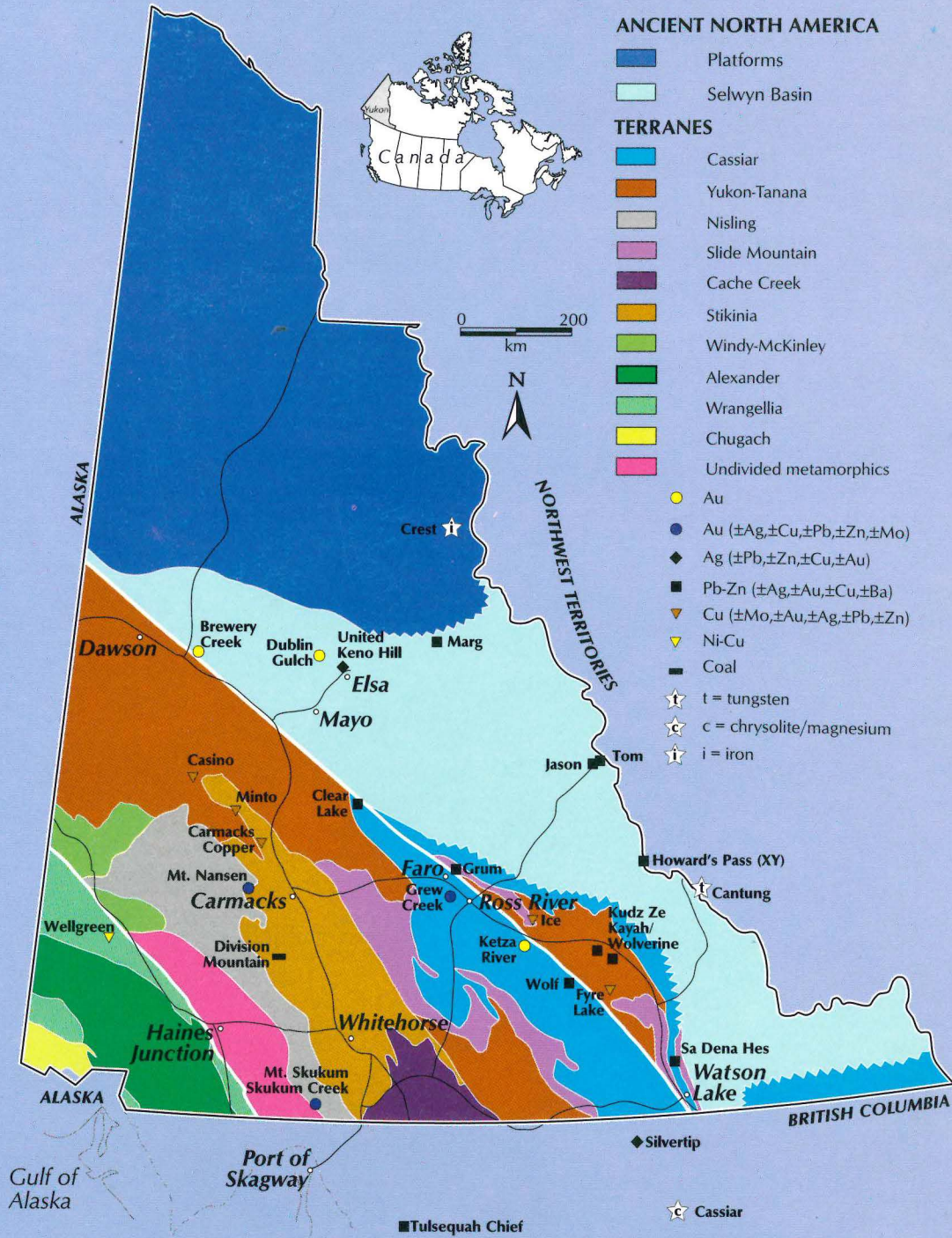


# YUKON MINERAL PROPERTY UPDATE

Prepared by Mineral Resources Branch  
 Department of Economic Development  
 Government of the Yukon



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Department of Economic Development  
Government of the Yukon

**January, 2001**

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# MINERAL RESOURCES BRANCH SERVICES

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## MINERAL RESOURCES BRANCH

This branch of the Department of Economic Development provides the following services to the exploration and mining community.

- Administers, in partnership with DIAND, the Yukon Geology Program.
- Maintains an extensive database of Yukon mining and exploration projects.
- Provides funding to individuals, partnerships and junior mining companies through the Yukon Mining Incentives Program.
- Provides information on the Yukon Mineral Exploration Tax Credit.
- Provides information to potential investors on the Yukon's mineral potential and mining investment opportunities.
- Assists exploration and mining companies through the regulatory process by providing advice on contacts, processes and timing requirements.
- Disseminates information about the Yukon's exploration and mining industry and the work of the Yukon Geology Program by attending trade shows and mining conferences.
- Provides technical expertise on behalf of the Yukon government on regulatory review committees and working groups.
- Provides information about Yukon's mineral resources through the Department of Economic Development website at [www.economicdevelopment.yk.ca](http://www.economicdevelopment.yk.ca).

If you want to find out more about the Yukon's mineral resources, contact Jesse Duke, Yukon Mining Facilitator, at (867) 667-3422.

## YUKON MINERAL PROPERTY UPDATE

The information in the Mineral Property Update was compiled by the Department of Economic Development, Mineral Resources Branch. Data was obtained from press releases, Yukon Minfile, mining company websites, property production records, initial environmental evaluations and from information graciously supplied by property owners. Contributions by the Department of Indian Affairs and Northern Development – Exploration and Geological Services Division, and the staff at the Yukon Geology Program are gratefully acknowledged.

In some instances, employment and power requirement figures were not available and estimates were used. Please let us know of any errors or omissions. Although the Department of Economic Development cannot take responsibility for the accuracy of the data provided, we would like to keep this document as accurate and up-to-date as possible.

If you have any comments or suggestions about this publication, please call or e-mail Lori Walton at (867) 667-5462 or [lori.walton@gov.yk.ca](mailto:lori.walton@gov.yk.ca).

Additional information on Yukon mineral deposits can be found in the publication "Yukon Mineral Deposits," available from the Department of Economic Development. Please call (867) 667-5466 for a copy or check the website at [www.economicdevelopment.yk.ca](http://www.economicdevelopment.yk.ca) for the publication.

## PLACER MINING INFORMATION

**"The potential for new placer discoveries in the Yukon remains high."**

*William LeBarge, Placer Geologist, Yukon Geology Program*

The first placer miners in the Yukon were Indians who recovered native copper nuggets from the White River area in southwestern Yukon. After 1850, prospectors and explorers began to report fine gold on river bars and coarse gold in the Fortymile and Sixtymile rivers. On August 17, 1896, the discovery of nugget gold on Bonanza Creek set off the Klondike gold rush.

Placer mining is still an important sector in the Yukon's economy; in fact, placer mining has contributed to the Yukon economy for over 100 years. Most of the placer operations are small and family-run.

In 2000, the number of placer mines and gold production decreased significantly. A total of 450 people were employed at 140 placer mines. The total gold production for 2000 was 76,507 crude ounces compared to 87,680 crude ounces for 1999. The total gold production dollar value for 2000 was C\$25.4 million compared to C\$29.7 million in 1999.

Placer gold is getting more difficult to find as reserves in traditional placer mining areas decline. Most placer gold exploration and mining is concentrated in unglaciated areas of the Yukon. By expanding our knowledge of placer gold deposits and applying it to other areas, we may be able to discover new sources of placer gold in different geological settings.

Many people living outside the Yukon would like to find out more about placer mining. Besides the difficulty in actually finding gold, there are various rules and regulations to become familiar with. Please call one of the contacts below to obtain a general summary of the history of placer mining in the Yukon, an overview of the geological setting of placer gold deposits and some of the factors you must consider when mining for gold.

The staff at the Yukon Geology Program or the Mineral Resources Branch can provide you with information and advice regarding placer mining in the Yukon. Publications on placer mining in the Yukon are available through the Publications Desk of the Yukon Geology Program.

### CONTACTS

**Klondike Placer Miners Association**

P.O. Box 4427, 3151-3<sup>rd</sup> Avenue  
Whitehorse, Yukon Y1A 3T5  
Phone (867) 667-2267  
Fax (867) 668-7127

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Yukon Geology Program  
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Fax (867) 667-3198

**Grant Lowey**

Placer Geologist  
Yukon Geology Program  
Phone (867) 667-8511  
Fax (867) 393-6232

**Whitehorse Mining Recorder  
(DIAND)**

Placer claim maps  
102-300 Main Street  
Whitehorse, Yukon Y1A 2B5  
Phone (867) 667-3190  
Fax (867) 667-3267

**Mining Land Use and Reclamation**

325-300 Main Street  
Whitehorse, Yukon Y1A 2B5  
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Fax (867) 667-3193

**Publications Desk**

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Whitehorse, Yukon Y1A 2B5  
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Fax (867) 667-3267

For more information, contact:

Yukon Geology Program at [www.geology.gov.yk.ca](http://www.geology.gov.yk.ca)

Department of Indian Affairs and Northern Development at [www.ainc-inac.gc.ca/yt/min-e.html](http://www.ainc-inac.gc.ca/yt/min-e.html)

# YUKON TOP MINING PROJECTS, 2001

Property	Reserves	Status
<b>OPERATING MINES</b>		
<b>Brewery Creek</b> Viceroy Resource Corporation	<b>Mineable reserve:</b> 3,100,000 tonnes 1.59 grams/tonne gold (as of December 31, 1999)	Total production for 2000 estimated at 45,000 to 50,000 ounces.
<b>UNDER CONSTRUCTION</b>		
<b>Minto</b> Grupo Mexico S.A. de C.V./Minto Explorations Ltd.	<b>Mineable reserve:</b> 6,510,000 tonnes 2.13% copper, 9.3 grams/tonne silver 0.62 grams/tonne gold	Water license is signed. Production decision depends on metal prices.
<b>DEVELOPMENT PROJECTS</b>		
<b>Keno Hill</b> United Keno Hill Mines Ltd.	<b>Mineable reserve:</b> 520,000 tonnes 6.64% lead, 4.95% zinc 1,049 grams/tonne silver	On hold.
<b>Dublin Gulch</b> New Millennium Mining Ltd.	<b>Mineable reserve:</b> 50,400,000 tonnes 0.93 grams/tonne gold	Undergoing final stages of environmental assessment.
<b>Kudz Ze Kayah/Wolverine</b> (Finlayson Project) Expatriate Resources Ltd. (Atna Resources owns 40% of Wolverine)	<b>Total probable reserves:</b> 14.57 million tonnes 0.97% copper, 1.53% lead, 7.23% zinc 184.5 grams/tonne silver 1.39 grams/tonne gold	Joint development planned. Prefeasibility complete. Amendments to permits underway.
<b>Carmacks Copper</b> Western Copper Holdings Ltd.	<b>Mineable reserve:</b> 14,109,800 tonnes 1.01% copper, 0.51 grams/tonne gold	Undergoing final stages of environmental assessment.
<b>EXPLORATION PROJECTS</b>		
<b>Wolf</b> Atna Resources/YGC Resources	Zn-Pb-Ag volcanogenic massive sulphide target Inferred resource of 4.1 million tonnes grading 6.2% zinc, 1.8% lead and 84 grams/tonne silver	Delineation drill program complete (6,625 m, 30 holes). Deposit strike length 600 m, down-dip length 450 m, good continuity of sulphide mineralization, deposit is open.
<b>Mt. Skukum/Skukum Creek Goddell</b> Tagish Lake Gold Corp.	<b>Mineable reserve:</b> <i>Rainbow Zone:</i> 956,949 tonnes @ 6.3 grams/tonne gold, 193.5 grams/tonne silver <i>Kuhn Zone:</i> 148,781 tonnes @ 8.78 grams/tonne gold, 167.70 grams/tonne silver <i>Goddell Zone:</i> 900,000 tonnes @ 7.0 grams/tonne	Resource/reserve definition planned.
<b>Fyre Lake</b> Pacific Ridge Exploration	<b>Preliminary resource:</b> 15.4 million tonnes within which 8.2 million tonnes grade 2.1% copper, 0.11% cobalt, 0.73 grams/tonne gold	Preliminary reserve estimate based on wide-spaced drill holes.
<b>Clear Creek</b> Redstar Resource Corporation	Gold-bismuth and gold-arsenic intrusive-related targets.	2000 drill program complete.
<b>Fire/Ice</b> Eagle Plains Resources	Volcanic massive sulphide properties	2000 drill program complete.
<b>McQuesten</b> NovaGold/Eagle Plains Resources/Newmont Exploration	Multiple styles of mineralization-gold targets.	2000 drill program complete.
<b>Canadian Creek</b> Alexis Resources Ltd.	Prophyry copper-gold and intrusive related gold targets.	2000 drill program complete.

# STAGES OF MINING

## PERMITTING PROCESS STAGES

*Environmental baseline studies*

*Permitting process begins*

*Company submits project overview*

*Company submits Initial Environmental Evaluation (IEE)*

*Water licence application*

*Water licence received*

### REGIONAL EXPLORATION

- Prospecting
- Regional surveys

### PRELIMINARY EXPLORATION

- Discovery of mineralization
- Delineation of mineral zone
- Magnitude of deposit

### ADVANCED EXPLORATION

- Diamond drilling
- Trenching

### PRELIMINARY FEASIBILITY STUDY

- Ore reserves
- Scale of operation
- Development plan
- Capital costs
- Operating costs
- Cash flow
- Net present value

### TEST MINING PROGRAM

- Sink shaft
- Obtain bulk sample
- Test ore continuity
- Identify underground problems

### FINAL FEASIBILITY

- Similar to preliminary but more detailed
- Budget for operating and capital costs
- Cash flow projection

### CONSTRUCT MINE, MILL AND PLANT

### PRODUCTION

### RECLAMATION

## YUKON PROJECTS

*Finlayson Lake area*

*McQuesten Intrusive Belt  
(Mayo to Dawson area)*

*Dawson Range Cu/Au Belt*

*Wolf*

*Division Mountain*

*Clear Lake*

*Grew Creek*

*Hyland Gold*

*Marg*

*Ice*

*Ketza River*

*Mount Skukum/Skukum Creek*

*Wellgreen*

*Crest*

*Fyre Lake*

*MacMillan Pass – Tom, Jason*

*Casino*

*Cantung*

*Silvertip*

*Dublin Gulch*

*Carmacks Copper*

*Sa Dena Hes*

*Tulsequah Chief*

*Kudz Ze Kayah/Wolverine*

*United Keno Hill*

*Minto*

*Cassiar*

*Brewery Creek*

## CONTACTS (Yukon area code is 867)

### DEPARTMENT OF ECONOMIC DEVELOPMENT

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### OTHER USEFUL CONTACTS

#### Whitehorse Mining Recorders Office

(claim sheets, mining legislation information)  
Phone 667-3190  
Fax 667-3267

#### Publications Desk (DIAND)

Phone 667-3266  
Fax 667-3267

#### Topographical map sales

Mac's Fireweed Books  
Phone 668-6104  
Toll-free 1-800-661-0508

#### Yukon Prospectors Association

Phone 668-7985  
E-mail ypa@northland.com

#### Klondike Placer Miners Association

Phone 667-2267  
Fax 668-7127

#### Yukon Chamber of Mines

Phone 667-2090  
Fax 668-7127  
E-mail ycmynes@internorth.com

# BREWERY CREEK MINE

## Viceroy Resource Corporation

President and CEO: Clynton Nauman

Chair: Ronald Netolitzky

### Corporate headquarters

Suite 2200, Oceanic Plaza  
1066 West Hastings Street  
Vancouver, British Columbia V6E 3X2

Phone (604) 688-9780

Fax (604) 682-3941

E-mail [info@viceroyresource.com](mailto:info@viceroyresource.com)

### Brewery Creek Mine

Bag 5040

Dawson City, Yukon YOB 1G0

Phone (867) 993-6057

Fax (867) 993-5606

Web site [www.viceroyresource.com](http://www.viceroyresource.com)

## PROJECT STATUS

In production



### Location

57 km east of Dawson City

### Ownership

Viceroy Resource Corporation

### Commodity

Gold

### Ore type

Oxide

### Mineable reserve (at December 31, 1999)

3,050,000 tonnes @ 1.59 grams/tonne gold

Also, additional 306,000 contained ounces of gold in resource of 14.1 million tonnes grading 0.68 grams/tonne

### Mining method

Open-pit heap leach, carbon adsorption/desorption/recovery

### Stripping ratio

1.5:1

### Current mine life (at December 31, 1999)

2.0 years depending on gold price

### Recovery rate

60-70%

### Production

1997: 72,387 ounces of gold

1998: 79,396 ounces of gold

1999: 48,164 ounces of gold

2000: 32,936 ounces of gold to September 30

### Cash operating costs per ounce

US\$250

### Employees

95

### Power

2 MW, on-site diesel

**HISTORY**

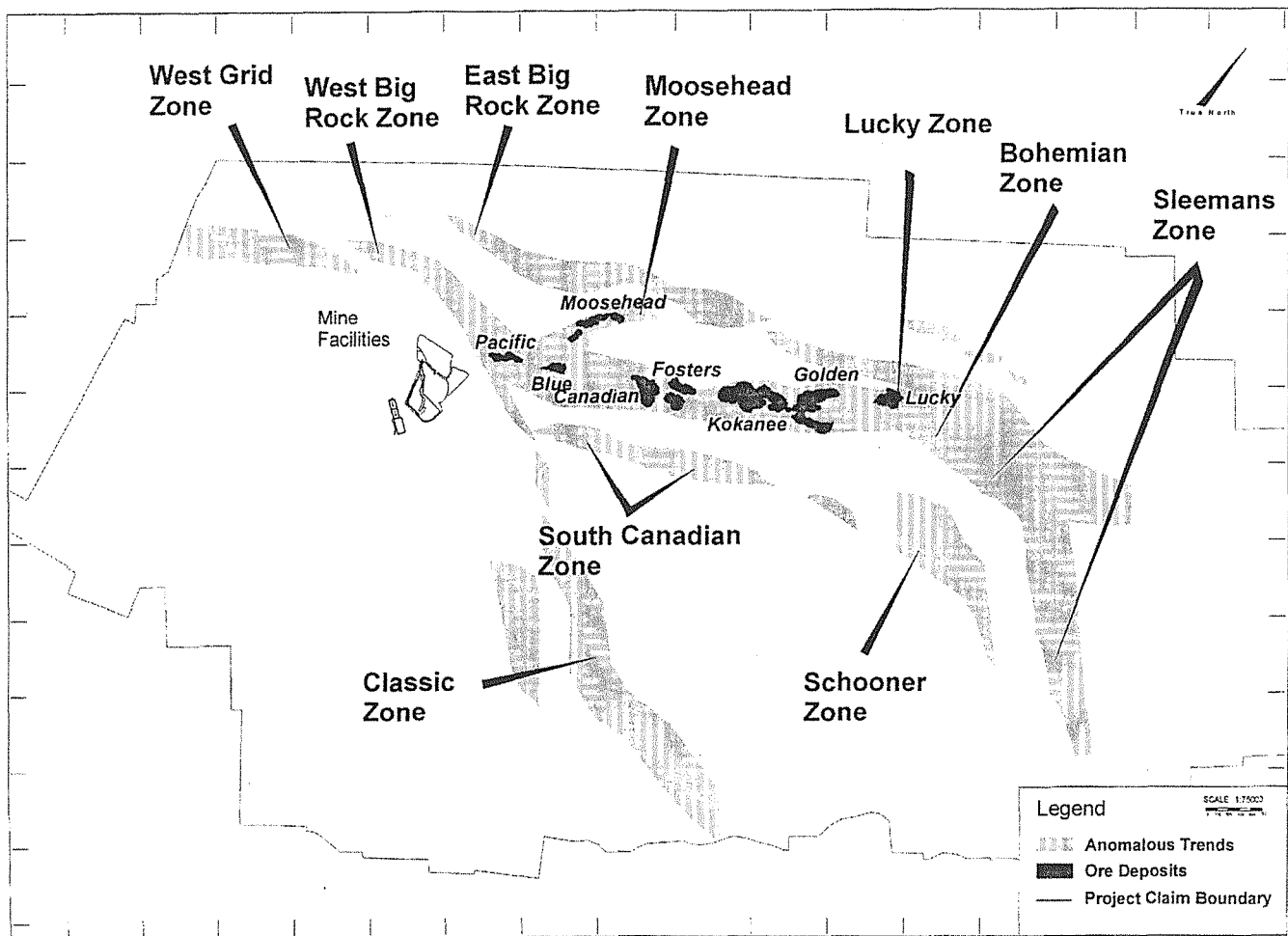
Gold mineralization in the Brewery Creek area was discovered in 1987 by Noranda Exploration after investigating a regional geochemical anomaly identified in a survey funded by the Canada-Yukon Mineral Development Agreement. Follow-up exploration work including extensive geochemical and geophysical surveys, mapping, prospecting and 9,000 feet of reverse circulation and diamond drilling were carried out from 1988 to 1992. In 1992, Loki Gold Corporation acquired a 100% interest in the property and began mine development work. A total of \$17 million was spent on the property before the start of construction. Loki Gold's Class A Yukon Water License was signed on August 9, 1995 and construction

began immediately. Loki Gold Corp. and Baja Gold Inc. shareholders approved a merger with Viceroy Resource Corporation in May, 1996. Viceroy owns 100% of Brewery Creek. The first bar of gold was poured on November 15, 1996, and the mine reached full production in May, 1997. The Brewery Creek Mine is the largest lode gold mine ever constructed in the Yukon.

**PROJECT SUMMARY**

The Brewery Creek Mine consists of 801 claims and leases covering 16,160 hectares located between 540 m and 1,225 m elevation, 55 km east of Dawson City, Yukon.

**Brewery Creek Mine Property Plan**  
*Ore Deposits & Anomalous Gold Trend Zones*



It is a year-round heap leach operation with seasonal open-pit mining of 11,000 tonnes of ore per day – 2,000,000 tonnes between April and October each year. Heap leaching of the ore takes place throughout the year. Most gold production takes place during the third and fourth quarters. Most employees reside at the mine camp, which has a permanent capacity of 124 rooms. The work force is 90% to 100% Yukon-based. A socio-economic agreement has been signed with the Tr'ondek Hwech'in First Nation which provides for employment, a scholarship fund, finder's fees and a framework for exploration and joint-venture activities on other First Nations land. It also provides for First Nations representation at technical, operational and environmental management meetings.

### GEOLGY AND MINERALOGY

Gold mineralization is structurally controlled and primarily contained in sedimentary and intrusive rocks in the hanging wall of reactivated thrust faults. The host rocks include porphyritic quartz monzonite, hornblende monzonite, interbedded sandstones and greywackes and fine-grained ash tuffs and pyroclastics. Gold primarily occurs as submicron-size particles with arsenopyrite and pyrite as growth bands around larger sulphide grains.

A total of eight main oxide deposits were originally delineated at Brewery Creek. From east to west these are the Lucky, Golden, Kokanee, Fosters, Canadian, Moosehead, Blue and Pacific deposits. Collectively, these deposits are referred to as the Reserve Trend. Each of these deposits has been mined to some extent with additional reserves available in most of the pits at higher gold prices.

### ORE CHARACTERISTICS

Gold production at the Brewery Creek Mine comes largely from oxide ore and minor amounts of transition (mixed oxide/sulphide) ore. Since most of the gold is concentrated in the outer rim, limited oxidation is required to liberate it from the sulphide minerals. Sulphide mineralization generally lies down-dip from known oxide reserves and is refractory. Initial work indicates that the sulphide ore may be amenable to bio-oxidation with gold recoveries in the range of 90%.

It was found in 1999 that sedimentary-hosted oxide ore has a longer-than-estimated leach cycle than the intrusive-hosted ore.

### INFRASTRUCTURE

The mine facility consists of a large permanent heap leach pad, an adsorption, desorption and gold recovery (ADR) plant, process and overflow ponds and ancillary facilities, including a power plant, water supply systems, mine service buildings and an assay laboratory. Mine service buildings include a two-bay maintenance shop, mine offices, warehouse and cold storage, and ambulance garage.

The current leach pad is divided into 7 discrete cells, each nominally 83 m wide and 462 m long, with capacity of 11.7 million tonnes of ore. The permitted and ultimate pad layout provides space to accommodate 18,000,000 tonnes of stacked, run-of-mine ore. The pad capacity is expandable. The design of the pregnant solution ponds is conventional. A total of \$6.2 million was spent at Brewery Creek in 1999 to expand the heap leach pad by 80,000 m<sup>2</sup> and extend the haul road to the Lucky Zone.

A multiple-layer liner system has been installed under the heap to collect process solution and direct it to the recovery plant, as well as prevent leakage to the environment. Of prime concern, because of the severe winter conditions, is the possible loss of solution to the ponds and subsequent freezing of the drip emitter system during an equipment failure. Temperatures have dipped to as low as -43.5°C. To prevent this, the following features were incorporated into the design.

- Emitters are placed into the surface to act as an insulator.
- All outside piping is insulated and heat traced.
- Waste heat from the diesel generator engines is used to heat the outgoing barren solutions.
- A waste oil-fired heat exchange is used to heat circulating solutions.

Ore processing employs a sodium cyanide, heap leach of run-of-mine gold ore. Gold recovery from pregnant leach solutions is by activated carbon adsorption and pressurized caustic solution desorption followed by electrowinning onto steel wool and on-site smelting to gold bullion.

A new, intermediate leach circuit, which doubles the solution handling capacity, was completed during the third quarter of 1998.

**PRODUCTION**

**1997**

From Kokanee and Golden pits; full production achieved in May, 1997.

Total gold	72,387 ounces
Total ore mined	2,100,000 tonnes
Total waste mined	3,600,000 tonnes
Stripping ratio	1.71:1
Total ore to leach pad	2,000,000 grading 1.87 grams/tonne gold
Cash operating cost	US\$184/ounce

Note 1: The mine produced a total of 72,387 ounces of gold during 1997, 66,545 ounces of which were produced at a cash operating cost of US\$184 per ounce after full commercial production was achieved in May, 1997. The additional 5,842 ounces of gold were commenced prior to achieving commercial production status.

Note 2: Gold recovery at 78% is taking 350 to 360 days versus the predicted 240 days.

**1998**

From Kokanee and Golden pits; production for 1998.

Gold production	79,396 ounces
Total ore mined	2,707,000 tonnes
Average grade of ore mined	1.46 grams/tonne gold
Total waste mined	4,033,000 tonnes
Total material mined	6,740,000 tonnes
Total ore to leach pad	2,238,000 tonnes grading 1.46 grams/tonne gold
Cash operating cost	US\$177/ounce

**1999**

From Kokanee, Golden, Lucky and Blue pits; production for 1999.

Gold production	48,164 ounces
Total ore mined	2,061,000 tonnes
Total waste mined	4,442,000 tonnes
Total material mined	6,932,000 tonnes
Total ore to leach pad	2,020,000 tonnes
Cash operating cost	US\$288/ounce

Gold production at the Brewery Creek Mine decreased by 35% in 1999. The mine produced 48,164 ounces of gold for 1999 at a cash operating cost of US\$288 per ounce. The shortfall is due to lower than anticipated recoveries from the ore and longer than anticipated leach cycles for sedimentary ore (comprising 15% of 1999 production). Viceroy commissioned a review of past metallurgical performance and metallurgical testwork and a new model was formulated to predict future heap-leach recoveries.

At the end of 1999, the reserve figure stood at 3.1 million tonnes grading 1.59 grams gold per tonne, equivalent to 156,000 contained ounces. An additional 306,000 ounces are contained in a resource of 14.1 million tonnes grading 0.68 grams per tonne. Viceroy spent \$600,000 on exploration for additional oxide reserves in 1999, but mining of the targets will not take place until gold prices improve.

**2000**

From the Blue, Moosehead, Lucky and Pacific pits; production for the nine months ending September 30, 2000.

Gold production	32,936 ounces
Total ore mined	1,680,000 tonnes
Total waste mined	1,611,000 tonnes
Total material mined	3,291,000 tonnes
Total ore to leach pad	1,933,000 tonnes @ 1.72 grams/tonne
Cash operating cost	US\$250/ounce

The plan for 2000 called for selectively mining those orebodies and areas that have the highest grade and are highly oxidized.

The modified mining schedule has decreased the number of people required at the mine from 150 to 95. A total of 45,000 to 50,000 ounces of gold in 2000 is expected at a cash operating cost of US\$245 per ounce.

A decision to mine in 2001 will depend on the price of gold.

## ENVIRONMENTAL CONSIDERATIONS AND RECLAMATION

A full environmental review, including baseline studies, heritage and archaeological investigations and an estimate of socio-economic impacts was completed for the Brewery Creek Mine. The following environmental design considerations were included:

- layout of the plant, facilities and roads to minimize adverse visual impacts;
- significant disposal of mine waste in the spent pits;
- a multi-layer liner system, installed under the leach pad to prevent leakage to the environment and to direct collected process solution to the recovery plant;
- a leak detection system to act as a further safeguard against leakage;
- double lining of process ponds with polyethylene, including two overflow solutions, one pregnant and one barren; and
- equipping process ponds with internal leak detection systems.

Monitoring of wildlife and air and water quality is ongoing during mine operations.

Post-mining reclamation will be extensive. Final effluent solution will be treated to destroy residual cyanide. Large portions of the disturbed areas will be covered with growth material and revegetation programs undertaken. All buildings and surface structures will be removed or buried, leaving the area as close to its original state as possible. An on-going cash reclamation bond posted to ensure adequate funds, along with asset salvage proceeds, are available to properly reclaim and decommission the leach pad and mine.

In 1997, Viceroy Resource Corporation was named the environmental leader of the Canadian mining industry by the Social Investment Organization of Canada.

## EXPLORATION

In 1997, Viceroy Resource Corporation added 483,000 ounces of gold (based on visual estimates, at least 50% of the resource is considered oxide mineralization) to the geologic resource at the Brewery Creek Mine.

In 1998 and 1999, reverse circulation drilling and trenching focused on expanding oxide resources at the Bohemian and Schooner zones.

## LUCKY ZONE

Drilling in 1997 adjacent to the Lucky Zone added a resource of 1,700,000 tonnes grading 2.63 grams gold/tonne (0.09 ounces/ton).

In the Lucky and East Big Rock zones drilling also intercepted mineralized faults that may represent sulphide feeder zones.

## BOHEMIAN ZONE

A new oxide resource of 364,000 tonnes grading 0.52 grams gold/tonne was defined at the Bohemian Zone in 1997. Continued drilling in 1998 included one of the best holes drilled on the property to date at 4.42 grams/tonne gold over 46 m including 10 m of 11.24 grams/tonne gold. In-fill and step-out drilling will be completed during the fourth quarter in order to establish a reserve on the Bohemian Zone.

## CLASSIC ZONE

A new oxide resource of 10,900,000 tonnes grading 0.52 grams gold/tonne was defined at the Classic Zone in 1997. Additional trenching and drilling was carried out in 1999.

## NORTH SLOPE ZONE

At the North Slope Zone, a new sediment-hosted resource of 2,200,000 tonnes grading 2.01 grams gold/tonne was defined in 1997. Additional drilling was carried out in 1999.

## SCHOONER ZONE

At the Schooner Zone, one trench returned 1.27 grams/tonne gold over 66 m. Trenching and drilling were carried out in 1999, around the Schooner Zone and the 200-m prospective area between the two zones, in order to establish a geologic resource. Trenching tested gold-in-soil anomalies 2.5 km east of the Schooner Zone with the expectation of extending the strike length of the Reserve Trend.

As of September 30, 1998, Viceroy Resource Corporation had 19 properties either staked or under option as part of their Yukon regional exploration program for "Brewery Creek-type" bulk mineable targets throughout the Yukon, including the McQuesten and Sprogge projects. Significant exploration work was carried out in 1998 on these properties.

In 1999, Viceroy sold its 22 Yukon regional properties to NovaGold Resources Inc. for 3.4 million common shares.

# CANTUNG PROPERTY

## North American Tungsten Ltd.

Chair: Stephen Leahy  
President and Chief Executive Officer:  
Udo E. von Doehren

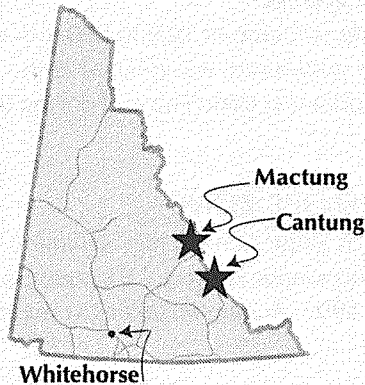
### Corporate headquarters

#11-1155 Melville Street  
Vancouver, British Columbia V6E 4C4

Phone (604) 682-1333  
Fax (604) 682-1324  
Toll free 1-800-478-5550  
E-mail westpac@intergate.ca  
Web site www.westpac.bc.ca

## PROJECT STATUS

Mine is on care and maintenance status



### Location

300 km north of Watson Lake

### Ownership

North American Tungsten Ltd.

### Commodity

Tungsten

### Ore type

Oxide

### Mineable reserve

0.7 million tonnes plus open pit reserves and exploration potential

Tungsten: 1.83%

### Mining method

Underground

### Employees when in operation

350

### Mine life

Closed

## HISTORY

The Cantung deposit was first discovered in 1954 by A. Berglund for Northwestern Exploration Ltd. The property was staked in 1955 and drilled in 1956. When the claims lapsed in November, 1958, the property was restaked by the Mackenzie Syndicate (Leitch, Highland Belt, Area Exploration Ltd., Dome Minerals Ltd., Ventures Ltd. and Lake Expanse Gold Minerals Ltd.), which formed a new company, Canada Tungsten Mining Corporation Ltd. (Cantung) and drilled 11 holes in 1959 and 41 holes in 1960. Falconbridge, Amax and Dome financed production which commenced in November, 1962. Production was suspended for a year in 1963-64 because of low metal prices, and was interrupted in 1967 by a mill fire. Falconbridge sold its interest in 1966 and Dome sold its interest about 1985.

A new deposit, the E-zone, was discovered with four deep surface holes in 1971 and explored with an additional eight surface holes, a 1,250 m adit and detailed underground drilling in 1972-73. Open-pit mining of the original Cantung orebody was completed in September, 1973 and milling began on underground ore from the E-Zone during the first half of 1974.

An expansion of mill capacity to 1,000 tpd was completed in mid-1979 but production was halted by a strike from November, 1980 to May, 1981. The mine was closed most of 1983 because of low metal prices and then operated at half capacity until May, 1986 when it closed indefinitely due to low tungsten prices and a labour dispute. In 1985, Amax transferred all of its tungsten assets, including the Mactung deposit, to Canada Tungsten Inc. but retained majority control. Canada Tungsten Inc. and Aur Resources

Ltd. merged in 1996. In 1997, North America Tungsten acquired 100% interest in both the Cantung and Mactung deposits. The mine has been on care and maintenance status awaiting higher commodity prices.

## PROJECT SUMMARY

The Cantung Mine and minesite is located 300 km north of Watson Lake, Yukon along the Nahanni Range Road. Although the mine is situated in the Northwest Territories, the town of Watson Lake was the staging area for trucking the tungsten ore and for supplying the minesite.

## GEOLOGY, MINERALOGY AND ORE RESERVES

The Cantung deposit is one of several tungsten skarn deposits, including Mactung, located along the eastern margin of the Selwyn Basin. Tungsten mineralization is associated with scheelite-bearing skarn within contact metamorphosed and metasomatized Lower Paleozoic carbonate rocks.

Original reserves in the E-Zone were about 4 million tons grading 1.6%  $WO_3$  and 0.22% Cu, which made it, at the time, the largest tungsten deposit being mined in the free world. An extension was discovered about 150 m west in 1984, from which intersections on the first five holes ranged from 1.2 to 3.0%  $WO_3$ , across thicknesses of one to 16 m.

Both the Cantung and E-Zone deposits consist of pyrrhotite, scheelite and chalcopyrite in a diopside skarn. Scheelite and skarn show a direct relationship. Minor constituents include garnet, epidote, actinolite and sphalerite.

Up to its shutdown in 1986, the Cantung mine produced about 31,185 tons of tungsten metal, or about 85% of Canadian production to date. At its peak, the mine produced 1,200 tonnes of ore per day, six days per week.

Remaining ore reserves are in the E-Zone, and are given as 0.7 million tonnes grading 1.83% tungsten over a three-year mine life.

Promising exploration targets in the area include a scheelite-bearing, pyrrhotite-rich diopside skarn within a hornfelsed lower Cambrian argillite about 2 km southwest of the townsite. One of the 1,979 holes returned 1.04%  $WO_3$  across 4 m.

## PRODUCTION AND DEVELOPMENT PLANS

North American Tungsten Ltd. is a Canadian public company whose assets include the Cantung Mine and the large Mactung deposit. Together these high grade reserves comprise about 15% of the western world's known tungsten reserves. The company plans to take advantage of its proprietary and patented technology to process tungsten ore. The process, called Gas Sparging Technology, was originally developed and patented by the U.S. Bureau of Mines. North American Tungsten has further developed the Gas Sparging Technology, which is expected to reduce tungsten ore processing costs by 50% and virtually eliminate the environmentally hazardous waste products traditionally associated with tungsten production.

North American Tungsten anticipates an increase in tungsten prices as excess supply from China, which has kept the price down for over ten years, is depleted.

Since 1999, tungsten prices increased as a result of a decline and rationalization in tungsten production from China. In addition, the U.S. army has announced that it intends to use a so-called "green bullet," which utilizes tungsten instead of lead in the core. Use of "green bullets" by the U.S. and, potentially, other NATO countries, could consume significant tungsten.

North American Tungsten anticipates a six-month time period for start-up of the mine, at a cost of about \$4 million. A \$3 million reclamation bond has been posted.

# CARMACKS COPPER PROPERTY

## Western Copper Holdings Ltd.

President: Thomas Patton  
Chief Executive Officer and Chair: Dale Corman

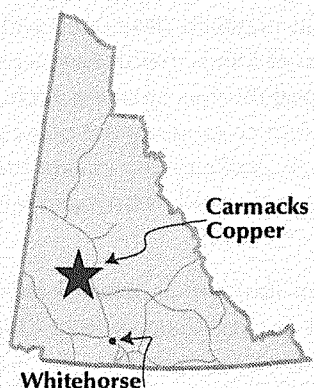
### Corporate headquarters

1650-1185 West Georgia Street  
Vancouver, British Columbia V6E 4E6

Phone (604) 684-9497  
Fax (604) 688-4670  
E-mail info@westerncopper.com  
Web site www.westerncopper.com

## PROJECT STATUS

Permitting stage



### Location

28 km northwest of Carmacks, 193 km north of Whitehorse

### Ownership

Western Copper Holdings Limited

### Commodity

Copper, silver, gold

### Ore type

Oxide

### Geological reserve

22.4 million tonnes grading 1.1% copper

### Mineable reserve

14,109,800 tonnes grading 0.99% copper and 0.51 grams/tonne gold

### Mining method

Open-pit, solvent extraction electrowinning (SXEW)

### Mine life

8.5 years

### Capital cost

C\$66 million

### Cash costs

C\$0.87/pound or US\$0.62/pound

### Copper production per year

31-32 million pounds of cathode copper

### Estimated number of employees

90

### Power

7 MW, on-site diesel or grid extension

## HISTORY

Copper was first discovered in the Carmacks Copper area in the late 1800s, but it wasn't until the late 1960s that the property was staked by G. Wing of Whitehorse. Subsequent exploration was carried out by the Dawson Range Joint Venture (Straus Exploration Inc., Great Plains Developments of Canada Ltd., Trojan Consolidated Minerals Ltd., and Molybdenum Corporation of America). Archer Cathro and Associates Limited acted as manager and earned the right to acquire abandoned properties. The G. Wing residual interest was acquired by A. Arsenault in 1971; the Arsenault interest is held under an option

agreement to Archer Cathro and Associates Ltd. In 1989, the property, including the rights to the Arsenault Option, was optioned to Western Copper Holdings Ltd. who farmed-out a 50% interest to Thermal Exploration Co. Archer Cathro and Associates retain a 3.0% NSR royalty to a maximum of C\$2.5 million.

A total of 12,900 m (43,000 feet) of drilling in 80 diamond drill holes and 11 reverse circulation drill holes has been completed on the property, mostly in the No. 1 zone. In addition, several kilometres of surface trenching has been carried out across the main deposit.

## PROJECT SUMMARY

The Carmacks Copper project covers 1,000 hectares. Access is by a 35 km gravel road from Carmacks, which is 175 km north of Whitehorse. Access to tidewater and port facilities is available through the port of Skagway, Alaska. The project is expected to be a low-cost producer of cathode copper, employing solvent extraction and electrowinning techniques to recover oxide copper from an open-pit mineable reserve of 14,109,900 tonnes grading 0.99% copper. The mine operation will employ 90 people, the majority of whom will reside in the town of Carmacks. A favourable feasibility study has been completed. The environmental permitting process is on-going.

## GEOLOGY, MINERALOGY AND ORE RESERVES

The copper deposits are generally fault bounded and zoned mineralogically with copper oxide and copper carbonate minerals at surface, and mixed oxides and sulphides at depth. Copper mineralization is primarily malachite with lesser azurite, cuprite, covellite and other copper minerals. There are 14 mineralized zones on the property. The No. 1 zone is the best explored and has a geological resource of 22.4 million tonnes grading 1.1% copper and a significant gold credit. The No. 1 zone has been defined by trenching and drilling over a 700 m strike length and down-dip for 450 m. The average width of the deposit is 34 m. An open-pit mineable reserve of 14 million tonnes averaging 0.99% copper has been calculated and will be the basis for a production decision. The total geological resource at a cutoff grade of 0.20% is 20,715,596 tonnes at 0.98% copper. The open-pit mineable reserve, diluted at 10% is 14,109,800 tonnes averaging 1.01% total copper at a 0.35% total copper cutoff. The reserves are classified as proven plus probable.

## INFRASTRUCTURE

The mine facility will consist of an ultimate leach pad, processing facilities, open pit and waste dump, water and power distribution services, propane storage and distribution, fire protection, diesel fuel storage, sewage

treatment and communications, trailers for offices, changehouse, operations camp, gatehouse and first-aid, and pre-engineered buildings for warehouse and shops, laboratory, water supply and distribution pumphouses. Off-site infrastructure includes 13 km of property access road (the road has been cleared and surveyed), 45 km of 138 kV overhead transmission line and 10,000 tonnes of acid storage facilities at Skagway to accommodate ocean shipping schedules and transportation to site.

The process facilities, ultimate leach pad, open pit and waste dump will occupy an area of approximately 100 hectares. Crushing and pad loading will only take place during 200 days of the year. Leaching of ore will be year-round with solution heating during winter operation. Copper will be recovered from the oxide ore by sulfuric acid heap leaching of crushed minus 19 mm agglomerated ore. Pregnant leach solution (PLS) will be treated in a solvent extraction plant to purify and concentrate the weak leach solution to a more concentrated solution suitable for electrowinning. High purity copper cathodes will be produced in an electrowinning plant for shipment from the ice-free port of Skagway. A pilot test plant, partially funded under the Canada-Yukon Mineral Development Agreement, operated from October, 1993 to February, 1994 and produced positive test results. A 220-ton bulk sample was crushed and placed in a 25-foot high crib for leaching. The test confirmed that copper can be recovered by solvent extraction during the colder winter months.

The first phase of the leach pad area has been cleared to ensure permafrost is thawed and to clarify the foundation condition.

## PRODUCTION

The open-pit mine plan calls for a stripping ratio of 4.25 tonnes waste to 1 tonne ore. The project will treat on average 1,763,700 tonnes of oxide ore per year, to produce 14,310 tonnes of copper cathodes per year, at a recovery rate of 80%. Based on a mine life of 8.5 years, and a capital cost of C\$66 million, including contingencies, the project is expected to yield 31 to 32 million pounds of cathode copper per annum at an average operating cost of C\$0.87 or US\$0.62 per pound.

# CASINO PROPERTY

## Great Basin Gold Ltd.

President & CEO: Robert Thiessen  
Co-Chair: Robert Hunter and Robert Dickson

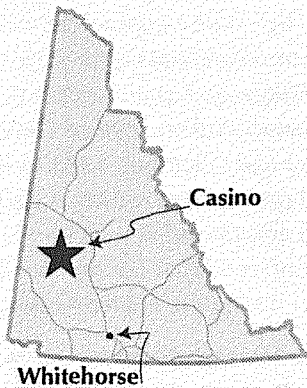
### Corporate headquarters

#1020-800 West Pender Street  
Vancouver, British Columbia V6C 2V6

Phone (604) 684-6365  
Fax (604) 684-8092  
Toll free 1-800-667-2114  
E-mail info@hdgold.com  
Web site www.hdgold.com

### PROJECT STATUS

Prefeasibility complete, project is on-hold



### Location

300 km northwest of Whitehorse

### Ownership

Great Basin Gold Ltd.

### Commodity

Copper, gold, molybdenum

### Ore type

Oxide and sulphide

### Geological resource

675 million tonnes

Copper: 0.25%

Gold: 0.48 grams/tonne

Molybdenum: 0.02%

### Measured resource

178.2 million tonnes

Copper: 0.30%

Gold: 0.38 grams/tonne

Molybdenum: 0.03%

### Mining method

Open-pit, conventional milling

### Stripping ratio

1.06:1

### Mine life

19 years

### Mill feed

25,000 tonnes/day, 9.125 million tonnes/year

### Employees

500

### Power

38 MW, on-site diesel

## HISTORY

The Casino area has been explored for placer gold since 1912 and for silver-lead-zinc vein systems since the 1930s. However, the bulk tonnage porphyry potential of the Casino property was not recognized until 1967, when a soil survey by Casino Silver Mines Ltd. returned widespread anomalous copper and molybdenum values. During the period 1967-1973 several property operators, including Brameda Resources Ltd. and Teck, completed 18,023 m of drilling which confirmed a several hundred

million ton gold-copper-molybdenum resource. However, gold was not systematically assayed for and reserve calculations at the time did not reflect the gold content of the Casino deposit. The property became dormant for a number of years until 1991 when Big Creek Resources Ltd. and Archer Cathro and Associates (1981) Ltd. optioned the property from Casino Silver Mines Ltd. and began a 4,729 m large-diameter drill program (21 holes) designed to evaluate the gold content of the property and to better define the copper and molybdenum grades. Pacific

Sentinel Gold, through merger arrangements with Big Creek and Casino Silver, and by renegotiating the Archer Cathro management contract, acquired 100% interest in the property in 1991. In 1994, they carried out a \$4.5 million program of delineation drilling (68,000 m in 215 holes), metallurgical, environmental and engineering studies. Although no exploration was carried out on the property from 1995-1997, environmental baseline and project scoping studies continued. In 1997, Pacific Sentinel Gold Corp. and Consolidated North Coast Industries Ltd. merged to become Great Basin Gold Ltd.

## PROJECT SUMMARY

The Casino property covers 735 mineral claims (11,704 hectares). Access to tidewater and port facilities is available through the port of Skagway, Alaska. The project has the potential to be a large bulk tonnage producer of copper, gold and molybdenum over a project life in excess of 20 years. A prefeasibility metallurgical and mine planning program has been completed. The company is now monitoring and assessing metal market conditions and technologies and is introducing the project to major mining companies for financing and acquisition. Geotechnical, infrastructure, environmental and socio-economic programs have been undertaken. The permitting process is not yet underway.

## GEOLOGY, MINERALOGY AND ORE RESERVES

The deposit is hosted by the Casino Complex, a suite of igneous intrusive rocks with an intense hydrothermal alteration overprint. The deposit area has not been glaciated. Mineralization is found in three different zones: an oxide-leached zone, a supergene zone, and a hypogene zone. The uppermost zone is an oxide gold-bearing leached zone from which copper has been largely carried away by descending groundwater. The leached zone is underlain by a copper enriched supergene gold-copper zone where dissolved copper has been redeposited. Below the supergene zone is the hypogene zone, which contains primary gold and copper mineralization that has not been affected by surface weathering or supergene enrichment. The deposit measures 1,100 m by 1,600 m and is open to the north and east. Primary hypogene mineralization below the supergene zone has been drilled to a depth of 798 m and is open to depth within most areas.

The Casino deposit contains a measured resource of 178.2 million tonnes of supergene sulphide and hypogene

sulphide ore at an average grade of 0.38 grams/tonne (0.011 ounces/ton) gold, 0.30% copper and 0.028% molybdenum, based on a net smelter return cutoff value of C\$7/tonne. This includes a 60 million tonne supergene sulphide resource grading 0.367% copper, 0.413 grams/tonne gold, 0.029% of molybdenum and a 117 million tonne hypogene resource grading 0.269% copper, 0.356 grams/tonne gold and 0.027% molybdenum.

## PRODUCTION

The open-pit mine plan calls for the prestripping and stockpiling of 50.6 million tonnes of predominantly lower grade oxide material which will expose the sulphide ore for sustained mining. The overall waste to ore ratio will be 1.06:1 after prestripping is complete. Direct mining from the open-pit will provide mill feed for 19 years to a 25,000 tonne/day (9.125 million tonnes/year) concentrator. During the course of mining, 50.7 million tonnes of low-grade sulphide material (0.187% copper, 0.222 grams gold/tonne and 0.010% molybdenum) will be stockpiled to provide an additional six years of mill feed after pit operations have ceased.

Extensive metallurgical testing of several possible process options for the mineral zones has been completed. Conventional, low-cost, flotation processing of supergene and hypogene sulphide ores is currently the optimum ore processing method for the Casino project. Conventional crushing, grinding and flotation of sulphide ore on average recovers 72% of gold, 80% of copper and 62% of molybdenum. Concentrates produced are a copper-gold concentrate, grading 21% copper and 23.6 grams gold/tonne, and a molybdenum concentrate forecast to grade 53%.

Net smelter return (from 1995) is estimated at US\$14.85 based on US\$1.20/pound copper, US\$395/ounce gold, US\$7/pound molybdenum, a 0.74 exchange rate and standard treatment and transport charges. Based on a 25,000 ton/day milling operation, annual output will average 48 million pounds copper, 3.5 million pounds molybdenum and 79,400 ounces gold over the 19-year reserve life. Head grades during the first six years are expected to average 0.392% copper, 0.028% molybdenum and 0.45 grams/tonne gold (0.013 ounces gold), netting 63 million pounds of copper and 98,000 ounces of gold per year. Head grades during the 19-year life of the mine are calculated to average 0.30% copper, 0.376 grams/tonne gold, and 0.028% molybdenum.

# CASSIAR MINE

## Cassiar Magnesium Inc.

Chairman: Clifford Frame  
President: Kenneth Bates

**Corporate headquarters**  
Suite 1910, 777 Bay Street  
Toronto, Ontario M5G 2C8

Phone (416) 204-1455  
Fax (416) 204-1450

### PROJECT STATUS

Chrysotile asbestos fibre production

#### Location

100 km southwest of Watson Lake

#### Ownership

Cassiar Magnesium Inc.

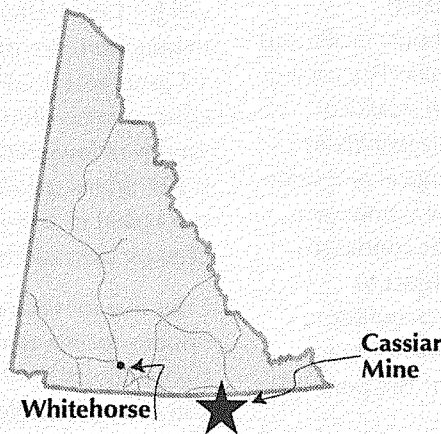
#### Commodities

Chrysotile asbestos, magnesium

#### Reserves

Chrysotile asbestos: 3.5 million tonnes of extractable chrysotile fibre

Magnesium: 20 million tonnes of serpentinite ore grading 23.5% of contained magnesium metal



## HISTORY

The Cassiar asbestos deposit was the first major orebody discovered in the Cassiar area. The mine produced 37 million tonnes of 7.23 per cent asbestos fibre during open pit mining between 1953 and 1990. In the early 1980s, an underground orebody was located downdip and to the south of the main open pit. It was mined underground for less than a year until Cassiar Mining Corporation went into receivership. In January, 1994, B.C. Chrysotile acquired from the receiver the Crown Grants, the existing tailings pile and certain assets of the abandoned mine for \$184,040. B.C. Chrysotile was owned 30% by Mineral Resources Corporation, 50% by Black Hill Minerals and 20% by Strategic Industry Investments Ltd. In 1994 and 1995, Pacific Resources Holdings, an affiliate of Mineral Resources Corporation, advanced \$510,420 and \$68,417 on behalf of Mineral Resources Corporation to B.C. Chrysotile to meet its working capital requirements. At

the end of 1995, the assets of Black Hill were placed into administration and the assets of B.C. Chrysotile were frozen by the administrator. In 1996, Mineral Resources Corporation launched a takeover bid for Pacific Resources Holdings and subsequently increased their interest in the B.C. Chrysotile project from 50% to 80%. In May, 1998, Mineral Resources Corporation announced the acquisition of the remaining 20% of Cassiar Chrysotile Inc. as well as a name change to Minroc Mines Inc. In 1999, Minroc changed its name to Cassiar Mines and Metals Inc.

In July, 1999, Cassiar Mines and Metals Inc. and Aluminum of Korea Ltd. entered into a Memorandum of Understanding for the development of a large-scale magnesium metal project. Aluminum of Korea (KORALU) acquired a 35% interest in the project in conjunction with an initial financing of US\$25 million, and, ultimately, may acquire a 65% interest by providing full project financing. KORALU would also have an off-take sales

agreement to purchase the magnesium metal product. On December 20, 1999, Cassiar Mines and Metals Inc. announced that the first production of chrysotile asbestos was achieved. In 2000, the company changed its name to Cassiar Magnesium Inc.

## PROPERTY SUMMARY

The Cassiar plant site is on a 720 hectare Crown Grant in British Columbia, approximately 100 km southwest of Watson Lake. An all weather paved highway connects the mine site to Watson Lake, Yukon and Dease Lake, British Columbia.

## GEOLOGY, MINERALIZATION AND RESERVES

The Cassiar orebody is a stockwork of chrysotile fibre veins developed in serpentinite, situated on the western edge of the Cassiar ultramafic body. The stockpiles of serpentine on surface at the plant site contain 20 million tonnes of stored serpentine, or greenstone, which contain some eight billion pounds of magnesium metal and 700,000 tonnes of chrysotile fibre, sufficient for 50 years production of magnesium metal and 20 years production of chrysotile fibres at the highest production rate planned.

## PRODUCTION

The first phase, now underway, involves the production and marketing of high-grade chrysotile fibre. Production began in early 2000 at a rate of 18,000 tonnes per year. In May, 2000, the company completed an expansion at a capital cost of \$500,000 to produce 27,000 tonnes of fibre annually. Over the next three years, the company plans to increase capacity, using both the wet and dry processes, to 50,000 tonnes of fibre annually.

The Cassiar property, including nearby Kutcho Creek, 125 km southeast of Cassiar, contains a total of 3,518,871 tonnes of extractable chrysotile fibre resources.

	Tonnes of recoverable chrysotile fibre
Six stockpiles on surface	282,931
Tailings pile	680,840
McDame lens in-situ underground	1,817,200
Kutcheo Creek	737,900

Stockpiles of fibre are contained in some 17 million tonnes of serpentine tailings on surface adjacent to the plant, and a further 6 million tonnes of primary ore materials in surface stockpiles and locations, and the remainder in the 32 million tonnes of ore resource, which is still in place underground in the mine, and the 16 million tonnes at the Kutcho Creek property. The tailings contain 4% chrysotile fibres, and the surface ore and the mine ore in place contain between 8% and 10% chrysotile fibre. The tailings and the surface and mine host rock contains approximately 24% magnesium metal. During the summer of 2000, the company planned to stockpile an estimated 200,000 tonnes of upgraded ore for processing through to May, 2001.

First stage refurbishment has now been completed at a capital cost of \$3.5 million. An additional \$10 million capital expenditure was made for the development of the wet process plant. Further capital expenditure investments will be made on an on-going basis to increase the combined wet and dry fibre production to the full planned level of 50,000 tonnes per year.

The second phase involves construction of a magnesium metal production plant facility with an annual capacity of 150 to 200 million pounds of magnesium metal. The total capital cost of the plant and facility will be in the order of US\$600 million. The first production of magnesium metal is planned for 2003. Upgrading the Cassiar plant site for chrysotile fibre production is the first stage of the development.

The metal will be produced from the existing stockpile of serpentine ore on surface, which contains some 20 million tonnes of serpentine grading 23.5% magnesium metal. The cleaned serpentine from the production of chrysotile asbestos is ideal material for the extraction of magnesium metal. The surface ore reserve is sufficient to support a magnesium metal plant production rate of 150 million pounds of magnesium metal annually for over 50 years. In addition, there are underground mine reserves of an additional 18,247,000 tonnes.

Cassiar Magnesium Inc. has carried out preliminary engineering and economic investigations and tests to interpret requirements for the plant. First production under the development plan is scheduled for late 2003.

Approximately 40 workers from northern B.C. and the Yukon have been hired to work at the Cassiar plant site.

# CLEAR LAKE PROPERTY

## United Keno Hill Mines Ltd.

President and Chief Executive Officer: Gerald Gauthier

### Corporate headquarters

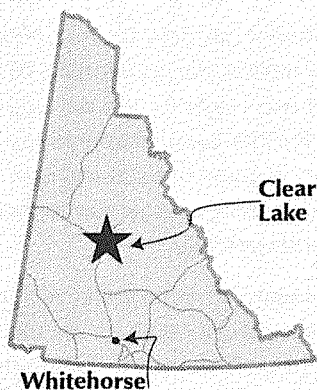
8<sup>th</sup> Floor, 350 Bay Street  
Toronto, Ontario M5H 2S6

Phone (416) 943-1500

Fax (416) 943-1600

### PROJECT STATUS

Inactive



### Location

70 km east of Pelly Crossing

### Ownership

United Keno Hill Mines Ltd.

### Commodities

Zinc, lead, silver

### Ore type

Sulphide

### Drill-indicated reserves

6.1 million tonnes

Zinc: 11.34%

Lead: 2.15%

Silver: 40.8%

## HISTORY

Claims in the Clear Lake area were first staked in 1965, following discovery of the Faro ore body, 80 km to the southeast. Preliminary property exploration followed by drilling was carried out, but the claims were allowed to lapse. In 1974, a syndicate of Conwest companies (Chimo Gold Mines Limited, Consolidated Canada Farday and International Mogul Mining Ltd.) and Teck Corp Ltd. restaked a large claim block in the area. U.S. Steel (Essex Metals Limited) acquired the Teck interest in 1975 and formed the Macmillan Joint Venture, which conducted exploration and drilling. In 1978, the Clear Lake massive sulphide deposit was discovered by drilling one 109-m hole. Additional drilling was carried out from 1979 to 1984. Getty Canada Metals Ltd. acquired Conwest Syndicate's interest in 1980. In early 1988, Total Erickson Resources merged with Getty Resources to form Total Energold Corp. In late 1989, Total Energold purchased

Conwest's interest in the property to hold a 79.6% interest, with a subsidiary of U.S. Steel Corp. holding the other 20.4%. Total Energold then added more Clear Lake claims to the property.

In 1991, Total Energold announced a joint venture with Mitsui Kinzoku Resources of Canada Ltd., a wholly owned subsidiary of Mitsui Mining & Smelting of Japan. Mitsui acquired a 19.375% interest in the property for a cash payment of C\$1.55 million. It also had an option to increase its interest in the property to 70% by making additional cash payments totalling C\$2.45 million and by funding C\$5.33 million in exploration over the next four years. Energold was the operator and would, under certain conditions, retain a 10% net profits royalty and 30% working interest. At the same time, Total Energold purchased U.S. Steel's interest in the property for US\$1 million.

Under the Energold and Mitsui Joint Venture, additional drilling, geophysics, mapping, trenching and soil sampling were carried out between 1991 and 1993. A total of 19 drill holes totalling 4,500 m were drilled in 1991, in conjunction with geophysical surveys. The 1992 program consisted of diamond drilling (3,100 m), mapping, soil geochemistry, line cutting and geophysical surveys. Six holes, totalling 1,456 m, were drilled in 1993. Baseline environmental studies were conducted.

The joint venture agreement was terminated and in October, 1999, United Keno Hill Mines Ltd. announced that they had acquired the Clear Lake property from Energold Minerals Inc.

## PROPERTY SUMMARY

The Clear Lake property, on NTS map sheet 105L, is located 70 km east of Pelly Crossing and about 110 km northwest of Faro. There is a winter road to the property from Pelly Crossing. The property consists of 636 claims.

## GEOLOGY, MINEROLOGY AND ORE RESERVES

The Clear Lake deposit is a shale-hosted stratiform lead, zinc and silver massive sulphide deposit located in a fault-bounded wedge of Devonian-Mississippian Earn Group shales, immature sandstones and minor exhalites. The property is bisected by the Tintina Fault. The main deposit consists of a 1,000-m long by 120-m wide sigmoidal-shaped sulphide body that consists mostly of laminated and framboidal pyrite. Other minerals include galena, sphalerite, barite, siderite and calcite. The deposit is folded, faulted and overturned.

Drill-indicated reserves consist of approximately 30 million tons of massive sulphide, mostly pyrite, including 6.1 million tonnes (5.53 million tons) grading 11.34% zinc, 2.15% lead and 40.8% silver, using a cutoff grade of 7% combined zinc-lead.

# CREST PROPERTY

## Crest Exploration Limited (Chevron Resources Canada)

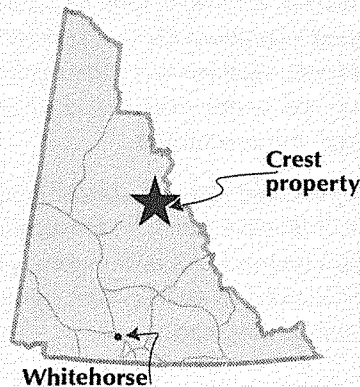
### Corporate headquarters

500 Fifth Avenue S.W.  
Calgary, Alberta T2P 0L7

Phone (403) 234-5000  
Fax (416) 360-4419

### PROJECT STATUS

Inactive



### Location

350 km northeast of Elsa, Yukon

### Ownership

Chevron Resources Canada

### Commodities

Iron

### Ore type

Oxide Iron Formation

### Mineral Resource

5.6 billion tonnes

46% Iron

## HISTORY

Hematite float in the Snake River area was known for years before the source iron-formation was discovered by California Standard CL in 1961. A total of 862 claims (an area of about 240 square km) were staked in spring 1962 and transferred to a new subsidiary company, Crest Exploration Ltd., which drilled one hole and mapped in 1962, and drilled 19 holes and cut 45 channel samples in 1963. Between 1962 and 1965 Crest Exploration Ltd. conducted detailed geological mapping of the exposed sections of iron-formation, systematic sampling and diamond drilling, beneficiating tests on bulk samples of the various stratigraphic units of iron-formation and extensive chemical and mineralogical investigations.

## PROJECT SUMMARY

The Snake River iron formation is located in a remote area of the Yukon, approximately 400 km east of the Dempster Highway and 350 km northeast of Elsa, Yukon. The thickest units of iron formation are located in the Iron Creek area at the headwaters of the Snake and Bonnet Plume rivers and are exposed extensively in the Yukon-NWT border region over an area 50 km long and 13 km wide.

## GEOLOGY

The Snake River iron formation lies near the base of the Late Proterozoic Rapitan Group in a section of conglomerate, mudstone, shale and sandstone, 2000 m or more in thickness. The iron formation is relatively fresh

and unaltered. Iron formation crops out in three structural blocks separated by northwest-trending faults. The Crest iron deposit lies in the westernmost fault block. The iron deposit consists of layers of unaltered hematite and jasper oxide facies, with interspersed beds, lenses, and 1- to 5-cm thick nodules of dolomite and ankeritic carbonate. The iron layers have a cumulative thickness of 85 to 105 m and are distributed through 120 m of stratigraphic section. The average composition of the Snake River iron formation varies from 40 to 50% Fe; 0.02 to 0.8% Mn, with an average of 0.25%; 0.2 to 0.7%  $P_2O_5$ ; 0.02 to 0.08% S; 0.02 to 0.11%  $TiO_2$  and varying amounts of  $SiO_2$ ,  $Al_2O_3$  and CaO in the order of 30%, 1.4% and 3% respectively. The average iron content is 43%. The hematite and silica are believed to have been carried in solution by fumarolic waters and precipitated in grabens on the sea floor. Phosphorus is the main impurity, occurring as finely disseminated apatite.

## RESERVES

A feasibility study was done between 1963 and 1964. The Crest deposit is one of the largest iron deposits in North America. A resource of 5.6 billion tonnes of iron ore formation averaging 46% Fe, 25%  $SiO_2$  and 0.35%  $P_2O_5$  was estimated. The resource could be mined from open pits with a favorable stripping ration of 1:1. An additional 3.6 billion tonnes of iron ore formation were estimated in the vicinity of the potential open pits. There are other, smaller deposits in the Rapitan belt of rocks. The total iron resource in the Snake River area was estimated at 18 billion tonnes.

Beneficiation studies showed that the fine-grained Snake River iron formation can be beneficiated by selective agglomeration methods. Material containing 54.6% Fe and 0.39%  $P_2O_5$  was treated to provide concentrate containing 65.9% Fe, less than 0.02%  $P_2O_5$  and 5.3%  $SiO_2$  with 85 percent of the iron being recovered in the concentrate.

The Bonnet Plume coal deposit discovered in 1977 and explored between 1977 and 1981 contains 38 million mineable tonnes of coal. It is 80 km southwest of the Crest Iron deposit.

# DIVISION MOUNTAIN PROPERTY

## Cash Resources Ltd.

President: Robert Carne

### Corporate headquarters

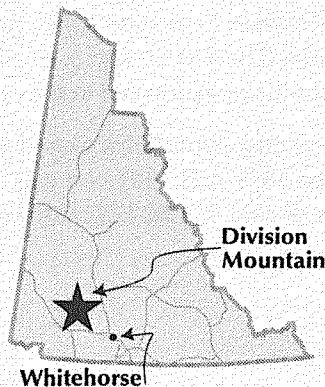
#1016-510 West Hastings Street  
Vancouver, British Columbia V6B 1L8

Phone (604) 683-1610

Fax (604) 688-2578

## PROJECT STATUS

On hold, high exploration potential



### Location

90 km north-northwest of Whitehorse

### Ownership

Cash Resources Ltd.

### Commodity

High volatile bituminous B coal

### Drill-indicated raw coal reserves

52.9 million tonnes

### Proposed mining method

Open-pit, 365 days per year

### Proposed processing method

Washing plant, 365 days per year

### Proposed adjoining development

20 MW, independent power plant

### Potential employment

340 people

## HISTORY

Three coal seams were mapped by D.D. Cairnes of the Geological Survey of Canada in 1907. The seams are exposed in the Teslin Creek cut, 2 km north of Division Mountain; an additional coal occurrence was located by Cairnes near the base of the eastern flank of Red Ridge, approximately 5 km northwest of the Teslin Creek showings.

The Division Mountain coal property is currently held under territorial coal licences and coal leases totalling 3,223 square km, owned by Cash Resources Ltd. A field program, including linecutting, geophysics, excavator trenching, hydrological surveys and diamond drilling, was funded by Cash Resources Ltd. and managed by Archer, Cathro and Associates (1981) Ltd. from 1992 to 1998. Large diameter diamond drilling has totalled 10,558 m in 64 holes. Extensive environmental, archaeological and sociological studies have also been carried out.

The property was optioned to Usibelli Coal Mine Inc. of Alaska in November, 1988. In the spring of 1999, Usibelli carried out a program of excavation trenching and 20 reverse circulation drill holes totalling 1,874 m. Coal measures were discovered in a previously undrilled area, 10 km east of Division Mountain. Usibelli dropped its option due to prevailing thermal coal market conditions, despite the high exploration potential of the project.

## PROJECT SUMMARY

The Division Mountain coal deposit is located only 20 km from the main electrical distribution grid for the Yukon and 280 km by highway from a deep sea port at Skagway, Alaska. Current access into the property is by a 31-km four-wheel drive road, leaving the Klondike Highway at Braeburn, Yukon. The coal at Division Mountain is similar to or better than the quality of most British Columbia export thermal coals.

## **GEOLOGY, EXPLORATION AND ORE RESERVES**

Coal occurs in at least 14 major seams at Division Mountain within a 50-m stratigraphic interval near the base of the Upper Jurassic Tanglefoot Formation. Aggregate coal thickness (in seams greater than one metre thick) ranges up to 32 m. An unaudited, preliminary resource calculation has been made using a cross-sectional modelling method conforming with the standardized coal reporting system developed by the Geological Survey of Canada. Indicated reserves currently stand at 52.9 million tonnes of near surface high volatile bituminous coal with a stripping ratio of 3.5 bank cubic metres of waste per tonne of raw coal. Washability tests indicate that a high quality export coal suitable for electric power generation can be produced with an 8% total moisture content and averaging 12.2% ash, 27.6% volatile matter, 52.1% fixed carbon and .046% sulphur with a calorific value of 6,170 calories/gram (11,018 Btu/pound) on an as-received basis.

## **PRODUCTION PLANS**

Results of coal analysis suggest that Division Mountain coal is ideally suited for thermal power generation with characteristics comparable to Alberta high volatile bituminous coals used to generate over 90% of the power needs of that province. The coal is also suitable for supply to the rapidly expanding use of Pulverized Coal Injection (PCI) technology in Japanese and Korean steel industries. Cash Resources has completed environmental baseline data collection required for the development of the coal reserves with an associated 20 megawatt mine-mouth electrical generating facility using mine-run and waste coal.

# DUBLIN GULCH PROPERTY

## New Millennium Mining Ltd.

President: Deb Bandyopadhyaya

### Corporate headquarters

#360, R141-757 West Hastings Street  
Vancouver, British Columbia V6C 1A1

Phone (250) 846-5764

Fax (250) 846-5765

### PROJECT STATUS

Bankable feasibility study complete, permitting  
nearing completion



### Location

40 km north of Mayo

### Ownership

New Millennium Mining (100% owned by First  
Dynasty Mines)

### Commodity

Gold (tungsten)

### Ore type

Gold in quartz veins

### Geological resource

98.9 million tonnes

Gold: 1.19 grams/tonne

### Mineable reserve

50.4 million tonnes containing 1.5 million ounces  
gold

Gold: 0.93 grams/tonne

### Mining method

Open-pit, 150 days per year

### Processing method

Heap leach, 365 days per year

### Mine life

10 years

### Employees

179

### Housing

Camp

### Power

4 MW, grid or on-site diesel

## HISTORY

Placer gold was discovered in Haggart Creek below Dublin Gulch in 1895 and in the Dublin Gulch and the Klondike area in 1898. Scheelite was identified in the Dublin Gulch placers in 1904 and lode gold was discovered in 1907. The history of hardrock exploration in the Dublin Gulch area is complex. The ground was explored in 1970 by a subsidiary of Placer Dome Inc., primarily looking for lode gold deposits in the intrusive rocks. Queenstake Resources Ltd. acquired ground in the area in 1977 and optioned their holdings to Ivanhoe Goldfields Ltd. in 1991. Ivanhoe discovered an intrusive-hosted porphyry gold deposit and granted an option to Amax Gold Inc. to earn a 50%

interest in the Dublin Gulch property. Amax drilled 46 reverse circulation holes totaling 5,651 m in 1992, in addition to extensive rock and soil sampling, but decided to drop the option. Ivanhoe Goldfields drilled an additional ten reverse circulation holes (2,078 m) during 1993 and carried out baseline environmental studies including hydrology, meteorology, water quality and wildlife monitoring. In 1994, Ivanhoe Goldfields Ltd. became a wholly owned subsidiary of First Dynasty Mines Ltd. In 1995, 24,400 m of drilling (151 holes), metallurgical testing, engineering and economic studies were carried out. In 1996, Ivanhoe Goldfields changed its name to New Millennium Mining Ltd. During 1994, the company completed 11,418 m of reverse circulation and diamond

drilling, 380 m of exploration trenching, 233 geotechnical test pits and 700 soil samples. A bankable feasibility study has been completed on the property, and project permitting is at an advanced stage, although the project is currently on hold pending higher gold prices.

## PROJECT SUMMARY

The Dublin Gulch project is an advanced exploration project covering a low-grade, bulk tonnage intrusive-hosted gold deposit located 40 km northeast of Mayo, Yukon. The property is accessible by an all-weather road. A bankable feasibility study has been completed and an Initial Environmental Evaluation report was submitted to the federal government in 1996. The company has invested more than US\$10 million to bring the Dublin Gulch project to the development stage and has signed a framework agreement with the First Nation of Na Cho Ny'a'k Dun. Further development is on hold pending higher gold prices.

## GEOLOGY, MINERALOGY AND ORE RESERVES

The deposit is hosted in and around the Cretaceous Dublin Gulch granodiorite stock. Mineralization is found in sheeted, low sulphide quartz veins containing gold and bismuth along the north side of the intrusion, scheelite skarn zones around the margins, and in auriferous quartz-arsenopyrite veins in the intrusion and in the host rocks. Gold occurs as native gold in gangue or associated with bismuth minerals, with lesser amounts of gold contained in arsenopyrite.

The main ore zone is the Eagle, with an estimated resource of more than three million ounces of gold. Three other zones on the property, the Olive, Shamrock and Steiner zones, contain similar gold mineralization.

The mineable gold reserve at Dublin Gulch (from the 1997 feasibility study) is 1,510,000 ounces gold out of a total estimated resource of 3 million ounces of gold. The total mineable reserve (proven and probable) is 50.4 million tonnes at 0.93 grams/tonne gold out of a total geological resource of 98.9 million tonnes grading 1.19 grams/tonne.

## PRODUCTION PLANS

Although inferred reserves indicate that a large open-pit mine with well over 100 million tonnes may be possible, the current concept is to initially develop a higher grade core of approximately 50 million tonnes grading 1.19 grams/tonne gold or better.

Highlights from a bankable feasibility study completed by Rescan Engineering Ltd. include:

Gold recovery	79.6%
Net recoverable	1.2 million ounces or 36,560 kg
Stripping ratio	0.8:1 (waste to ore)
Throughput rate	35,000 tonnes per day (seasonal)
Average annual production	135,000 ounces per year
Initial capital cost	US\$106.7 million
Average cash production cost	US\$221 per ounce (including reclamation)

It was suggested in the feasibility study that using a larger haul fleet, contract mining, optimizing the crushing/conveying circuits, and optimizing the heap-leach pad construction and operation would improve the project economics, as well as increasing the mineable reserves.

The mine would consist of an open pit in the Eagle Zone, mined at 20,000 tonnes per day producing 10,000 tonnes per day mine waste rock. Based on 50 million tonnes of reserve, the mine would have a life expectancy of approximately 10 years. Ore would be crushed and conveyed or trucked to a cyanide heap leach pad. Pregnant solution would be processed using an adsorption-desorption gold recovery (ADR) method and the resulting gold collected would be poured into dore bars on site.

A 1997 agreement between First Dynasty Mines Ltd. and Cornucopia Resources Ltd. for Cornucopia to acquire New Millennium Mining was cancelled. New Millennium Mining Ltd. is in the advanced stages of environmental permitting. While the feasibility study concluded that Dublin Gulch would have a cash cost of production below the average of North American producers, the current gold price has meant that the project is currently unfeasible, and is on hold.

# FARO PROPERTY

## Deloitte & Touche Inc.

(Interim Receiver)  
BCE Place, Suite 1400, 181 Bay Street  
Toronto, Ontario M5J 2V1

Phone (416) 601-6150  
Fax (416) 601-6390

## Grum Deposit

### Commodity

Zinc, lead, silver, gold

### Ore type

Sulphide

### Geological resource

30.8 million tonnes

Lead: 3.1%

Zinc: 4.9%

Silver: 49 grams/tonne

### Mineable reserve

16.9 million tonnes

Lead: 3.0%

Zinc: 4.9%

Silver: 47 grams/tonne

## Grizzly Deposit

### Commodity

Lead, zinc, silver, gold

### Ore type

Sulphide

### Geological resource

21,356,000 tonnes

Lead: 5.54%

Zinc: 7.33%

Silver: 81.10 grams/tonne

Gold: 0.87 grams/tonne

### Mining method

Will be underground

## Swim Deposit

### Commodity

Lead, zinc, silver

### Ore type

Sulphide

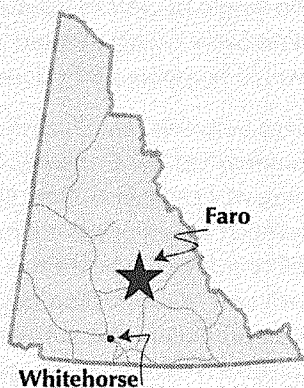
### Drill indicated resource

4.75 million tonnes

Lead: 3.8%

Zinc: 4.7%

Silver: 42 grams/tonne



## PROJECT STATUS

Inactive

The Faro area lead-zinc deposits are located in the Anvil Mountain Range within the Selwyn Basin, immediately northeast and adjacent to the Tintina Trench. The age of the stratigraphic sequence in the Anvil district ranges from late Precambrian to Permian. The sulphide deposits are located in a 150-m thick stratigraphic interval straddling the Mt. Mye formation and the Vangorda Formation contact. Mineralization is one of two types; massive sulphides and quartzose disseminated sulphides. The Cretaceous granodiorite-quartz monzonite Anvil batholith intruded and uplifted the sedimentary package.

There are five major lead-zinc deposits in the Vangorda plateau area. From northwest to southeast, they are Faro, Grum, Vangorda, Grizzly (formerly called the Dy deposit) and Swim. The status of each deposit is as follows.

Vangorda	mined out
Faro	mined out
Grum	open-pit mine, 4 to 5 years of reserves left
Grizzly	advanced exploration stage, would be mined by underground methods
Swim	undeveloped

**HISTORY**

Prospector Al Kulan discovered and staked the Vangorda lead-zinc deposit in 1953. The property was optioned to Prospector Airways, and diamond drilling between 1953 and 1955 was carried out. Kerr-Addison Mines Limited eventually acquired Prospector Airways, but interest in the property waned for a number of years because of depressed metal prices, declining metal markets and the remoteness of the area.

In 1962, Kerr-Addison resumed exploration in the Vangorda plateau area, and the Swim lead-zinc deposit, eight km southeast of Vangorda, was discovered in 1963. At the same time, Dynasty Explorations, under the direction of Dr. Aaro Aho, commenced a detailed exploration program on several claim groups in the Faro area in 1964 and discovered the Faro lead-zinc deposit in 1965. Cyprus Anvil, a joint venture between Cyprus Mines (60%) and Dynasty (40%), was formed in December, 1965 to develop the Faro deposit.

Anvil Mining Corporation (later Cyprus Anvil Mining Corporation) commenced open-pit mining operations on the Faro lead-zinc deposit in late 1969 at rates of up to

10,000 per day. The mine was officially opened on January 28, 1970. The mine was open from 1969 to 1982.

In 1973, the Grum lead-zinc deposit was discovered by a joint venture between AEX Minerals and Kerr Addison while testing a gravity anomaly. Cyprus Anvil Mining Corporation purchased the Grum property in 1979.

Concentrate production from the Faro deposit was halted in 1982 because of falling metal prices, low productivity, high operating costs and the added burden of the debt load brought about by expansion. Between June, 1983 and October, 1984, some open-pit waste stripping operations were carried out, but production ceased completely by the end of 1984.

The Anvil Range mineral assets of Cyprus Anvil, including the Grum and Grizzly deposits, were acquired in November, 1985 by a predecessor partnership of Curragh Inc. Curragh resumed operations at the Faro mine in the spring of 1986 and made its first shipment of concentrates in June, 1986. In 1989, development of the Vangorda Plateau was begun with stripping of the Grum and Vangorda deposits. Ore removal commenced at the Vangorda pit and supplemented the mill feed. Ore removal from the Grum pit continued, but was not significant.

Curragh carried out an extensive program of surface drilling on the Grum deposit to delineate reserves and obtain samples for metallurgical testing in preparation for production. Preparation of the Grum deposit for mining commenced in 1989.

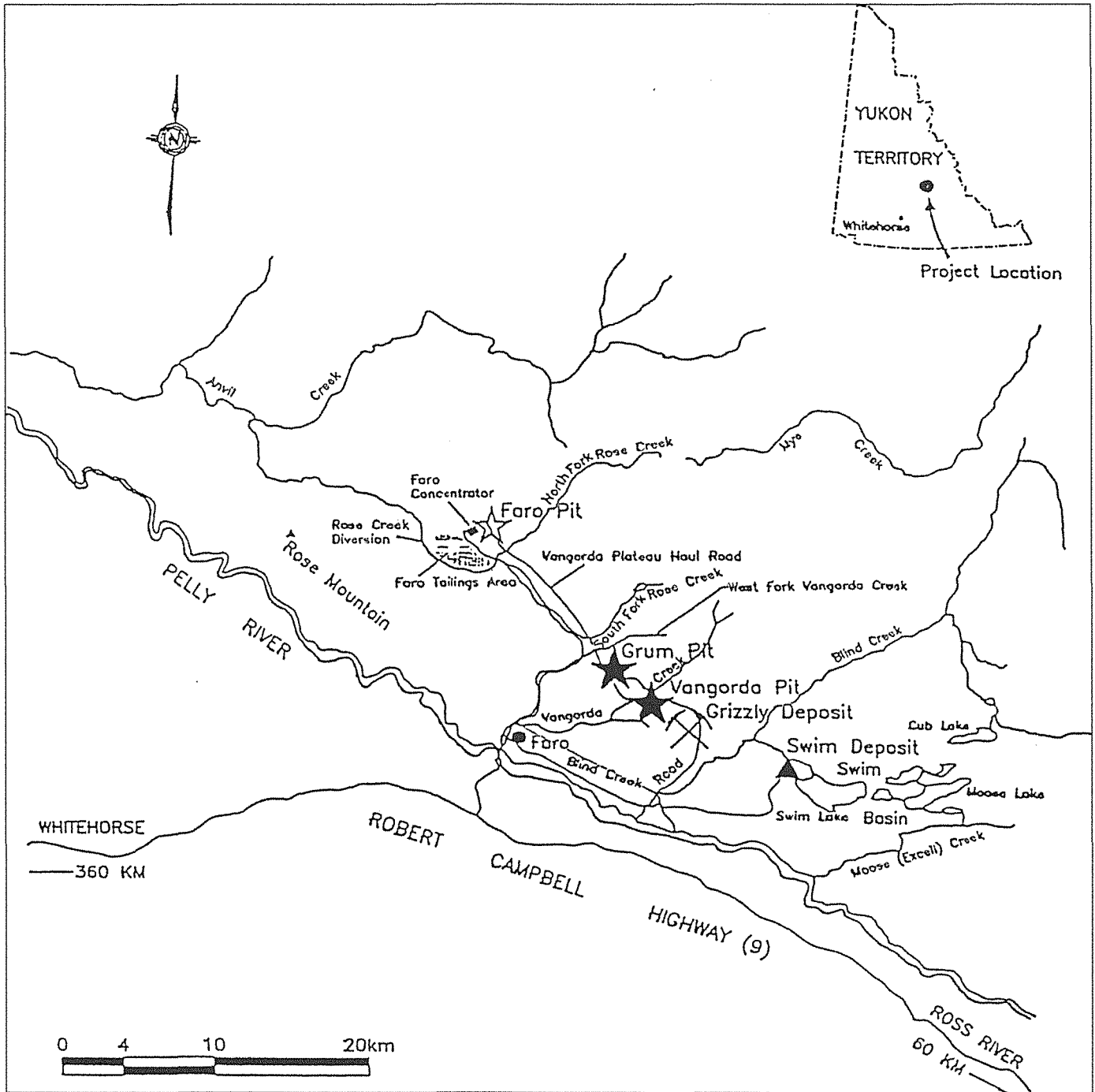
In early 1990, an underground operation was initiated just southwest of the Faro pit from a portal in the pit. This operation closed in October, 1992 after mining 1.8 million tonnes of ore.

In 1991, Curragh began stripping the Grum deposit. As of October, 1991, the total waste requiring stripping from Grum was 193.2 million tonnes for a stripping ratio of 6.70:1. The ore reserves in the Faro pit were exhausted in August of 1992 and remnant ore was salvaged by early 1993.

In late 1992, sufficient stripping in the Grum open-pit had been done to expose the top of the Grum deposit and to extract some 15,000 tonnes of mineralization for testing in the Faro concentrator. After removing 21.4 million tonnes, Grum stripping was suspended in December, 1992.

All mining operations ceased in April, 1993 due to low metal prices. Curragh was forced into receivership by its creditors.

FARO PROPERTY



Modified from an Anvil Range Mining Corporation figure.

Anvil Range Mining formed in 1994 to acquire the Faro properties from the receiver for a purchase price of \$27 million. A nine-month \$75-million pre-stripping and mill refurbishment program was carried out. Anvil Range Mining began concentrate production from the Grum open pit in August, 1995 and resumed production from the Vangorda open pit in September, 1995. The first concentrates were shipped from Skagway to Asia and Europe in September, 1995. The mining operation achieved commercial production on November 1, 1995.

By the end of 1996, the Vangorda pit was mined out, and mining operations were suspended because of low metal prices and other factors, including lower head grades, mechanical problems in the mill and lower metal recoveries which contributed to less than planned production. The mill continued to process low-grade stockpiles at 50% capacity until March 31, 1997.

In February, 1997, Anvil Range Mining Corp. announced the closing of a private placement of 4.1 million common shares for a total of \$9.4 million with Cominco. ARM also secured a \$15 million loan at 8.5% interest from its principal shareholder, Cominco, in July, 1997. The loan was advanced to ARM in two tranches.

Stripping of the Grum pit started in August, 1997. The mine re-opened at full production in November, 1997 and operated until January 16, 1998, when Anvil Range announced that it planned to file for court protection from creditors. On April 21, 1998, an interim receiver was appointed to review the company's assets.

In 1999, the Yukon government, Department of Indian Affairs and Northern Development (DIAND) and Cominco entered into a Memorandum of Understanding (MOU) to form a holding company that will control the Faro mine activity. It is expected that the MOU will be implemented when there is a settlement agreement in place with the creditors and the receivership is removed.

## HISTORICAL PRODUCTION

When operating in 1989, the Faro operations supplied 3% of the western world's zinc and 5% of its lead concentrates, making Curragh Resources, the operator at that time, the sixth largest zinc producer in the world.

### ANVIL RANGE MINING CORPORATION

Production for the 14 months ended December 31, 1996 was 345,700 tonnes of zinc concentrate and 186,000 tonnes of lead concentrate. From September, 1995 to December 31, 1996, ARM loaded 25 ships for a total of 383,000 dry metric tonnes of zinc concentrates and 181,000 dry metric tonnes of lead concentrates. The concentrate tonnage equates to 566.9 million pounds of payable metal. To produce this amount of concentrate, 28.8 million tonnes of waste and 4.5 million tonnes of ore were moved. The mill processed 4.8 million tonnes of ore, at an average head grade of 5.14% for zinc and 3.04% for lead. Recoveries in the mill averaged 71.3% for zinc and 76.7% for lead.

Concentrates were dried to approximately 7% moisture before being loaded into specially designed shipping containers for trucking to the port of Skagway, Alaska. The lead and zinc concentrates were loaded separately into pots which had a capacity of 11-12 tonnes of concentrate. Four pots could be carried on a tractor-trailer unit. Concentrates were transferred to a storage building prior to loading onto vessels for shipment to smelters in Europe and Japan.

Power for the Grum project, 22 MW, was provided from the Whitehorse-Aishihik-Faro grid.

The target recovery rates for the Grum open pit were 78% for zinc and 80% for lead.

Anvil Range investigated the feasibility of building a crushing and grinding unit adjacent to the Grum site and transporting the ground ore by slurry pipeline to the mill. They made significant improvements to the milling and concentrating facilities. Two 40-foot high column cells were added (the largest in the western world), a Provox custom digital control system was installed, and improvements to the regrind circuit increased recovery.

### FARO MINE DEVELOPMENT

- 1953 Vangorda lead-zinc deposit discovered and staked by prospector Al Kaulan.
- 1953-1955 Prospector Airways optioned the property and conducted drilling programs.
- 1955-1962 Kerr-Addison Mines acquired the property but due to depressed metal prices, little work was done.
- 1962 Exploration resumed.
- 1965 Faro lead-zinc deposit discovered; a joint venture between Cyprus Mines and Dynasty was formed to develop the Faro deposit.
- 1969 (late) Open pit mining of Faro pit commenced (official opening January 28, 1970).
- 1969-1982 Cyprus Anvil Mining Corporation operated the mine.
- 1973 Grum lead-zinc deposit discovered.
- 1975 In March, a tailings pond spill occurred when 245,000 cubic metres of tailings slurry contaminated Rose Creek.
- 1982 Concentrate production halted.
- 1983 Some open-pit waste stripping operations was carried out (June, 1983 to October, 1984).
- 1984 All production ceased completely by the end of 1984..
- 1985 Curragh Inc. acquired the property in 1985 and resumed operations in 1986.
- 1989 The Faro operations supplied 3% of the western world's zinc and 5% of its lead concentrates, making Curragh Inc. the sixth largest zinc producer in the world.
- 1990 Underground mining at Faro pit took place.
- 1991 Stripping of Grum deposit began.
- 1992 Ore reserves in Faro pit are exhausted; test work done on Grum deposit.
- 1993 Mining operations ceased due to low metal prices and Curragh was forced into receivership by its creditors.
- 1994 Anvil Range Mining Corporation acquired the Faro property from the receiver and resumed production in August, 1995, from Grum, then Vangorda.
- 1996 Anvil Range Mining Corporation filed a decommissioning plan.
- 1996 By the end of 1996, the Vangora pit was mined out but the mill continued to process low-grade stockpiles at 50% capacity until March, 1997.
- 1997 The mine reopened at full production in November, 1997 and operated until January 16, 1998.
- 1998 On April 21, 1998, an interim receiver was appointed to review the company's assets.
- 1999 Yukon government, DIAND and Cominco enter into a Memorandum of Understanding to form a holding company that will control the assets.

## Reclamation and environmental work

In 1995, Anvil Range Mining filed the Initial Comprehensive Abandonment Plan with the Yukon Water Board. Anvil Range Mining accrued the cost of reclamation and closure monitoring at the rate of \$0.42 per tonne of mill feed.

To fund the closure and reclamation costs, Anvil Range Mining, after negotiating with DIAND, established a Reclamation Security Trust (RST). Payments to the RST were made under the provisions of a formula tied to the price of zinc, with a minimum quarterly payment of \$175,000 being required subject to available cash flow. The fund was managed by an independent trustee, who obtained independent investment counsel for investment decisions.

## Tailings

In 1996, Anvil Range Mining also filed the Tailings Reprocessing Feasibility Study. Over 50 million tonnes of flotation tailings accumulated from the Faro mill operation from 1969 to 1992.

## GRIZZLY DEPOSIT

The Grizzly deposit was discovered in 1976 by Cyprus Anvil Mining Company (CAMC). For the next five years, CAMC drilled 52 holes and developed a preliminary interpretation and mineral inventory. Curragh Resources acquired the property in 1985 and, between 1989 and 1991, drilled an additional 21 holes. In 1991, three holes were drilled to test a fault in the Dy deposit, and five holes were drilled to test the path of a proposed decline. Ten holes were drilled through overburden to test the proposed portal site. The Dy deposit was re-named the Grizzly deposit in 1996.

The Grizzly deposit is similar to the other deposits in the Faro area. It is a multi-layered, polydeformed, sediment-hosted sequence of exhalative, massive and disseminated pyritic sulphides.

There are two main mineralized horizons:

- "A" horizon: relatively lead enhanced; and
- "B" horizon: relatively zinc enhanced.

Collectively, the two horizons are referred to as the "AB" zone. The internal structure of the deposit is poorly understood, but the current thinking is that the structural complexity known to exist at Vangorda and Grum will be exhibited at Grizzly.

Geological reserves have been calculated by various parties. The most recent determination, by Curragh, by means of a polygonal method, suggests that the Grizzly deposit has probable and possible reserves of 21.3 million tonnes grading 5.54% lead, 7.33% zinc, 81.1 grams/tonne silver and 0.87 grams/tonne gold using a 9% Pb+Zn cutoff grade.

The ore reserves lie between approximately 500 m and 850 m below the surface. Mining would be only by underground methods. Additional exploration is required before this deposit would be mined.

Anvil Range commissioned a pre-feasibility study in 1996 for the Grizzly project. It is estimated that the initial development and underground exploration phase will take 27 months, cost approximately \$26 million and include driving twin access ramps, drilling, metallurgical testing and a feasibility study. If a production decision results, shaft construction would take a further 34 months and cost an estimated \$52 million, plus an additional \$27 million for new and replacement mine equipment. It is estimated that at a production rate of 1.5 million tonnes of ore per year, the Grizzly mine's life would be 11.5 years, which could be extended by continued exploration.

## SWIM DEPOSIT

The Swim is the easternmost of five synsedimentary stratiform lead-zinc-silver deposits located in an arcuate belt along the south flank of the Anvil Batholith. The Swim deposit strikes northwest and dips about 25° northeast. Drilling in 1996 outlined 4.75 million tonnes grading 4.7% zinc, 3.8% lead and 42 grams/tonne silver (using a 6% lead + zinc cutoff) with minor copper and gold values, within an 18 million-tonne deposit of massive sulphides that is roughly 460 m long and 150 m wide. Average thickness is about 21 m, with a maximum thickness of 85 m.

# FYRE LAKE PROPERTY

## Pacific Ridge Exploration Ltd.

President: John Brock

### Corporate headquarters

#1407-675 West Hastings Street  
Vancouver, British Columbia V6B 1N2

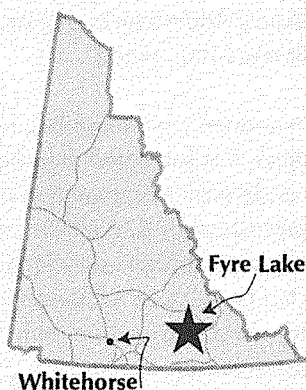
Phone (604) 687-4951

Fax (604) 687-4991

E-mail jsbrock@istar.ca

## PROJECT STATUS

Seeking joint venture partner



## Location

160 km northwest of Watson Lake

## Ownership

Pacific Ridge Exploration Ltd. has an 80% interest in half of the property. Welcome Opportunities has the other 20%. Pacific Ridge owns 100% of the remaining claims.

## Commodity

Copper, cobalt, gold

## Ore type

Sulphide

## Drill-indicated reserves (preliminary estimates based on wide-spaced drill-holes)

15.4 million tonnes, within which 8.2 million tonnes grade (using a 1% copper cut-off)

Copper: 2.1%

Cobalt: 0.11%

Gold: 0.73 grams/tonne

## HISTORY

Massive sulphide mineralization was first discovered in the Fyre Lake area on the property in 1960 by Cassiar Asbestos Corporation, and since then various companies, including Atlas Explorations (1966-67), Amax Potash Limited (1976), Welcome North Mines Ltd. (1980-81) and Placer Dome Explorations (1990-91), have explored the area. A total of 23 shallow packsack (224 m) and 20 AX (1,423 m) drill holes were completed during this period.

In 1995, Pacific Ridge (formerly Columbia Gold) optioned the core group of claims from Welcome Opportunities Ltd. and, by 1997, had acquired 80% interest in approximately half of the claims by spending \$6 million (\$3 million to earn 50% and an additional \$3 million to earn up to 80%). Upon a positive feasibility study, Welcome Opportunities may elect to either arrange all production financing and place the property into production, thereby increasing its interest to 55% with Pacific Ridge retaining a 45% joint venture interest, or Welcome may convert its interest to a 2% Net Smelter Return Royalty. Pacific Ridge fully owns

the balance of the claims on the property. During 1996 and 1997, the company drilled 115 drill holes through completion of 23,200 m of diamond drilling and has partially defined a copper-cobalt-gold resource. An economic scoping study has been completed and preliminary metallurgical tests have been carried out. The company is seeking a joint venture partner to finance on-going exploration work. In 1999, Pacific Ridge carried out a small, \$72,000-program of geological research and environmental clean-up.

## PROJECT SUMMARY

The Fyre Lake property is situated approximately 160 km northwest of Watson Lake. It consists of claims covering 85 square km in the Finlayson Lake district immediately east of Fire Lake, along the North River drainage. The property is 30 km southeast of the Wolverine project of Expatriate and Atna Resources.

## GEOLOGY, MINERALOGY AND ORE RESERVES

The Finlayson Lake District is underlain by a Late Paleozoic metamorphosed volcano-sedimentary assemblage of the Yukon-Tanana terrane which is regionally bounded to the southwest by the Tintina Fault and to the northeast by the Finlayson Lake fault zone. Copper-cobalt-gold mineralization is hosted by a well deformed and moderately metamorphosed chlorite to quartz-chlorite schist sequence which is interpreted to be a succession of basic to intermediate flows with interbedded tuffs and volcanically-derived fine-grained sedimentary rocks belonging to the middle unit of the layered metamorphic sequence. The chloritic schist sequence is overlain by a micaceous quartz schist unit, which is in turn overlain by a thick sequence of phyllite of the upper metasedimentary sequence.

The Fyre Lake project covers over 9 km of favourable host rocks with several geochemical-geophysical targets indicative of volcanogenic massive sulphide mineralization. To date, the company has focused its attention to delineating the Kona deposit (23,200 m in 115 holes).

The Kona deposit to date consists of two parallel northwest-trending zones of copper-cobalt and gold massive sulphide mineralization found in horizons with thickness from eight to 40 m over a length of 1,500 m and width of 250 m. Massive sulphide mineralization in the Kona deposit consists of pyrite, chalcopyrite, pyrrhotite and sphalerite, while semi-massive sulphide mineralization consists of thinly-laminated pyrite, chalcopyrite +/- pyrrhotite within alternating laminae of very fine-grained siliceous chlorite schist. Banded and massive magnetite layers host trace to 10% sulphides, usually chalcopyrite, pyrite and rarely bornite.

Utilizing kriging methods, the Kona deposit has been estimated to contain 15.4 million tonnes, 1.2% copper, 0.8% cobalt and 0.46 grams/tonne gold at a 0.50% copper cutoff. Using the sectional block method and a higher copper cut-off grade of 1.0% copper, the Kona deposit contains 8.2 million tonnes grading 2.1% copper,

0.11% cobalt and 0.73 grams/tonne gold. The ultimate size of the Kona deposit remains to be drill tested. Two additional large targets remain to be explored by drilling.

## MINE PLAN

The company commissioned a preliminary resource estimate for the Kona deposit with the northwest portion of the deposit holding potential for open-pit mining and the deeper southeastern extension being a prospective underground target.

Preliminary scoping by a major independent engineering firm indicates the objective 20 million tonne target would be economic, half of which could be mined by open-pit and half by underground methods. The study assumes a reserve of 10 million tonnes of open-pit ore grading 2.0% copper, 0.7 grams/tonne gold and 0.12% cobalt and a further 10 million tonne reserve to be mined underground at a grade of 3.0% copper, 1.0 grams/tonne gold and 0.12% cobalt. The study was based on metal prices of US\$1 copper, US\$10 per pound cobalt and US\$365 per ounce gold. The deposit is presumed to be mined at a rate of 6,700 tonnes per day or 2.2 million tonnes per year. Mining would yield approximately 95 million pounds of copper, 3.5 million pounds of cobalt and 37,000 ounces of gold annually for the ten-year life. The study projects operating costs of \$20 per tonne during the open-pit phase and \$36 per tonne during the underground phase. Initial capital costs are projected to be \$246 million, including \$85 million specifically for on-site treatment and recovery of cobalt. A further \$27 million would be required for underground mining operations.

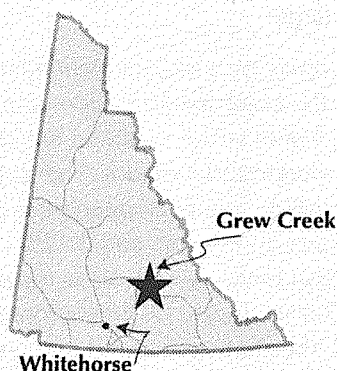
Preliminary metallurgical testwork by Lakefield Research indicates the massive sulphide mineralization is amenable to a two-stage standard flotation process, the first stage of which would involve the collection of a copper gold concentrate with recoveries estimated at 90% for copper and 70% for gold. Concentrate grades range from 21% to 23% copper and 10 to 15 grams gold/tonne. Tests suggest 50% to 75% of the cobalt is recoverable in a two-stage pyrite concentrate.

# GREW CREEK PROJECT

Owner: A. Carlos  
Whitehorse, Yukon  
Phone (867) 668-6309

## PROJECT STATUS

Available for option



## Location

35 km west of Ross River

## Ownership

A. Carlos

## Commodity

Gold, silver

## Ore type

Oxide

## Geological reserve

773,012 tonnes

Silver: 33 grams/tonne

Gold: 8.9 grams/tonne

## Proposed mining method

Open-pit, 365 days per year

## Processing method

Conventional mill, dore bar, 365 days per year

## Power

3 MW, on-site diesel generation

## HISTORY

The original Grew Creek claims were staked by Whitehorse prospector A. Carlos in 1983 and optioned by the Mincan JV (Hudson Bay Mining and Minerals), which carried out an extensive exploration program from 1984 to 1986.

In 1987, the claims were optioned by Noranda, who subsequently signed a joint-venture agreement with Golden Nevada Resources and Brenda Mines. Results of the 1987 program triggered a flurry of claimstaking and exploration activity in the area. A large-scale exploration program continued in 1988. In 1989, Golden Nevada changed its name to Goldnev Resources and renegotiated the joint venture agreement to give it a 100% interest in the property.

In 1992, Wheaton River Minerals took an option to conduct an underground development program, however, the option was dropped shortly after.

YGC Resources Ltd. optioned the property in 1993, and completed a \$150,000 drilling program at Grew Creek in 1995 and a 17 diamond-drill hole program in 1996. YGC terminated its option agreement with Carlos in January, 1997.

In 2000, a total of \$36,000 was spent by A. Carlos exploring a new area 1.8 km from the main zone.

## PROJECT SUMMARY

The Grew Creek deposit can be mined by open-pit methods with a stripping ratio of 9:1, waste to ore. Metallurgical testing by Noranda in 1988 indicated that recoveries of 92% to 94% are possible using simple cyanide processing.

The Grew Creek property is located approximately 35 km west of Ross River and one km from the Robert Campbell Highway and the Whitehorse power grid. The property consists of 332 claims and is owned by A. Carlos of Whitehorse.

## GEOLOGY, MINERALOGY AND ORE RESERVES

The Grew Creek epithermal gold deposit is hosted by Eocene volcanic and sedimentary rocks deposited in a pull-apart basin within the Tintina Fault zone. The gold occurs in stockwork quartz veins and hydrothermal breccias cutting hydrothermally altered rhyolite.

In the main zone, rhyolitic tuffs are juxtaposed by an east-west fault against a cyclic sequence of fluvial sediments. The faulted contact is partly intruded by a quartz-feldspar porphyry dyke. The pyroclastic rocks, dyke, fault and sediments all dip steeply to the north. The volcanic rocks are hydrothermally altered to illite-quartz and illite-quartz-adularia assemblages, with an outer propylitic halo.

Mineralization consists of pyrite, marcasite, arsenopyrite, chalcopyrite, argentite, electrum, silver selenides, galena and sphalerite. Fluorite is also present in the Tarn zone. Gangue minerals include quartz, adularia, carbonates, and quartz pseudomorphs after calcite. In the main zone, gold and silver occur as micron-size grains in chalcedony stringer stockworks and adjacent silicified tuffs. There is a good correlation between gold and silver, with a gold:silver ratio of about 1:4 for ore-grade mineralization, which occurs in an elongated zone trending west northwest. The mineralization is strongly anomalous in arsenic and mercury, but mercury shows only a weak correlation with gold and silver. Most high mercury values lie along the fault, above the gold-silver zone.

Initial drilling on the main zone gave a best intersection of 11.7 grams/tonne Au and 150.9 grams/tonne Ag across 31.4 m while the best section exposed in a trench assayed 3.6 grams/tonne Au and 15.3 grams/tonne Ag across 13 m. The 1989 drilling focused on the main zone, with the best hole returning 10.5 grams/tonne Au over 13 m.

The Tarn zone, located 2 km to the east, consists of quartz-fluorite-chalcedony stockworks and localized silicification within a 900 x 100 m zone of sericitized rhyolite dykes and tuff. The best assays were 150 ppb Au across 2.0 m in a trench and 520 ppb Au over 1.5 m in a drill hole.

Prospecting in the area is difficult due to a thick cover of glacial till. Plouffe (1989) showed that gold is concentrated in the silt- and clay-size fraction down ice from the Grew Creek deposit, but the common pathfinder elements Ag,

Sb, As and Hg show little correlation with the gold distribution.

In 1991, a trench in the K410 zone, 15 km northwest of the deposit, uncovered intensely iron-stained, highly fractured acid-leached volcanic rocks. Carlos excavated four hand pits to bedrock in 1992 and encountered intensely clay-altered Eocene sediments with hematite-rich bands. Samples from the pits returned anomalous values of mercury and barium, and a heavy mineral concentrate from 45 kg of glacial till in Pit #2 assayed 9,320 ppb Au.

The 1993 diamond drilling intersected strongly altered volcanic rocks beneath a zone of hydrothermal alteration exposed in a surface trench.

The 1994 drilling showed that mineralization in the South Zone consists of an extensive quartz-adularia stringer stockwork of low-grade Au-Ag values. The best intersections were 2.33 grams/tonne Au and 4.1 grams/tonne Ag over 10.4 m. The South Zone mineralization appears to be connected with the Main Zone mineralization, but further drilling between the two zones needs to be carried out to confirm this theory. Drilling in the Main Zone confirmed earlier reported grades. The best intersection was 1.69 grams/tonne Au and 3.0 grams/tonne Ag over 24 m.

In 2000, a total of 450 soil samples were grid-collected over a 2 km area and analyzed by the enzyme leach method. To date, three new geochemical targets have been delineated in a favourable structural area north of the Tarn zone, adjacent to the Robert Campbell Highway.

## PRODUCTION PLANS

In 1989, Orcan Mineral Associates estimated geological reserves of 773,012 tonnes grading 8.9 grams/tonne Au and 33.6 grams/tonne Ag at a cut-off grade of 0.2 grams/tonne and containing a higher grade reserve of 184,947 tonnes grading 12.1 grams/tonne Au.

# HOWARD'S PASS (XY) PROPERTY

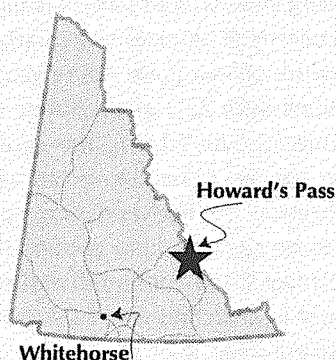
## Placer Dome North America

### Corporate headquarters

#600, 1055 Dunsmuir Street  
Box 49305  
Bentall Postal Station  
Vancouver, British Columbia V7X 1L3  
Phone (604) 661-1991  
Fax (604) 661-3786  
Web site www.placerdome.com

### PROJECT STATUS

Inactive



### Location

55 km northwest of Cantung

### Ownership

Placer Dome North America

### Commodity

Zinc, lead

### Ore type

Sulphide

### Geological resource (total)

110.5 million tonnes based on cut-off of 4% combined lead and zinc

Zinc: 5.4%

Lead: 2.3%

## Anniv deposit

### Indicated resource

55.5 million tonnes grading 7.1% combined zinc-lead, including 48 million tonnes grading 8.1% combined zinc-lead using a 4% combined zinc-lead cut-off

### Preliminary mineable diluted resource

8.9 million tonnes grading 10.6% zinc and 5.5% lead

## XY deposit

### Indicated resource

55 million tonnes grading 8.3% combined zinc-lead

## HISTORY

Placer Development Ltd., operating as Canex Placer, carried out a regional reconnaissance and grid geochemical and mapping program in 1968, 1971 and 1972. After lead-zinc mineralization was discovered, it staked the X, Y, DON and NOD claims over what was to become the Howard's Pass, or, sometimes, the XY deposit.

A staking rush ensued from October, 1972 to April, 1973. Canex Placer drilled in 1973 and 1974. In 1975, Canex entered into a joint venture with Essex Metals and drilled additional holes and constructed a road to the property from the Cantung Road. An adit was driven in 1980 and underground holes drilled in 1981. Essex Metals interest was transferred to Cygnus Mining Ltd. in April, 1982. Approximately \$15 million was spent on surface

exploration and underground bulk sampling through to 1982.

Placer Development Ltd. was amalgamated into Placer Dome Inc. in August, 1987.

The Anniv and OP claims were staked 22 km northwest of the main Howard's Pass deposit by Canex Placer in 1972, following a regional geochemistry program and discovery of the Howard's Pass showing. After initial property work in 1973 and 1974, Canex Placer entered into a joint venture with Essex Metals (U.S. Steel Western Hemisphere Inc.) and carried out drill programs from 1975 to 1979.

Placer Dome spent approximately \$15 million on surface exploration and underground bulk sampling through to 1982.

In 1982, Essex's interest was transferred to Cygnus Mining Ltd. In 1994, Placer Dome restaked parts of the original claim holdings. Archer Cathro and Associates (now Expatriate Resources) restaked part of the original claim block as the Nod claims in 1994.

On July 6, 2000, Copper Ridge Explorations Inc. announced the acquisition of an option from Placer Dome and U.S. Steel to purchase 100% interest in the Howard's Pass zinc deposit by making staged payments totalling \$10 million over four years. A further \$5 million would be payable on a production decision. A subsequent deal with Billiton Metals Canada fell through after Billiton Metals Canada Inc. terminated the proposed joint exploration of the Howard's Pass deposit. Copper Ridge completed its own due diligence, including 2,000 m of diamond drilling in 8 holes, with supportive conclusions by independent consultants. In December, 2000, Copper Ridge announced it could not make the initial payment to purchase the project.

## **GEOLOGY, MINERALOGY AND ORE RESERVES**

The Howard's Pass deposits consist of three (XY, Anniv and OP) complexly folded and faulted saucer-shaped bodies that host laminated to massive sulphide mineralization. The shaley host rocks have a high carbon content of 6 to 7% and are finely rhythmically interlaminated with carbonaceous chert, calcareous mudstone and limestone. The bodies are believed to have formed separately in anoxic (oxygen deficient) sub-basins along the base of a paleoslope in the eastern Selwyn basin. The mineralization formed through exsolution of metal-rich, interstitial fluid during shale compaction, and deposition in brine pool basins. The main sulphide minerals are sphalerite and galena, with minor pyrite. Quartz and calcite are present as veins and nodules. There is a large exotic Holocene supergene zone at surface from groundwater over the downhill edge of the deposit.

The Anniv deposit, located 22 km northwest of the XY deposit has an indicated resource of 55.5 million tonnes grading 7.1% combined zinc-lead, plus an additional

261 million tonnes of inferred resources at an unspecified grade. The inferred resource estimates were based on projected extensions of potential mineralization and have not been drill-tested. The Anniv is divided into the West, Central and East zones. The Central zone contains the largest tonnage, at 48 million tonnes grading 8.1% combined lead and zinc using a 4% zinc-lead cutoff. Placer calculated a preliminary mineable diluted resource of tonnes grading 10.6% zinc and 5.5% lead.

The XY deposit, located 22 km southeast of the Anniv deposit, represents a complex folded and faulted lens of intercalated chert, limestone, mudstone and sulphide, which occurs within a syncline. The XY deposit hosts an indicated resource of 55 million tonnes grading 8.3% combined zinc-lead plus an additional 113 million tonnes of inferred resource at an unspecified grade.

## **EXPLORATION AND PRODUCTION PLANS**

Copper Ridge intended to define a minimum of 70 million tonnes of open-pittable reserves to support a 10-year mine life at a daily throughput of 20,000 tonnes for Phase One. Zinc metal production would be between 350,000 and 500,000 tonnes per year. They had estimated that Phase One would cost more than \$1.2 billion to develop and once in operation would create approximately 475 direct high-paying jobs plus another 1,000 indirect jobs. Copper Ridge proposed to produce zinc metal on-site through autoclave leaching and/or bioleaching and electrowinning, and thereby cut transportation costs. A bulk zinc, lead, cadmium and silver concentrate could be transported south via slurry pipeline to a pressure leaching, purification and electrowinning plant at the Robert Campbell Highway near Frances Lake, or perhaps even at Watson Lake. A gas-fired generating plant at Watson Lake could provide electric power and transportation would be principally by rail via a B.C. rail extension into the Watson Lake region.

Copper Ridge had planned for an expanded Phase Two at the rate of 40,000 to 60,000 tonnes per day of ore mined from open pits for 30 years or more.

The Howard's Pass and Anniv deposits are being monitored by Placer Dome.

# ICE PROPERTY

## Expatriate Resources Ltd.

President and Chief Executive Officer:  
Harlan Meade

### Corporate headquarters

701-475 Howe Street  
Vancouver, British Columbia V6C 2B3

Phone (604) 682-5474, toll free 1-877-  
682-5474

Fax (604) 682-5404

E-mail [info@expatriateresources.com](mailto:info@expatriateresources.com)

Web site [www.expatriateresources.com](http://www.expatriateresources.com)

### Location

60 km east of Ross River

### Ownership

Expatriate Resources Ltd. (100%)

### Commodities

copper, minor gold, silver, cobalt

### Ore type

Sulphide, oxide

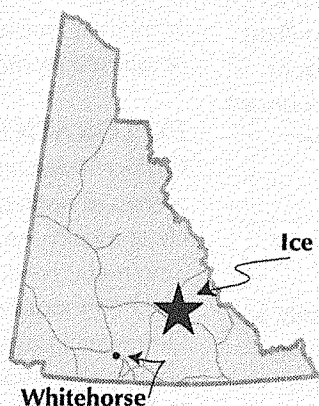
### Indicated mineral resources

4,561,863 tonnes

Copper: 1.48%

## PROJECT STATUS

Exploration planned



## HISTORY

The Ice claims were staked in February, 1996 by Expatriate Resources Ltd. to cover a previously unstaked copper soil geochemical anomaly identified during a 1973 survey by Archer, Cathro & Associates Limited. High-grade secondary oxide copper mineralization on surface was discovered in May, 1996 and additional claims were staked. Exploration work in 1996 and 1997 consisted of geological mapping, grid and reconnaissance soil sampling, airborne and ground magnetic and electromagnetic surveys. A total of 34 diamond drill holes (2704 m) in 1996 and 87 diamond drill holes (7880 m) in 1997 were completed. No exploration work has been carried out on the property since 1997.

## PROPERTY SUMMARY

The Ice property is 100% owned by Expatriate Resources Ltd. It is located 60 km east of Ross River on NTS map sheet 105 G/14 in the northern part of the Finlayson Lake volcanogenic massive sulphide district. The Ice property is 70 km northwest of the Kudz Ze Kayah deposit. The property consists of 1,105 claims covering some 22,000 hectares located west of the Pelly River and north of the Robert Campbell Highway. Access is by helicopter from the Robert Campbell Highway, 18 km to the south, or along a winter trail.

## **GEOLOGY, MINERALOGY AND ORE RESERVES**

The Ice deposit is underlain by Devonian to Triassic igneous and sedimentary rocks consisting of basalt, ultramafic and mafic plutonic rocks, ribbon chert and associated argillite, sandstone and marble. Most exploration to date has focused on a 600 m by 400 m area. The "Cyprus-type" mineralization is hosted in a relatively undeformed ophiolite sequence belonging to Slide Mountain Terrane, consisting of a basalt breccia unit lying within a thick package of interlayered massive to pillowed basalts and deep-water sedimentary rocks. The best mineralization is contained within an area 350 m long and 50 m wide of thick massive sulphide accumulations.

Primary mineralization is composed of pyrite, chalcopyrite and localized bornite within a fine quartz  $\pm$  carbonate gangue in a massive to semi-massive sulphide horizon and underlying stockwork sulphide zone. Secondary copper minerals consist of cuprite, malachite, black copper oxides and chalcocite.

The Ice deposit is estimated to contain an indicated mineral resource of 4,561,863 tonnes grading 1.48% copper with minor gold, silver and cobalt, including about 3.4 million tonnes of near-surface, open-pittable mineralization at the same grade.

Although drilling has largely closed off the Ice deposit itself, most of the favorable stratigraphy on the rest of the large claim block remains untested.

# JASON PROPERTY

## MacPass Resources Ltd.

### Registered office

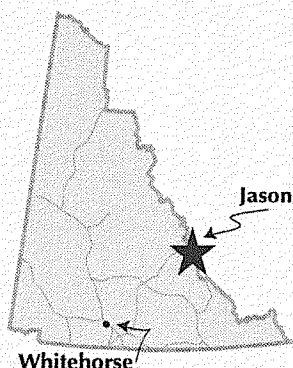
Anton, Campion, Macdonald, Oyler, Buchan  
(Barristers and Solicitors)  
Suite 200, 204 Lambert Street  
Whitehorse, Yukon Y1A 1Z4

Phone (867) 667-7885

Fax (867) 667-7600

### PROJECT STATUS

Inactive



### Location

13 km from Macmillan Pass

### Ownership

MacPass Resources Ltd.

### Commodities

Lead, zinc, silver

### Ore type

Sulphide

### Indicated mineral resources

14.1 million tonnes

Lead: 7.09%

Zinc: 6.57%

Silver: 79.9 grams/tonne

## HISTORY

The Jason deposit was staked in 1974 by C.L. Smith, representing the Ogilvie Joint Venture. Smith explored with mapping, geochemistry, geophysics and drilling. Interests in the property were acquired by Ogilvie Mining Corp. Ltd. in 1978, which then drilled 17 holes. In 1979, the property was optioned by Pan Ocean Oil Ltd., who carried out drilling from 1979 to 1981. Pan Ocean Oil Ltd. was acquired by Aberford Resources Ltd in late 1981. Abermin carried out mapping, geochemistry and environmental studies and drilled nine holes in 1982. In 1985, Aberford carried out joint feasibility and environmental studies with Hudson Bay Mining and Smelting on the Jason and Tom deposits, and then transferred its interest to Abermin Corp. Abermin Corp. was acquired by CSA Gold Corp. in 1991. At this time, all owners with interest in the Jason property transferred their interest into a private Yukon corporation, MacPass Resources Ltd.

Phelps Dodge Corp. of Canada Ltd. optioned the property in 1990 and drilled additional reconnaissance holes, but dropped its option in 1992.

## PROPERTY SUMMARY

The Jason property is located about 13 km southeast of Macmillan Pass on the Yukon-Northwest Territories border, 400 km northeast of Whitehorse, and is accessible via the North Canal Road. A 700-m airstrip is situated midway between the Tom and Jason properties.

## GEOLOGY, MINERALOGY AND ORE RESERVES

The Jason deposits are hosted by Lower Earn Group shales and turbidites near the eastern margin of Selwyn Basin in the Macmillan Fold Belt. The deposits consist of lead, zinc, silver, barium and iron precipitated from

exhaled hydrothermal brines near the margins of a small graben. The mineralized zones are situated at the same stratigraphic level as the mineralization at the Tom deposit. The Jason deposits are well zoned.

Drilling has defined total geological reserves in three zones: South, Main and End zones. The South Zone contains indicated and inferred geological reserves of 9.01 million tonnes grading 9.43% lead, 5.19% zinc and 119.0 grams/tonne silver. The Main Zone contains indicated geological reserves of 4.55 million tonnes grading 2.08% lead, 9.75% zinc and 2.1 grams/tonne

silver. The End Zone contains 0.54 million tonnes of inferred geological reserves grading 10.30% lead, 2.78% zinc and 80.2 grams/tonne silver. An arbitrary cut-off grade of 8% lead plus zinc was used in the tonnage calculations.

Total geological reserves of the Jason deposit are 14.1 million tonnes grading 7.09% lead, 6.57% zinc and 79.9 grams/tonne silver using a cutoff grade of 8% zinc + lead.

Approximately 32,500 m of surface diamond drilling has been carried out on the Jason property to date.

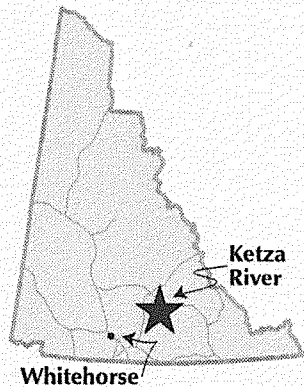
# KETZA RIVER PROPERTY

## YGC Resources Ltd.

Director: Robert Stroshein  
26 Liard Road  
Whitehorse, Yukon Y1A 3L4  
Phone/fax (867) 668-2489

### PROJECT STATUS

Drilling and exploration planned to find new zones and increase ore reserves



### Location

50 km south of Ross River

### Ownership

YGC Resources Ltd.

### Commodity

Gold, silver

### Ore type

Sulphide, oxide

### Mineable reserve

230,000 tonnes

Gold: 10.9 grams/tonne

### Mining method

Undetermined

### Power

3 MW, on-site diesel

## HISTORY

Exploration activity began in the Ketza River district in 1947 with the discovery of silver-lead veins on the nearby Iona property by Hudson Bay Mining and Smelting Company Limited. On the Ketza property to the west, gold was discovered in 1954 and 1955 by prospectors working for Conwest Exploration Company Limited. From 1955 until 1960, Conwest explored the Ketza River sulphide gold deposit with trenching and 59 drill holes and outlined 75,000 tonnes grading 12 grams/tonne Au. Work completed by Conwest was frequently conducted under harsh conditions, often involving a two-day sled dog or packhorse trip to and from the site for supplies. Packhorses were also used for drill moves. Given a \$35 gold price and difficulties in working in this remote location, the project was mothballed.

The Ketza River property was optioned by Pacific Trans-Ocean Resources in late 1983. Pacific Trans-Ocean and Canamax entered a joint venture agreement to explore and develop the property in early 1984, with Canamax the operating partner. After three years of aggressive

exploration, an oxide reserve totalling 495,800 tonnes at 18 grams gold/tonne was established. A sulphide reserve of equal size but lower grade was delineated. A production decision based solely on the oxide reserve, was approved early in 1987. Facilities for a 320 tonne per day mining and milling operation were constructed in 1987. The first gold bar was poured on April 28, 1988 and the mine was officially opened on July 21, 1988. In April, 1989 Canamax Resources Inc. purchased Pacific Trans-Ocean's share of the property and became 100% owner of the Ketza River Mine.

The mine operated from July, 1988 until October, 1990 when the oxide reserves were depleted. The mine produced over 100,000 ounces of gold.

In 1992, Wheaton River Minerals Ltd. purchased the property and equipment of the former Ketza River Mine. Responsibility for all operations at the Ketza River site shifted to Wheaton River on August 24, 1992 with the formal closing of the agreement in late November, 1992. Wheaton River Minerals (WRM) formed Ketza River Holdings (KRH), a 100% owned subsidiary, to cover the

assets of the Ketz River Mine. In August, 1993, Ketz River Holdings optioned the Shamrock zone of the Ketz River mine property to Hemlo Gold Mines. The option was dropped in 1995. In 1994, WRM sold KRH to YGC Resources Ltd. for shares.

In 1995 and 1996, YGC Resources Ltd. carried out an extensive exploration program including diamond drilling. In April, 1997, WRM sold its entire shareholding in YGC to BYG Natural Resources and responsibility for all operations at the Ketz River site shifted to BYG. In June, 1997, YGC Resources Ltd. concluded a deal with BYG Natural Resources where BYG purchased an additional 16.5% of the issued and outstanding shares of YGC. BYG would receive 50% of future mine production. The property was dormant in 1998 and 1999.

## PROJECT SUMMARY

The Ketz Mine area is located 50 km south of Ross River, Yukon. The property consists of 322 quartz claims, fractions and leases covering approximately 6,100 hectares.

## GEOLOGY AND MINERALOGY

A total of 100,000 ounces of gold was produced between April, 1988 and November, 1990.

The Ketz property currently has mineable gold reserves of 230,000 tonnes oxide and sulphide, grading 10.9 grams/tonne gold and possible reserves of 1,764,000 tonnes at 0.0915 ounces per ton gold.

## EXPLORATION AND DEVELOPMENT PLANS

YGC conducted a diamond drilling program in 1995 during which additional oxide gold mineralization was identified. Exploration and a reinterpretation of the property geology at Ketz River led to the discovery of two new oxide zones, the Fork Zone and the McGiver Zone, and an extension to the B-Mag Zone. The company spent close to \$500,000 on the property during 1995.

YGC drilled 21 widely-spaced diamond-drill holes on the Shamrock Zone during 1996. The holes were drilled over a strike length of 1,300 m across a width of 700 m and over a vertical interval of 750 m, with the objective of defining controls to gold mineralization within a large, coincident gold-in-soil, magnetic and visual colour anomaly. Assay results and observed styles of mineralization are consistent with YGC's exploration target of a bulk tonnage, low-grade disseminated and stockwork deposit within a portion of the large anomalous area. An intensive program of prospecting and mapping was completed in 1996 to investigate a number of other gold geochemical and coincident geophysical anomalies on the Ketz property.

In 1997, BYG Natural Resource acquired an additional 16.5% of YGC Resources. The agreement called for the milling of Ketz ores at the Mount Nansen mill and for revenues to be shared 50/50 net of costs with BYG advancing pre-production costs. BYG also acquired net smelter return royalties on the Ketz River property. In 1997, YGC Resources continued to explore the Ketz River property. Diamond drilling in the area of the McGiver, Nu and B-mag zones was directed towards demonstrating continuity between the zones. Drill hole KR-97-587 suggested a connecting mineralization between the Nu zone and McGiver, with an intersection of 6.1 m grading 16.3 grams/tonne Au in oxide mineralization. Drilling also intersected a new zone of oxide mineralization named the McDood. Two intersections 100 m apart returned assays of 6.7 grams/tonne Au over 4.7 m and 4.6 grams/tonne Au over 5.8 m. The 1997 program was aimed at increasing oxide reserves on the former producing mine property in preparation for possible production in 1998. In 1997, YGC also conducted work on the Shamrock Zone, a bulk-tonnage low-grade gold target. The Shamrock Zone was tested with widely spaced drilling in 1996 which returned numerous intersections. The 1997 work included detailed mapping, sampling and re-logging of all core drilled by previous operators.

# KUDZ ZE KAYAH/WOLVERINE/GP4F PROPERTIES

## Expatriate Resources Ltd.

President and Chief Executive Officer:  
Harlan Meade

### Corporate headquarters

701-475 Howe Street  
Vancouver, British Columbia V6C 2B3

Phone (604) 682-5474, toll free 1-877-682-5474

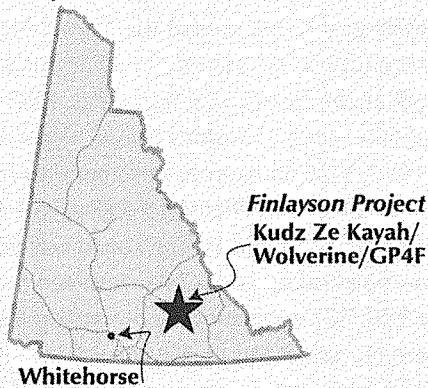
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E-mail [info@expatriateresources.com](mailto:info@expatriateresources.com)

Web site [www.expatriateresources.com](http://www.expatriateresources.com)

## PROJECT STATUS

Prefeasibility study complete



### Location

110 air km southeast of Ross River

### Ownership

Kudz Ze Kayah - Expatriate Resources Ltd.

Wolverine - Expatriate Resources Ltd., 60%  
- Atna Resources, 40%

### Commodity

Zinc, lead, copper, silver, gold

### Ore type

Sulphide

### Probable reserves, Kudz Ze Kayah

19.2 million tonnes

Zinc: 5.61%

Lead: 1.56%

Copper: 0.85%

Silver: 136.9 grams/tonne

Gold: 1.33 grams/tonne

### Probable reserves, Wolverine

3.47 million tonnes

Zinc: 12.43%

Lead: 1.44%

Copper: 1.37%

Silver: 336.6 grams/tonne

Gold: 1.59 grams/tonne

### Total probable reserves, Kudz Ze Kayah and Wolverine

14.57 million tonnes

Zinc: 7.23%

Lead: 1.53%

Copper: 0.97%

Silver: 184.5 grams/tonne

Gold: 1.39 grams/tonne

### Geological resource, combined Kudz Ze Kayah and Wolverine

19.2 million tonnes

Zinc: 8.0%

Lead: 1.6%

Copper: 1.05%

Silver: 207 grams/tonne

Gold: 1.49 grams/tonne

### Geological resource, GP4F deposit

1.5 million tonnes

Zinc: 6.4%

Lead: 3.10%

Copper: 0.10%

Silver: 90 grams/tonne

Gold: 2.0 grams/tonne

### Mining method

Open pit and underground

### Processing method

Conventional mill, 365 days per year

### Mine life

11 years

### Employees

252

## HISTORY

### Kudz Ze Kayah

Cominco carried out a geochemical survey in 1977 in the Finlayson Lake area, but the survey was too wide-spaced to reveal evidence of the ABM deposit (later renamed Kudz Ze Kayah). In 1992, Cominco returned to the area to follow up on anomalous base metal stream silt samples which had been collected in 1988 by the GSC. In late 1993, quartz-sericite altered rhyolite rocks and a 15-cm piece of banded massive sulphide-magnetite float were noted, but the source of mineralization was not found until geophysical surveys revealed a major anomaly under the valley. The initial discovery hole was drilled in April, 1994. A large regional airborne electromagnetic and magnetic survey was flown and a total of 8,500 m in 52 diamond-drill holes were completed in 1994 in a helicopter-supported, low impact exploration program.

The 1995 exploration program included construction of a tote road from the Robert Campbell Highway (approximately 20 km), 15,000 m of diamond drilling in 120 holes, sampling, and engineering and environmental studies. The purpose of the drilling was to define the ore reserve, assess mining methods and confirm the absence of important mineralization under possible locations for mill, tailings, and waste rock sites. Cominco spent \$3.5 million during 1995 on advanced exploration and \$800,000 on grassroots exploration.

During 1996 and 1997, Cominco drill-tested targets outlined by airborne geophysics. The company's 1997 exploration budget for the area was about \$2 million compared with \$4.2 million in 1996. Environmental permitting began in 1996 and was completed in December, 1997.

In 1998, Cominco carried out diamond drilling and geology work on the Kudz Ze Kayah property and discovered the GP4F deposit, 5 km southeast of Kudz Ze Kayah.

In 1999, Cominco conducted a small geophysics program. In total, Cominco spent a total of \$11 million to find and delineate the Kudz Ze Kayah deposit, and take it to the prefeasibility stage. The company received its type "A" water licence late in 1999.

On March 1, 2000, Expatriate Resources Ltd. announced an agreement in principal to purchase 560 square km of prime exploration lands from Cominco Ltd., including the Kudz Ze Kayah and GP4F deposits.

### Wolverine

The property was originally staked as the Fetish claims in July, 1973 by Finlayson JV (Chevron Canada Limited, Union Oil Company of Canada Ltd., and Marietta Resources International Ltd. and Messrs. L.T. and Harris Clay), which conducted grid soil sampling, mapping and trenching later in the year and drilled two holes. Additional Fetish claims were staked in August, 1974. The property was restaked as the Kink claims in September, 1982 by Archer, Cathro and Associates and optioned briefly to Esso Mineral Limited, who conducted airborne and geophysical surveys later in the year.

By July, 1993, only one Kink claim remained and the rest of the property was restaked as the Foot 1-20 claims by Atna Resources, which later added the Pak and Toe claims. Atna explored with prospecting, geological mapping, and soil and silt geochemistry in September, 1993. The property was optioned by Westmin Resources Limited and a drill program in 1995 resulted in the discovery of the Wolverine deposit on the Kink claims. By the end of 1995, Westmin had earned a 60% interest in the project and entered into a 60/40 joint venture, with Westmin as operator.

In February, 1998, Boliden Limited acquired the assets of Westmin Resources Limited. In May, 1998, Boliden Westmin Ltd. entered into a letter of intent with Expatriate Resources Ltd. to sell its interest in mineral properties and assets in the Finlayson Lake area, including Boliden Westmin's 60% interest in the Wolverine project. Expatriate completed the sale agreement with Boliden in March, 1999 and became the operator of the Wolverine joint venture.

In 1999, joint venture partners Expatriate Resources and Atna Resources spent \$200,000 conducting metallurgical and marketing investigations on the Wolverine ore.

## GEOLOGY, MINERALOGY AND ORE RESERVES

### Kudz Ze Kayah

The Kudz Ze Kayah deposit is hosted by a thick sequence of Devonian-Mississippian-age felsic volcanic pyroclastics comprising quartz and feldspar crystal tuffs, fine lapilli ash tuffs, and ash tuffs with lesser rhyolite flows or sills. Immediately above the deposit are felsic pyroclastics which are intensely deformed and altered to quartz-muscovite-carbonate schists containing fine pyrite and quartz veinlets.

## KUDZ ZE KAYAH/WOLVERINE/GP4F PROPERTIES

The deposit is a tabular mineralized body that contains several lenses of mineralization that collectively provide thicknesses up to 22.5 m. The deposit dips moderately to the north near its subcrop and becomes flatter, dipping with depth.

Exploration work in 1994 delineated the approximate extent of the Kudz Ze Kayah deposit.

Current ore reserves for the Finlayson Project, as calculated in the prefeasibility study released in November, 2000, are as in the charts below.

### Wolverine

The Wolverine deposit is a high-grade volcanogenic massive sulphide (VMS) body. The zinc-copper-lead-silver-gold mineralization is hosted within a thick sequence of felsic volcanic rocks interbedded with argillaceous and epiclastic sedimentary rocks of probable Devonian age within the Yukon-Tanana terrane. The main sulphide minerals in the deposit, in decreasing order of abundance,

are pyrite, sphalerite, chalcopyrite and galena. Most of the silver occurs with argentian tetrahedrite, with the remainder occurring in galena and electrum.

The 1996 field program, which cost an estimated \$6 million, commenced with construction of an air strip near the Wolverine deposit. Drilling started in mid-March and was completed in October. The known Wolverine Zone was expanded to the northwest with the discovery of the Lynx Zone immediately to the west. Exploration was also done on the Fisher Zone and Toe Claims. The 1996 drilling program significantly expanded the known area of mineralization at Wolverine and brought the number of massive sulphide intersections from 15 in 1995 to 49 to the end of the 1996 program. Systematic geological and geochemical evaluation of the numerous airborne geophysical targets on the remainder of the claims was also carried out in 1996.

During the 1997 program, the Sable Zone was discovered 1.6 km southeast of the Wolverine Zone by recognition of

Finlayson Project Probable Reserves <sup>1</sup>						
	Tonnes	Grade				
		Zinc (%)	Lead (%)	Copper (%)	Silver (g/t)	Gold (g/t)
Kudz Ze Kayah	11,100,000	5.61	1.56	0.85	136.9	1.33
Wolverine	3,470,000	12.43	1.44	1.37	336.6	1.59
Total Reserves	14,570,000	7.23	1.53	0.97	184.5	1.39

<sup>1</sup>Probable reserve for Kudz Ze Kayah and Wolverine estimated by Hatch Associates Ltd., November 2000.

Finlayson Project Resource						
	Tonnes (000s)	Zinc %	Lead %	Copper %	Silver g/t	Gold g/t
Kudz Ze Kayah <sup>1</sup> (a)	13.720	6.0	1.61	0.90	139.2	1.38
Wolverine <sup>2</sup>	5.439	13.06	1.59	1.43	378.1	1.76
<b>Sub-total</b>	<b>19.159</b>	<b>6.96</b>	<b>1.60</b>	<b>1.05</b>	<b>207.0</b>	<b>1.49</b>
Wolverine <sup>3</sup> (b)	6.237	12.66	1.55	1.33	371.0	1.76
GP4F <sup>4</sup> (c)	1.500	6.40	3.10	0.10	90.0	2.0
<b>Total resource (a)+(b)+(c)</b>	<b>21.457</b>	<b>7.96</b>	<b>1.70</b>	<b>0.97</b>	<b>203.1</b>	<b>1.53</b>

<sup>1</sup>Indicated resources for Kudz Ze Kayah and Wolverine estimated by Hatch Associates Ltd., November 2000.  
<sup>2</sup>Indicated and inferred resource for Lynx-Wolverine lens of Wolverine estimated by Hatch Associates Ltd., Nov. 2000.  
<sup>3</sup>Wolverine Resource (measured, indicated, inferred) for Wolverine estimated by Westmin in 1998.  
<sup>4</sup>Inferred resource for GP4F estimated by Cominco, 1998

the footwall-type alteration zone in a drill hole. Thin zones of high-grade massive sulphides were intersected in two holes along with significant alteration. Chalcopyrite and pyrrhotite veins in chlorite-altered footwall rocks suggest feeder-style alteration associated with a massive sulphide deposit.

Drilling in 1997 of the Wolverine deposit took place on the margins of the deposit as outlined by the 1995 and 1996 drilling. Of the 22 successfully completed holes drilled in the Wolverine deposit during 1997, 19 intersected ore grade mineralization.

**PREFEASIBILITY STUDY (FINLAYSON PROJECT)**

The Finlayson project consists of Expatriate Resources' 4,500 wholly owned claims, its 60% interest in the Wolverine Joint Venture (1,200 claims) and the approximately 3,000 claims acquired from Cominco Ltd. Atna Resources owns 40% of the Wolverine project. The Finlayson project, a consolidation of deposits into a single development plan, is 135 km southeast of Ross River and 237 km northwest of Watson Lake.

A prefeasibility study for the Finlayson Project was completed by Hatch Associates Ltd. in early November, 2000. The study allowed for the concurrent development of the Kudz Ze Kayah and Wolverine deposits. Metal prices used in the prefeasibility study were: US\$0.55/lb zinc, US\$0.90/lb copper, US\$0.20/lb lead, US\$5.00/oz silver, US\$275/oz gold, US exchange rate \$0.68.

Highlights of the study include:

- The upper part of the Kudz Ze Kayah deposit will be mined by an open pit producing 3,000 tonnes per day. The waste to ore ratio is 6.73:1.
- The Wolverine deposit will be developed as a 1,250 tonne per day underground mine with the ore trucked approximately 35 km to the mill located at Kudz Ze Kayah.
- The mill will treat 4,250 tonnes/day blended ore from the two deposits by simple flotation methods to produce zinc, lead and copper concentrates. (Blending the ore reduces the high selenium content of Wolverine ore to acceptable levels.)

Expected annual production, years 1 to 5		
	Concentrate (tonnes)	Contained metal
Zinc concentrate	198,000	109,000 t
Lead concentrate	27,000	15,000 t
Copper concentrate	48,000	12,000 t
Silver in concentrate		8,000,000 oz
Gold in concentrate		54,000 oz

- Predicted recoveries are: zinc (91%), lead (66%) and copper (81%) to their respective concentrates. Silver recovery is 85% and gold is 75% in the zinc, lead and copper concentrates.
- The concentrates will be shipped by truck 700 km to Skagway, Alaska.
- Project capital cost: C\$186.5 million  
Capital payback period: 2 years  
Life-of-mine average cash costs for zinc: US\$0.20/lb  
Life-of-mine operating costs: C\$41.61 per tonne of ore
- On a 100% equity financing basis, the base case discounted cash flow analysis of the project shows that the pre-tax Internal Rate of Return (IRR) is 39.2% and the after-tax IRR is 31.9%. The project Net Present Value at a 10% discount rate is C\$225 million pre-tax and C\$163 million after-tax.
- The 24-km tote road connecting the Kudz Ze Kayah deposit with the Robert Campbell Highway will be upgraded and additional facilities will be built on-site. The operating plan provides for a workforce of 252 people working on a fly-in and fly-out basis, and a camp facility on-site. Modest service facilities are planned at the Wolverine site to support the underground mining.

The existing permits and water licenses are being amended to add the development of an underground mine at Wolverine and an expansion of the mill at Kudz Ze Kayah.

The development schedule provides for completion of a feasibility study in 2001, leading to a production decision in early 2002, start of construction in mid-2002 and completion in the fall of 2003.

Kudz Ze Kayah, Wolverine and GP4F are open and there are numerous exploration targets in close proximity to the planned production.

# MARG PROPERTY

## Atna Resources Ltd.

President and Chief Executive Officer: David Watkins

### Corporate headquarters

#1550, 409 Granville Street  
Vancouver, British Columbia V6C 1T2

Phone (604) 684-2285

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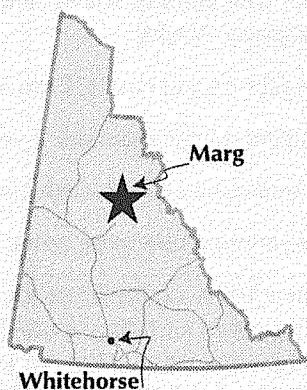
Toll free 1-800-789-ATNA

E-mail atna@atna.com

Web site www.atna.com

## PROJECT STATUS

On-going exploration



### Location

42 km northeast of Keno City

### Ownership

United Keno Hill Mines Ltd.

### Commodity

Copper, lead, zinc, silver, gold

### Ore type

Sulphide

### Geological resource

5.5 million tonnes

Copper: 1.8%

Lead: 2.5%

Zinc: 4.6%

Silver: 62.7 grams/tonne

Gold: 1.0 grams/tonne

### Mining method

Not determined

### Processing method

Conventional milling

## HISTORY

The Marg property was first staked by Canadian Superior Exploration Ltd. in 1965 on a GSC stream sediment anomaly and explored with soil sampling, mapping, and hand trenching in 1965 and 1966 in a joint venture with United Keno Hill Mines Limited. Canadian Superior performed additional trenching and detailed geochemistry in 1967.

The property was restaked as Flash in July, 1977 by Mountaineer Mines Limited and Welcome North Mines Limited and as Tudl in 1982 by ZX Joint Venture (Chevron, SMD Mining and Enterprise Exploration Limited), who explored with mapping, geochem sampling and trenching in 1982 and 1984. In 1986, All North Resources Ltd. optioned a 66<sup>2</sup>/<sub>3</sub>% interest in the property and performed soil sampling, hand trenching and VLF, mag, Max-Min and IP surveys. The remaining 33<sup>1</sup>/<sub>3</sub>% interest is held by SMD Mining, which changed its name to Cameco in 1989.

NDU Resources Ltd. bought the All-North interest in 1987. It staked additional claims and explored by prospecting, mapping, Max-Min and pulse-EM surveys, airstrip construction, road building and 6,037.5 m of diamond drilling (33 holes in 1988). Exploration in 1989 consisted of mapping, VLF, mag and pulse-EM geochem surveys and 5 drill holes. NDU added more Marg claims in 1990 and drilled 10 holes totalling 4,119.4 m.

NDU conducted an exploration and 26-hole drilling program on the property during 1996. Two drills were working on the property. One drill extended reserves on the D horizon and underlying A, B, and C horizons. The second drill explored targets elsewhere on the property.

Diamond drilling in 1996 more than doubled the area of previously defined mineralization. The results demonstrate remarkable lateral continuity over a 1,200 m strike length and up to 700 m down-dip.

Surface exploration drilling consisting of seven holes was completed in early August, 1997. Core samples were sent for metallurgical testing.

NDU Resources Ltd. was merged with United Keno Hill Mines in April, 1998. United Keno Hill Mines Ltd. had to relinquish its interest in the Marg property to a private company as the result of a judgement against UKHM. Atna Resources Ltd. purchased a 2/3 majority interest in the Marg property from the private company for \$250,000 in February, 2000, and carried out core re-logging, mapping and prospecting during the 2000 field season.

### **PROJECT SUMMARY**

The Marg property is located 42 km northeast of Keno City and, until recently, was owned by NDU Resources Ltd. NDU Resources conducted a large diamond drilling program on the property from 1987 until 1990. No exploration was conducted on the property from 1991 to 1995.

### **GEOLOGY, MINERALOGY AND ORE RESERVES**

The Marg deposit consists of four stacked massive sulphide lenses hosted by Devonian-Mississippian felsic metavolcanic rocks. From bottom to top, the sulphide lenses are designated A, B, C and D, with the upper, or D Zone, being the most continuous, and also the thickest (up to 23 m). The sulphide lenses strike east-northeast, dip southeast, and are elongated in a down-dip direction. Along strike, they grade into massive carbonate. The lenses average 6.1 m in thickness, but can be up to 23 m thick.

### **EXPLORATION AND PRODUCTION PLANS**

As of December, 1997, drill-indicated reserves for the Marg were 5.5 million tonnes at an average grade of 1.76% copper, 2.46% lead, 4.6% zinc, 0.29 ounces per ton gold and 1.8 ounces per ton silver. The nearby Blende deposit hosts a drill-indicated resource of 21,495,000 tons of open-pittable material with an average grade of 3.04% zinc, 2.79% lead and 1.6 ounces per ton silver.

The deposit is partly open to expansion along strike and down-dip. Very minor work has taken place outside the deposit area on this very large property. The Jane Zone, a sulphide occurrence within the same host rocks 6 km from the Marg deposit, points to excellent potential for additional discoveries.

# MINTO PROPERTY

## Minto Explorations Ltd.

President: Lutz Klingmann

### Corporate headquarters

6411 Imperial Avenue  
West Vancouver, British Columbia V7W 2J5

Phone (604) 921-7570

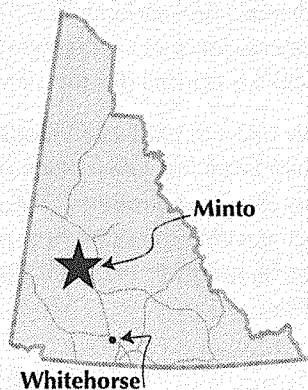
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Web site [www.mintomining.com](http://www.mintomining.com)

## PROJECT STATUS

Awaiting production decision



### Location

240 km northwest of Whitehorse

### Ownership:

Minto Explorations Ltd., Asarco Inc.

### Commodities

Copper, silver, gold

### Ore type

Sulphide

### Mineable reserves

6,510,000 tonnes

Copper: 2.13%

Silver: 9.3 grams/tonne

Gold: 0.62 grams/tonne

### Geological reserves

8,818,000 tonnes

Copper: 1.73%

Silver: 7.5 grams/tonne

Gold: 0.48 grams/tonne

### Mining method

Open-pit and underground, 360 days per year

### Mine life

12 years

### Employees

79

### Power

2 MW, diesel generation at the mine

## HISTORY

Anomalous copper concentrations were first detected during a program of stream sediment sampling in the Minto area in 1970. The MINTO claim group was staked by Asarco Inc./Silver Standard Mines Ltd. (The Dawson Range Syndicate) in 1971. The DEF claim group was staked to the north of, and adjoining, the MINTO claim group by an exploration consortium managed by United Keno Hill Mines Ltd., also in 1971. Both properties were explored from 1972 to 1974. The first significant drill intersection was made in July, 1973 and subsequent extensive diamond drilling outlined an ore deposit. A feasibility study was completed under the joint direction of Asarco Inc. and

United Keno Hill Mines Ltd. in 1976, but the project did not proceed at that time due to poor indicated financial returns. Drill programs were conducted in 1984 and 1985 by United Keno Hill Mines. (The UKHM holdings were acquired by Falconbridge Limited.)

Minto Explorations Ltd. was incorporated in April, 1993 specifically for the acquisition of the Minto property interests held by Asarco Inc. and Teck Corp. (the MINTO claims and leases) and by Falconbridge Limited (the DEF claims and leases) and for the further exploration and development of the Minto property. Teck Corp. and Asarco each sold their interest in the MINTO claims to Minto Explorations for shares in the company, and

provided initial working capital of \$375,000 by purchasing further shares. An agreement was signed with Falconbridge Ltd. for the acquisition of the DEF claims and leases on June 9, 1993. The essence of the agreement is that a cash payment of \$1 million will be made to Falconbridge Ltd. after a production decision has been made and project financing secured.

### 1996 construction

The initial 16 km of access road along the west side of the Yukon River, and the bridge across Big Creek, were constructed in September and October.

### 1997 construction

The remaining 12.8 km of access road were constructed, with only final grading and minor cleanup to be done after the 1998 spring break-up.

The site for the permanent camp was excavated in September. A water well to supply domestic water for the camp for drilled to a depth of 72 m, tested and equipped. A set of septic tanks was installed and a leach field was constructed. A camp services unit was built in Whitehorse during the winter months and this was then moved to the site. The unit includes a water purification system and water storage for both fire protection and domestic purposes.

In October, the mill site was excavated and various on-site roads and the pit perimeter for the first phase of mining were constructed. Two used grinding mills were purchased in the United States, dismantled and shipped to the Yukon and across the Yukon River.

### 1998 construction

Detailed engineering was completed in 1998. The mill footings were constructed in September. Ketza Construction Corp. of Whitehorse placed a total of 1,688 m<sup>3</sup> of concrete over a period of eight weeks.

The company purchased a used, eight-unit, 42-person camp and a new, seven-unit kitchen-diner-changehouse complex. These units were erected and all services, such as sewage disposal, potable water supply and power distribution for the camp, were installed.

Final grading, minor clean-up and reclamation were done along the 28.8-km long access road. The road is now in excellent condition and approximately 60 loads of freight were hauled to the site during the three months of construction.

A grout curtain, designed to control seepage through the foundation of the tailings-water dam, was also completed.

The two mill motors were reconditioned and placed in storage in Okanagan Falls, B.C.

### 1999 construction

A short construction program was completed in September. The two grinding mills were moved to the site, mill components were cleaned, sandblasted and painted, and the two mills were assembled. Svedala Canada Inc. completed a detailed inspection of the mills and a proposal for final installation has been submitted. Some roadwork and preparations to permit construction to continue through the coming winter were also completed.

### 2000 construction

Work in 2000 included roadwork, completion of the camp and equipment purchases.

### Cost of construction

The following are the construction costs in Canadian and American dollars.

	Canadian \$	American \$
1996	909,294	657,765
1997	2,557,106	1,849,758
1998	3,585,663	2,390,515
1999	<u>426,102</u>	<u>282,745</u>
Total to date	7,471,166	5,180,783
Numbers rounded off	7,471,000	5,181,000
To the start of production, 2001	<u>19,816,000</u>	<u>13,475,000</u>
<b>Total</b>	<b>27,287,000</b>	<b>18,656,000</b>
Contingency		1,500,000
Feasibility study estimates (May, 1995)	25,822,000	19,127,400

In June, 2000, Hatch Associates, Vancouver, completed an independent review of the capital and operating costs for the project. The capital required is estimated at \$22.8 million with contingencies. The project is viable at prices of US\$0.85/pound copper and has an internal rate of return of 32.3% on the remaining capital at these copper prices.

The permitting process for the Minto project was completed, with the granting of a Type A water use licence in 1998 and a production licence in 1999. Due to continued low copper and gold prices in 1999, and delays in receiving the Type A Water Licence, start-up of operations could be in March, 2002, pending a production decision. The Minto project is viable under current market conditions.

### PROJECT SUMMARY

Minto Explorations Ltd. is proposing to develop the Minto property located approximately 240 km northwest of Whitehorse, on the west side of the Yukon River. The orebody is located in the upper reaches of the Minto Creek watershed, approximately 10 km upstream of the Yukon River confluence, at an elevation of 2,660 to 2,900 feet. Access is by barge across the Yukon River from Minto Landing, then via road.

The Minto project will employ 76 people. Approximately 70% of the positions are expected to be filled by residents of Whitehorse, 15% by residents of Carmacks and the Little Salmon First Nation, 10% by residents of Pelly Crossing and the Selkirk First Nation and 5% by residents of Faro. The Minto project is situated on traditional Selkirk First Nation land. The Selkirk First Nation selected an area surrounding the property as Category A Settlement Land under an agreement negotiated with the Government of Canada and the Government of the Yukon. The title to the mining claims and leases and the access road right-of-way held by Minto Explorations Ltd. are protected under the Umbrella Final Agreement and the Selkirk First Nation Final Agreement respectively. The Selkirk First Nation actively supports the project and a comprehensive co-operation agreement was signed with Minto Explorations Ltd. on September 16, 1997.

### GEOLOGY, MINERALOGY AND ORE RESERVES

The Minto deposit is hosted in a flat-lying, tabular zone of foliated biotite granodiorite and quartzofeldspathic gneisses enclosed in a Klotassin granodiorite. The main ore

zone is 335 m long, 247 m wide and 6 to 61 m thick, with an average width of 30 m. The principal ore minerals are chalcopyrite and bornite in variable proportions with significant gold and silver values. The in-situ geological reserve for the deposit above a cut-off grade of 0.50% copper is 8,818,000 tonnes with 1.73% copper, 0.48 grams/tonne gold and 7.5 grams/tonne silver. The reserve contains 336 million pounds of copper, 140,500 ounces of gold and 2.176 million ounces of silver. The ore that will be mined as per the current mine design is 6,510,000 tonnes with 2.13% copper, 0.62 grams/tonne gold and 9.3 grams/tonne silver.

### MINE PLAN

The proposed Minto project would entail an open pit and underground operation, waste rock stockpiles, a tailings storage facility and a conventional copper flotation mill. These facilities will occupy an area of approximately 141 hectares. The stripping ratio is 4.9:1. The mill will be designed to process 550,000 tonnes per year. Ore will be treated by conventional flotation to produce annually up to 35,000 tonnes of copper concentrate which will contain, on average, 28.5 million pounds of payable copper, 11,000 ounces of gold, and 155,000 ounces of silver during the first five years of production. The tailings impoundment will be located within the Minto Creek valley, approximately 850 m east of the mill and will have a capacity of 6.5 million tonnes. Concentrate will be trucked on a daily basis to the Port of Skagway, or to Fort Nelson, for shipment to smelters. To bring the Minto deposit into production, Minto Explorations Ltd. signed a joint venture agreement on June 17, 1996 with Asarco Inc., where Asarco Inc. will acquire 70% interest in the project in consideration for providing up to US\$25 million for project development. Minto Explorations Ltd. retains a 30% interest in the project and is the operator.

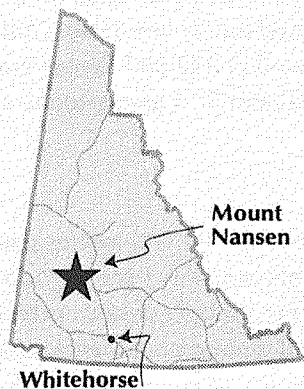
ASARCO Inc. and Grupo Mexico, S.A. de C.V. announced a merger in October, 1999, where Grupo Mexico would acquire all outstanding shares of ASARCO Inc. Minto Explorations has submitted a detailed construction budget for 2001-2002 to ASARCO/GRUPO.

# MOUNT NANSEN PROPERTY

## BYG Natural Resources Inc.

### PROJECT STATUS

Federal government is maintaining mine site



### Location

60 km west of Carmacks

### Commodity

Gold, silver

### Ore type

Sulphide

### Geological reserves

Brown-McDade Zone

Oxide reserve: nearly depleted

Sulphide reserve: 220,000 tonnes grading  
6.8 grams/tonne Au and 57 grams/tonne Ag

Flex Zone

Oxide mineable reserve: 81,700 tonnes grading  
7.37 grams/tonne Au and 312 grams/tonne Ag

Webber Zone

Oxide reserve: 102,500 tonnes grading  
7.83 grams/tonne Au and 466.4 grams/tonne  
Ag

Huestis Vein

Mineable sulphide reserve: 148,600 tonnes  
grading 11.75 grams/tonne Au and  
79.7 grams/tonne Ag

## HISTORY

Placer gold was originally discovered on Nansen Creek in 1899. The first recorded lode gold discovery on the current Mount Nansen property was made by prospectors Brown and McDade in 1943.

The first underground work was conducted on the Brown-McDade zone in 1947 by the Spud Huestis Syndicate. After a few years of mine development, mapping, surface trenching and sampling, the property remained inactive until 1962 when the Mount Nansen Syndicate acquired the Brown-McDade, Webber and Huestis deposits and conducted additional exploration. Mount Nansen Mines Ltd. was acquired by Peso Silver Mines Ltd. which conducted exploration over the next three years on all three deposits. A 270-tonne per day floatation mill was constructed during 1967-68. A total of 14,500 tonnes of development muck produced during 1967-68 had an estimated average grade of 7.8 grams/tonne Au and 162 grams/tonne Ag, while mill feed of 5,236 tonnes produced from stopes during 1969 had an estimated average grade of 11.7 grams/tonne Au and

282 grams/tonne Ag. Low gold recovery rates, estimated at 60% to 65% led to the mine closure in April, 1969. In late 1975, a total of 5,450 tonnes at an estimated grade of 16.8 grams/tonne Au and 248.8 grams/tonne Ag was produced from the Huestis deposit and processed during May, 1976, but the mine once again shut down shortly after. As of 1976, over 4,572 m of underground development was completed on the three veins. Approximately 22,680 tonnes of ore were treated in the flotation mill in 1975 and 1976.

In 1984, BYG Natural Resources Inc. (BYG) acquired the properties and combined them with additional claims to form the current property. BYG and Chevron Minerals Ltd. carried out an exploration program from 1985 to 1987. Over \$5 million was expended on geological mapping, geochemical and geophysical surveys, trenching, 2,605 m of diamond drilling (41 holes) and 1,283 m of rotary percussion drilling (17 holes). During 1988, BYG continued exploring on its own by carrying out surface trenching and 85 holes (5,397 m) of diamond drilling. A previously unrecognized near-surface oxide zone was discovered

and the underground sulphide reserves were expanded. Metallurgical testing, mill flow sheet designs, tailings disposal and environmental impacts were studied at this time, and commercial gold production began on January 1, 1997. Production continued intermittently until February, 1999, when all mining and operations ceased.

Between 1994 and 1997, BYG conducted exploration consisting of diamond drilling on the Brown-McDade and Flex (990 m, 12 holes in 1994), Flex and Huestis (1,490 m, 21 holes in 1995), Webber and Flex (780 m, 10 holes in 1996) and Vince Vein (745 m, 9 holes in 1997). During 1997, a program of overburden stripping and excavator trenching was completed on the Flex zone. During 1998, a further 16 holes (1,092 m) were drilled on the Flex Zone.

In May, 1999, BYG Natural Resources went into receivership (D. Manning and Associates) and was convicted of violating its water license. In July, 1999, the federal government took over mine-site maintenance.

### PROJECT SUMMARY

The Mount Nansen mine is located 60 km west of the village of Carmacks, Yukon and is accessible by a gravel road from Carmacks to the minesite. The property consists of 257 mining claims and 30 mining leases covering an area of 53 square km.

### GEOLOGY, MINERALOGY AND ORE RESERVES

The Mount Nansen district is underlain by metamorphosed intrusive, sedimentary and volcanic rocks of the Yukon-Tanana terrane. These rocks are intruded by Early Cretaceous felsic plutonic rocks and overlain by Mid-Cretaceous Mount Nansen mafic to intermediate volcanic rocks and related sub-volcanic feldspar porphyry dykes and plugs.

The Mount Nansen property is host to four distinct gold deposits: Brown-McDade, Webber, Huestis and the Flex Zone. The zones are situated in a series of anastomosing veins in northwesterly trending faults or shear zones. The gold and silver mineralized structures consist of fault-shear-hosted veins and associated clay-rich and bleached alteration zones. The veins occur in a 2.5-km wide corridor which has been traced over a strike length of 15 km. Clay-rich leach zones near the surface are underlain by blankets or lenses of gold-rich supergene ores.

### Brown-McDade Zone

The Brown-McDade Zone lies at the southeasterly end of the belt. It is 55 m long by 200 m wide and consists of quartz veins and associated feldspar porphyry dykes. The oxide ore of the Brown-McDade is currently being mined by a small open pit. A mineable open-pit reserve of 110,000 tonnes grading 12.33 grams/tonne gold and 78 grams/tonne silver was outlined in the open pit, with an additional 80,000 tonnes of low-grade mineralization. Most of this was mined out by late 1998. Underground resources are estimated at 222,000 tonnes grading 6.8 grams/tonne gold and 57.0 grams/tonne silver below the open pit.

### Webber Zone

A diluted oxide reserve of 102,500 tonnes grading 7.83 grams/tonne gold and 466.4 grams/tonne silver has been established in the Webber deposit from extensive trenching, drilling and underground development.

### Huestis Vein

Mineable sulphide reserves of 148,600 tonnes grading 11.75 grams/tonne gold and 79.7 grams/tonne silver have been defined on the Huestis vein by trenching, diamond drilling and detailed underground sampling. The ore is sulphide-rich and refractory.

### Flez Zone

A preliminary, shallow open-pit design encloses a calculated mineable resource of 81,700 tonnes grading 7.37 grams/tonne gold and 312.5 grams/tonne silver.

There is a geological sulphide reserve on the Flex Zone of 599,247 tonnes grading 8.88 grams/tonne gold and 190 grams/tonne silver.

### PRODUCTION

The initial capacity of the mill was 700 tonnes per day.

Gold production from surface oxide ores commenced during the week of October 18, 1996 and the company poured the first bar of gold on November 23, 1996. Commercial production began on January 1, 1997. The mill was established to process 700 tonnes per day; intended yearly production is 50,000 ounces of gold. The gold was sold through Gerald Metals Inc.

In January, 1997, the company produced 2,700 troy ounces of gold and 13,000 troy ounces of silver. Ore throughput increased to 450 tonnes per day which is 64%

of design capacity. Recoveries averaged 88% and the head grade averaged 0.235 ounces equivalent gold/tonne.

The unanticipated presence of clay-alteration minerals in the ore forced the daily milling rate down to less than 325 tonnes during the first nine months of operations. The problem was solved by installing a semi-autogenous grinding mill (SAG). Also, record rainfall aggravated existing difficulties milling the gold-rich, clay-altered ores and restricted capacity to 36%. The SAF mill was operational by the end of August, 1997. During July and August, 1997, the mill operated largely on stockpiled ores leaving the high-grade open-pit clay-altered ores to be mined and processed when the SAG mill became operational.

Unseasonably heavy rainfall created a water imbalance problem in late 1997. There was inadequate provision for run-off of the rainfall, which led to an environmental discharge danger. BYG engineered a water treatment system in the spring of 1997 by transporting facilities from the Canamax mine controlled by YGC. The treatment facility enabled the company to meet water quality discharge levels.

The mine re-started production at the end of January, 1998 and delivered its first gold and silver for sale in

April, 1998. At first, production was limited to 50% of the mill's 700 tonne per day capacity, then installation of new pumping facilities allowed the mill to operate at full capacity. BYG estimated that it would be able to produce gold at an operational cost of \$160 per ounce.

The company downsized in 1998 and carried out exploration and drilling programs to delineate additional oxide ore reserves on the Mount Nansen mine property, particularly on the nearby Flex Zone. The mine shut down in the spring of 1999

<b>Total production in 1998</b>
472 kg (15,190 ounces) gold • 1,208 kg (38,849 ounces) silver

<b>Total production in 1999</b>
15,500 tonnes at a grade of 7.5 grams/tonne gold and 50 grams/tonne silver, or 3,738 ounces (116,200 grams) of gold and 24,917 ounces (775,000 grams) silver

# MOUNT SKUKUM/SKUKUM CREEK/GODDELL PROPERTIES

## Tagish Lake Gold Corp.

President: Robert Rodger

### Corporate headquarters

302-856 Homer Street

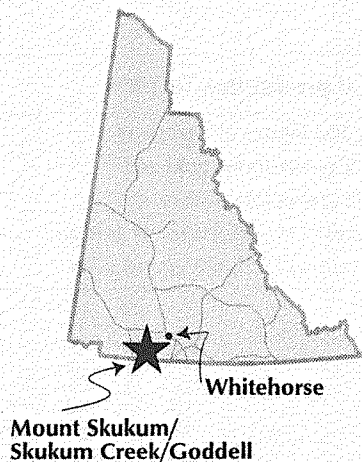
Vancouver, British Columbia V6B 2W5

Phone (604) 687-7938

Fax (604) 687-2319

## PROJECT STATUS

Reserve delineation ongoing



### Location

40 km west of Carcross

### Ownership

Tagish Lake Gold Corp.

### Commodity

Gold, silver

### Ore type

Mount Skukum: quartz-carbonate

Skukum Creek: quartz-sulphide

Goddell: breccia

### Mineable reserve (November, 1997)

Rainbow Zone-Skukum Creek: 956,949 tonnes

Silver: 193.5 grams/tonne

Gold: 6.3 grams/tonne

Kuhn Zone-Skukum Creek: 148,781 tonnes

Silver: 167.70 grams/tonne

Gold: 8.78 grams/tonne

Goddell Shear Zone: 900,000 tonnes

Gold: 7.0 grams/tonne

### Mining method

Underground, 365 days per year

### Mine life

8 years

### Processing method

Conventional mill, 365 days per year

### Power

on-site diesel generation

## HISTORY

The Wheaton River area first received attention in the early 1890s when prospectors discovered gold-bearing quartz-stibnite veins. With the completion of the White Pass and Yukon Route Railroad in 1903, the area became more accessible to prospecting and numerous other gold and silver occurrences were located between that year and 1906. Stibnite mineralization was discovered approximately 11 km east of Mount Skukum at Goddell Gully in 1909, and in 1922, gold-silver mineralization

was discovered on the southeast side of Skukum Creek approximately 5.3 km southeast of Mount Skukum.

Exploration activity slowed with the beginning of World War One and did not resume until the 1960s when activity increased and stibnite veins in the Goddell Gully, Becker-Cochrane, Wheaton River and Skukum Creek areas were re-examined. During the 1970s, most of the exploration activity in the Wheaton River District was carried out in search of copper, molybdenum and uranium.

In 1981, exploration activity peaked in the Wheaton River District due to an increase in the price of gold and the

discovery of gold-bearing quartz-carbonate veins in the Mount Skukum volcanic complex by AGIP. The project became the site of the Mount Skukum Gold Mine which, from 1986 to 1988, mined 223,439 tons of ore and recovered 77,796 ounces of gold by underground methods. In 1986, Omni Resources Inc. reported geological reserves of 745,000 tonnes grading 7.9 grams/tonne gold and 305 grams/tonne silver on their Skukum Creek property. From 1985 to 1988, Berglynn Resources Inc. carried out an exploration program on the Goddell Gully property located at the southeast corner of the Mount Skukum property and adjoining ground held by Omni Resources Inc. This program led to the intersection of high-grade gold mineralization in drill core. The Omni, Berglynn and Mount Skukum Gold Mine properties were dormant from 1991 to the mid-1990s.

Omni Resources completed a drill program on the Goddell gold project in 1995. The five-hole, 2,820 m diamond-drill program confirmed a large, well-mineralized shear zone. The shear zone is open to extension in depth and length. Omni Resources completed a 620-m decline in December, 1996 at the Goddell Shear Zone. Underground crews have extended the decline by 600 feet to the east and established drill stations at 50-m intervals.

### **PROJECT SUMMARY**

The Mount Skukum and Skukum Creek deposits are located approximately 65 km southwest of Whitehorse at the termination of the Annie Lake Road. The Goddell Shear Zone was acquired from Arkona Resources Inc. and 276 Taurus Ventures. In April, 1996, Omni Resources entered into an agreement with Trumpeter Yukon Gold whereby Trumpeter would finance Omni through equity over one year to earn a 50% joint interest in Omni's holdings. The agreement further provides the opportunity for Trumpeter to enter into a 50/50 joint venture with Omni on the Mount Skukum properties. In October, 1997, Omni Resources announced that they had purchased a 100% interest in the RACA claim group which lies on strike and northeast of the Skukum Creek deposit.

During 2000, the two companies, Omni Resources Inc. and Trumpeter Yukon Gold Inc., merged into Tagish Lake Gold Corp., which now holds 100% of the interest in the property.

### **MOUNT SKUKUM DEPOSIT**

Mineralization on the Mount Skukum property consists of gold within epithermal quartz carbonate veins hosted in an Eocene volcanic caldera complex. Underground mine production began on the Main Cirque body in 1986, at a rate of 300 tonnes per day and continued until August, 1988, when that orebody was exhausted. Approximately 223,400 tons of ore were mined and 77,796 ounces of gold were recovered. The mineral processing facility remains on site. It is a conventional Merrill-Crow crushing, grinding, cyanidation, zinc precipitation circuit with cyanide destruction using the Inco SO<sub>2</sub> system. It is estimated that about 98,885 tonnes of oxide ore grading 14.75 grams/tonne gold remain at the Lake Zone. There has been no development on Mount Skukum since 1989.

### **SKUKUM CREEK DEPOSIT**

The Skukum Creek property was originally staked in 1922 and obtained by Omni Resources in 1984. Exploration and development proceeded quickly on the property from 1985 to 1988. The program, financed largely through flow-through share funding, included more than 24,000 m of surface and underground diamond drilling and 2,200 m of underground development on the 1300 and 1350 levels. The Skukum Creek orebody includes the Rainbow and Kuhn sulphide-rich veins which contain moderate gold and significant silver values. A feasibility study is planned for mining the Skukum Creek deposit. Production rates are anticipated to be 1,000 tonnes per day.

### **GODDELL DEPOSIT**

The Goddell gold-bearing breccia, part of the Skukum Creek property, was drilled in 1995 and 1996. The Omni-Trumpeter joint venture has spent \$4.4 million on exploring and developing the Goddell Shear Zone, which was acquired from Arkona Resources Inc. (60%) and 276 Taurus Ventures (10%). The mineralized strike length of the Goddell Shear Zone is now over 1,100 feet and is still open to the east and at depth.

# SA DENA HES PROPERTY

## Cominco Ltd.

President: David Thompson

### Corporate headquarters

500 – 200 Burrard Street  
Vancouver, British Columbia V6C 3L7

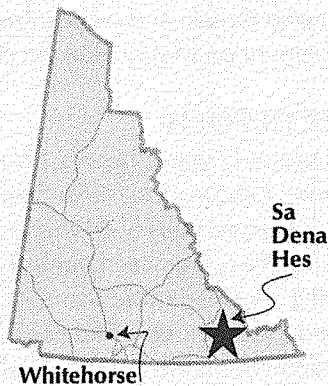
Phone (604) 682-0611

Fax (604) 685-3019

Web site [www.cominco.com](http://www.cominco.com)

## PROJECT STATUS

Care and maintenance



### Location

50 km northeast of Watson Lake

### Ownership

Cominco Ltd. (25%), Teck (25%),  
Korea Zinc (50%)

### Commodity

Lead, zinc, silver

### Ore type

Sulphide

### Geological resource

3.2 million tonnes

Lead: 3.70%

Zinc: 12.90%

Silver: 57 grams/tonne

### Mineable reserve

1.4 million tonnes

Lead: 2.3%

Zinc: 10.2%

Silver: 44 grams/tonne

### Mining method

Underground, 365 days per year

### Processing method

Conventional mill, 365 days per year

### Employees

100

### Power

6 MW, on-site diesel generation

## HISTORY

Mineralization was discovered on the Sa Dena Hes property in 1962 by the Frances River Syndicate. The property was worked on at various times by Atlas Explorations, Cima Resources, and Canamax Resources. Curragh Resources (80%) and Hillsborough Resources Limited (20%), as joint venture partners, acquired the property in 1989 from Canamax Resources. Between April, 1989 and August, 1990, the Joint Venture spent a further \$5.3 million on a field program of geological exploration and diamond drilling. Following completion

of the detailed geological assessment, the Joint Venture decided to proceed with construction of the project and work commenced in October, 1990.

In early 1991, a socio-economic agreement was signed by the Joint Venture, the Kaska Dena First Nation, the Town of Watson Lake and the Government of the Yukon. The objective of the agreement was to ensure that business and employment opportunities were available to local residents on a preferential basis. In addition, an agreement between the Joint Venture and the Kaska extended

business, employment, and training opportunities to the Kaska, as well as an option to purchase a 10% interest in the mine.

The Sa Dena Hes mine began production in August, 1991 and ceased operations in December, 1992 because of low metal prices. In September, 1993, the Ontario Court appointed Coopers & Lybrand as the interim receiver acting for the Bank of Nova Scotia for the Sa Dena Hes and Stronsay (Cirque) assets.

The Sa Dena Hes and Stronsay (Cirque) lead-zinc properties were bought by Teck (25%), Cominco (25%), Korea Zinc (40%) and Samsung (10%) in December, 1993. The four partners paid an estimated \$43 million for the Sa Dena Hes and the Stronsay (Cirque) properties. There has been no production at Sa Dena Hes since closure in 1992.

## **PROJECT SUMMARY**

The Sa Dena Hes lead-zinc mine is located approximately 45 km north of Watson Lake. It is owned by Teck Resources (25%), Cominco (25%), and Korea Zinc (50%). The property covers approximately 5,600 hectares.

Production began at the Sa Dena Hes mine in August, 1991 and ceased operations in November, 1992 due to low zinc prices. During the 14 months of operation, the mine produced 607,500 tonnes of concentrate containing 374,400 tonnes of payable zinc and 290,200 tonnes of

lead. Infrastructure on site includes the underground mine, ore handling facilities, a 1,500 tonne per day conventional mill, loadout facilities, tailings and reclamation system, shops, warehouse, security and first-aid office, a 200-person camp, administration building, and a 6.2 MW power plant.

## **GEOLOGY, MINERALOGY AND ORE RESERVES**

The mineable reserve on the property is estimated to be 1.4 million tonnes grading 2.5% lead, 10.2% zinc, and 44 grams/tonne silver.

## **EXPLORATION AND PRODUCTION PLANS**

In August, 1997, Cominco announced that Sa Dena Hes might open in the second quarter of 1998. Pre-operational work, including contract tenders for road upgrading and underground rehabilitation, was initiated. Cominco, Teck and Korea Zinc upgraded the mine's infrastructure and prepared for the mid-1998 start. However, due to poor market conditions, the re-opening was cancelled in December, 1997.

At full production, the operation would produce 75,000 tons per year of zinc concentrates and 15,000 tons per year of lead concentrates. Output would be sold into Asian markets, with Korea Zinc the most likely smelter.

In October, 1997, Cominco and the Liard First Nation signed a socio-economic participation agreement related to the Sa Dena Hes mine.

# SILVERTIP PROPERTY

## Silvertip Mining Corporation/ Imperial Metals Corporation

President: Pierre Lebel

### Corporate headquarters

420-355 Burrard Street  
Vancouver, British Columbia V6C 2G8

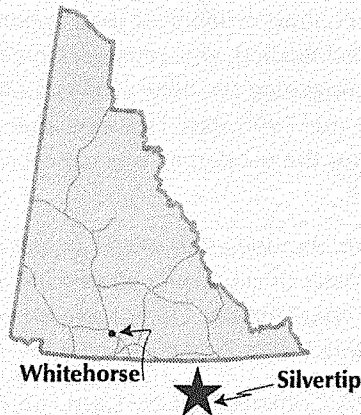
Phone (604) 669-8959

Fax (604) 687-4030

Web site [www.imperialmetals.com](http://www.imperialmetals.com)

### PROJECT STATUS

Exploration for additional reserves



### Location

Northern British Columbia, 80 km west of  
Watson Lake

### Ownership

Silvertip Mining Corp. (subsidiary of Imperial  
Metals Corp.)

### Commodities

Silver, lead, zinc, gold

### Ore type

Massive sulphide

### Mineral resource

2.57 million tonnes

Silver: 325 grams/tonne

Lead: 6.4%

Zinc: 8.8 %

Gold: 0.63 grams/tonne

### Mining method

Open-pit for the first 2 years then  
underground, 365 days per year

### Mine life

4-5 years

### Employees

Approximately 140 when operational

## HISTORY

The Silvertip deposit was first discovered in 1980, at which time it was thought to be a shale-hosted zinc-lead deposit. When spectacular silver-rich mineralization was intersected in the underlying limestone formation in 1981, the property became classified as a major precious-base metal deposit. Over the next three years over \$15 million was spent on intensive exploration that attempted to define the mineral resource. Underground exploration took place in 1985, 1989 and 1990, revealing that the mineralization was deposited in a network of tabular and pipe-like bodies.

In 1997, exploration was focused on the expansion of known ore bodies. Two new zones of high-grade massive sulphide mineralization were discovered through geological mapping, seismic surveying and 8,000 m of follow-up drilling. The zones are known as the Silver

Creek Extension Zone and the Discovery North Zone. A 1998 geophysical exploration program identified several additional anomalies, outside of the known deposit.

In April, 1999, Imperial optioned a 60% interest in Silvertip to Peruvian Gold Limited whereby Peruvian was to spend \$5 million over three field seasons with a minimum commitment of \$450,000 in 1999. Imperial retained operatorship throughout the option period, preserving cash and offsetting the risk associated with deep drilling, and retained the right to buy back a 20% interest in the property by making subsequent expenditures of \$2 million.

A total of 5.65 line/km of CSAMT survey was completed in July, 1999 as part of phase one. The survey revealed three well defined areas exhibiting anomalously conductive signatures. A 2,000-m drill program to test the anomalies was completed in the fall of 1999. Results were most encouraging with one hole intersecting 31 m grading

318 grams/tonne silver, 8.65% zinc and 5.53% lead. A decision was made to proceed immediately with underground drilling. Existing underground workings were dewatered in December and 22 holes were drilled in January, 2000. Peruvian Gold Limited dropped its option in November, 2000.

## PROJECT SUMMARY

Silvertip Mining Corporation, a wholly owned subsidiary of Imperial Metals Corporation, has applied to the B.C. government to develop the Silvertip property. The property is located in northern British Columbia, 80 km west of Watson Lake, Yukon. Access is by a 25-km two-wheel drive gravel road from kilometre 1,128 of the Alaska Highway. The property covers approximately 227 square km.

The company submitted an environmental assessment application in 1998.

## GEOLOGY, MINERALOGY AND ORE RESERVES

The Silvertip prospect is situated on Silvertip Mountain, near the last tributary of the Tootsee River called Silvertip Creek.

"The deposits occur in a carbonate and clastic sedimentary sequence of the Cassiar terrane, which has been intruded into the west by the mid-Cretaceous Cassiar batholith. The sediments include the Kechika, Sandpile, McDame and Earn groups. The deposits are situated on the west limb of a broad, open, northwest trending synclinorium, the core of which is occupied by volcanics, sediments and ultramafic rocks of the Devonian-Triassic Sylvester Allochthon. Massive sulphide zones occur in limestones of the Middle Devonian McDame Group. This unit is unconformably overlain by clastic sediments of the Upper Devonian-Mississippian Earn Group, which consists of two upward-coarsening sequences of turbiditic flows. Several exhalative horizons, consisting of fine-grained massive to laminated silica and/or barite, with pyrite, sphalerite and minor galena occur in the Earn Group sediments. Two of these, the Upper and Discovery zones, occur near

the base of the second cycle, and contain lead-zinc-silver mineralization. Sulphides within the exhalite zones are restricted in extent although exhalites are wide-spread and may be stratigraphically correlatable." (from B.C. Minfile 1040 038)

"Galena, sphalerite, and tetrahedrite replacement mineralization occur in highly oxidized zones in the Mid-Devonian McDame Group limestone just west of a fault zone separating McDame carbonates from a down-dropped block of Upper Devonian to Mississippian Earn Group clastic sediments. A sulphide zone 12 m in length was exposed underground, but surface mineralization is generally oxidized, with residual galena and minor sphalerite. Stannite has been identified in the sulphide assemblage, and a magmatic-hydrothermal source is suspected." (B.C. Minefile, 093M 055)

The deposit contains a total resource of 2.57 million tonnes of high-grade silver-lead-zinc-gold massive sulphide mineralization grading 325 grams/tonne silver, 6.4% lead, 8.8% zinc and 0.63 grams/tonne gold.

## PRODUCTION PLANS

The project will employ up to 150 people during the construction stage, and approximately 140 people during operation. The first two years of production will remove 0.74 million tonnes of ore by open-pit mining. The remaining 1.83 million tonnes will be removed by underground mining throughout the following two to three years.

The Goldstream Mill from Revelstoke, B.C., will be moved to the Silvertip site and upgraded. A crushing and dense media separation (DMS) circuit will then be added and the mill will treat 1,500 to 2,000 tonnes of ore per day. Conventional crushing, grinding and flotation processes will be used. Waste rock will be stored underwater either in the flooded open pit or in a storage facility that will be built in the Silvertip Creek valley. Seven to 10 daily truck-loads of concentrated ore, each containing 40 to 50 tonnes, will be transported to either Skagway, AK, Stewart, B.C., or Fort Nelson, B.C.

# TOM PROPERTY

## Hudson Bay Exploration and Development

President: Edward Yarrow

### Corporate headquarters

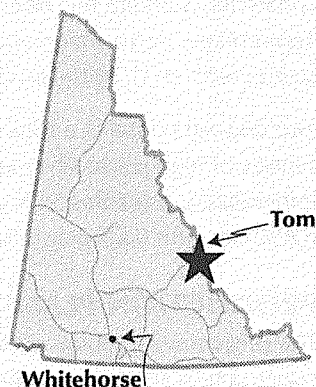
#800, 700 West Pender Street  
Vancouver, British Columbia V6C 1G8

Phone (604) 684-1454

Fax (604) 689-3480

## PROJECT STATUS

Inactive



### Location

13 km southeast of Macmillan Pass

### Ownership

Hudson Bay Exploration and Development

### Commodities

Lead, zinc, silver

### Ore type

Sulphide

### Mineable reserves

9,283,700 tonnes

7.5% zinc

6.2% lead

69.4% silver

## HISTORY

Extensive work has been carried out on the Tom property since it was first staked by Hudson Bay Mining and Smelting in 1951. It was explored with mapping and hand trenching in 1951, and 37 drill holes (5,435 m) between 1951 and 1953. From 1966 to 1979, additional exploration work, including 1809 m of drifting and 75 underground drill holes (3,617 m), were completed. Hudson Bay Mining and Smelting completed part of a major feasibility study between 1980 and 1982 including additional underground work, engineering and environmental studies. A joint feasibility study with Aberford Resources Ltd., which included the nearby Jason deposit, was completed in 1985. At this point, a total of 3,523 m of underground development, 4,970 m of underground diamond drilling and 14,630 m of surface drilling had been completed on the property.

In July, 1988, Cominco Ltd. optioned the Tom property for a 60% interest through expenditures of \$5.5 million and

cash payments totalling \$4 million before the end of 1993. Cominco remapped the property and drilled four holes (2,226 m) in 1988, four holes (2,175 m) in 1989, seven holes (3,578 m) in 1990 and eight holes (2,882.7 m) in 1991. Cominco dropped its option in 1992.

## PROPERTY SUMMARY

The Tom deposit is located about 13 km southeast of Macmillan Pass on the Yukon-Northwest Territories border and is accessible via the North Canol Road. A 700-m airstrip is situated midway between the Tom and Jason properties.

## GEOLOGY, MINERALOGY AND ORE RESERVES

The Tom property is underlain by fine-grained black clastic rocks of the Devono-Mississippian Earn Group. Mineral consists mainly of galena, sphalerite and barite and is concentrated in three zones: Tom East, Tom West and Tom

Southeast. The Tom West zone is a tabular body 1,200 m long and up to 40 m thick which dips 70 degrees west. It extends down-dip for 360 m. The Tom East zone consists of fault-bounded pods of high-grade laminated barite, chert, sphalerite and galena near the hinge of an anticline. The Tom Southeast zone is thinner and higher grade than most of the Tom West zone. It consists of a

tabular body 400 m long and 0.5 to 6.0 m thick, which dips 60 to 70 degrees east.

Mineable reserves for the Tom East and West zones are published at 9,283,700 tonnes grading 7.5% lead, 6.2% zinc and 69.4% silver using a 7% zinc + lead cutoff, a 15% dilution factor and 90% recovery.

**Summary of tonnage and grades, Tom deposit.**

	Tonnes	Silver grams/tonne	Zinc %	Lead %
<u>Tom West Zone</u>				
Geological resource	13,385,400	28.5	6.53	3.19
Mining reserves	6,864,800	42.6	7.16	4.44
<u>Tom East Zone</u>				
Geological resource	2,337,100	167.3	9.68	12.8
Mining reserves	2,418,900	145.4	8.42	11.13
<u>Tom Deposit - Total</u>				
Geological resource	15,722,500	49.1	7.00	4.61
Mining reserves	9,283,700	69.4	7.49	6.19
(1) geological resource - 5% zinc + lead cut-off				
(2) mining reserves - 7% zinc + lead cut-off, 15% dilution factor, 90% recovery				

# TULSEQUAH CHIEF PROPERTY

## Redfern Resources Ltd.

President: Terence Chandler

### Corporate headquarters

Box 40, 900-999 West Hastings Street  
Vancouver, British Columbia V6C 2W2

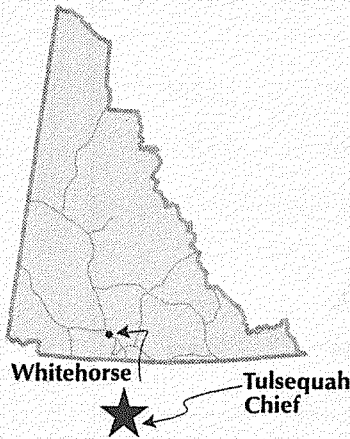
Phone (604) 669-4775

Fax (604) 669-5330

E-mail redfern@redfern.bc.ca

### PROJECT STATUS

Permitting complete; renewed project approval pending



### Location

100 km south of Atlin, B.C.

### Ownership

Redfern Resources Ltd. (100%)

### Commodities

Copper, lead, zinc, gold, silver

### Ore type

Sulphide

### Geological resource

8.93 million tonnes

Copper: 1.31%

Lead: 1.24%

Zinc: 6.61%

Silver: 107.56 grams/tonne

Gold: 2.53 grams/tonne

### Mineable reserve

7.56 million tonnes

Copper: 1.32%

Lead: 1.23%

Zinc: 6.63%

Silver: 105.2 grams/tonne

Gold: 2.51 grams/tonne

### Mining method

Underground, 343 days per year

### Processing method

Conventional mill, 365 days per year

### Mine life

9 years minimum

### Employees

199

### Power

12 MW, on-site diesel

## HISTORY

In 1923, W. Kirkham of Juneau, Alaska discovered the Tulsequah Chief deposit while prospecting in the Tulsequah River valley. The initial discovery of a highly mineralized showing located above the present 6,500 level adit (400 m above sea level) initiated a wave of prospecting activity in the area. The ensuing years

of intensive prospecting efforts culminated in the 1929 discovery of the Big Bull deposit some seven km to the south. The Sparling, Banker and Polaris-Taku deposits were also discovered in 1929. The Tulsequah and Big Bull deposits were acquired by Cominco in 1946 and were put into production by 1951. For six years, both deposits were mined at an average rate of 482 tonnes/day. In 1957,

due to low metal prices, Cominco was forced to close its operations with substantial reserves in place. From 1957 until 1971, the mine site lay dormant and unexplored.

During operations in the 1950s, the Tulsequah Chief deposits were considered to be shear-zone controlled. In 1971, re-examination of the local geology by Cominco geologists led to identification of volcanogenic massive sulphide (VMS) mineralization. Ten years passed before the next wave of exploration commenced. In 1981, 1:250,000 and 1:50,000 mapping was conducted. This work was followed in 1982 by airborne Dighem and Questor Input AEM geophysical surveys conducted by Cominco and Redfern Resources Ltd., respectively. The 1:50,000 mapping work was originally published in 1984 and then in 1987 it was further refined and re-published for Cominco.

In 1987, ongoing discussions between Cominco and Redfern led to an agreement whereby Redfern acquired the right to earn up to a 40% interest in the Tulsequah Chief deposits. Redfern secured a 100% interest in 1992 and continued exploration until 1994. All work since 1994 has been focused on feasibility and permitting. Redfern has spent \$26 million on exploration, delineation drilling, metallurgical testing, environmental work, engineering design and feasibility studies on the property since 1987.

In 2000, Redfern Resources Ltd. became a wholly owned subsidiary of Redcorp Ventures Ltd.

## PROJECT SUMMARY

The Tulsequah Chief project, 100% owned by Redfern Resources Ltd., is a former base and precious metal producing mine hosting copper, lead, zinc, gold and silver mineralization. The project site is located in the British Columbia Coastal Mountain Range near the Alaska border, some 64 km northeast of Juneau, Alaska. Access to the property is currently by helicopter or fixed wing from Atlin or Juneau. Redfern is proposing a 160-km access road to be constructed from the minesite to the existing road near Atlin and operated as a restricted access road under the B.C. Mining Right-of-Way Act. The project will employ about 200 people. The crews will be flown in from either Vancouver, Smithers or Whitehorse and the workers will reside in a mine camp. Power requirements are estimated at about 12 MW. Redfern completed the required environmental review and received approval from the B.C. government in 1998. All permitting work on the project has been temporarily suspended following a June 28, 2000 decision by a B.C. Supreme Court judge which determined that the B.C. government had not provided sufficient opportunity for

consideration of concerns raised by the Taku River Tlingit First Nation prior to approving the project. The company and the B.C. government have appealed the decision.

Pursuant to the June decision, a court order has been obtained to allow re-consideration of the project and re-submission to the B.C. government for new project approval. A review process, focused on the aboriginal concerns, commenced in September, 2000. It is expected this process will culminate in a revised Project Committee Recommendations Report by early 2001 for consideration by the ministers.

## GEOLOGY, MINERALOGY AND ORE RESERVES

The Tulsequah Chief property is predominately underlain by folded, faulted and metamorphosed pre-Permian, volcano-dominated rocks of the Mount Eaton Group as well as intrusive rocks of the coast Plutonic Belt. The Tulsequah Chief property contains Kuroko-type volcanogenic massive sulphide deposits which are believed to have precipitated on the sea floor adjacent to fumaroles associated with felsic submarine volcanism. Sulphide mineralization consists of thin-banded to massive pyrite with lesser amounts of sphalerite, chalcopyrite and galena. The mineable ore reserve is estimated to contain 7.6 million tonnes grading 1.32% copper, 1.23% lead, 6.63% zinc, 2.51 grams/tonne gold and 105.2 grams/tonne silver. This reserve is open to expansion.

## PRODUCTION PLANS

Underground mine production is estimated at 2,466 tonnes per day over a minimum nine-year mine life. The proposed milling plan involves gravity concentration within the grinding circuit, followed by differential flotation to recover free gold and to produce separate copper, lead and zinc concentrates. It is estimated that in full production, the mine will deliver 52,620 ounces of gold and 2,655,000 ounces of silver per year. Concentrate would be hauled from Atlin, B.C. to port facilities in Skagway, Alaska.

Redfern met with smelter representatives in Asia and North America seeking buyers for the copper and zinc concentrates from the Tulsequah project and concurrently has been reviewing options for project financing. Letters are in hand from smelters in Japan and Canada expressing an interest in buying 100% of the bulk copper-lead, plus precious metal concentrates. Redfern is also conducting discussions with certain operating mining companies which have expressed an interest in participation, either through joint venturing or via corporate merger.

# UNITED KENO HILL PROPERTY

## United Keno Hill Mines Ltd.

President and Chief Executive Officer: Gerald Gauthier

### Corporate headquarters

8<sup>th</sup> Floor, 350 Bay Street  
Toronto, Ontario M5H 2S6

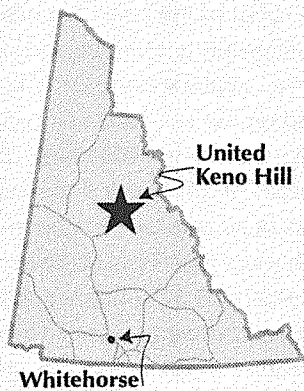
Phone (416) 943-1500  
Fax (416) 943-1600

### Elsa Mine

Elsa, Yukon Y0B 1J0

## PROJECT STATUS

Oh hold



### Location

Elsa

### Ownership

United Keno Hill Mines Ltd.

### Commodities

Silver, lead

### Ore type

Sulphide

### Mineable reserve

520,000 tonnes

Lead: 6.64%

Zinc: 4.95%

Silver: 1049 grams/tonne (32.77 ounces per ton)

### Geological resource

944,000 tonnes

Lead: 4.80%

Zinc: 3.90%

Silver: 930 grams/tonne

### Mining method

Underground, 365 days per year

### Processing method

Conventional mill, 365 days per year

## HISTORY

Silver and lead mineralization was first discovered on the property in 1903. Treadwell Yukon Company Limited acquired the better showings in the area and began shipping hand-cobbed ore in 1921. Treadwell mined the deposits from 1921 to 1941; a total of 1.5 billion grams of silver were produced during this time. In 1945, Frobisher Exploration Company Ltd. and Conwest Exploration Company Ltd. formed Keno Hill Mining Company Ltd. United Keno operated the mine from 1946 until 1988. A strike from September, 1980 to May, 1981 severely curtailed production. Low silver prices forced the mine to close from July, 1982 to August, 1983. In January, 1989, the mine was closed due to low silver prices. From 1946 to 1988 about 5.08 billion grams of silver were produced from the Hector-Calumet, Galkeno, Bellekeno, Elsa, Keno (No. 3 & 9), Lucky Queen, Silver King, Sadie-Ladue and Husky mines. In 1990, Archer, Cathro and

Associates mined over 100 tonnes of high-grade ore from open-pits on the Lucky Queen, Keno #3 and Keno #9 veins.

In July, 1990, BLM Mines Inc., a unit of Bharti Laamanen Mining Inc. (BLM) of Sudbury, Ontario, purchased the 44.8% interest in United Keno Hill Mines Ltd. formerly held by Falconbridge Ltd. In 1991, Romith Investments and Stephen Powell each acquired directly or indirectly, 50% of the issued and outstanding common shares of BLM. In September, 1993, United Keno Hill retained mine engineers Watts, Griffis and McOuat Ltd. (WGM) of Toronto to undertake a complete review of its Elsa area properties, geological reserves and mine plans. A surface drilling program was completed in the Silver King, Husky SW and Bellekeno areas during the summer of 1994. From mid-October, 1994 to April, 1995, underground drilling and rehabilitation were conducted on the Bellekeno and Silver King mines. A feasibility study on the property was

completed in October, 1996, and a merger with NDU Resources was completed in March, 1998. Since then, the company has attempted to raise financing to re-open the mine.

In 1999, United Keno Hill Mines applied for creditor protection. Various legal issues pertaining to United Keno Hill Mines are now before the court.

## PROJECT SUMMARY

The United Keno Hill silver vein deposits are located in Elsa, approximately 354 km north of Whitehorse. The property is owned by United Keno Hill Mines Limited (UKHM) and consists of several underground and open-pit silver-lead-zinc mines in the Keno Hill-Galena Hill area. The Elsa operations have been in production since the initial discovery of silver in 1906. Between 1947 and 1989, United Keno Hill Mines produced 148 million ounces of silver, 482 million pounds of lead and 4 million pounds of cadmium from the Elsa operations.

## GEOLOGY, MINERALOGY AND ORE RESERVES

More than 65 mineral deposits and prospects have been identified within the Keno Hill district. All of the mineable silver veins to date occur in an area 26 km long and one to 6.4 km wide. The deposits consist of mineralized vein faults 0.3 to 30 m wide in the Keno Hill quartzite. Underground mineable reserves, mostly in the Bellekeno and Silver King veins, stand at 520,000 tonnes grading 1049 grams/tonne silver (32.77 ounces/ton), 6.64% lead, and 4.95% zinc. Geological reserves are 944,000 tonnes grading 930 grams/tonne silver, 4.8% lead and 3.9% zinc.

## PRODUCTION PLANS

United Keno Hill Mines Ltd. has been conducting surface and underground exploration with the goal of increasing existing reserves to support an initial five-year mine life at a historic average grade of approximately 1,300 grams/tonne silver. The company hired Watts, Griffis and McOuat Ltd. of Toronto to oversee the 1994-1995 exploration programs and to undertake a complete review of its Elsa area properties, geological reserves and mine plans. A surface drilling program was completed in the Silver King, Husky SW and Bellekeno areas during the summer of 1994. From mid-October, 1994 to April, 1995 an underground drilling (\$5 to \$8 million) and rehabilitation program was

conducted on the Bellekeno and Silver King mines, which increased reserves at both mines. A Type B Water License from the Yukon Water Board was issued for this work. Water treatment facilities were constructed in the fall of 1994 for three of the mine sites, and the Bellekeno and Silver King mines are now substantially rehabilitated. New 5 kV lines and transformers provide a modern electrical system in each mine, and new compressors and re-engineered ventilation deliver the necessary underground working environment. The underground program was halted in April, 1995 to compile and assess the data and plan the next step.

In 1996, the company resumed the underground exploration and development program on the Bellekeno and Silver King Mines in an effort to increase reserves and establish mineable ore reserves. Environmental fieldwork and background data gathering also continued.

Rescan Engineering completed a feasibility study on the property in October, 1996. The feasibility study supports the company's view that it can reduce costs and increase efficiency. The effectiveness of the proposed mining methods and mine development strategies has been confirmed and the feasibility study suggests substantial improvement over historic operating costs and recoveries. United Keno Hill Mines adopted the recommendations of the feasibility study and, based on its conclusions, plans to implement a program of rehabilitation and development intended to permit the recommencement of commercial production from Elsa in 1998. In March, 1997, United Keno Hill Mines ceased work on the property pending raising capital.

In July, 1997, United Keno Hill Mines, NDU Resources Ltd., (Marg and Blende properties) and Yukon Gold and Mineral Development Company entered into letters of intent respecting the reactivation of UKHM's mines and mill at Elsa, and the evaluation of the merits of a joint operation between UKHM and NDU involving a common milling facility and related infrastructure utilizing UKHM's present facilities at Elsa. The agreement with Yukon Gold and Mineral Development was terminated in December, 1997, leaving NDU Resources and United Keno Hill Mines to complete their merger.

The Yukon Water Board issued a water license to United Keno Hill Mines in August, 1997. The water license has been signed by DIAND.

# WELLGREEN PROPERTY

## Northern Platinum Ltd.

President: John McGoran

### Corporate headquarters

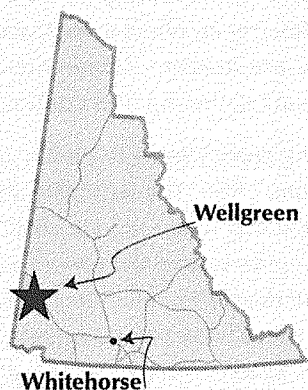
#206-837 West Hastings Street  
Vancouver, British Columbia V6C 3N6

Phone (604) 669-2066

Fax (604) 669-3522

## PROJECT STATUS

Exploration ongoing



### Location

125 km northwest of Haines Junction

### Ownership

Northern Platinum Ltd.

### Commodities

Copper, nickel, platinum, palladium

### Ore type

Sulphide

### Geological resource

50,032,466 tonnes

Copper: 0.35%

Nickel: 0.36%

Platinum: 0.54 grams/tonne

Palladium: 0.34 grams/tonne

### Mining method

Open-pit, 365 days per year

### Processing method

Conventional mill, on-site smelter

### Mine life

12 years

### Power

35 MW

## HISTORY

The Wellgreen deposit was discovered in 1952 by the Yukon Mining Corporation Limited and optioned to Hudson Bay Mining and Smelting Ltd. From 1952 to 1955, Hudson Bay explored with 4,267 m of drifting and raising from four levels, two internal shafts and 19,815 m of surface and underground drilling. The property was transferred in 1955 to Hudson-Yukon Mining Company Ltd. They conducted a Turam survey in 1968, drilled 762 m, prepared a feasibility study in 1969, and arranged a marketing agreement with Sumitomo in 1970. Due to underground problems, initial production from the 544 tonne/day mill was delayed from September, 1971 to May, 1972, and was suspended in July, 1973 after treating only 171,652 tonnes. Total production was 33,853 tonnes of concentrate grading 7.4% nickel and 6.6% copper.

The property was optioned in June, 1986 by the Kluane Joint Venture who carried out grid soil sampling,

mapping, prospecting, bulldozer trenching and test geophysical surveys. Hudson-Yukon was purchased by Galactic Resources Ltd. in June, 1986 and merged with All-North Resource Ltd. in November, 1986. In 1987, additional soil sampling, bulldozer trenching, geophysical surveys, underground rehabilitation and 4,932 m of diamond drilling in 45 holes were carried out. In 1988, the 4,250 level was rehabilitated and 34 underground holes were drilled totaling 5,500 m. On surface, bulldozer trenching and 37 holes totalling 6,073 m were drilled in addition to bulldozer trenching. Metallurgical tests and a preliminary feasibility study were carried out in 1988 and 1989.

J.P. Sheridan and Northern Platinum optioned the property in June, 1994 from All-North Resources. All-North Resources granted an option to earn an 80% interest to Sheridan in return for \$80,000 cash and a commitment to spend \$4 million on exploration by November 30, 2002. Sheridan, in turn, assigned the option to Northern

Platinum, retaining back-in rights for half of that company's interest at the feasibility stage. Sheridan is a director of Northern Platinum. Northern Platinum has been carrying out reserve evaluation drilling, underground sampling and exploration.

In the summer of 1999, Northern Platinum Ltd. received Vancouver Stock Exchange approval to purchase Kaiteur Resource Corp. (formerly named All-North Resources Ltd.) and J. Patrick Sheridan's 20% interest in the Wellgreen property for \$25,000 cash and 150,000 Northern Platinum shares. Northern Platinum now owns 100% interest in Wellgreen, subject to a 1.5% net smelter return in favour of Hudson Bay Mining and Smelting Co. Ltd. Upon completion of a positive feasibility study, Belleterre Quebec Mines Limited has the right to back into the project for a 50% interest upon paying 50% of Northern Platinum costs.

## PROJECT SUMMARY

The Wellgreen platinum group metal (PGM) rich, copper-nickel deposit is located in the southwestern Yukon, approximately 317 km northwest of Whitehorse and 125 km northwest of the town of Haines Junction. The property consists of 91 claims held under a renewable 21-year mining lease. An intensive underground sampling program took place on the Wellgreen deposit during the winter of 1997-98. The goal of the program was to determine the grade and tonnage of massive sulphides which could quickly be extracted if a mining operation was to commence.

## GEOLOGY, MINERALOGY AND ORE RESERVES

Mineralization on the Wellgreen property occurs within a variably serpentized, 20-km-long ultramafic body, known as the Quill Creek Complex, that intrudes Permian sedimentary and volcanic rocks. Three main zones of PGM-enriched copper-nickel mineralization have been

outlined on the Wellgreen property, the East Zone, the West Zone and the North Zone. Proven and probable reserves are estimated to be 50.03 million tonnes grading 0.35% copper, 0.36% nickel, 0.54 grams/tonne platinum, and 0.34 grams/tonne palladium.

Northern Platinum did not conduct any exploration on the property during 1995. During the 1996 program, a total of 57 holes were drilled. The drill results confirmed previous tonnage and grade calculations, and several zones of higher grade material were indicated. A mining plant, complete with compressors, generators, office facilities, bunk house and cook house facilities has been established near the portal of the adit.

During the summer of 1997, drilling took place on the Linda claims, southeast of the Wellgreen deposit. Assays over 1.3 m of massive sulphides returned average grades of 4.12% Ni, .89% Cu, .06 ounces/ton Pt and .043 ounces/ton Pd. The lower showing is disseminated to semi-massive sulphides over a width of 20 feet of broken rock ranging from 2.94% Cu and 3.02% Ni, with platinum and palladium assays as high as 0.13 ounces/ton Pt and 0.40 ounces/ton Pd. Drilling in the vicinity of the lower showing intersected sulphide mineralization grading 0.175 % Cu and 0.187 % Ni over 20 feet.

## PRODUCTION

A 1989 preliminary feasibility report by consultants Watts, Griffis and McQuat proposed open-pit mining at 10,000 tonnes per day (3.65 million tonnes per year) at an average stripping ratio of 3.5:1; processing by conventional mill producing a concentrate with approximately 15% combined copper and nickel as well as PGMs and the cobalt, gold and silver in the ore; and, a Noranda reactor type smelter to reduce the shipping cost. The smelter would produce a 40% copper-nickel matte on site. Capital costs were estimated at \$228 million and operating costs were thought to be about \$18.61 per tonne ore. The power requirements are expected to be about 35 MW and the project should employ 400 to 500 people.

# WOLF PROPERTY

## Atna Resources Ltd.

President and Chief Executive Officer: David Watkins

### Corporate headquarters

#1550, 409 Granville Street  
Vancouver, British Columbia V6C 1T2

Phone (604) 684-2285

Fax (604) 684-8887

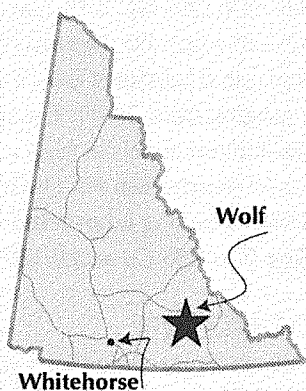
Toll free 1-800-789-ATNA

E-mail atna@atna.com

Web site www.atna.com

## PROJECT STATUS

Exploration planned



### Location

90 km southeast of Ross River

### Ownership

Atna Resources Ltd. (65%) and  
YGC Resources Ltd. (35%)

### Commodities

Zinc, lead, silver

### Ore type

Sulphide

### Inferred resource

4.1 million tonnes

Zinc: 6.2%

Lead: 1.8%

Silver: 84 grams/tonne

## HISTORY

The first recorded discovery of mineralization on the Wolf property was in 1955, but it wasn't until 1966 that Newmont Mining Corp. staked claims, constructed a tote road and carried out mapping, soil sampling and hand trenching. Hesca Resources Ltd. restaked the property in 1972 and drilled two X-ray holes in 1974. Newmont and Asamera restaked in 1976 and explored in 1977 and 1978 with geochemical, geophysical and mapping surveys, trenching and drilling. Amax, who transferred its interest to Canamax Resources in 1982, staked in 1982 and carried out surface work in 1983.

YGC Resources Ltd. staked the Wolf claims in 1990 and Cominco surrounded the Wolf claims a few days later with the Fox claims. YGC tied on the Lynx claims in 1991. Later in 1991, Cominco optioned the Wolf and Lynx

claims from YGC and performed mapping, geochemistry and geophysics. The option was dropped and in 1995, YGC then optioned the Wolf claims to Atna Resources. Atna carried out lithochemical sampling and reconnaissance geological mapping in 1995 and 1996, followed by three diamond drill holes (399 m) in 1996. The three holes intersected significant, but subeconomic zinc, lead and silver. In 1997, Atna carried out a C\$400,000 drill program (nine holes, 2,956 m) and intersected massive sulphide mineralization. Continued drilling (30 holes, 6,625 m) in 1998 located the down-dip extension of the mineralized upper horizon. A total of 31 diamond drill holes over a 600 m strike length and a 500 m down-dip width into the deposit have been completed. The property was dormant in 1999 and 2000. Atna has completed its option requirements (65% interest for expenditures of \$1.5 million over a five-year period).

## PROJECT SUMMARY

The Wolf property is located approximately 90 km southeast of Ross River, Yukon, on NTS map sheets 105G/5 and 6 in the Finlayson Lake volcanogenic massive sulphide camp. The property is 45 km west of Cominco's Kudz Ze Kayah deposit and 65 km from the Wolverine deposit. The property, as of early 1999, consists of 23 mineral claims covering an area of 481 hectares. Access is by helicopter from Ross River or from the Hoole airstrip, located on the Hoole River, 22 km north of the property.

## GEOLOGY, MINERALOGY AND ORE RESERVES

The Wolf property is underlain by Devonian to Mississippian volcanic rocks, including felsic tuffs, pyroclastic flows, trachyte flows, mudstones, and carbonates which form an arcuate belt nearly 5 km wide and 130 km long. The belt lies within the Pelly Mountains and hosts numerous volcanogenic massive sulphide showings.

The Wolf deposit is hosted in one of four stratigraphic levels of volcanogenic massive sulphide and exhalative barite mineralization. Sulphide mineralogy consists of pyrite, sphalerite, galena and rare chalcopyrite. Selenium is not present in the Wolf mineralization. The deposit is a tabular massive sulphide horizon across a 600 m strike length and approximately 500 m in the down-dip direction. Most of the mineralization is hosted in a higher grade "keel" that has a strike length of 125 m, a down-dip length of 400 m, an average thickness of 12 m and dips 45 degrees to the south. The stratigraphy may have been overturned.

The Wolf deposit has an inferred resource of 4.1 million tonnes grading 6.2% zinc, 1.8% lead and 84 grams/tonne silver.

The Wolf deposit is open along strike and down-dip. Discovery of the East Slope Zone, 1,200 m east of the Wolf deposit has enhanced the exploration potential of the property. Additional drilling will be required to determine the potential of the discovery and the intervening area between the Wolf deposit and the East Slope Zone.



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