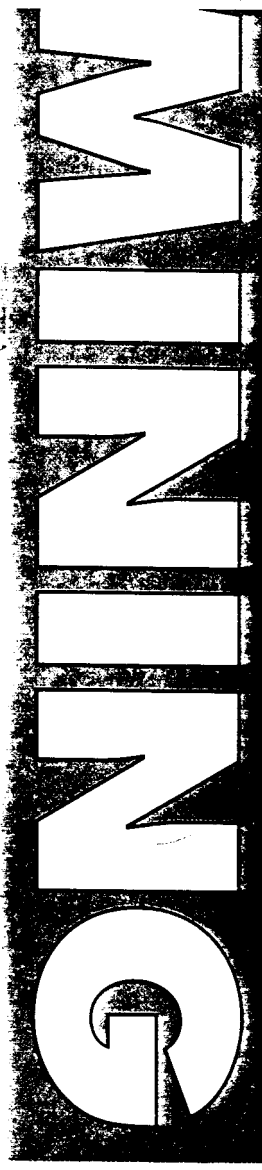




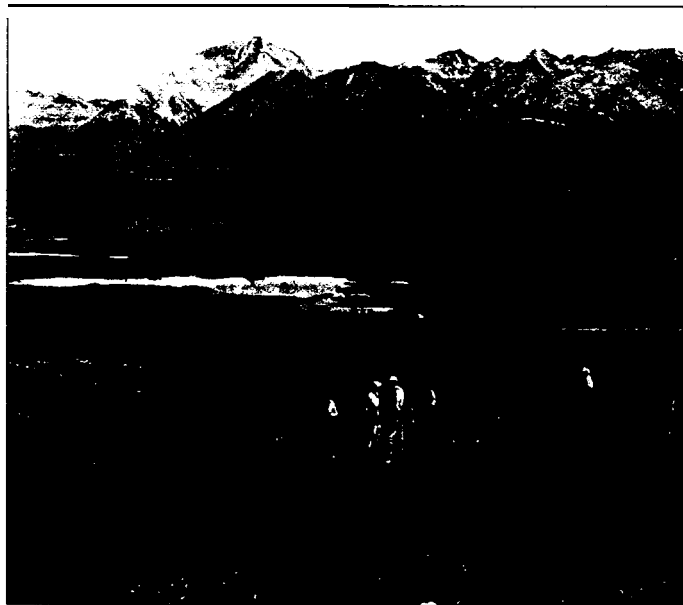
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Leading In Canadian Exploration
Type of Study: Reference Material
Date of Report: 1993
Author: The Mining Journal
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JOURNAL

NORTHWEST TERRITORIES



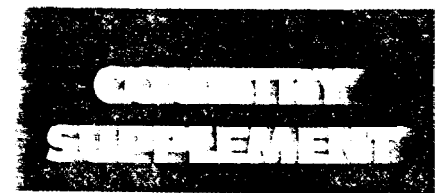
LEADING IN CANADIAN EXPLORATION

The Northwest Territories (NWT) has a rich mining history, with both the economy of its capital Yellowknife and its infrastructure being based primarily on the minerals industry. Today the NWT has numerous gold and base metal exploration programmes under way and has taken centre stage with one of the most concentrated exploration efforts for diamonds in the world. The Territories has a secure investment climate with support for mining from both the government and native peoples, attractive tax rates, an eager and available workforce and highly favorable geology.

The NWT covers over one-third of Canada's 9,200,000 km² of land area, making it considerably larger than any African nation or the combined member states of the EC. The Territories extends from 60° N to the northern limits of Canada, and is flanked to the west by the Yukon Territory and to the east by Greenland. It also includes the Arctic islands and the islands of Hudson and Ungava Bays. The climate is subject to large fluctuations in seasonal temperatures, with notable extremes.

The economy of the NWT is in many respects still in a developing phase. Self-reliance in the economy is a key objective for both the territorial and federal governments, the attainment of which is given increased urgency in the light of factors such as a relatively high birth rate, an unacceptable level of unemployment and government per-capita expenditure that is two and a half times the national average. Cornerstones in achieving economic self-reliance are seen to include tourism and, in particular, the mining industry.

In 1992, the value of mineral production and exploration in the NWT was C\$476 million. Mineral production currently accounts for around 75% of the value of goods produced in the NWT and over 25% of the gross domestic product. While other Canadian jurisdictions have been seeing investment in minerals exploration and development decrease as companies have refocused their interest elsewhere, this is not the case in the NWT where the minerals industry is currently in a major development phase. In



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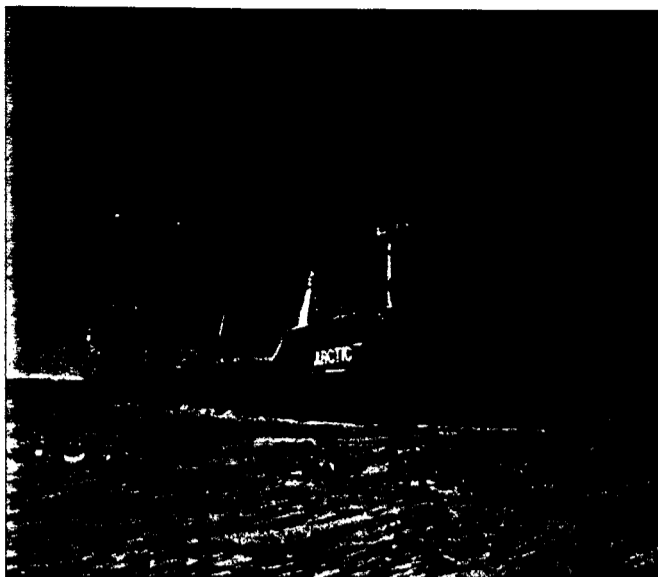
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Spectacular scenery in the Nahanni National Park

recognition of this fact, the Northwest Territories Chamber of Mines has commissioned this supplement, which has been prepared by Mining Journal Research Services and which provides up-to-date information on the NWT minerals industry! including current exploration and mining incentives.

Much of the infrastructure in the NWT can be attributed principally to the mining industry. The Con mine built the first hydroelectric power plant in the NWT and Pine Point was responsible for the third. The Mackenzie Highway was built to reach the mining town of Yellowknife, well before it became the centre of government, and the NWT'S only railway was built to service Pine Point. The Eldorado mine at Great Bear Lake initiated river shipping and the mines' need for fuel helped bring the





The MV Arctic is the world's only ice-breaking cargo ship.

LAND CLAIM AGREEMENTS

Land claim settlements have been moving forward very successfully in the NWT over the past two years, lending a greater sense of security of land tenure for mining companies. There are two distinct areas of these settlements, related to the different ancestry of the native residents.

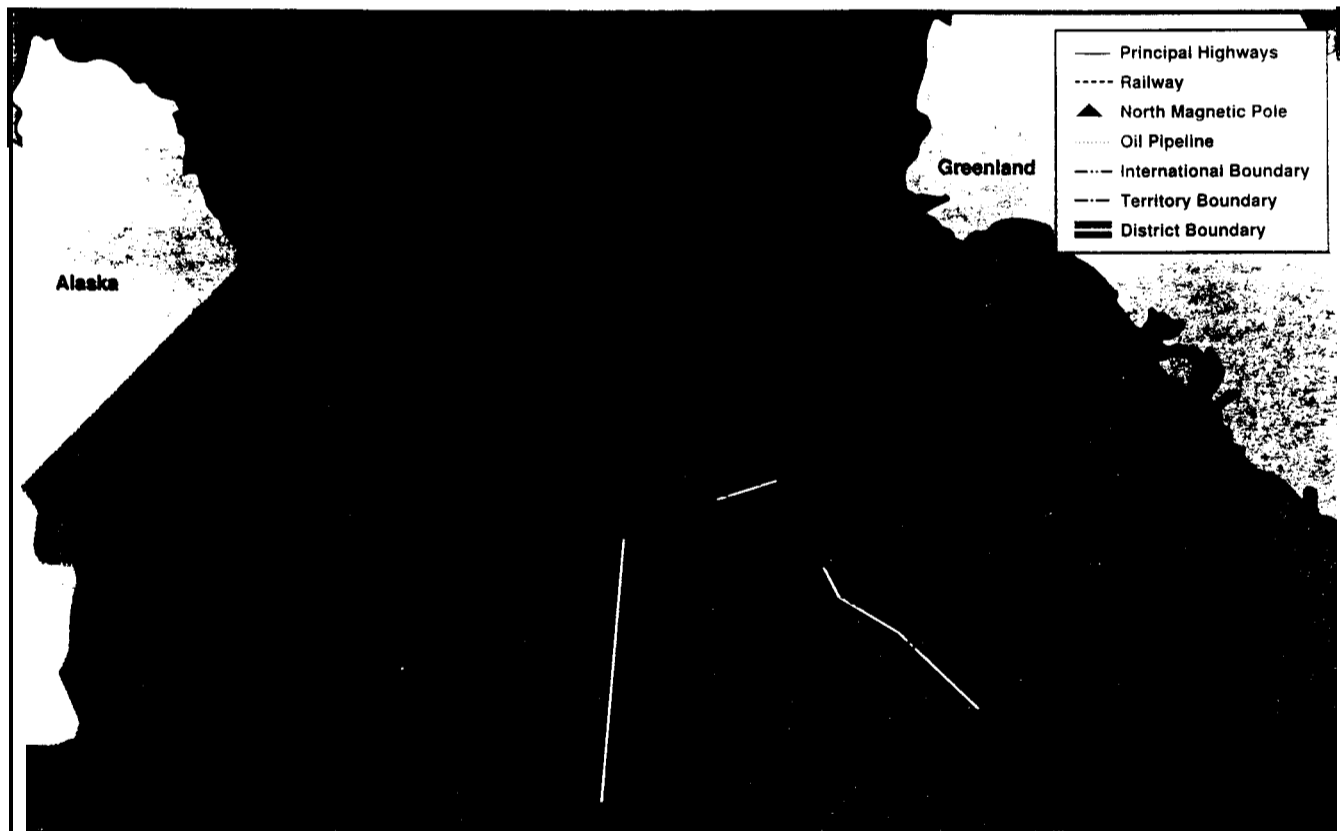
In the High Northern and Eastern Arctic, the Inuit people ratified their land claim in mid-1993; as part of this process, the federal government has agreed to pursue the creation of a new territory - Nunavut - encompassing traditional Inuit lands. The settlement gives the Inuit title to 350,000 km² of land, of which 36,000 km² is subsurface rights, plus financial and other participatory rights.

In the Western Arctic, meanwhile, land claim settlements have progressed more slowly. Following the demise of a comprehensive land claim agreement in 1990, individual native groups have been pursuing regional land claims. The first of these was ratified in late 1992 between the federal government and the Gwich'in people, resulting in the transfer of some 22,400 km² in the NWT and 1,550 km² in the Yukon Territory. Subsurface rights and a share of resource royalties were also included.

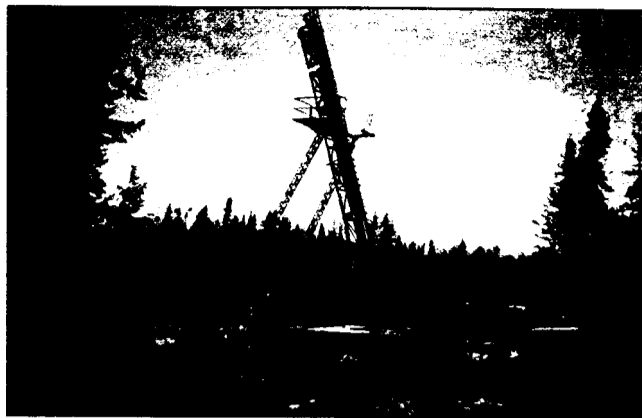
Norman Wells oil field into production. Canada's - and the world's - only ice-breaking ore-carrying ship, the MV Arctic, was built to service the Nanisivik and Polaris mines.

Today, government recognises the substantial role that the minerals industry can play in developing the NWT. Neither has this fact been lost on the native peoples, who are a political majority at territorial government level. With new transportation routes, the NWT will be able to provide easier and cheaper access to support expanding exploration programmed and to assist in bringing new mines into production. The

operators of the MV Arctic are examining several new shipping routes and indications are that shipping to and from Coronation Gulf will be both economically and environmentally viable. The NWT government is also studying the possibility of further development of all-weather roads and the feasibility of new hydroelectric power projects. Meanwhile, the mining industry is in the forefront in its ability to supply employment opportunities for the native population, an example being the Colomac mine which was the first to sign a comprehensive employment agreement with its local communities.



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The southern neighbors of the Gwich'in, the Sahtu Dene and Metis peoples, followed with the negotiation of their own land claims, resulting in the transfer of over 41,400 km² plus financial benefits. The Dogrib people are in the process of negotiating a similar package, while the Dene and Metis peoples of the South Slave and Deh Cho districts - in the far south of the NWT - have yet to embrace regional land claims.

In essence, the content of each of the territorial land claims is similar, the native residents receiving a combination of surface lands, subsurface rights, cash and participation rights in matters such as surface rights, wildlife management, water, and environmental impact review procedures.

In the context of the minerals industry, Benefit Agreements are a significant feature of land claims, guaranteeing claimants an opportunity to participate in any mineral development. Clarification of title, along with guaranteed participation

in resources management and mineral development, has encouraged many Native peoples, organisations to support mining and mineral exploration.

ATTRACTIVE GEOLOGY

The NWT has very attractive mineral prospects, not least due to its being the least mapped and explored jurisdiction in Canada. Very little was known about the geology and mineral potential until the Geological Survey of Canada first mapped the Yellowknife area in 1935. Gold was discovered in quartz veins, first on the east shore of Yellowknife Bay and then in Archaean volcanic rocks on the west shore. A minor rush ensued, and within two years the Con mine was in production and most of the volcanic belt had been staked. Later discoveries of base metals and uranium consolidated the Territories' position as a world-class mineral province.

Structural Provinces

Geologically, the NWT is divided into nine geological provinces, ranging in age from the Slave province (the oldest)

through the Bear and Churchill Precambrian provinces, the Arctic, Interior and Hudson Platforms and the Cordilleran and Innuitian provinces to the most recent in geological terms, the Arctic Coastal Plain.

The Slave province, which exceeds 2,500 Ma, consists of Archaean greenstones and Precambrian granites and gneisses. Folding, the injection of granites and the formation of gneisses all occurred in an orogenic period at around 2,650 Ma, all following basement structural trends. Together with the Bear and Churchill provinces, the Slave forms the Precambrian Canadian Shield and while in general terms the Slave is the oldest, both the others contain similarly aged fragments. All three have a complex history involving volcanism, metamorphism and deformation, fracturing and faulting, resulting in the formation of a wide range of valuable mineral deposits.

The Bear province (average age 1,750 Ma) is the smallest province and borders the Slave on its western side. Sediments are the main lithology, with some volcanic rocks and Precambrian granites and gneisses. Deformation and metamorphism are very variable. Bear is best known for its uranium and silver deposits, which were mined in the past.

GEOLOGICAL PROVINCES	
<input type="checkbox"/> Cordilleran	<input type="checkbox"/> Hudson
<input type="checkbox"/> Interior	<input checked="" type="checkbox"/> Churchill
<input type="checkbox"/> Slave	<input type="checkbox"/> Innuitian
<input type="checkbox"/> Bear	<input type="checkbox"/> Arctic Coastal
<input type="checkbox"/> Arctic Platform	<input type="checkbox"/> Plain



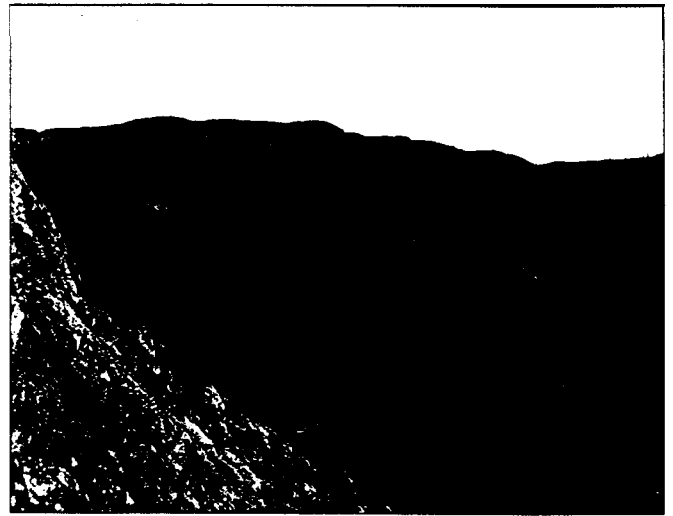
The Churchill Province (2,670-1,400 Ma) has a wide range of lithologies including Precambrian granites and gneisses, basic and ultrabasic intrusions, volcanics and sedimentary rocks. Deformation and metamorphism, caused by an orogenic phase at circa 1,700 Ma, range from medium to high grade.

The Churchill province has a highly favourable mineral potential, with mineralisation including uranium, iron, lead and zinc. The Nanisivik mine produces lead, zinc and silver, while elsewhere in the province conglomerates and sandstones overlying unconformities dating from the orogenic period contain economic uranium deposits.

Of particular note is the Rankin-Ennadai greenstone belt, a southwest-trending belt of Archaean rocks within the Churchill province, that contains all the classical Archaean-type deposits, including volcanogenic massive base metal sulphides and shear zone- and banded iron formation-hosted gold. In addition, the Churchill province contains a vast sedimentary basin, the Thelon Basin, that is believed to be a sister to the uranium-rich Athabasca Basin in northern Saskatchewan.

The Cordilleran structural province lies between the Yukon border and the

Typical rugged terrain in the Bear Geological Province



Mackenzie River, forming a mountainous area consisting of sedimentary rocks with some volcanics and gabbro sills. The rocks range from late Precambrian basement to Mesozoic sediments, with varying deformation and metamorphism throughout the province. This rugged country has had some exploration in the past, indicating mineralisation such as placer gold, copper, tungsten, silver, lead and zinc, as well as oil and gas occurrences. Commercial production has come from the Pointed Mountain gas field and the

Cantung tungsten mine, currently on care and maintenance.

The Interior Platform is located to the east and, as with the Hudson and Arctic Platform, comprises hundreds of metres of relatively undisturbed younger sedimentary rocks, volcanics and gabbroic sills. They are mainly Ordovician, Devonian and Cretaceous in age, with some Precambrian and Tertiary rocks as well. The Platforms are best known for the lead-zinc deposits they host, such as those at Pine Point. They also host extensive oil and

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gas deposits, of which the Norman Wells oilfield is an example.

The Innuition province and the Arctic Platform comprise the majority of the islands in the north. The Innuition province, located in the high Arctic, is the least explored region in the NWT. Polaris mine (Canada's most northerly mine) is in the south of this province on Little Cornwallis Island. The geology comprises lower Paleozoic sediments and volcanics as well as Jurassic to Quaternary sediments.

The Arctic Coastal Plain sediments are Tertiary and Quaternary in age and are only exposed in coastal areas. Some coal has been found, and the province is thought likely to contain substantial oil and gas resources.



Local marker on the shores of the Great Bear Lake

Economic Geology

Recent exploration activity has centred on diamonds, the Canadian Shield comprising one of relatively few ancient cratons that can host diamondiferous kimberlites and lamproites. The Slave province in particular is viewed as having strong diamond potential, with exploration directed at the identification of kimberlite occurrences through their association with characteristic and distinctive suites of indicator minerals that include pyrope garnet, chrome diopside, chromite and ilmenite.

Gold mining has been a major component of the NWT minerals industry since the late 1930s. From then until the Lupin mine opened in 1982, the shear zone-hosted deposits in the Yellowknife volcanic belt contributed nearly 90% of the territories' total gold production. At Lupin, gold is found in association with iron formations, and the shear zone deposits now contribute less than half the NWT's annual output. A summary of gold deposit occurrence types is given in the adjoining table.



The Alexandra Falls, near Yellowknife

Based on the size and grade of current and past gold producers, basaltic volcanic belts similar to those around Yellowknife provide the most favorable exploration targets, with gold and associated iron sulphides occurring in shear zones and in volcanic-sedimentary contact quartz veins. Favorable areas, not currently seeing intensive gold exploration, include the Beaulieu River, Camsell, Indian Mountain and Point Lakes, and the Thelon-Front district.

Base metals exploration has traditionally been directed at Mississippi Valley-type deposits, hosted in platform carbonates. These settings have contained the NWT's principal lead, zinc, cadmium and silver producers, which to date have included Pine Point, Polaris and Nanisivik.

Other mineral resources include the Cantung and Mactung tungsten deposits, both on the border between the NWT and the Yukon Territory, Mactung being the western world's largest known undeveloped tungsten resource.

m GOLD DEPOSIT TYPES			
TYPE	Examples	Genesis	Description
Quartz-carbonate-sericite shear	Campell, Con & Giant Shears	Epigenetic, hydrothermal	Quartz rich lenses, various sulphides, arsenides
Quartz Veins in: volcanic rock	Rycon, Negus	Epigenetic, hydrothermal	In shears without extensive chlorite-sericite-carbonate
at/near volcanic-sediment contact	Tundra, Discovery	Epigenetic, hydrothermal	Narrow, with consistent mineralisation, low tonnage
greywacke-turbidites	Camlaren, Old Parr, Ptarmigan, Ruth & TA Group	Epigenetic, hydrothermal (where metamorphosed)	Erratic width, and mineralisation, few sulphides, controlled by folds/-cleavage, resemble 'saddle reefs'
granitoid plutonic rocks	Arcadia property	Epigenetic, hydrothermal	Up to 12 m wide, 10 m long, low consistent grades
dykes and sills	Hydra deposit (Colomac dyke)	Epigenetic, hydrothermal	Crosscut intrusions of the same origin
quartz stockworks	MOS claims (in volcanics) & MAG	Metamorphic mobilisation	Disseminated sulphides in bedding parallel veinlets, low consistent grades
Sedimentary rocks mainly in iron formations	Cullation Lake, Contwoyto Lake (Lupin mine)	Syngenetic concentration during metamorphism	Disseminated with sulphides, arsenides, iron minerals in iron formations, sedimentary amphibolite
Sulphide Deposits: volcanogenic massive sulphides sheared, silicified metamorphic zones	Izok & High Lakes & Hackett River Outpost Island	Volcanogenic hydrothermal (exhalative) Hydrothermal	Disseminated throughout mineralised zones Disseminated with tin and tungsten sulphides
Placer deposits	Liard River bars	Placer	Very fine grained, found in black sand layers

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- Aber now holds a 10% vested interest in the Tlikwi Cho diamond bearing kimberlite pipe in the Lac de Gras area. This pipe is presently undergoing underground bulk sampling and results are expected in early spring, 1994.



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Continental holds major claims that surround Kennecott's High Lake deposit on strike both to the north and south.

Partnership with Metall Mining

The 1993 exploration program conducted by Metall on Continental's Run property successfully located 3 substantial structures, below previously known sulphide zones, using deep geophysical surveys, geological and mapping. \$700,000 was spent in 1993. For 1994 Metall plans an initial 1350 metres of drilling to test these structures. The 1994 program is open ended; depending on first results Metall could undertake a major program and spend upwards of \$2,000,000.

Major Transportation Infrastructure

Shipping via the NW passage from the Coronation Gulf to Europe and Asia is planned for 1996, including deep sea ports and inroads, funded by the Government and all involved companies. Metall intends to ship ore from Izok Lake at that time.

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MINING PAST AND PRESENT

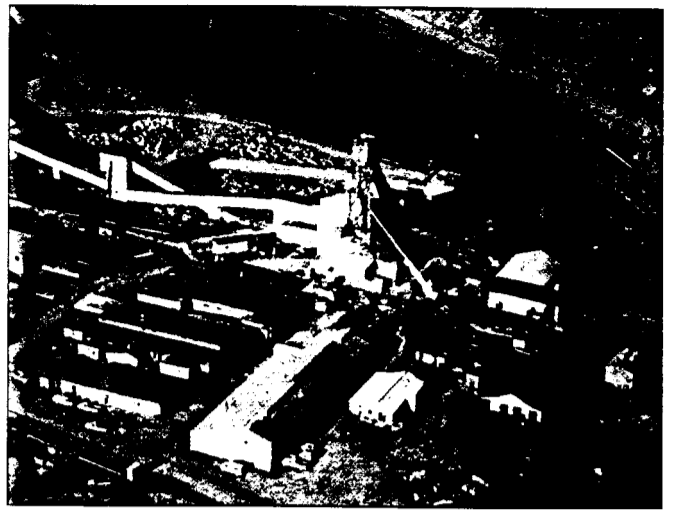
The mining industry of the NWT directly provides work for around 2,000 people, making it the region's largest private sector employer. It has been estimated that at least a further 2,000 are employed in service sectors related to the minerals industry.

The NWT is the third largest zinc producer in Canada and the fourth largest gold producer. There are currently six hard-rock mines in operation. Four are located in the Slave structural province, producing primary gold - the Con, Giant, Lupin and Ptarmigan/Tom mines. The remaining two, Polaris and Nanisivik, both producers of lead and zinc, are in the Arctic Islands region, well north of the Arctic circle.

Gold Mines

Canada ranks fifth amongst gold-producing countries and on its own the NWT would rank about fifteenth. During 1992 the Lupin mine accounted for 48% of the total gold output from the NWT, with Con following at 27%, Giant at 22% and Ptarmigan at 3%.

The Giant mine is located on the outskirts of Yellowknife



Recently acquired by Miramar Mining Corp, the Con mine, located in Yellowknife, is the oldest operating mine in the NWT. Ore is extracted from underground by cut and fill, long-hole and shrinkage stoping. In 1992, 430,100 t of ore were mined, grading 10.6 g/t gold and 2.8 g/t silver to produce 120,000 oz of gold. The ore is processed by flotation, cyanidation and precipitation. In early 1992 proven and probable reserves were estimated at 8.21 Mt at 10.6 g/t gold, representing 1.1 Moz of contained gold. The mine's former owner, NERCO, commissioned a C\$20 million autoclave (the second to be built in Canada) to treat old arsenic-bearing wastes and substantial refractory ore reserves.

The Giant mine, now operated by Royal Oak Mines Inc, started underground production in the late 1940s. The refractory, arsenic-bearing, sulphide ore is being treated by roasting, cyanidation and zinc precipitation. Just under 475,000 t of ore were treated during 1992, yielding 102,335 oz of gold. Mineable reserves of 3.1 Mt will last a further seven years, yielding 28 t of gold. In April 1993, Royal Oak purchased the recently closed Colomac gold mine, located 208 km north-northwest of Yellowknife. The mine opened in May

1990, and produced 131,800 oz of gold. Reserves were estimated in 1990 at 24.2 Mt at a grade of 1.9 g/t, giving the mine a life of a further seven years. Colomac had been on care and maintenance since operations were suspended in July 1991 and Royal Oak intends to bring it back into operation in 1994.

The Lupin mine, owned by Echo Bay Mines Ltd, is situated on Contwoyto Lake, 400 km north of Yellowknife. It began production in 1982 and in April 1993 produced its two millionth ounce of gold. Outside Russia, Lupin is the world's most northerly gold mine and despite its remote location, it is a major Canadian gold producer. The sulphide ore is extracted by longhole open stoping; the mill has a processing capacity recently upgraded to 2,100 t/d, and in 1992 yielded 257,000 oz of gold. Reserves were estimated in 1992 at 1 Mt with a grade of 10.1 g/t. The mine is serviced by air and by a winter ice road from Yellowknife.

Treminco Resource's joint Ptarmigan and Tom mines represent much smaller operations, with Tom being a new deposit. Ptarmigan was originally mined briefly during the Second World War. In 1987, it was purchased by Treminco and was

SEEKS GOLD OPPORTUNITIES WORLDWIDE

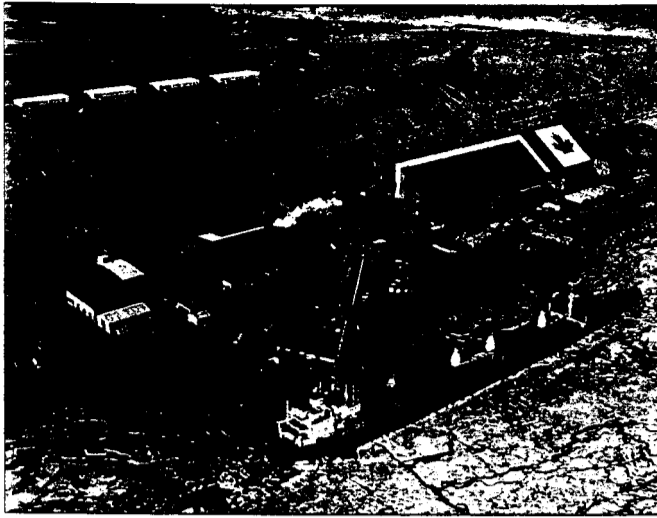
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Lupin mine is one of the world's most northerly gold mines



The MV Arctic being loaded with concentrates at the Polarismine

recommissioned. A third ore source, located between the two existing orebodies has since been accessed, and production from all three is now treated at the company's 70,000 t y mill. Mining is by shrinkage stoping on vertical gold-bearing quartz veins.

Base Metal Mines

Polaris and Nanisivik, although both located in the high Arctic, are among the lowest cost zinc producers in the world. On its own, the NWT would rank eighth amongst world zinc producers. During

1992, Polaris accounted for 72% and Nanisivik for 28% of zinc production.

Polaris, on Little Cornwallis Island, is the world's most northerly base metal mine. Shipping of its lead and zinc concentrates to European markets is only possible between June and October of each year. Cominco, which owns 77.6% of Polaris, undertook 21 years of high Arctic exploration before bringing the mine into production in 1981. In 1992, 1.07 Mt of sulphide ore were milled, yielding 217,900 t of zinc and 51,740 t of lead. "Extraction is by mechanised,

longhole, sub-level open stoping, with access to the workings by a ramp. Reserves were estimated in 1992 at 10.45 Mt grading 14% zinc and 3.7% lead.

Nanisivik, wholly owned by Conwest Exploration, is situated at the northern end of Baffin Island and came into production in 1976. The mine is managed by Strathcona Mineral Services. Extraction is mainly by room and pillar, supplemented by mechanised cut and fill. 764,100 t of sulphide ore were processed in 1992, with 56,300 t of zinc, 440 t of lead and 17.6 t of silver produced. Reserves are estimated at 2.55 Mt with grades of 8.5% zinc, 0.3% lead and 39 g/t of silver.

Past Producers

No review of the NWT's mining history would be complete without mention of Pine Point. Although mineralisation was first discovered in the area in 1898, and subsequent exploration revealed the true size of the lead-zinc orebody, it was not until the NWT's only railway was constructed in 1964 that mining at Pine Point was able to commence. Production lasted until 1989, when the last of the stockpiled concentrates from the mine were shipped to Cominco's smelter in British Columbia. Pine Point contained 84 Mt of ore and yielded 1.8 Mt of lead and 3.9 Mt of zinc - a world-class deposit by any standard.

Rhonda

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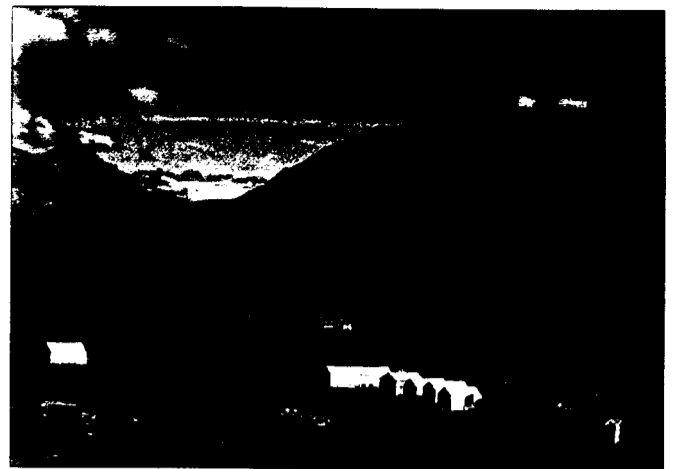
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Other significant past producers include the Cantung mine, once one of the world's largest tungsten mines. The deposit, where production was suspended in 1986, is owned by Canada Tungsten Inc. and could be re-opened with an upturn in world tungsten prices. There are proven and probable reserves at the site of 1.4 Mt grading 1.2% WO₃.

The Discovery gold mine produced some 1.0 Moz from 1 Mt of ore, the Port Radium mine operated for 50 years producing in sequence radium, uranium and silver, and the Eldorado and Rayrock mines produced uranium during the boom years of the 1950s. Nickel was produced during the late 1950s from the North Rankin mine, an operation that was significant not only for its mineral output, but for pioneering the use of sea transport in the high Arctic.

*Left: Pine Point was a world-class base metal deposit until production ended in 1989
Right: An exploration camp in the Mackenzie Mountains*

are also significant gold and base metal exploration programmed under way. In 1992 exploration activity was split 37% on gold, 29% on base metals, 26% on diamonds and the remaining 8% on other commodities, mainly uranium. This year, however, diamonds will have taken by far the major share of exploration expenditure.

The Slave province has witnessed the greatest exploration activity in 1993. The diamond rush is located here, as well as the successful base metal exploration programmes at Izok Lake and High Lake. Gold prospects are also being evaluated, by companies such as BHP Minerals and Homestake.

The other major commodity, under exploration, albeit at a significantly reduced level from former times, is uranium. The 1992 exploration budget of C\$3 million was spent predominantly in evaluating occurrences in Proterozoic rocks of the Churchill province in the Keewatin district.

Diamond Exploration

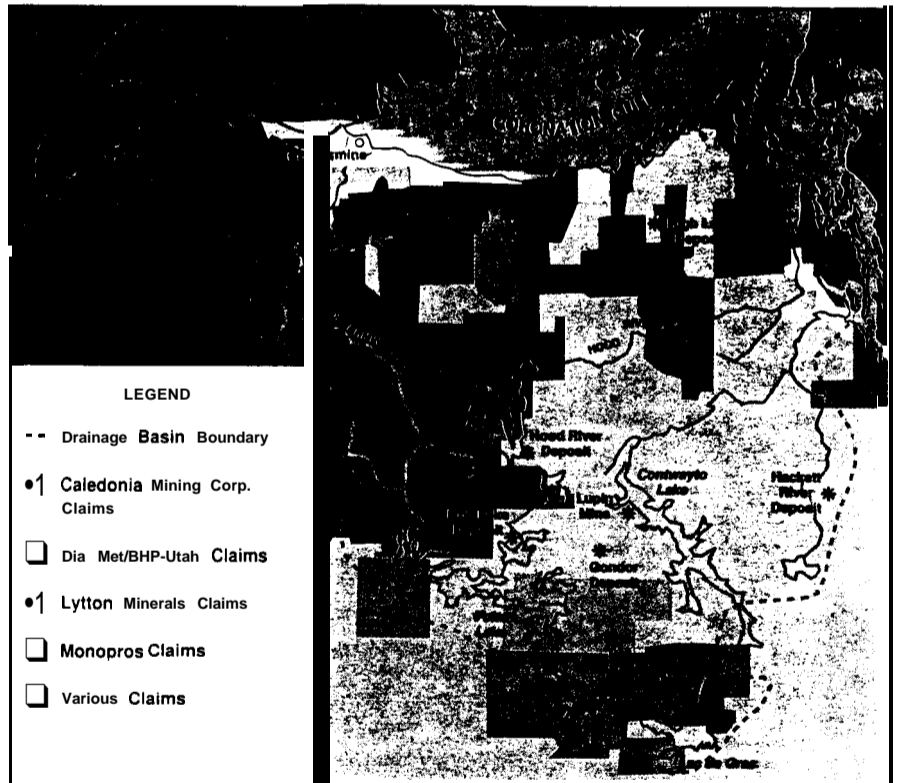
Companies such as De Beers have been exploring for diamonds in the NWT for some 20 years, but until recently success was very limited. This was primarily the result of kimberlites being obscured by a blanket of overburden deposited by vast Quaternary glacial ice sheets. In some cases, the kimberlites are softer than the surrounding Archaean country rocks and are therefore overlain by a thicker cover of glacial deposits or even in several cases by lakes.

CURRENT EXPLORATION

Exploration over the past 60 years has revealed many mineral deposits. The best known of these are the Yellowknife gold deposits, where the Giant, Con and Ptarmigan/Tom mines are located, and the Lupin mine in the north. Numerous other deposits are scattered throughout the Slave province, from gold to zinc, copper and rare earths together with the recent discoveries of economically significant diamond-bearing kimberlite pipes that have been made in the Lac de Gras area. Iron formations are also known.

Exploration expenditure in the NWT is expected to exceed C\$70 million during 1993. This is the second successive year in which exploration investments have risen from the exceptional 1991 low of C\$30 million. NWT was the only part of Canada to have enjoyed an exploration upturn in 1992.

These increases are, to a large extent, the result of the diamond rush, but there



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Results from summer till samples & geophysics have located many new targets on all claim blocks.

The winter exploration drill programme will be based out of the Echo Lake Camp while the bulk sampling crews will be in the Th Kwi Cho camp soon to be connected by winter road to the Lupin winter highway.

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David M. Hurburgh
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Ashton Mining of Canada Inc.

BHP-Dia Met Minerals

Four months after its initial discovery of the Point Lake kimberlite, Dia Met Minerals formed a joint-venture partnership with BHP Minerals Canada. Processing of stockpiled samples from two kimberlite sources began in early 1993, and while sample sizes remain small, results have suggested that their discoveries may be on a par with the world's richest pipes. A comparison with the Jwaneng deposit in Botswana is indicative: stones from BHP-Dia Met's Pipe 4 deposit have returned a value of \$112/ct (Jwaneng \$100/ct) with an overall value of \$139/t compared to Jwaneng's \$154/t.

This year, BHP has increased the project's exploration budget to almost C\$12 million. Large-core drilling and underground development are already under way to recover 3,500 t and 5,000 t bulk samples, from which the commercial value of packages of stones will be determined, followed by a full feasibility study.

The joint venture has an estimated resource of 88 Mt at Point Lake, grading 63 ct per 100 t within two separate kimberlite pipes to a depth of 220 m. The assumption is that Pipe 4 is larger, although no specific reserve estimate has been produced.

Kennecott Canada

RTZ is represented in the NWT through Kennecott Canada which is in joint ventures with a number of companies holding claims in the area. Several kimberlite pipes have been drilled, with one in particular, TliKwi Cho on a DHK property, yielding encouraging results. Underground ramp development is already under way to produce a 5,000 t bulk sample that will be transported over the L upin ice road for processing at the Con mill in Yellowknife.

DIAMOND EXPLORATION

Lytton Minerals

Preliminary analyses of drill core samples from the Ranch Lake kimberlite pipe returned a total of 6 macro and 38 microdiamonds in early 1993. A sufficient proportion were reported to be of gem quality to justify further, extensive evaluation of the pipe. Delineation drilling has already shown the pipe to have a surface area of around 14 ha and an estimated 100 Mt of kimberlite to a depth of 300 m.

Tanqueray Resources

Tanqueray property in the Lac de Gras area originally covered potential base and precious metal targets. It is one of the few companies with significant claim blocks close to the original Point Lake discovery that has not optioned the land to one of the major companies. Since the diamond rush began, the surrounding district has been staked by Monopros (De Beers). Exploration on Tanqueray's claims has produced macro- and microdiamonds in amounts similar to those at the BHP and Kennecott discoveries.

Aber Resources

Kennecott Canada is funding the Diavik project in which Aber has interests ranging from 20% to 100% in properties covering approximately 5,600 km² in the Lac de Gras area. Other companies holding interests in the project include Commonwealth Gold, SouthernEra Resources, DHK, KRL Resources, Amaro Resources and Winspear Resources.

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The 1991 discovery of the Point Lake kimberlite by Dia Met Minerals in the Lac de Gras area and the news of its contents of 81 small diamonds in a 59 kg sample, initiated the largest claim staking operation in Canada to date.

Since Dia Meals diamond discovery, more than 19 Mha (47 million acres) of land has been claimed, with numerous companies now holding interests not only in the Lac de Gras area but also in other districts. A key factor in the development of interest in the NWT's diamond potential has been that, while activity was originally confined to junior explorers, the entry of major companies such as BHP and RTZ has provided it with much additional credibility.

Exploration activities involve both geophysical and geochemical techniques for the delineation of potential drill and bulk sampling targets. Airborne geophysics has been used extensively to identify anomalies on a regional basis, with the addition of surface geophysics to pinpoint individual targets. The kimberlites in the Lac de Gras area display low resistivity as well as magnetic anomalies, while associated diabase dyke swarms appear as linear magnetic highs.

Indicator mineral sampling has also been an important exploration tool, with grid sampling of the glacial tills and eskers down-ice from the geophysical targets usually following anomaly

ATION PROGRESS

Of the eight targets drilled in 1992, seven intersected kimberlite pipes and a kimberlite dyke. The exploration programme for 1993 has involved extensive ground geophysical surveying and diamond drilling to test approximately 30 targets identified from an analysis of heavy mineral samples.

Lumina Investment Corp.

Lumina holds land both in the Lac de Gras area and on Baffin Island. Its Lac de Gras property is being evaluated for both diamonds and gold, while geochemical surveys on the Baffin Island property have shown the presence of significant indicator minerals, with geophysical surveys revealing over 40 potential kimberlite targets.

Gerle Gold

Gerle has staked nearly 60 magnetic anomalies in the Slave province and has entered joint venture agreements with Teck Corp. and Cominco, which are committed to spending a minimum of C\$500,000 on their exploration in 1994.

Ashton Mining

Ashton with partners Pure Gold Resources are exploring for diamonds in the Slave Lake district, 100 km to the west of Lac de Gras, airborne magnetic and electromagnetic surveys having identified a number of anomalies in their claim areas. Ashton is also drilling on claims held by Island Arc Resources, which has various interests in over 6,000 km² in the Lac de Gras area.

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Sterling Pacific Resources

Sterling Pacific, formerly Consolidated Top Gun Explorations, is involved in two diamond projects in the NWT. The company holds .25% interests in the Tara and Heal properties in the Mackenzie district and 10% in the West Snare property in the Humpy Lake Area.

Caledonia Mining

Caledonia Mining has acquired 2,100 km² of claims in the Coronation Gulf and Bathurst coastlines which drain the entire Lac de Gras area and around 40% of the Bear and Slave provinces, in the prospect of finding alluvial diamonds originating from erosion of the Lac de Gras kimberlites.

Noranda/Rhonda Mining

A joint venture between Noranda and Rhonda Mining has staked claims in the Proterozoic basin to the south of Coronation Gulf, an area that contains raised beaches with the potential for alluvial diamond deposits.

Skeena Resources

Skeena Resources, in joint venture with Connecticut Development Corp. and Leeward Capital, has discovered a diamond occurrence in the Keewatin district, unrelated to the Lac de Gras discovery. Sampling has revealed gem-quality microdiamonds in the Outlet Bay diatrema, and kimberlite intrusion 20 ha in area located on the northeast shore of Dubawnt Lake. The discovery spurred another staking rush and more than 20 similar targets have since been identified along a northeast-trending diabase dyke corridor.


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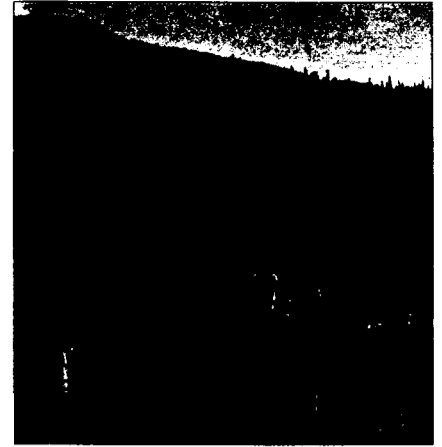
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Right: Diamond drilling in the Bear Province
Below: Tailings line maintenance at Colomac mine



Lac de Gras, in Churchill province.

High Arctic islands, such as Baffin and Somerset Islands.

Base Metal Exploration

Over the years, the north Slave province has attracted several major mining companies prospecting for volcanogenic massive base metal sulphide deposits discovering, amongst others, the Izok Lake polymetallic deposit. While a lack of major transport infrastructure has impeded their development, this is now changing. From experience gained in operating the world's only ice-breaking ore-carrier to Polaris and Nanisivik, the shipping industry now believes that the north Slave province coast is commercially accessible, the implications of which are enormous for the long-term development of the region's base metal deposits.

The Izok deposit, discovered in 1974, is the largest undeveloped zinc-copper deposit in North America. Located 350 km north of Yellowknife and 90 km west of the Lupin mine, it is owned by Metall Mining Corp. Exploration has revealed at least 18.5 Mt of polymetallic reserves, including the newly discovered Inukshuk deposit. Grades are 14.6% zinc, 2.5% copper, 1.6% lead and 77.7 g/t silver. An all-weather camp and gravel airstrip have been constructed at the site, while a winter road and port facilities on the Coronation Gulf will be needed if a mine is brought into production. Exploration is continuing with the intention of increasing the reserves to 20 Mt.

Feasibility studies, scheduled for completion in early 1994, have been based on the concept of mining from two adjoining open pits at a rate of 3,000-4,000 t/d of ore, giving a mine life of 10 to 11 years. Any deeper reserves discovered would be mined from underground, thereby adding to the mine life. Production could start as early as 1997.

A C\$2 million exploration programme is under way on the High Lake copper-zinc deposit, funded by a joint venture between Kennecott and Aber Resources.

location. Follow-up drilling is often confined to winter when the lakes and muskeg are frozen. Winter also allows exploration companies to move fuel and supplies using the Lupin mine's ice road which conveniently traverses the Lac de Gras area.

By Mid-1993, 125 kimberlite pipes had been discovered in the Lac de Gras area and fieldwork activities are continuing. By June 1993 bulk and diamond core sampling had suggested that of the 24 pipes thus far sampled in the area, up to five could be economic. Should this be the case, it would make the ratio of economic to uneconomic pipes considerably higher than in most of the world's other major diamond producing areas.

Various theories exist over the extent of erosion of the NWT's kimberlite pipes, with some apparently virtually complete, including a surface crater, while others may be more heavily eroded. The latter hypothesis has led some companies to suggest, using the South Africa/Namibia model, that concentrations of both indicator minerals and diamonds may occur in alluvial deposits along the northern coastline.

Six major mining houses and over 150 junior companies are involved with NWT diamond exploration. The box on page 12 describes the current activities of some of the principle participants.

There are four major areas of exploration interest:

- The Corridor of Hope, which trends parallel or sub-parallel to the diabase dyke swarm that transects the Lac de Gras area. All the kimberlites in the Lac de Gras cluster seem to follow this corridor.

- Humpy Lake, some 150 km west of Lac de Gras.

- Dubawnt Lake, some 475 km east of

Aber has already completed 3,500 m of diamond drilling and another 2,500 m are planned. The drill programme in 1992 included one hole that intersected 6.9% copper over 71 m, including 3.75 m of 9.2% copper. Reserves outlined in 1957 were 5 Mt grading 3.5% copper, 2.5% zinc and 0.8 g/t gold, and Aber believes the deposit to have a resource of between 10 and 30 Mt of copper-zinc-precious metal ore. High Lake is located 40 km south of Coronation Gulf, well-sited for marine shipping access.

Continental Pacific has been exploring the area for over six years and currently is the largest base metal claim holder in the north Slave. The company has identified 21 potential polymetallic zones adjacent to Kennecott's High Lake deposit. Its work schedule for 1993, being carried out with partner Metall Mining, includes comprehensive geological, geophysical and drilling programmed.

While the Slave province is receiving increased interest in volcano genic massive sulphides, Noranda and Rhonda Mining have made significant discoveries at their Woolgar Project with the delineation of a new copper province south of the Coronation Gulf coastline. The stratabound copper is found within the Proterozoic basin adjacent to the greenstone belts, where base metal exploration has mainly been confined until now. The joint-venture initially discovered a series of fault-hosted copper veins up to 100 m thick, which outcropped at the surface. The source of the mineralisation was then traced down to the stratabound sedimentary deposits below. The stratabound mineralisation also has zones of lead, zinc, gold and silver associated with the copper mineralisation. Noranda/Rhonda have 68 known occurrences and continued exploration of other promising areas is also under way.

Meanwhile, the owner of the Nanisivik mine, Conwest Exploration, holds a 35% interest in Highwood Resources, which together with Noranda and Aber has been prospecting for copper on Victoria Island; Aber has also been evaluating

the parts of the island for Norilsk-type copper-platinum group metals potential.

Much further to the southwest in the Cordillera San Andreas Resources has reported that recent assays at its Prairie Creek exploration site confirm the continuity of a flat-lying stratabound Mississippi Valley Type copper-lead-zinc-silver deposit and the steeply dipping vein which is attached to it. The deposit is similar to those at Pine Point, Nanisivik and Polaris. Reserves are estimated at 3.3 Mt grading 13.35% lead, 15.61% zinc and 0.18 g/t silver at a cut-off of C\$124/t.

Gold Exploration

Gold exploration is essentially confined to Archaean rocks that make up the Slave province and the neighboring Rankin-Ennadai Belt (the Archaean inlier) in the Keewatin district of the Churchill province.

Athabaska Gold Resources has been diamond drilling at its Damoti Lake property, situated 150 km north of Yellowknife. Wide, high-grade intersections from a Lupin mine-type iron formation, have prompted the company to mount an aggressive exploration programme, including geophysical surveys and drilling.

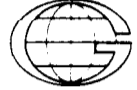
Noble Peak Resources has two gold properties optioned to Placer Dome, the Southwin and Turquetil projects. Two gold occurrences, the Cache and Mac zones, have been identified in the Southwin project. The Cache zone, in which the gold occurs in altered pyrite-bearing felsic volcanic rocks, preliminary reserves are 0.44 Mt grading 9.2 g/t gold. At the Mac zone, mineralisation occurs in altered mafic volcanics. Elsewhere, drilling on the Turquetil property has indicated preliminary reserves of 0.55 Mt at 6.2 g/t gold.

Other gold exploration programmed in the Slave province have indicated several promising deposits, including George Lake, ULU and Arcadia. At George Lake, Homestake has announced drill indicated resources of 2.8 Mt grading 12.4 g/t gold in five separate deposits: the company is now

concentrating on its nearby Boot and Goose Lake prospects.

Also in the Keewatin, the Cumberland/Comstate joint venture has intersected the most significant gold values discovered to date on their Meliadine project. The best hole of 1993 at the Wes-Meg prospect intersected 0.006 g/t over 27.5 m including 0.012 g/t over 4.0 m. The potential for more iron formation and shear zone-hosted gold deposits continues to be extremely high in the belt. Located on tide-water 25 km north of Rankin Inlet, in the Keewatin District, the Meliadine project is a priority because of its near-term production potential.

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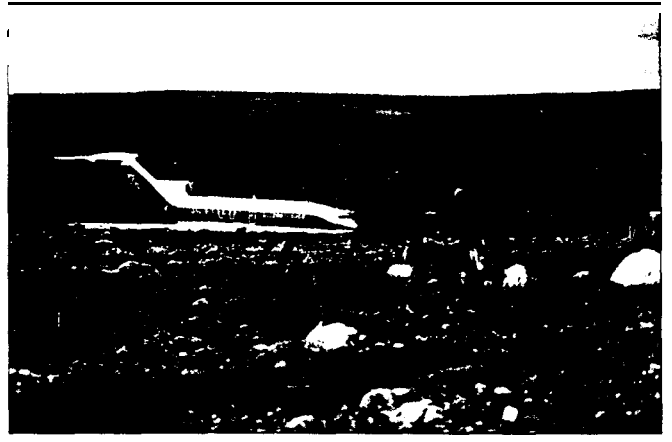
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MINERALS ADMINISTRATION

The XWT is one of the two Canadian territories constituted by an Act of Parliament. It is administered by both the federal and territorial governments, with the native peoples groups effectively forming a third level of quasi-government. All three groups support mineral exploration and production.

In August 1988, the federal government published the 'Northern Political and Economic Framework' which outlined its policies on the NWT, giving the Territories the responsibility to promote economic development, to settle any remaining northern land claims and to enhance Canadian Arctic sovereignty.

As a whole, Canada has a legislative framework that has traditionally

encouraged the discovery and development of mineral resources. Through geological surveys, government has provided a high quality geoscience database in support of exploration, and in addition has provided favorable fiscal and regulatory regimes. While in some cases, these have been eroded in other parts of Canada, they have been maintained virtually intact in the NWT.

In September 1993 the Inter-governmental Working Group on the Mineral Industry completed a study on the taxation in Canada. From an income and mining taxation perspective, the NWT remains one of the most attractive jurisdictions in the world. Tax rates at high and low profit levels are on a par with Chile and the U. S., and are more advantageous than comparable regimes in Australia, Brazil, Indonesia and Mexico. Part of the reason for this is the NWT's three year mining tax holiday and its graduated tax rate schedule. The government is also making a concerted effort to bring the higher

Left: Underground workings at Nanisivik lead-zinc mine

Right: A Boeing 737 owned by Echo Bay, brings the crew change at Lupin mine

non-profit taxes down to a more competitive rate.

Favorable fiscal and non-fiscal incentives also encourage exploration in the NWT. Two main fiscal incentives offered by the Canadian governments include 100% write-off of all pre-production exploration and development expenditures, and the flow-through share mechanism. This permits the transfer of deductions for exploration and development expenses to flow-through shares, government currently allowing a 100% deduction of eligible exploration expenditures against personal income.

Non-fiscal incentives offered by the NWT are primarily funded under a five year, C\$8 million economic development agreement. They take the form of geological, technology and information programmed, and the grubstake grant programme.

In June 1993 the federal government announced an amendment to tax rules such that all diamond deposits now fall under the definition of a mineral resource. This means that more companies will now qualify for a Canadian Exploration Expense, for tax purposes, making exploration more financially attractive.

Both the territorial and federal governments realise that the minerals industry has the greatest potential of bringing significant long-term investment to the Territories. To date they have maintained a positive policy framework, allowing the NWT to become more attractive to potential minerals investors and refuting the long-held assumption that 'more remote' means 'less economic'.

There is currently substantial research into expanding the transportation and hydroelectric infrastructure in the Slave province, instigated by the rich mineral potential and recent developments at Izok and Lac de Gras. A steering group,

REGULATORY AND FINANCIAL FRAMEWORK

- a) Exploration tax allowances, valid only for the year in which they were incurred; 100% write off is permitted for all mine site exploration, irrespective of the start of formal production.
In the case of off-site exploration, an allowance of 10% of revenue or the cost of the exploration, whichever is the lesser.
- b) An allowance not greater than 15% (or 100% in the aggregate), is allowed for preproduction development and exploration expenditures.
- c) Mining tax rate;
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Royalties are calculated on sliding scale, with profits under C\$1 million having a levy of 3%, between C\$1 million and C\$5 million, the rate is 5%, and a further 1% of tax is added for each additional C\$5 million profit until the maximum of 12% is reached.
However, a royalty free period of three years commencing from the date of production may be determined by the Minister.
- d) Depreciable assets;
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- e) Furthermore, a number of special allowances are available, particularly relating to treatment costs.

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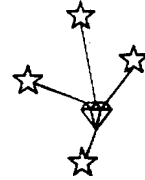
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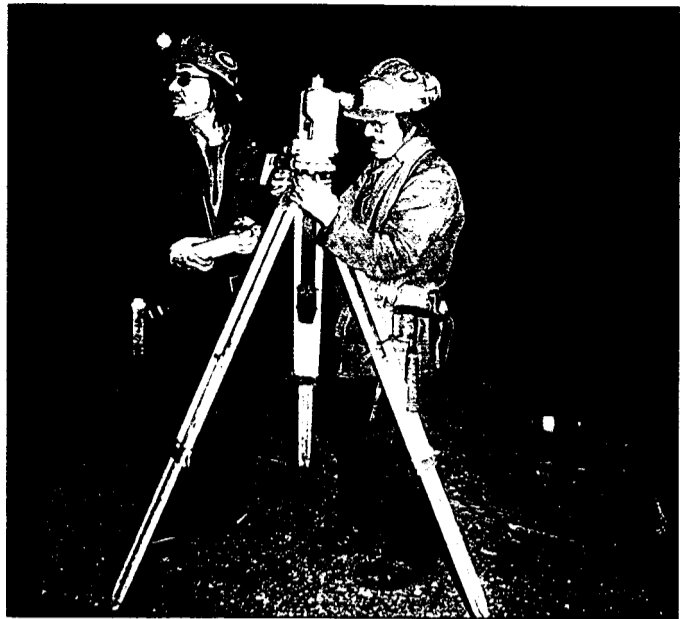
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comprising representatives from industry, the territorial government, native groups and the business community has been set up to press the federal government for its support for an all-weather road into the region and the construction of a shipping port on the Coronation Gulf coast. In addition, agreement has been reached with one native group over the construction of two new hydroelectric plants, which have the potential to service the needs of any new diamond mines.

Inuit surveyors working underground at Nanisivik mine



SERVICES AND INFORMATION

Companies interested in obtaining further information about the NWT mineral industry from the territorial government, should contact either the NWT Chamber of Mines, the Minerals Division or the Canada/NWT Mineral Initiatives Office. Information from DIAND, The Mineral Policy Sector of DEMR Canada and the Geological Survey Of Canada, for whom contact details are included in the adjoining box.

The NWT Chamber of Mines provides a voice for the region's mining operations. It was formed in 1967 as a centre of contact and to represent the mining industry. The Chamber of Mines publishes a bi-monthly newsletter, a

Service and Supply catalogue and an Active Exploration Companies list, all available free-of-charge to members. Members also have access to a reference library, government publications, and updates on mining legislation, land claims and other relevant issues.

The objectives of the NWT Chamber of Mines are:

- To encourage, assist and stimulate the prosperity, orderly development and necessary growth of mining and mineral exploration, in all modes and phases in the NWT;

- To consider, study and discuss matters of public interest affecting the NWT and other parts of Canada in relation to mining and mineral exploration;

- To encourage, assist and undertake research and enquiries into matters pertaining to mining and mineral exploration;

- To inform the public of matters relating to mining and mineral exploration;

- To co-operate with and seek the co-operation of all persons, associations, corporations and authorities, both public and private, to attain these objectives.

In the services sector, NWT-based firms can offer a full range of services to exploration and mining development companies. For example transport, drilling and laboratory services can be obtained from companies headquartered in Yellowknife, and also from others that have regional operations: Geographic Air Survey specialises in airborne geophysics; Longyear provides diamond drilling services and Lakefield Research has been undertaking analyses for diamond exploration projects.

The NWT has an excellent potential for expanding its mineral industry. With

the proposed development of transportation links and increasing knowledge of the region's geology and mineral potential, the NWT is very clearly 'open for business'.

SOURCES OF INFORMATION

Northwest Territories Chamber of Mines

1910 - 50th Street
PO Box 2818
Yellowknife, NWT X1A 2R1
Tel: (403) 8735281
Fax: (403) 9202145

Department of Energy, Mines and Petroleum Resources

Panda Centre II, 3rd Floor,
4915- 48th Street
P.O. Box 1320
Yellowknife, NWT X1A 2L9
Tel: (403) 920 3222/3125
Fax: (403) 8730254

Mining Directorate
Department of Indian Affairs and Northern Development (DIAND)

Les Terrasses de la Chaudière
Ottawa, Ontario
K1A 0H4

The Mineral Policy Sector

Department of Natural Resources Canada
580 Booth Street
Ottawa, Ontario
K1A 0E4

Geological Survey of Canada

601 Booth Street
Ottawa, Ontario
K1A 0E8

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ISLAND-ARC RESOURCES CORPORATION

716-850 West Hastings St., Vancouver, B.C. V6C1E1
VSE Trading Symbol "IAR"

DIAMOND EXPLORATION INTERESTS

◆ Various working interests in 1,500,000 acres in the Lac de Gras area, Northwest Territories, including 120,000 acres at the Humpy Lake find. Ashton Mining plans to resume drilling on Humpy Lake in early 1994.

◆ 25% working interest in 4,120,000 acres in Alberta in 6 land parcels and interests in 13 claim blocks in Saskatchewan in the Fort à la Corne, Sturgeon Lake and Carrot River areas

MASSIVE SULFIDES

An earn-in agreement with Rio Algom Exploration Inc. has been signed on Island-Arc's Lockwood volcanogenic massive sulfide deposit near Everett, Washington.

Drilling by Rio Algom is in progress. Results are excellent so far and more are expected to be released shortly.

GOLD IN MEXICO

Examining a gold property in Baja, California, Mexico, currently in production, with a view to increasing its production rate.

SHARES OUTSTANDING (November 15, 1993): 3,964,701

With so few shares outstanding, Island-Arc is one of the lowest capitalised companies in the entire diamond play.

CONTACT: L.D. Barr (604) 682-4488 Fax (604) 682-8728.

ROYAL BAY GOLD CORPORATION (V-RBG)

TRADED: Vancouver Stock Exchange
SYMBOL: V-RBG
RECENT PRICE: \$0.20
52 WEEK HIGH: \$0.65
AUTHORIZED: 20,000,000
ISSUED: 4,972,373

Gold - British Columbia - Royal Bay holds a 100% interest in four mineral claims (80) units known as the Waratah Property, located in the Iskut River "gold camp", approximately 3km east-northeast of the highly successful Snip Gold Mine. This property appears to exhibit excellent potential for hosting mesothermal shear/vein gold deposits similar to those known elsewhere in the Stewart-Sulphurets Iskut areas.

Diamonds - Northwest Territories - Royal Bay holds an option to earn 20% interest in 8 mineral claims comprising 20,247 acres and 5 prospecting permits granting exclusive mineral exploration and staking rights in over 21,630 acres in the Dubawnt Lake Area of the Northwest Territories, Canada.

Exploration 1993- The preliminary results of the summer exploration programme indicate the presence of two exposed Pipes and five excellent magnetic anomalies thought to be expressions of pipes. During a visit to the property by representatives of a major mining company, work samples from the two exposed pipes were taken for heavy mineral analysis, petrography and age-dating.

For further information write to:

P.O. Box: 27039 COLWOOD CORNERS, VICTORIA,
BRITISH COLUMBIA, CANADA V9B 5S4

Telephone (604) 474-7999 or 1800667-4188

Fax (604) 474-7997 C. E.O., President - Kevin C. Whelan

DID YOU KNOW?

- We represent nearly 200 members actively engaged in the exploration for and extraction of mineral resources in the NWT or who are dependent on this activity for all or part of their earnings.
- Operating from our office in Yellowknife, we maintain continuous communications with members all across Canada.
- We are the most informed industry organization on issues of interest respecting the Northwest Territories in Canada.
- We actively pursue matters of importance to our members with vigour at every opportunity.



NWT Chamber of Mines

- We maintain effective communications with all levels of government and special interest groups on relevant matters.
- Through an intricate system of committees, we effectively express the viewpoint of our industry at all levels of the decision-making process of our society,
- Our membership includes Service and Supply companies, Consulting Firms, Prospectors, Surveyors and individuals from all walks of life, as well as National and Multi-National Firms engaged in mineral production and exploration.
- We encourage and promote our industry whenever and however possible.

If your curiosity is aroused, or you think we might be of service, please contact us. We will be pleased to talk to you. Chances are we are already being of assistance and you are not aware of it.

Write or phone

Tom Hoefler, General Manager

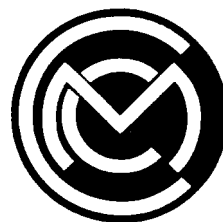
Northwest Territories Chamber of Mines

P.O. Box 2818 Yellowknife, Northwest Territories X1A 2R1 Tel: (403) 873-5281 / Fax: (403) 920-2145

CALEDONIA...GAINING GROUND

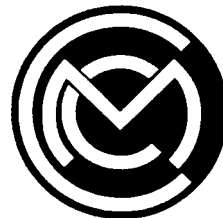
NORTH AMERICA

- Diamonds** ● A 100% interest in 530,000 acres of the most prospective land in the Northwest Territories for the exploration of river and coastal diamonds. The land contains 230 kilometres of coastline and the estuaries of 12 rivers with a drainage area of 30 million acres including the Lac de Gras discovery area.
- Diamonds** ● A 65% interest in 23,000 acres and an 80% interest in 260,000 acres of prospective kimberlite diamond claims near Winter Lake and Kikerk Lake, Northwest Territories.
- Gold** ● A 100% interest in varying interests and royalties in claims in and about Homestake's Nickel Plate Gold Mine, Hedley, B.C.
- Technology** ● A 37% indirect net profits interest in a developing U.S.A. based airborne laser exploration project.



AFRICA

- Diamonds** ● A 48% indirect interest in 5.9 million acres of diamond exploration permits in Zimbabwe & Tanzania where 14 kimberlite pipes and a major anomaly have been located. Another party can earn up to 50% by spending \$CDN 10 million over 4 years.
- Base Metals** ● A 48% indirect interest in the Auriga and KD8 Polymetallic Project in Zimbabwe where drilling has given encouraging values. Another party can earn up to 50% by spending \$CDN 3.4 million over 3 years.
- Base Metals** ● A 28.8% indirect interest in the Sanyati, 5.7 million tons, zinc and copper oxide ore, heap leach project in Zimbabwe which is at the advanced feasibility stage.
- Gold** ● A 48% indirect interest in a 50:50 gold exploration project with Falconbridge Gold in Zimbabwe where several major anomalies are being explored.



EUROPE

- Gold** ● A 25% interest in a very profitable open pit, heap leach gold mine in Spain, producing 22,000 ounces per annum.
- Gold** ● A 100% interest in 233,000 acres of gold exploration properties in Scotland where an exploration program has revealed twelve anomalous areas of possible gold mineralization.
- Marble** ● An 18% indirect interest in the former Hungarian state marble and travertine industry comprising 11 quarries, 6 processing plants, 2 masonry workshops and employing 500 persons.



A Diverse, Multi-national, Multi-mineral, Resource Company.

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