Crystal Peak
82ESW 102
Property File

001595

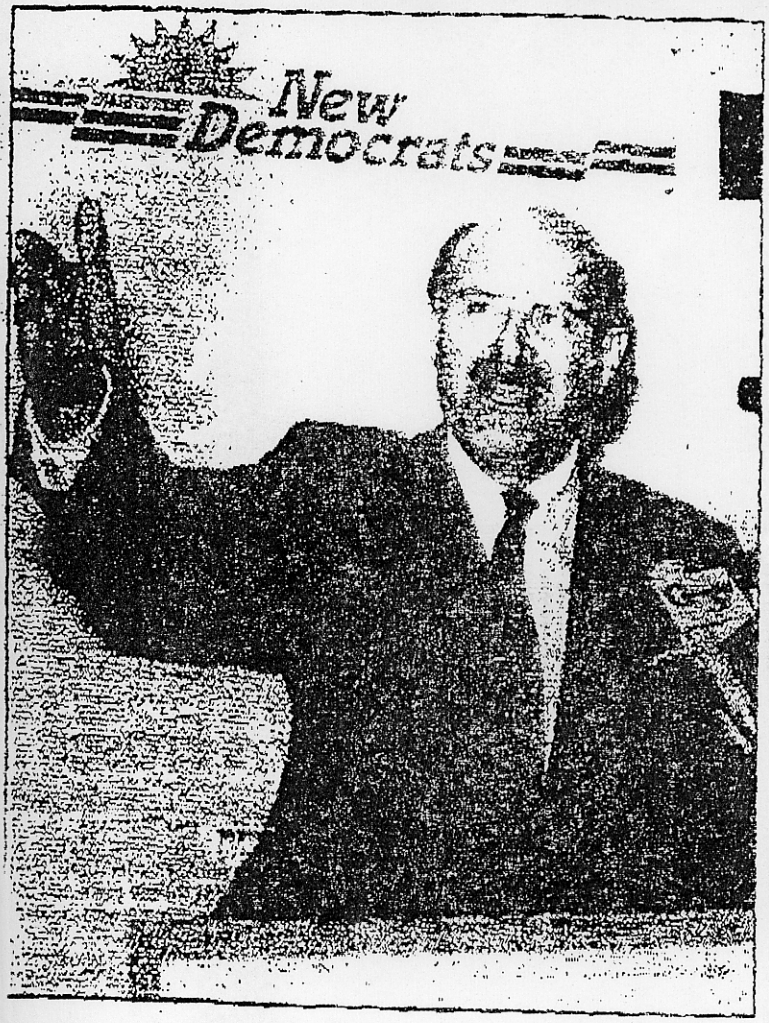
NDP would halt mine

Project doesn't belong in park, says Harcourt

By HARVIE GAY
Penticton Herald Staff

A provincial NDP government would prevent a garnet mine in the Apex recreation area and would push for additional measures to protect Okanagan Lake from pollution, New Democrat leader Mike Harcourt said here Wednesday.

In a pre-election campaign speech promising a common sense, honest and open government, Harcourt also said it is unfair that Penticton should have to absorb the costs of extra policing over the Peach Festival and B.C. Day Holiday weekends.



Penticton Herald/Rob Mullin

Mike Harcourt, provincial NDP leader, addresses a "town meeting" Wednesday night at the Penticton Inn. Harcourt, along with local NDP candidate Jim Beattie, spoke to a crowd of about 230 people.

He criticized Solicitor General Ivan Messmer, Socred MLA for Boundary-Similkameen, for an apparent about-face in declining to pick up that bill.

Messmer, "who for only a few weeks more is going to be solicitor general," should remember one of the famous qualities of former Socred Premier W.A.C. Bennett and take a second look, Harcourt told a receptive audience of 230 at a meeting at the Penticton Inn.

In a declaration of support for preservation of farm land, Harcourt promised a strengthening of the Agricultural Land Commission and an end to appeals to cabinet to eliminate the practice "of building condominium developments disguised as golf courses."

He said the NDP would never allow any mining development in a park or wilderness area, which would rule out the controversial project planned by Polestar Exploration Inc. on Mount Riordan near Apex ski resort.

He also pledged to work with area communities to build sewage treatment plants to halt pollution of Okanagan Lake and to assist them with water treatment to eliminate periodic outbreaks of giardiasis lambia, or beaver fever.

Harcourt said the upcoming election will be about choices: "a continuation of the Vander Zalm-Rita Johnston administration or a new government that looks to the future and represents all British Columbians, not just a few friends on the inside."

Harcourt said he is not promising any miracles because there are limits to change and what can be done. But in most cases miracles are not needed, he said, just common sense.

"The NDP's platform will be doable, affordable and what mainstream British Columbians want to see done to improve the province," he said.

An NDP government would live with its means, with balanced budgets and residents would get full value for their tax dollars, he said.

"It'll be good old fashioned, efficient, equitable, getting-your-spending-priorities-right," sort of government, he said.

In a wide-ranging speech, in which he fielded about 20 questions from the floor, Harcourt pledged a doubling of parks and wilderness areas; negotiation of a "just and honorable" settlement with the aboriginal peoples of the province; more affordable housing and a roll back of unconscionable rent hikes; equality for women in the workforce; stronger measures to protect women from violence, a repeal of unfair labor laws, and one of the toughest conflict-of-interest laws in Canada for politicians.

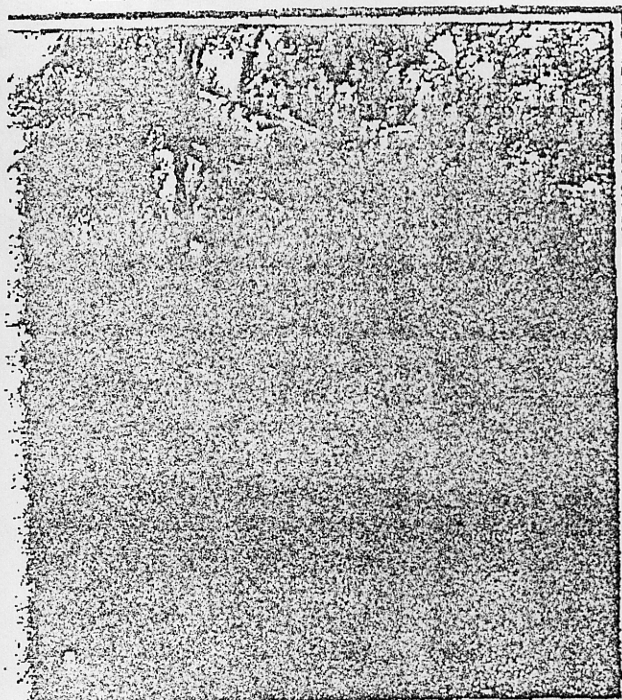
He also pledged a stable business climate with no tax surprises and reiterated his commitment to balanced budgets.

Harcourt said he favors some lottery proceeds going to finance health care.

He also said issues such as location of a cancer clinic in the Interior should be based on intelligent decisions on what are in the best interests of the people instead of a politics.

TOTAL P.02

LOCAL NEWS



Penticton Herald/Rob Mullen

...week at the Knights of Columbus housing project site off South Main Street.

...from one woman ...are currently in ...cause there is no ...amily to live, and a ...iving in a tent with ...cause of the lack of ...ly housing.

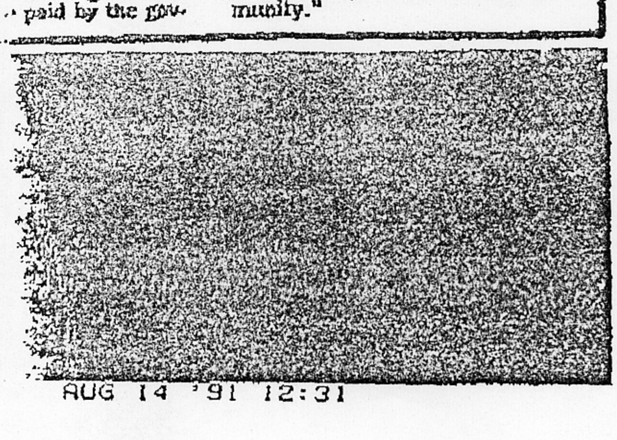
...bad that somebody ...a couple of years ...id, noting there are ...no are living in de...tions. "We didn't ...re are as many sad ...re. We didn't real...

...ubsidized housing ...rs will pay only a ...per cent of their ...housing. The re... paid by the government.

The cost of the project is split between the two levels of government, with the province picking up one-third of the cost and the federal government the remaining two-thirds.

Berry noted the Christopher Housing Society leases the housing project from the government and is responsible for paying the mortgage. The society plans to hire a part-time administrator and full-time caretaker for the project.

Berry is optimistic the project will be a success. "We're going to do everything in our power to make it a good part of the community."



Garnet decision unlikely before election called

By JOHN MOORHOUSE
Penticton Herald Staff

A provincial government decision on the proposed garnet mine at Mount Riordan probably won't be made before the next provincial election.

Following a helicopter flight to the Apex area Tuesday, Jack Weisgerber, Minister of Energy, Mines and Petroleum Resources said it will be some time yet before cabinet makes a final decision.

Polestar Exploration Ltd. of Vancouver wants to develop an open pit garnet mine on Mount Riordan, located within the Apex Recreation Area.

However, the mine is being opposed by the owners of the nearby Apex-Alpine ski resort and the group SARA (Save Apex Recreation Area).

Weisgerber, Environment Minister Dave Mercier and Tourism Minister Howard Dirks toured the proposed mine site with Polestar and Apex-Alpine officials Tuesday afternoon. A later meeting with a SARA representative was also held.

Weisgerber told reporters that the mine development review process will be complete "sometime within the next few months" and brought before cabinet.

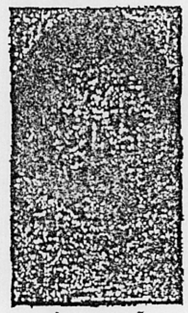
However, the mines minister wouldn't confirm that the decision will wait until after the provincial election, noting that it depends on when the election is called.

He also stated that "some relatively small environmental concerns" would have to be dealt with, and a public meeting must be held.

But speculation is that Premier Rita Johnston will call the province-wide vote within the next few weeks. The government's maximum five-year mandate expires Oct. 22.

Meanwhile, Weisgerber said the tour of the proposed mine site gave the three ministers a good overview of the situation.

"We're not here to make the decision. We're here to look at and weigh the factors, and meet with the people involved," he said.



Guerard

Weisgerber

Despite the apparent conflict between mining and recreation, Weisgerber suggested that speaking in a broad sense, the two may not be incompatible. "I think the question is location and what other activities there are within the recreational area," he said.

However, SARA spokesman Doug Guerard disagreed.

"We still take the stand that mining and recreation are not compatible — that there is not room for both in that area," he said following a meeting with the ministers.

Polestar Exploration, through its subsidiary Crystal Peak Mining Corp., wants to mine 60,000 tons of industrial grade garnet a year at Mount Riordan.

This spring it submitted its Stage One report on the project to mine development steering committee. The report describes the proposed mine and milling operation and outlines Polestar's efforts to minimize noise and dust problems.

Polestar spokesman David Pow said the firm feels it has addressed the environmental concerns and compromised on the visual impact of the mine, by relocating the proposed quarry and mill sites.

The government is still compiling reaction and further input on the Stage One report.

No commitment from

CIM Paper Presentation (?)

A MASSIVE SKARN-HOSTED ANDRADITE DEPOSIT NEAR PENTICTON, BRITISH COLUMBIA

April 2, 1991

Helen C. Grond, Chief Geologist, M.Sc., Polestar Exploration Inc.

Robert Wolfe, P. Eng., Vice-President, Polestar Exploration Inc.

Joseph H. Montgomery, Ph.D, P.Eng., President, Polestar Exploration Inc.

Gary H. Giroux, P.Eng., Montgomery Consultants Ltd.

701-675 W. Hastings St. Vancouver, B.C. V6B-1N2

082 E SW 102
Property File

ABSTRACT

Crystal Peak Garnet Corporation is in the permitting stage of developing the largest known, highest grade garnet deposit in the world. The deposit is located near Penticton, British Columbia, and consists of mainly andradite garnet in a skarn environment. Drill indicated reserves total 40 million tonnes of about 80% garnet in three zones, with additional geological reserves of 60 million tonnes. Detailed drilling in the proposed pit area defined 3.35 million tonnes of 81.3% garnet. At the proposed operating rate of 60,000 tonnes per year, it is expected that Crystal Peak will soon be the world's largest garnet producer.

Garnet is an important industrial mineral. Its high density, angularity, hardness and non-toxicity make it an excellent product for many abrasive applications and other uses. However, currently available garnet products are relatively expensive: Idaho garnet sells for about US$160-260/ton FOB minesite. Because of the size and purity of the Crystal Peak deposit, it is expected that production costs will be low enough to capture a significant share of existing markets as well as allow development of markets previously inaccessible because of garnet's historically high cost.

INTRODUCTION

Crystal Peak Garnet Corporation, a wholly-owned subsidiary of Vancouver-based Polestar Exploration Inc., is in the permitting stage of developing a large, high grade deposit of skarn-hosted andradite garnet near Penticton, British Columbia. Drilling conducted in 1989 and 1990 indicated 40 million tonnes of about 80% garnet in three zones, with additional geological reserves of 60 million tonnes. Detailed drilling in the proposed pit area has defined 3.35 million tonnes of 81.3% garnet.

The deposit has excellent potential for development. Elevations are moderate, ranging from 1900 to 2100 m.a.s.l. Road access and power lines are already in place because of nearby mining and recreational developments. All supplies, facilities and manpower requirements are available in the nearby communities of Penticton and Keremeos.

Capital pre-production costs are estimated at approximately $3,000,000. The construction phase of the project, scheduled for June 1991 (depending on permitting), is estimated to require six months to complete.

The Crystal Peak deposit is larger and of higher grade than any garnet deposit currently mined anywhere in the world. At the proposed operating rate of 60,000 tonnes

per year, it is expected the Crystal Peak deposit will be the world's largest producer.

GEOLOGICAL SETTING

The Crystal Peak deposit comprises much of Mt. Riordan, within the Intermontane Belt of the Canadian Cordillera. The major rock units in the area are members of the Late Triassic Nicola Group. Early Jurassic intrusions are fairly common, and are represented in the area by the Bromley Batholith and Cahill Creek Pluton.

The Crystal Peak skarn deposit is the most easterly of a series of skarns which includes the presently operating Nickel Plate Mine and the old French and Goodhope mines. The composition of the skarns varies from high arsenic and gold with low garnet in the western part of the series to high garnet with low gold and no arsenic in the eastern part at Crystal Peak (Ray and Dawson 1988; Ray et al. 1988).

The Crystal Peak garnet deposit is unusual in that it is very large and of very high grade. The surface extent of the garnet body is 300x800 m, including three major zones of particularly high grade (North, South, and West Zones). Cliff exposure and drilling indicate high grade garnet at considerable depths: one drill hole intersected high grade garnet at a depth of 200 m. Replacement of limestone by garnet is almost complete: only one small limestone lens was observed in a drill hole (Grond and Wolfe 1991).

Diopside (clinopyroxene) is the most common accessory mineral. In most cases, the diopside has been partially altered to actinolite, sericite and epidote. Quartz, epidote and occasionally sphene occur in relatively low quantities. Calcite content is also relatively low, occurring in small veins near the top of Mt. Riordan and as interstitial blebs up to 3 cm across. Magnetite, hematite and various sulphides including pyrite, pyrrhotite and rarely chalcopyrite occur in very minor amounts throughout the deposit. Average values for accessory minerals in the North Zone deposit are as follows:

Diopside - 10.94%
Quartz - 2.46%
Calcite - 1.83%
Actinolite, epidote, sericite - 4.67%
Feldspar - .03%
Sphene - .064%
Apatite - .06%
Opaque - .44% (magnetite and minor sulphides)

Garnet occurs as massive garnetite or coarsely crystalline aggregates, locally showing growth zonation. Red-brown, green, and pink-orange are the most common colours although buff and black varieties have been noted.

Microprobe analyses show the garnet to be about 90% andradite ($Ca_3Fe_2Si_3O_{12}$) and 10% grossularite ($Ca_3Al_2Si_3O_{12}$). Andradite and grossularite form a solid solution series with Fe and Al being interchangeable. To a lesser extent Mg or Mn can substitute for Ca.

A granodiorite contact at the eastern edge of the skarn is well exposed. In addition, small diorite remnants are scattered in a broad zone through the centre of the skarn. The

diorite remnants are believed to have had some influence on skarn formation: samples of adjacent massive garnetite rock have distinct relict intrusive textures.

GRADE DETERMINATION

Since garnet content cannot be determined by conventional assay techniques, a variety of different methods was employed. Both visual estimates and thin section analyses were used to estimate garnet content in the drill core. Representative samples (532 in total) were selected for thin section analyses during core logging. In general, thin section analyses corresponded remarkably well with visual estimates.

Two additional methods of grade determination were employed to check results - thin section analyses of crushed mixed core and heavy liquid separation. All methods correlated well and final results were judged to be accurate within a percent or two.

RESERVE CALCULATIONS

Simple reserve calculations for the entire deposit have been generated based on average garnet content in drill holes. Surface dimensions were derived by results of detailed surface sampling and mapping to outline exposed areas of high grade garnet-bearing rock. An average specific gravity of 3.5 was used to determine tonnage.

A total of approximately 40,000,000 tonnes of about 80% garnet was calculated based on modest depths (less than 100 m). An additional 60,000,000 tonnes of possible geological reserves are indicated. This is based principally on extended depth, as drill hole data and cliff exposures indicate that the deposit is much deeper than cut-off depths used in calculations.

Detailed reserve calculations have been made for the proposed quarry in the North Zone (Giroux 1991). Semi-variogram analysis indicates an isotropic structure for garnet, with a horizontal range of 120 m. The nugget effect is less than 10% of the sill value so estimation errors are relatively low.

Blocks 20 x 20 x 5 m were estimated by ordinary kriging and show reserves in the North Zone of 3.35 million tonnes averaging 81.3% garnet at a 64% garnet cutoff between levels 2025-2085 m. The current pit outline in this zone contains 1.93 million tonnes of 80%

garnet or 25 years production at 75,000 tonnes per year (60,000 tonnes finished product).

MARKETING

Current world production of garnet is estimated at 100,000 tonnes annually, with North American production being about 50,000 tonnes produced from two mines - one in New York and the other in Idaho. Other important producers are Australia and India, and recent reports indicate that pilot plant testing is being conducted in Montana and California. North American consumption is estimated at about 46,000 tonnes annually.

Garnet's main applications are:

- Abrasive blast cleaning
- Abrasive waterjet cutting
- Water filtration
- Bonded and coated abrasive products
- High density aggregate
- Wear resistant surfaces

The first four uses listed above probably account for about 90% of North American garnet consumption.

The most promising future market for garnet is in abrasive blast cleaning. In North

America alone, 5,000,000 tonnes of blasting abrasives are used each year, with west coast consumption estimated to be at least 500,000 tonnes. The market is currently dominated by silica sand and smelter and coal slags, with garnet consumption being on the order of only 20,000 to 30,000 tonnes. Garnet has a good chance of increasing its market share, however, because of serious health concerns about silica (which is linked to silicosis) and some slags (which commonly contain toxic heavy metals which can endanger workers and contaminate landfills after disposal).

Garnet's success in winning a market share in the abrasive blast cleaning industry to date has been limited by two factors: relatively high price (averaging about US$230/ton compared to sands and slags costing US$50-US$100/ton) and limited availability. Despite this, from 1983 to 1988 garnet consumption in all markets increased by 50% in the United States and in the last five years has tripled in the rest of the world.

Strong future markets are developing in Japan and Europe for garnet in the blast cleaning industry. This is as a result of health and environmental risks associated with silica sand and slags. The use of silica is banned in most European countries and current demand is filled primarily with slags. Extremely high disposal costs are causing consumers to look for alternatives. Garnet is receiving considerable attention for several reasons including its ability to be reused several times in blast cleaning thus reducing disposal costs by reducing the amount of waste produced.

An increasingly important market for garnet is in abrasive waterjet cutting. The market for garnet in this sector is increasing at a rate of 30% per year and annual consumption is estimated at 20,000 tonnes. Customers are currently paying between US$300 and US$600/ton for garnet product. This market is very price sensitive as garnet represents 70% of the hourly operating cost of the process.

Extensive testing of the Crystal Peak garnet products has been done under both laboratory and field conditions. The quality of the product is excellent and it performs very well in both sandblasting and waterjet cutting applications. Continued testing will be carried out for numerous other industrial applications.

Both demand and price outlook for garnet products are very positive. Given recent growth rates in garnet consumption, it is reasonable to predict the world market could require another 200,000 tonnes annually within five years at the present high price structures. If garnet could be sold in the US$100/ton range (Crystal Peak Garnet's projected price for sandblasting grit), it is estimated the blast cleaning industry in the western United States alone could consume more than 200,000 tonnes annually.

CONCLUSIONS

Crystal Peak Garnet Corporation is in the permitting stage of developing the largest known, highest grade garnet deposit in the world. The deposit is located near Penticton,

British Columbia, and consists of mainly andradite garnet in a skarn environment. Drill indicated reserves total 40 million tonnes of about 80% garnet in three zones, with additional geological reserves of 60 million tonnes. Detailed drilling in the proposed pit area defined 3.35 million tonnes of 81.3% garnet. At the proposed operating rate of 60,000 tonnes per year, it is expected that Crystal Peak will soon be the world's largest garnet producer.

Garnet is an important industrial mineral with rapidly expanding markets in spite of its currently high price relative to available alternatives. Because of the size and purity of the Crystal Peak deposit, it is expected that production costs will be low enough to capture a significant share of existing markets as well as allow development of markets previously inaccessible because of garnet's historically high cost.

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Energy, Mines and Resources Canada | Énergie, Mines et Ressources Canada

CANMET

Canada Centre for Mineral and Energy Technology | Centre canadien de la technologie des minéraux et de l'énergie

GEOLOGY, MINERALOGY AND PROCESSING OF MOUNT RIORDAN GARNET ORES

G.I. Mathieu and M.R. Boisclair
Mineral Processing Laboratory

R. Wolfe
Polestar Exploration Inc.

November 1990

For presentation at FORUM '91, Geology of Industrial Minerals Banff, Alberta, Canada - May 5-9, 1991 and for publication in the proceedings.

Project: 30.13.05
Beneficiation of Industrial Minerals

MINERAL SCIENCES LABORATORIES
DIVISION REPORT MSL 90-99 (OP&J) DRAFT

GEOLOGY, MINERALOGY AND PROCESSING OF MOUNT RIORDAN GARNET ORES

by

G.I. Mathieu*, R. Wolfe** and M.R. Boisclair***

ABSTRACT

An exceptionally large, high-grade garnet skarn deposit has been discovered by Polestar Exploration Inc., on the Crystal Peak property located on Mount Riordan, south central British Columbia. The deposit outcrops extensively over an area of approximately 800m X 300m. Three high grade zones averaging almost 80% garnet have been outlined by diamond drilling. Indicated reserves from the 1989 drilling program stand at approximately 40,000,000 tonnes. The three zones, namely, South, West and North have excellent potential for development.

Examination of samples from Crystal Peak property has indicated garnets of two main types, namely, (i) one rich in andradite and (ii) the other high in grossularite. POLESTAR has submitted to CANMET bulk samples originating from various zones for detailed mineralogy and beneficiation studies. In this paper, we will report the investigation of both the andradite-rich and the grossularite-andradite occurrences. These were characterized with respect to mineral composition, specific gravity, magnetic susceptibility and degree of liberation of the minerals. The data obtained have led to the development and the testing of flowsheets for the beneficiation of the garnet to marketable grade. The processes will be described in detail along with the parameters of operations. An evaluation of the garnet products will be given.

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*Research Scientist and ***Technologist, Energy, Mines and Resources, CANMET, 552 Booth St., Ottawa, Ontario, K1A 0G1.
**Vice-president, Polestar Exploration Inc., 701-675 West Hastings St., Vancouver, British Columbia, V6N 1N2.

GEOLOGY, MINERALOGY AND PROCESSING OF MOUNT RIORDAN GARNET ORES

INTRODUCTION

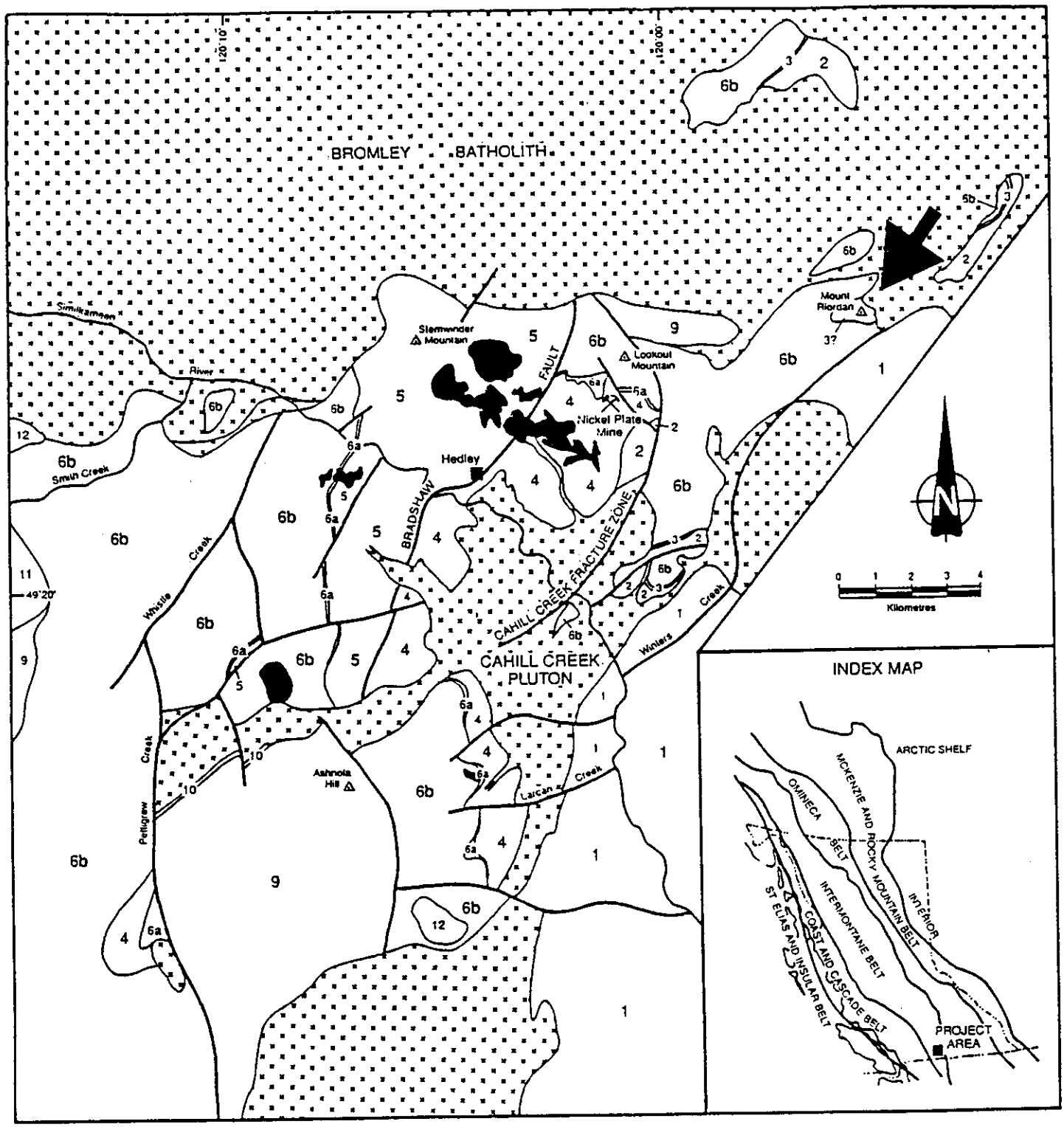
The Mount Riordan garnet skarn deposit is located in the Hedley district, Osoyoos Mining Division, south central British Columbia. The property is mostly covered by the Apex Recreation area, which was opened to staking on April 17, 1989.

During the late summer and fall of 1989, a program of geological mapping and diamond drilling was carried out by Polestar Exploration Inc. on the Crystal Peak prospects on Mount Riordan. The purpose was to outline high grade garnet bodies suitable for open-pit quarrying. Bulk samples were submitted to the Canada Centre for Mining and Energy Technology (CANMET) for beneficiation studies and flowsheet development.

REGIONAL AND PROPERTY GEOLOGY

The Crystal Peak property lies within the Intermontane Belt of the Canadian Cordillera (Figure 1). The major rock units in the area are members of the Late Triassic Nicola Group. Early Jurassic intrusions are fairly common, and are represented in the area by the Bromley Batholith and Cahill Creek Pluton. The area was mapped and described in detail by Dr. G.E. Ray et al. from the B.C. Ministry of Energy, Mines and Petroleum Resources (Paper 1988-1) (1).

The Mount Riordan deposit is the most easterly of a series of skarns, which includes the presently operating Nickel Plate Mine and the old French and Goodhope mines. The composition of the skarns varies from high arsenic and gold-low garnet in the west to high garnet-low gold-no arsenic in the east, i.e., the Mount Riordan region. This skarn has peculiar features which are summarized in Table 1 (2).



LEGEND

TERTIARY

12 — Basaltic flows

EROSIONAL UNCONFORMITY

EARLY CRETACEOUS

11 — VERDE CREEK INTRUSION – *granite and microgranite*

10 — RHYOLITE INTRUSION – *quartz porphyry*

9 — SPENCES BRIDGE GROUP – *andesitic to dacitic pyroclastics and flows with minor sediments*

CONTACT UNCERTAIN

EARLY JURASSIC

8 — BROMLEY BATHOLITH AND CAHILL CREEK PLUTON – *granodiorite to quartz monzodiorite*

7 — HEDLEY INTRUSION – *quartz diorite, diorite, and gabbro*

NICOLA GROUP

LATE TRIASSIC

6b — WHISTLE CREEK FORMATION – *bedded to massive ash and lapilli tuff, minor tuffaceous siltstone*

6a — Copperfield Conglomerate – *limestone boulder conglomerate*

5 — STEMWINDER MOUNTAIN FORMATION (WESTERN FACIES) – *thinly bedded argillite and limestone*

4 — HEDLEY FORMATION (CENTRAL FACIES) – *thinly bedded siltstone, thick limestone beds and minor tuffs*

3 — FRENCH MINE FORMATION (EASTERN FACIES) – *limestone, limestone breccia and pebble conglomerate*

2 — PEACHLAND CREEK FORMATION – *basaltic ash tuffs and flows with minor limestone and chert-pebble conglomerate*

CONTACT OCCUPIED BY CAHILL CREEK PLUTON

PALEOZOIC

1 — APEX MOUNTAIN COMPLEX – *ophiolite sequence of cherts, greenstones, siltstones, argillites and minor limestones*

Figure 1.

POLESTAR EXPLORATION INC.

Crystal Peak Garnet Deposit

Regional Geology

(by Ray et al)

Table 1 - Characteristics of Mount Riordan Skarn

Skarn mineralogy	Massive, garnet-dominant skarn. Crystalline garnet with highly variable colour.
Degree of skarn overprinting	No sedimentary structures preserved.
Skarn metallogeny	W, Cu, Ag
Skarn-related intrusions	Associated with I-Type granodiorites that do not resemble the Hedley intrusions.
District hostrock geology	Massive limestone

The Crystal Peak property consists of 1, 24 unit 1-post claims and 2 reverted crown grants. In addition, 2 single unit claims, the Lake 1 and 2, have been purchased for a potential plant site. Claim information is as follows:

Table 2 - Claims of Crystal Peak Property (3)

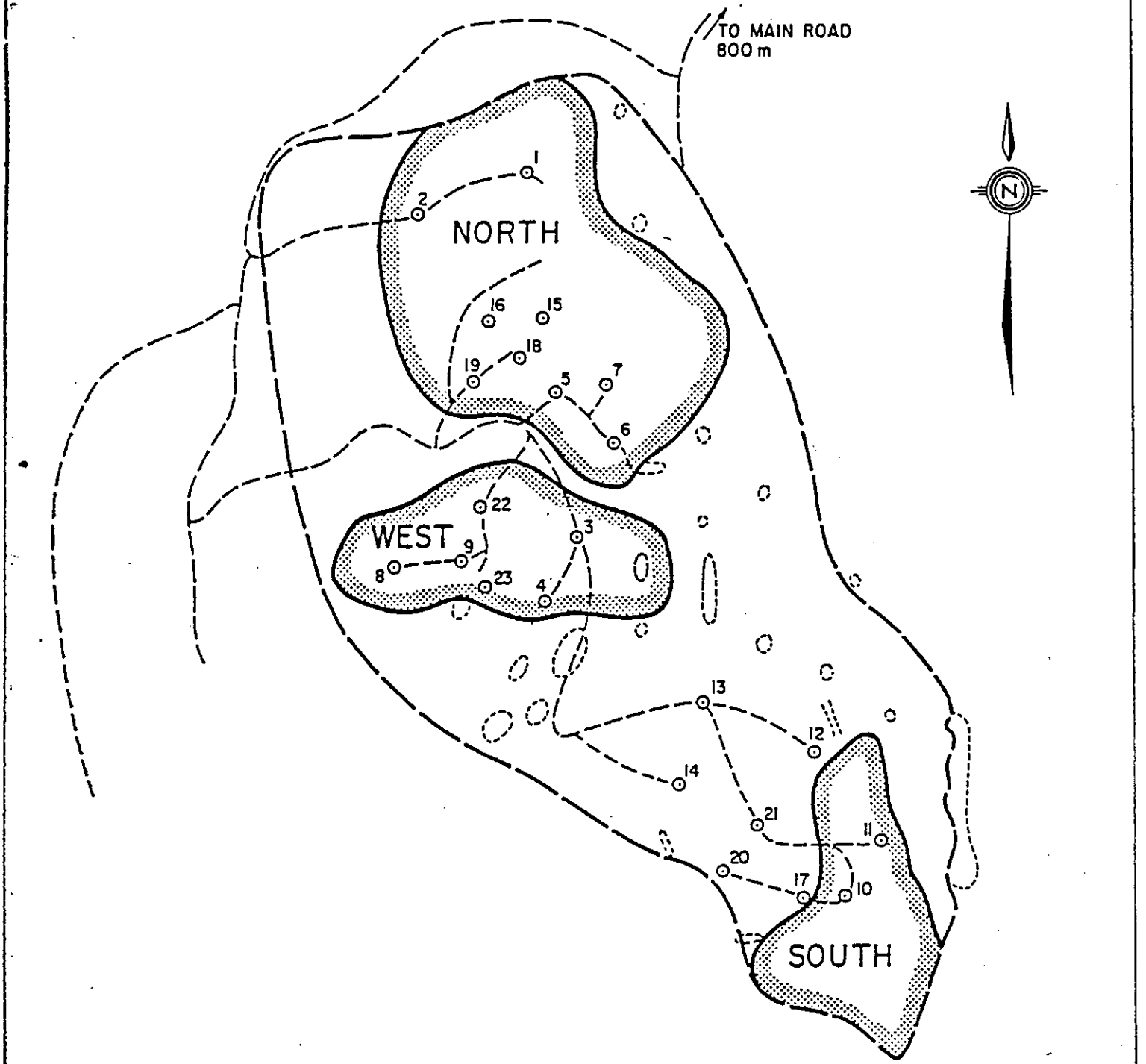
Type	Name	No. of Units or Acreage	Recording Date
Located	KE8674	24 Units	April 18, 1989
Crown-Granted	Billy Goat (L3122)	34.62 Acres	Sept. 15, 1898
Crown-Granted	Shamrock (L3123)	10.54 Acres	July 13, 1899
Located	Lake 1 (797)	1 Unit	July 30, 1979
Located	Lake 2 (798)	1 Unit	July 30, 1979

Detailed geological mapping was carried out at a scale of 1:1000 over Mt. Riordan. Outcrop exposure is generally excellent, especially on the boundaries of the garnet body where cliff faces tend to predominate. The main reason for the good showing is the resistive nature of the garnetite. Several areas of low-lying overburden covered ground were also tested by drilling, as no outcrop was present. These areas tended to consist primarily of meta-diorite and sedimentary units.

The "skarnification" or replacement of limestone to garnet is almost complete. No limestone is found on the property and none of the original sedimentary structures have been preserved. Diopside (a clinopyroxene) is the most common accessory silicate. Quartz, epidote and actinolite occur in relatively low quantities. Calcite content is also relatively low, occurring in small veins near the top of the mountain and occasionally as interstitial blebs 1.3 mm across.

Garnet occurs either as massive garnetite or coarsely crystalline, often showing growth zonation. The garnet minerals are andradite and grossularite. Red-brown, green, and pink-orange are the most common colours, although buff and black varieties have been noted.

Relative to other garnet-rich skarns, this deposit appears to be very large. Garnet-rich outcrop occurs intermittently over an area 800 m x 300 m. Diamond drilling indicates that the garnet body has a minimum depth of 300 m. This is based on the distance between the uppermost exposure of garnet at the peak to the lowest intersection of garnet in the deepest hole. In areas of almost continuous outcrop, three major high-grade zones (60%-100% garnet) occur. These areas are identified as the North, South and West zones in Figure 2, which also shows the 23 drill holes of the mineral-searching programs (3).



LEGEND

- HIGH GRADE ZONES (80% GARNET)
- DIORITE/GRANODIORITE OUTCROP
- DIAMOND DRILL HOLE
- OUTLINE OF GARNET BODY
- ROAD

m 0 50 100 150 200 250 m

Figure 2.

POLESTAR EXPLORATION INC.

CRYSTAL PEAK GARNET DEPOSIT

IDEALIZED GEOLOGY & DIAMOND DRILL HOLES

DIAMOND DRILLING, RESERVES AND MINERAL CONTENT

A total of 1,020 metres was drilled over 23 holes. Out of these, 17 hit high-grade garnet in the North, West and East zones. Reserves in these were calculated by multiplying the average garnet content by the drill core length and the surface dimensions outlining high-grade garnet-bearing rock, and assuming a density of 3.5 tonnes per cubic metre, as shown in Table 3.

Table 3 - Estimation of Garnet Tonnage and Grade in North, West and South Zones (3)

Zone	Average Garnet Grade	Approximate Surface Area in Metres	Depth in Metres	Drill Indicated Reserves (1,000,000 tonnes)
North	80%	350 x 200	73	17.8
West	78%	300 x 124	91	11.8
South	77%	270 x 124	91	10.7

Some variation has been noted between the main zones. In particular, the South zone garnetite varies significantly from the North and West zones which are similar. The garnet in the South zone is generally coarsely crystalline (up to 1 cm) and has a distinctive pink-orange or salmon colour. The garnetite is exposed in a series of cliffs up to 300 feet high on the southern boundary of the deposit. The most common accessory mineral is coarse-grained radiating actinolite crystals up to 5 cm long. A 3 to 5 m wide band of massive calcite/epidote, striking roughly east-west occurs just south of Drill hole No. 10.

The North and West zones consist primarily of dark green garnet which is extremely variable in grain size. Coarse garnet is often intimately associated with very fine grained garnet giving a "blotchy effect". The most common accessory mineral is diopside; it generally occurs in patches that can grade up to 100%.