic and this level is considered to be acceptable by some authorities. Others regard 5 parts per million as a level that can be accepted as occurring in non-exposed populations."

The Government intends to examine the environment in the mines and mills to identify sources of arsenic pollution and to assess whether further controls are necessary.

The health of people with significant levels of arsenic in their hair is not necessarily affected because arsenic could be deposited on the hair by fallout from the air or could reach the hair internally through the ingestion of arsenic.

Of the total, 45.2 per cent of the workers and 81.3 per cent of other residents showed arsenic hair levels of less than five parts per million.

The tests for mercury found all samples had levels of less than 10 parts per million with one exception, which was 11 parts per million. The accepted maximum safety level for mercury is 60 parts per million, the Lalonde statement said, and further tests will not be undertaken.

Arsenic hazard possible

By DON SELLAR
Southam News Service

OTTAWA — A special inquiry has concluded that arsenic may pose a health hazard to some Yellowknife gold mine workers.

Health Minister Marc Lalonde, prodded into launching the investigation last winter, issued a summary report here yesterday promising further action on the potential problem.

The study also gave a clean bill of health to Yellowknife's water supply, which originally had been suspected as a source of arsenic poisoning.

After running tests on arsenic levels in hair samples from 700 volunteers in Yellowknife, Medical Services Branch officials found the highest readings among mine and mill workers.

Nearly one-third of the gold workers tested were found to have more than 10 parts of arsenic per million in their hair. Among other residents of the town only 3.4 per cent had readings that high.

COMPARE THIS DATA
WITH MINE COMPANY DATA
IN MEMOS IN NIB LIBRARY.

"A statement issued by Lalonde noted, however, that scientists disagree about the significance of arsenic levels in hair.

Over-all, the study found that 91 per cent of the Yellowknife residents other than miners had arsenic levels of less than 5 ppm in their hair.

The minister promised to study conditions at the town's two gold mines to identify sources of arsenic pollution. This action will "recommend corrective measures if indicated," the statement said.

Health officials said recently the Giant Mine smelter at Yellowknife releases between 800 and 1,000 pounds of arsenic into the air each day.

(SUMMER, 1974)

MONTREAL
GAZETTE
MAY 28/75

communication research



FROM
DU

Edmonton

DATE

May 28, 1975

Report allays North arsenic fears

By Gorde Sinclair
Of The Journal

YELLOWKNIFE, N.W.T.

— It's "not likely" that arsenic is a health hazard for Yellowknife residents who don't work in gold mines according to a national health and welfare interim report.

But the report, which was released here Tuesday, indicates arsenic may be a health hazard for workers in specific jobs in the mill and mine.

The findings came from the analysis of hair samples taken from 700 Yellowknife residents who responded to a voluntary testing program last February. The testing was ordered after another health and welfare arsenic study of Yellowknife. Residents surfaced last December. It had sat buried for at least three years.

Of the 700 tested, 63 had levels over 10 parts per million (ppm). These 63, including two boys and a woman, will undergo extensive clinical testing the week beginning June 9 to discover if their bodies contain levels of more than 10 ppm.

While the hair testing assures those with insignificant levels that they are free of arsenic contamination, the program doesn't really tell the others one way or the other. It's inconclusive for those over 10 ppm.

That's because high levels of arsenic in hair samples doesn't necessarily mean there are high levels in the body.

"Arsenic in the hair may result from ingestion," says the news release containing the reports findings, "or may merely represent arsenic deposited on the surface

of the hair from fallout in the air.

"Significant levels in the hair have often been found associated with insignificant levels in the body."

Says Dr. Derek Eaton of Edmonton, programs medical officer with Northern Health Services: "It's our firm belief that the majority of the arsenic in the people with high levels is on the hair not in it."

These were the major findings of the report:

- Individuals employed in specific mill occupations showed significantly higher levels than the population as a whole . . . underground miners did not show significant levels.

- Over 90 per cent of the other Yellowknife residents tested had arsenic levels of less than five ppm in their hair.

- There is no correlation between arsenic levels and drinking water in Yellowknife.

- Samples which were analysed for mercury contamination as well as arsenic all showed levels well within accepted norms.

The statistical breakdown went this way: For mine and mill workers, of the 136 tested 45 per cent had levels under five ppm. Twenty-two per cent were in the five to 10 ppm category and about a third of the workers - 44 were over 10 ppm.

Of the so-called "other" residents of Yellowknife, 565 were tested. Thirty had levels between five and 10 ppm and 19 were over the 10 ppm level.

However, Dr. Eaton says that 19 count is misleading. He says 16 of those actually have jobs associated with the mines.

The remaining three are an 11-year-old boy, a 16-year-old high school student and a single woman. The boys have levels just over 10 ppm, the doctor says, and the woman has a level of about 60 ppm.

"The citizens of Yellowknife can feel reassured that they are not being poisoned," Dr. Eaton said at a press conference here Tuesday

"As far as the general population of Yellowknife is concerned, the survey results that we have give a clean bill."

Asked how he could state that Yellowknife "residents" had no worries when at least three of the non-mining population were undergoing further tests, the doctor replied: "In my opinion there's no health hazard to residents."

He pointed out that the kind of arsenic dust that might be produced from the Yellowknife area naturally, from the green stone rocks of the area, is non toxic. This kind of arsenic dust might be to blame for the high counts among the three residents being tested.

There were two people who took part in the survey, Dr. Eaton said, who had been in Yellowknife for 34 and 57 years respectively. Neither had a trace of arsenic in their hair.

He estimated 55 native people were tested including some from the back bay area of town where warning signs tell people not to drink the water.

Dr. Eaton said the native people fell in the range below 10 ppm and that "one or two" people who had been drawing their water from Lack bay had no trace of arsenic.

Dan Billing, the chairman of a local committee formed to coordinate arsenic testing, said he was "very encouraged" by the results of the testing program.

But if Mr. Billing and Dr. Eaton were pleased by the survey results, local steelworkers union president Marsh Hawes wasn't.

"To me this sounds scary," the gold miner commented after attending the press conference. "I came out of there with a lot of questions unanswered."

One of the questions Mr. Hawes wanted answered was what — in the race of the acknowledged exposure hazard that exists at the Giant Mines milling operation — does health and welfare suggest the workers there do.

Dr. Eaton commented that no orders will be issued Giant Mines until the results of an environmental study at the mill are analysed. The study will occur the same week as the clinical tests on the 63 people with high arsenic levels in hair samples.

"There is an exposure hazard," Dr. Eaton said earlier. "Whether that exposure is doing any harm to the individual we intend to find out."

Dr. Eaton attempted to explain what the difference is between an "exposure hazard" and a "health hazard."

"The difference is the dust falling onto the body may or may not be reflected by the ingestion of arsenic within the body."

The highest level of arsenic recorded in the samples came from a mill worker with a 440 ppm count. Dr. Eaton said there was one other mine worker with a 300 count, two in the 200 range and one on the 100 level.