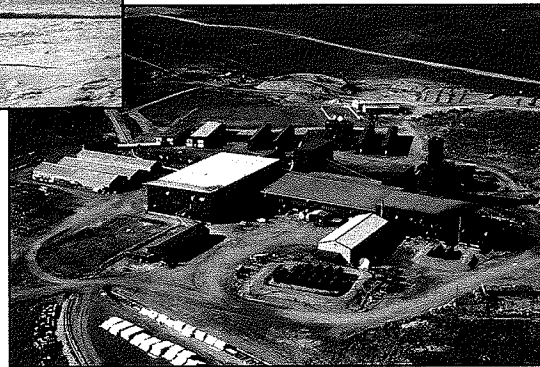

O V E R V I E W

THE SLAVE PROVINCE, NORTHWEST TERRITORIES
CANADA'S NEWEST MINING PROVINCE?



N . W . T . C H A M B E R O F M I N E S

THE SLAVE PROVINCE: CANADA'S NEWEST MINING PROVINCE?

The North is on the road to self-reliance.

Increasingly, government, aboriginal groups, business, industry and northern residents are realizing that economic development is required if we are to break free from our reliance on government.

While there are other industries in the North that will help increase northern self-reliance, few have the same ability to maximize economic development as does mining.

One area in particular, the Slave Geological Province, contains many known mineral deposits and has tremendous potential to host many more. It is especially ripe for mining development. However, it is remote.

A proposal to access the vast mineral resources of the Slave Province holds the promise to provide thousands of jobs, reduce the cost of living in northern communities, and reduce the North's dependency on southern financial assistance.

The proposed development will be long-term and, in addition to providing direct benefits from mineral development, will provide substantial spin-offs in the construction, transportation, and service industries; eventually, it can also contribute to increased tourism.

In sum, with the provision of transportation and power infrastructure, the Slave Geological Province can become Canada's newest mining province. New mines in the Slave Province will make tremendous contributions to increased northern self-reliance.

KNOWN MINERAL WEALTH OF THE SLAVE PROVINCE

The Arctic mainland between the Coronation Gulf and Great Slave Lake is a storehouse of mineral wealth (see map).

Known to geologists as the Slave Province, exploration over the past 60 years has revealed many mineral deposits. Best known of these are the gold deposits being mined at Yellowknife near the south end of the province, and at the Lupin mine near its north end.

In addition, numerous other deposits are scattered throughout the Slave Province, from gold to zinc to copper to rare earths and now, even diamonds.

GOLD DEPOSITS

Gold was originally discovered along Great Slave Lake near the south boundary of the Slave Province. Two of the original deposits discovered at Yellowknife are still being mined, making the area a world-class gold camp.

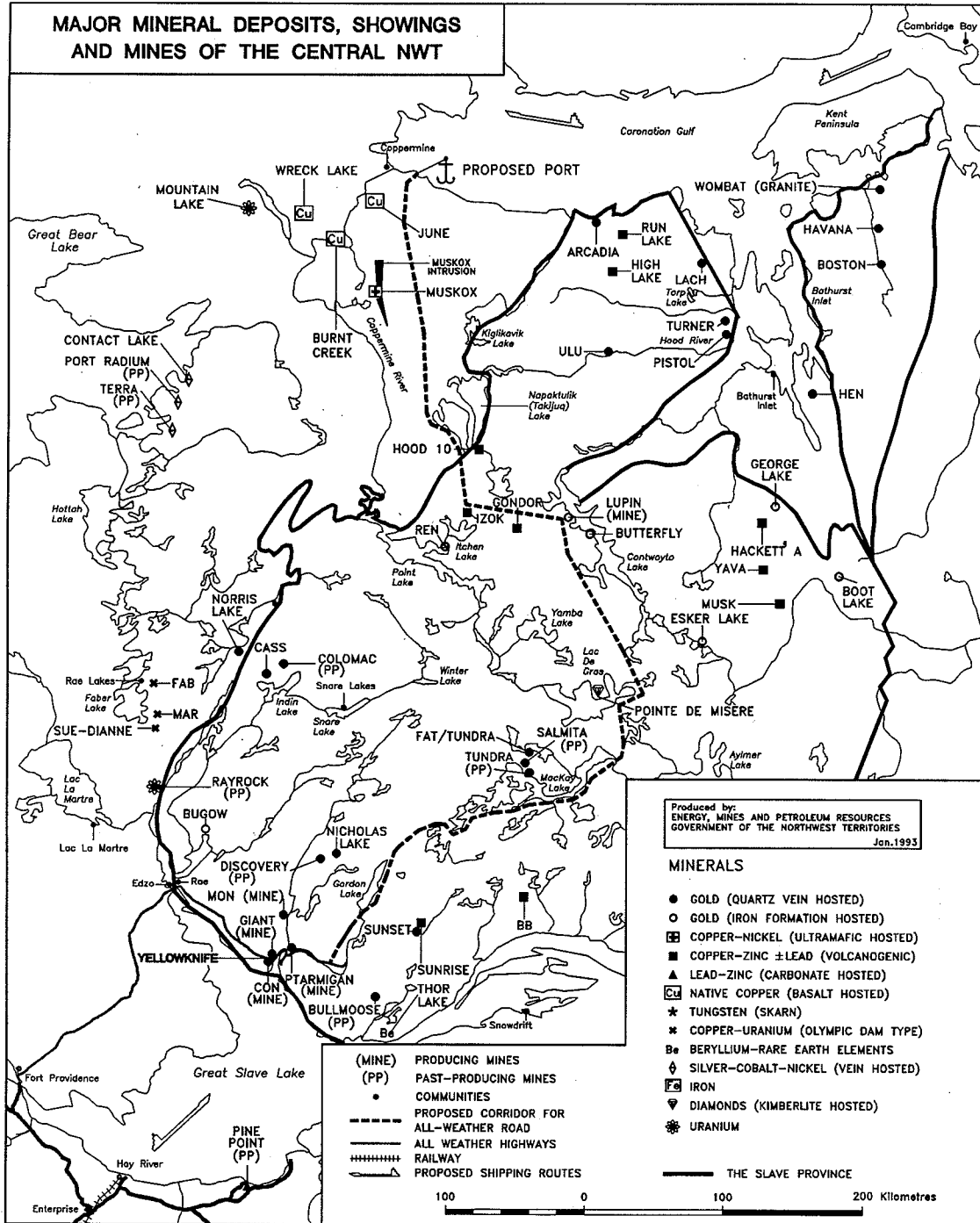
Gold is also being mined today at the Lupin Mine, 400 kilometres northeast of Yellowknife near the north end of the Slave Province.

Numerous other gold deposits have been mined in the Slave Province over the years. Some, like the Colomac Mine, 200 kilometres north of Yellowknife, could be re-opened in the near future.

Ongoing exploration has located several promising gold deposits which could become mines in the future. These include the:

- Tundra - 4 million tonnes with 6.2 grams per tonne (g/t)
- George Lake - 3.1 million tonnes with 12.41 g/t
- ULU - more than 1 million tonnes with 18 g/t
- Nicholas Lake - 1 million tonnes with 15.8 g/t
- Arcadia - 860,000 tons with 6.8 g/t

THE SLAVE PROVINCE: A STOREHOUSE OF WEALTH



BASE METAL DEPOSITS

Base metal deposits in the Slave generally contain copper, zinc, and lead with variable amounts of silver and gold.

At least nine deposits with reserves over one million tonnes are known in the Slave Province. These include:

- Hackett River - nearly 20 million tonnes
- Izok Lake - over 13 million tonnes
- Gondor - over 7 million tonnes
- High Lake - nearly 5 million tonnes
- Sunrise - 1.8 million tonnes
- Yava - over 1 million tonnes
- Hood River - nearly 1 million tonnes

Of these, the Izok deposit is a world-class deposit of zinc, lead, copper and silver located approximately 250 kilometres from the Coronation Gulf. It is by far the most attractive of the base metal deposits found to date and a feasibility study of mining the deposit is currently underway.

DIAMOND DEPOSITS

The recent discovery of diamonds stunned miners and the general public alike. Few suspected the N.W.T. would become the major focus of diamond exploration in the world, and that over 130,000 square kilometres would be staked in the rush to acquire land.

To date, drilling has outlined one kimberlite resource of 80 million tons containing 63 carats per 100 tons at Lac de Gras. And many more diamond-bearing kimberlites are being found and sampled.

The high number of diamond-bearing kimberlites being discovered is creating optimism that at least one diamond mine will be built, hopefully within five years. Some even believe that the Slave Province will rival South Africa as a diamond producer.

TREMENDOUS ADDITIONAL MINERAL POTENTIAL

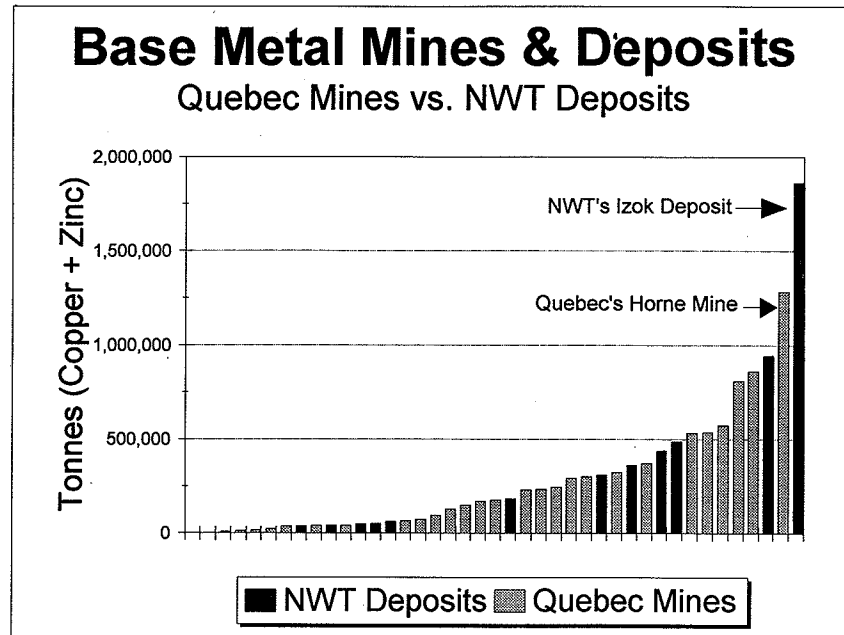
While exploration has already identified many important mineral deposits in the Slave Province, the potential for future discoveries is very great.

Reasonable conclusions can be drawn about mineral potential by comparing the Slave Province with similar areas like the Abitibi Geological Province in Quebec.

Since 1906, some 100 deposits have been found in the Abitibi. Of these, approximately 35 became base metal mines and 65 became gold mines. These mines helped make Quebec a wealthy province.

Geologists believe the Slave Province has similar potential. In comparison, then, the surface has barely been scratched in the Slave Province.

NWT deposits would be mines in Quebec



Interestingly, by comparing base metal deposits in the Slave Province with those that became mines in Quebec, it becomes apparent that many of our deposits would be mines if they were located in Quebec (see graph). Or, in other words, if the Slave Province had the same infrastructure as Quebec, we would have many more mines.

CAN WE UNLOCK THE SLAVE PROVINCE'S MINERAL WEALTH?

We know that the Slave Province is very rich in mineral deposits. However, do we have the know-how and the financial ability to access and mine its deposits?

AN ENGINEERING PERSPECTIVE

From an engineering perspective, the mining industry is confident it can be done.

Given that a deposit is sufficiently rich, mining has been successful at various remote northern sites:

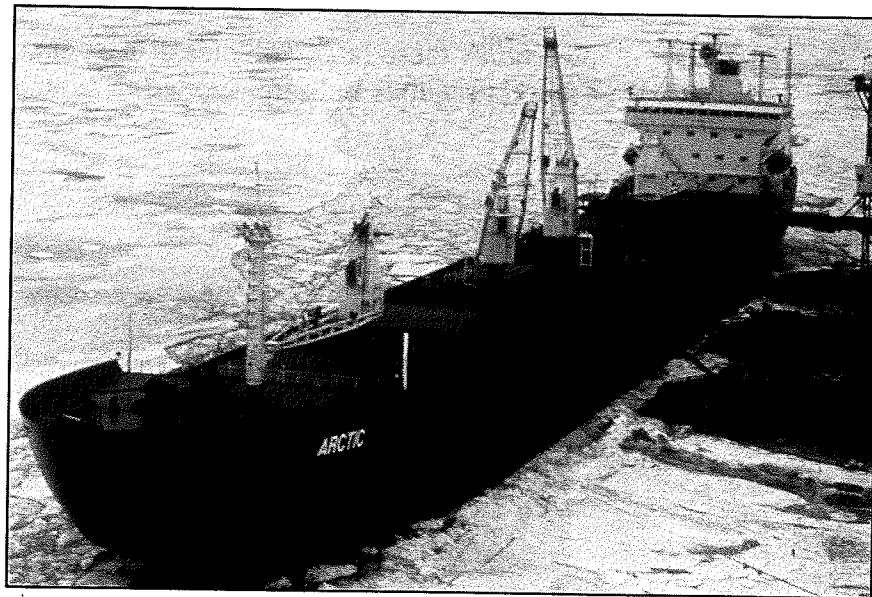
- In the 1930s, the Yellowknife gold mines went into production with virtually no infrastructure. In fact, the mines supplied much of it, including hydro-electric power. An all-weather road constructed in the early 1960s guaranteed the mines' long-term success.
- The Lupin gold mine operates today as one of Canada's lowest cost gold producers despite having to build 500 kilometres of winter road each year over which essential freight and fuel is transported over two short months.

A 500 km. winter road supplies Lupin Mine with access.



- Base metal mines at Nanisivik and Polaris, in the high Arctic, are economic despite the harsh climate, the tough sea-ice conditions, and their remote locations.
- Cominco mines the Red Dog zinc deposit in Alaska's Arctic in partnership with a native development corporation that owns the deposit. Concentrate is trucked on an all-weather toll road, constructed by the Alaska Government, to the coast, some 84 kilometres away. There it is stored until the 3-month ice-free shipping season, when it is transferred to ocean-going freighters.

M.V. Arctic services
Nanisivik Mine.



A recent study funded by industry and government has confirmed that Canada now has the technology to commercially access the Slave Province's north shore with cargo-carrying ice-breakers modelled after the *M.V. Arctic*.

Given that mining in the Slave Province will require some combination of these proven transportation technologies - ice roads, all-weather Arctic roads, and marine shipping - the mining industry is confident that from an engineering perspective it can access and mine any deposit in the Slave Province.

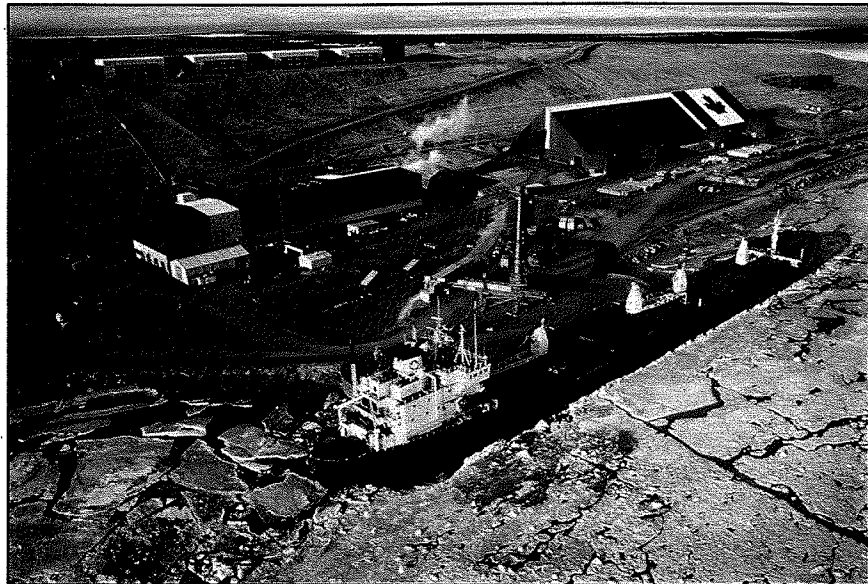
A FINANCIAL PERSPECTIVE

From a financial perspective, however, industry is not as confident about accessing deposits in the Slave Province, especially base metal deposits.

While gold (and diamond) mines export very small volumes of products - gold bars can be carried in a suitcase, diamonds in a briefcase - base metal mines produce large volumes of mineral concentrates with a much lower value than gold or diamonds.

To move these large volumes of base metal concentrates to market requires bulk transportation such as ship, rail or road.

**M.V. Arctic loading
base metal
concentrates at Polaris
Mine.**



If the deposit is fortunate enough to be located on tide water, such as the base metal mines at Nanisivik and Polaris, then shipping costs are manageable. However, if they are located many miles inland, like the Izok deposit, then a combination of road and shipping is needed. Shipping costs rise considerably.

It is clear to industry that no single mining company can afford to build hundreds of kilometres of all-weather roads, construct a port, and finance ice-breaking cargo ships.

Mining companies must have help in developing infrastructure if major mining development is to proceed in the Slave Province.

BENEFITS OF DEVELOPMENT COULD BE SUBSTANTIAL

Substantial direct and indirect benefits will result if new mines are built in the Slave Province.

DIRECT BENEFITS

MINE EMPLOYMENT

If four new mines open in the Slave Province, they could create over 200,000 person-years of direct employment at the mines.

ASSOCIATED EMPLOYMENT

In addition, considerable associated employment will be created.

Construction

Building the mines themselves will require hundreds of workers. Associated infrastructure will require more.

Building winter roads and all-weather roads will require many heavy equipment operators and equipment.

Building a port will require the construction of docks, a fuel storage facility, and buildings to store concentrates awaiting shipment.

Operation

During the operations phase, substantial numbers of heavy equipment operators will be required to maintain roads, and haul fuel, supplies, and mineral concentrates to, and from, the mine sites.

In addition, a port facility will need employees to receive incoming fuel and freight, to operate the fuel storage facility, and to manage concentrate storage and loading.

INDIRECT BENEFITS TO NORTHERNERS

There are additional non-mining benefits available in addition to the substantial benefits from mining.

COMMUNITY BENEFITS

The cost to deliver freight and fuel to the Arctic Coast by deep-water vessels will be lower than currently paid.

Fuel is one of the most important commodities in the North, for it provides energy to run vehicles and electrical generating plants, as well as to heat homes and businesses. Food, clothing, and construction materials are equally important to Northerners.

Lower freight costs of these basic necessities would improve the viability of all Arctic coastal communities from the Mackenzie Delta to Spence Bay, and would lead to an decreased cost of living.

The potential impact on larger communities should not be forgotten. Virtually all new remote Canadian mines operate as commuter operations, with employees working on a rotational basis. Northern communities would benefit tremendously if they became "bedroom" communities for new mines.

Jobs are an important benefit of mining development.



INCREASED & IMPROVED LOCAL TRANSPORTATION

To pass the benefits of reduced costs to local community residents will require a refocused local transportation network.

Over the years, northerners have built up a great deal of expertise in northern marine shipping using shallow draft vessels. Using these smaller vessels, cheaper fuel and supplies can be shipped from the new port facility over much shorter distances, passing the reduced costs on to the local communities.

Tugs and barges could be stored and serviced at the port site over the winter months. This would require the additional construction of maintenance shops and the employment of maintenance workers.

As a result, a regional centre of operations would grow at the new port facility.

INDIRECT BENEFITS TO ALL CANADIANS

The potential scope of development in the Slave Province is large enough to tap the available resources of the Northwest Territories. Specialized technical and professional workers will be required from southern Canada. And mining equipment must be purchased and shipped in from the south.

The construction of new, specialized ice-capable cargo ships will also require expertise not available in the North.

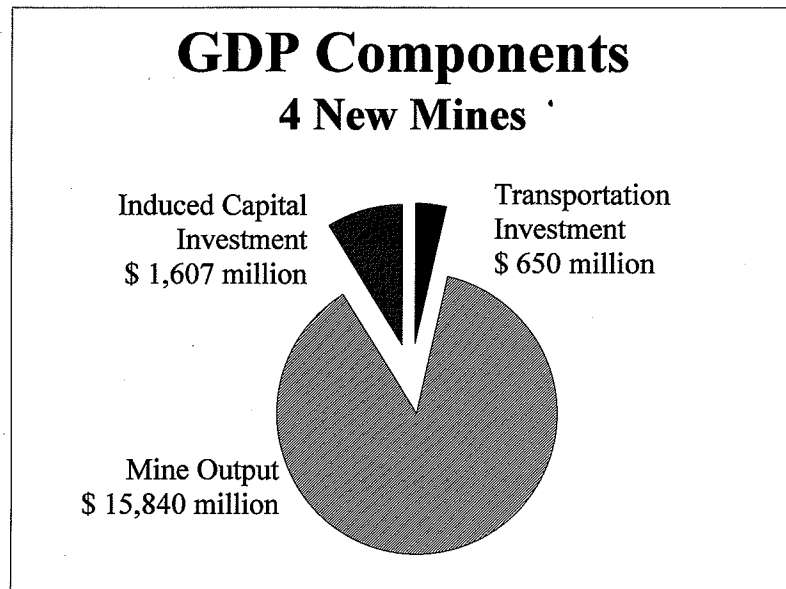
SIZE OF BENEFITS

A Territorial Government study projects that if only four new mines open in the Slave Province, they will create the following benefits (also see graphs below):

- over 210,000 person years of employment;
- a net increase of \$18 billion to the Canadian GDP;
- \$8 billion in wages;
- income tax on wages alone of at least \$1.6 billion;
- exports valued in the range of \$15 billion.

Needless to say, the benefits are substantial.

Mineral development will generate tremendous benefits.



ENVIRONMENTAL CONSIDERATIONS

From an environmental perspective, Northerners should not fear development in the Slave Province.

Today, all proposed mining projects must be screened by several government departments including Fisheries & Oceans, Environment, and Indian Affairs & Northern Development.

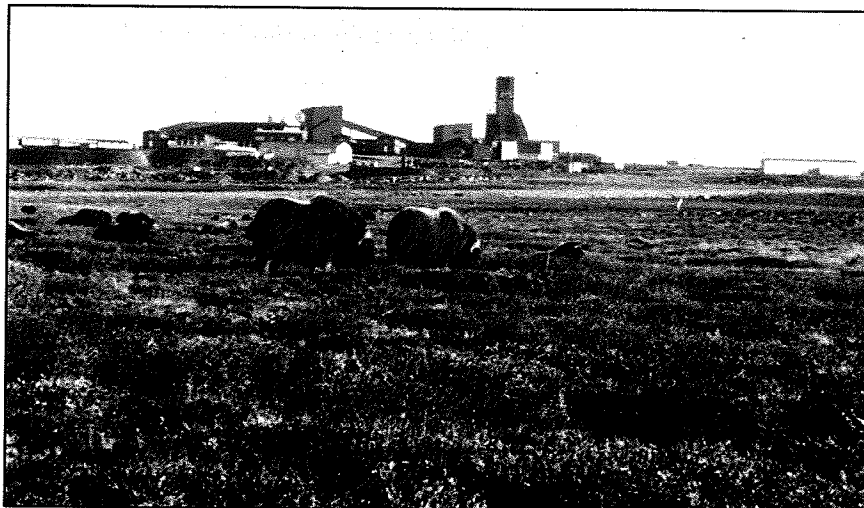
Any subsequent activities are subject to exhaustive regulation, including the Environmental Protection Act, the Fisheries Act, and the Northern Inland Waters Act, to name but a few.

The environmental impact of development in the Slave Province is not expected to be great:

- Ice road technology is a proven method of crossing the tundra without damaging it;
- Ice breakers and cargo vessels routinely service virtually all Arctic communities without environmental damage;
- All-weather roads service the Mackenzie Delta and northwest Alaska with minor impact;
- Northern mines are some of the most environmentally sensitive operations in Canada. Polaris Mine, for example, follows the most stringent effluent regulations of any Canadian mine.

No major environmental impacts are expected from new mines in the Slave Province.

Musk-oxen graze in safety near Lupin Mine.



THE IZOK PROJECT: THE FIRST PRIORITY

Major development of mining in the Slave Province will rely on the supply of infrastructure. To justify this, will require some initial mining development to give it the justification needed.

The Izok project can provide this "kick start."

IZOK: THE PROJECT

The Izok deposit is the most attractive of the base metal deposits known in the Slave Province. It is located some 250 kilometres south of Coppermine on the Arctic coast. To date, over 13 million tonnes of zinc-copper-lead-silver reserves have been identified. When compared with Quebec's Abitibi deposits, the deposit is moderate in size but richer in grade.

Minnova Inc., a major Canadian mining company, is currently studying the feasibility of mining the Izok deposit from two adjoining open pits. Based on a production rate of 3,000 to 4,000 tonnes of ore per day, the ore body would have a mine life of 10 to 14 years. Any deeper reserves discovered would be mined from underground, adding to the mine life.

The mine would require from 200 to 250 workers, with additional workers to manage transportation of concentrates and supplies. Conventional mining equipment utilizing 85-ton haul trucks, 12-13 cubic yard loaders and 6.5-8 inch blast-hole drills will likely be used.

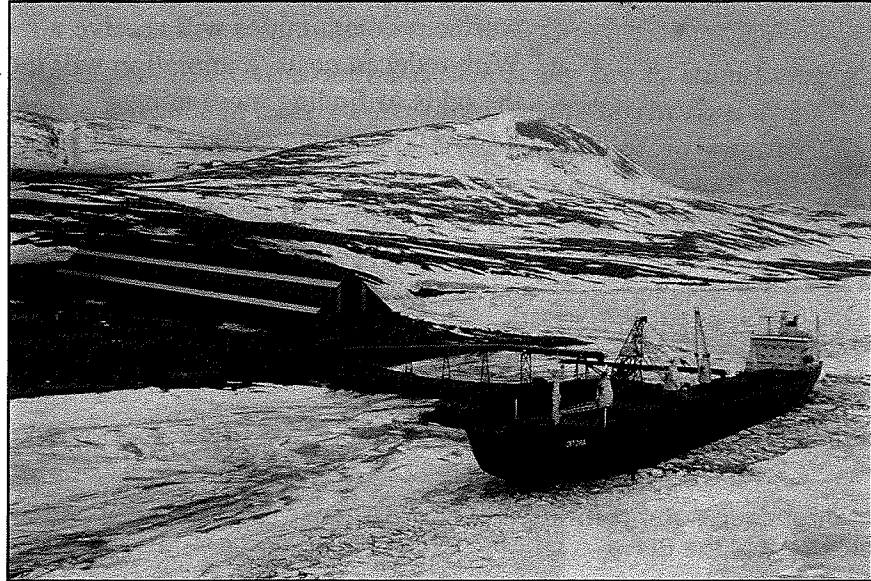
IZOK: THE HURDLES

The mine will produce from 350,000 to 450,000 tonnes of concentrates each year. As with any base metal mine developed far from the coast, moving this amount of product

from such a remote site to world markets will require a road to a port on the coast, followed by ice-breaking, deep-water marine shipping to market.

A feasibility study by Canarctic Shipping, owners of the ship *M.V. Arctic* which services Nanisivik and Polaris Mines, indicates that ice-breaking cargo carriers can be built to transport concentrates from Coronation Gulf to market.

M.V. Arctic loading concentrates at Nanisivik Mine



Studies into road construction indicate that either an ice road or an all-weather road can be engineered to access the deposit. Despite their higher cost, however, all-weather roads are favoured as they provide several advantages over ice roads:

- They provide a longer shipping season, resulting in lower working capital requirements.
- Their year-round use requires fewer trucks.
- They require lower maintenance.
- They are easily improved to handle additional traffic.
- They reduce the requirement for fuel and concentrate storage at both ends of the road.

As stated earlier, however, no single mining company can afford to pay for all-weather roads, a port facility, and ice-breaking cargo ships.

If others supply some or all of the transportation infrastructure, it will become much more economically attractive to mine the Izok deposit and, for that matter, any other deposits in the Slave Province.

IZOK: THE OPPORTUNITY

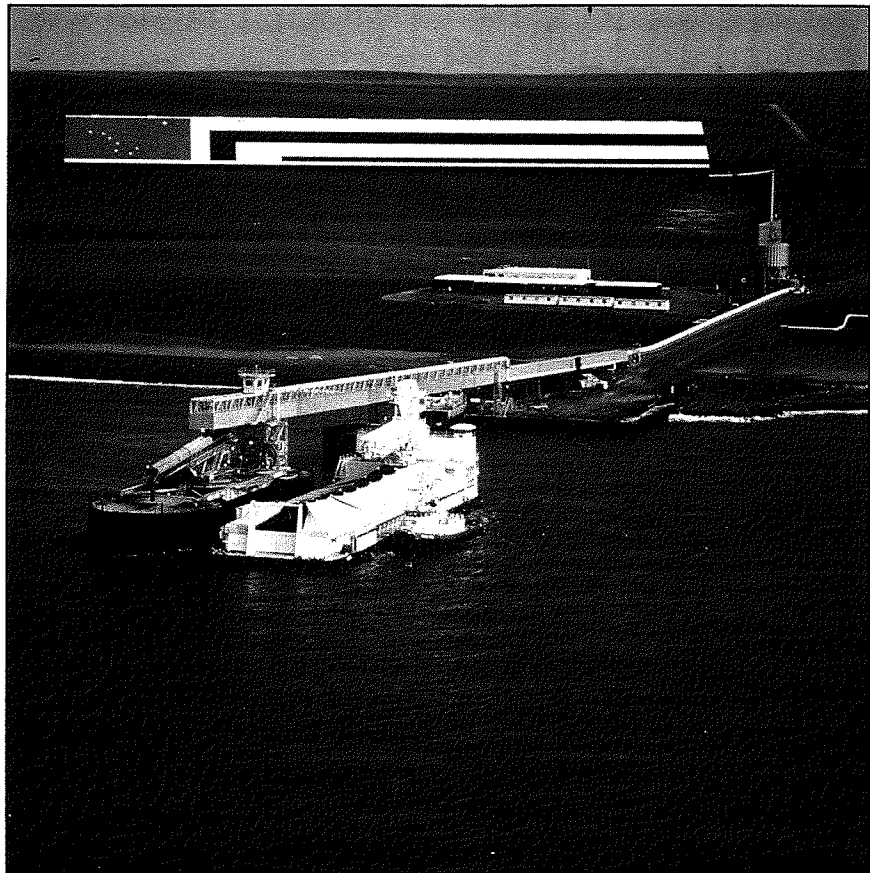
If Izok goes into production, it will establish deep-water shipping to the Coronation Gulf. In addition, Izok will help justify road access to a very rich part of the Slave Province.

Everyone will benefit:

- Northern communities will receive a reduced cost of living;
- With reduced costs, exploration will increase, thus improving the odds of finding more mines;
- Reduced operating costs at the Lupin Mine will extend its life and jobs for its employees;
- More deposits will become economic to mine, creating more jobs and benefits.

Without Izok, however, this will be very difficult.

A similar deep-water port could service the Slave Province.



SUMMARY: MINING NEEDS INFRASTRUCTURE

A previous economic study completed by the Centre for Resource Studies at Queen's University in 1988 clearly summarized what must be done to start major mining development in the Slave Province.

"An improved transportation system is the key to stimulating a major advance in base metal mining in the territories. The most critical requirement is the construction of all-weather road networks from the fringes of the region into the hinterland. Another economic priority for the large scale base metal development is the provision of regional power generating facilities. These are the two areas where government investment would have the greatest impact on the economic climate for base metal mining in the North.

Given the provision of regional road and power facilities, there is little doubt that the [Slave Province] will be an important part of Canada's long term mining future."

Prophetic words, indeed.

PARTNERSHIPS, ANALYSES & INVESTMENT ARE KEY

Investment in marine shipping, in all-weather roads, and in hydro-electric power in the Slave Province will lead to increased mining development.

Providing this common, public infrastructure is a natural role for government.

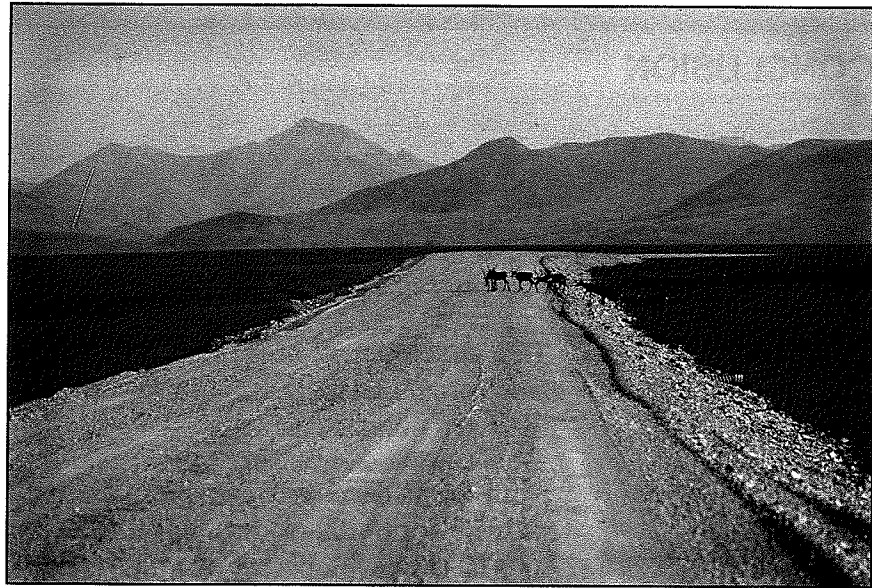
However, given the difficult economic times, government is reluctant to write big cheques for such initiatives.

Despite this fiscal restraint, infrastructure for the Slave Province can be developed successfully through strategic and shared investment by government and other stakeholders.

This will require several things happen:

- Partnerships must be created between industry, government, business and aboriginal groups. Each of them has something to gain from, and something to offer to, development and investment in the Slave Province. But their roles and responsibilities must be clarified and brought into one vision.
- Assessments must be made of various transportation options as well as of their impacts. For example:
 - Does an all-weather road from Yellowknife to the coast make economic sense at this time?
 - Can ice roads continue to handle the load requirements of proposed diamond mining developments as well as supply Lupin Mine?
 - Can a phased approach in building all-weather roads to access the Slave Province be done at a cheaper cost? If so, which routes should be built first?
 - Can all-weather roads be constructed in combination with ice roads to extend shipping requirements at a lower cost?
- Hydro-electric power options must also be analyzed. For instance:
 - If power is supplied to new mines, they will require far less fuel. What impact will this have on transportation needs and priorities?
 - Can Beaufort Sea oil be used at future mines?

Caribou cross all-weather toll road from Red Dog to coast.



- What potential power sites are available, what are their generating capacities, and what are their development costs?
- Given that new mining development is accelerated, socio-economic and environmental assessments should be started to help the North prepare. Land use planning should be also considered, both on a regional and municipal scale.
- Innovative ways can and must be found to help fund investment in the Slave Province. No one party should have to carry the entire burden of opening up and developing the Slave Province. To this end, government, industry, aboriginal groups, and the general public should be considered as potential investors. Various investment options must be determined and analyzed. For example:
 - Can bond issues be used to both pay for infrastructure and can they provide a healthy return to investors?
 - What other investment vehicles are available?
 - Can tolls be applied to the roads to help pay for them?
- Finally, decisions must be made and actions taken.

CONCLUSION

Through the development of its rich mineral deposits, the Slave Province holds the potential to substantially benefit the economy of both the Northwest Territories and Canada.

This development provides a unique opportunity for Northerners to participate in improving their economy and their self-reliance.

Both the Federal and Territorial Governments are mandated to provide for northern development. Both can play a strategic role in the development of transportation and power infrastructure and in providing education and training for northern residents.

Aboriginals are becoming major northern land owners and will secure the rights to important mineral deposits. New transportation infrastructure will be critical to their needs if these deposits are to be developed.

Aboriginals are also becoming major investors. Northern mining and transportation and power infrastructure will provide them with new avenues for northern investment.

Industry has the expertise to develop the important mineral resources of the North. Through innovative applications of science and engineering, the northern mining industry has proven it can build viable, economic, and environmentally safe mines under adverse conditions.

As Northerners, and as representatives of the mining industry, the N.W.T. Chamber of Mines recommends that these interested parties join in helping make major mining development in the Slave Province a reality.

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