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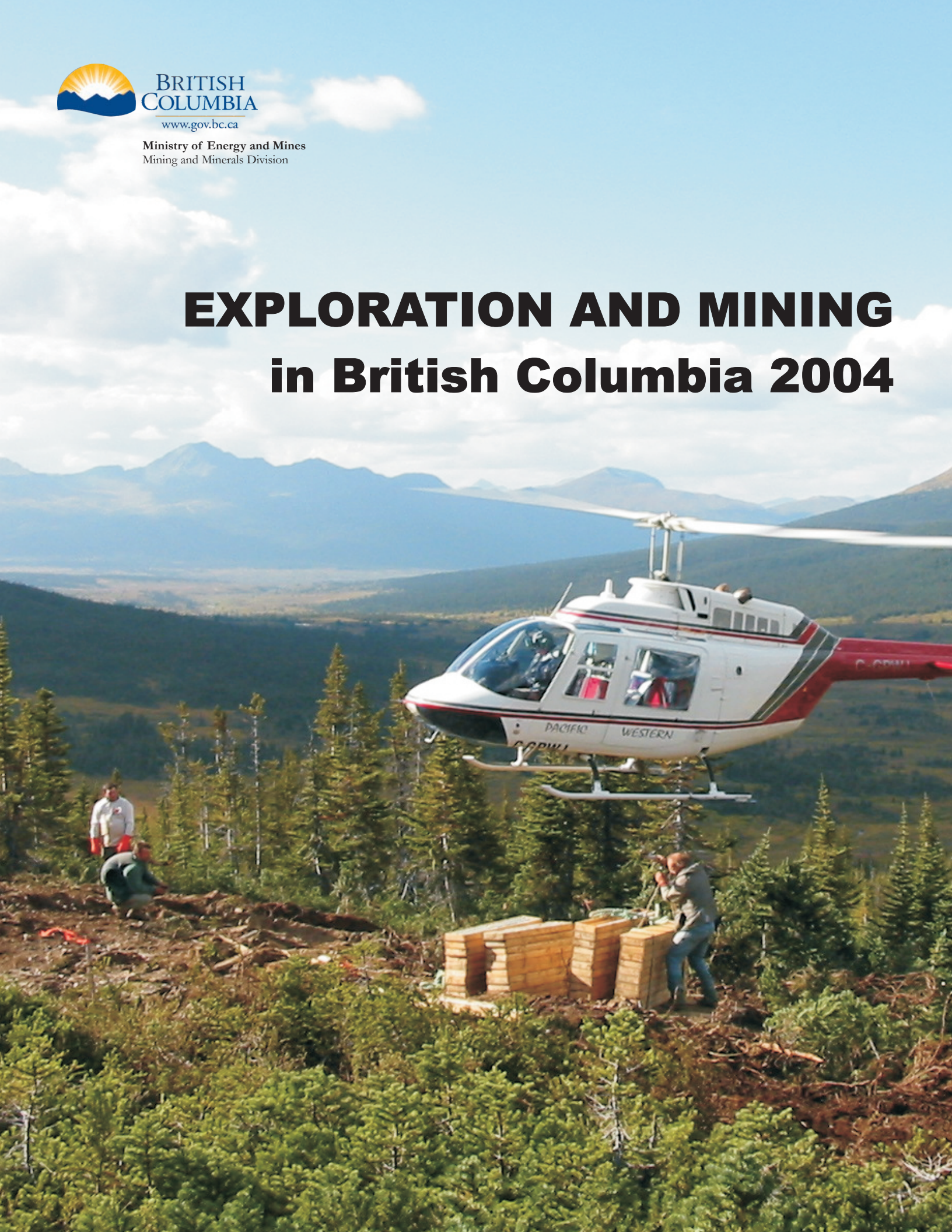
Ministry of Energy and Mines
Mining and Minerals Division

EXPLORATION AND MINING in British Columbia 2004



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Front Cover:
Western Keltic Mines Inc revived exploration on the Kutcho Creek volcanogenic massive sulphide property during 2004. Photo shows the exploration crew transporting drill core by helicopter at the property.

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Ministry of Energy and Mines

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INTRODUCTION

British Columbia's mineral resources are strategically located to play a role in the international mining industry, particularly for North American and Asian markets. The province has a well-defined potential for a wide variety of minerals and deposit types. The geoscience database is extensive and easily accessed and the provincial government is committed to aggressively improving that data and encouraging new developments. With attractive energy costs, a well-developed, all-weather highway system, rail links and a number of deep-water ports, British Columbia has the infrastructure to get coal, minerals and resulting products to markets.

Mining is a strong component of the British Columbia economy with 7 metal mines and 9 coal mines, approximately 27 industrial minerals quarries and mines, numerous placer mines and more than 1100 aggregate pits in operation. The **Willow Creek** and **Dillon** (Burnt River project) coal mines opened in the northeast and the **Gibraltar** copper-molybdenum mine re-opened in late 2004. A number of other mine development projects are underway and new mines are expected to open in 2005.

During 2004, British Columbia experienced a significant upturn in minerals-related exploration activity which will impact mining developments in the province for years to come. Commodity prices for nearly all metals and types of coal rose substantially over the year, led particularly by gold, copper, molybdenum and coking coal. For example, gold reached a 16-year high of over US$450 per ounce in early December. Mineral exploration expenditures increased to their highest level since 1991 and are estimated at $120 to $130 million for 2004 (Figure 1). The number of new mineral claim units recorded in 2004 is 47 232, an increase of 30% from the previous year (Figure 2). The number of total mineral units in good standing as of January 1, 2005 was 184 464, up about 18% from 2003. The number of forfeited units in 2004 was 12 209, down 10% from 2003. This is the fifth year in a row that there has been an increase in new mineral units recorded and a decrease in forfeited claims, another indicator of sustained and growing interest in the province's mineral resources.

Both the *Mining Exploration Tax Credit Program* and *Exploration Investment Tax Credit* for flow-through investors provide extra incentives to attract risk capital to the province.

*Photo 1. The **Willow Creek** coal mine in northeastern British Columbia opened in July, 2004.*

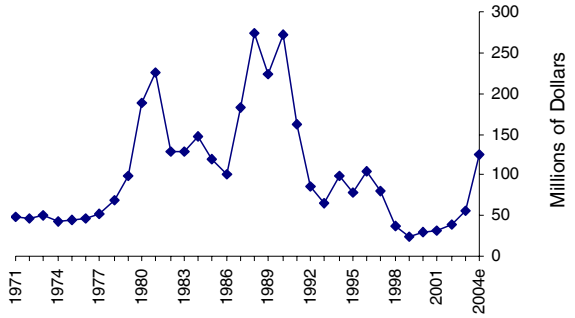

Figure 1. Mineral exploration expenditures.

Figure 2. Mineral units (new, forfeited and good standing).

MapPlace, the British Columbia government's geoscience map and data information system, had over 4 million hits during 2004, reflecting the interest in finding new mineral resources.

MINING HIGHLIGHTS

British Columbia's operating mines in 2004 (Figure 5) are forecasting a total value of solid mineral production of $3.39 billion, an increase of 15% over 2003 (Figure 3). The province ranks third in Canada for the value of its mineral production. Coal is the single most important mineral commodity, and copper is a close second (Figure 4). Despite the increase in the value of production, the actual production dropped slightly for copper, gold, silver and zinc. Molybdenum production increased 164% in value over 2003 to about $350 million. This large increase reflects the much higher molybdenum price for production from the Endako and Huckleberry mines, and mining of higher grade ore and improvements to the molybdenum circuit at Highland Valley Copper. Mine production and resources for 2004 are listed in Table 1.

Clean coal production for 2004 is expected to total 27.1 million tonnes, with a forecast value of approximately $1.1 billion. British Columbia has three major coal ports on the west coast - **Roberts Bank**, south of Vancouver, has a capacity of 26 million tonnes per year; **Neptune** terminals (Vancouver Port) has a capacity of 8 million tonnes per year and **Ridley Island** terminal, near Prince Rupert, has a capacity of 12 million tonnes per year. All three had significant unused capacity in 2004.

British Columbia's industrial minerals production for 2004 (including sulphur) is estimated at a value of $340 million. The most economically significant industrial minerals in British Columbia are magnesite, white calcium carbonate, limestone, silica, dimension stone, gypsum, sulphur, construction aggregate, and crushed rock. Commodities produced in lesser quantities include jade (nephrite), magnetite, dolomite, barite, volcanic

*Photo 2. Looking southwesterly over the **Eskay Creek** gold-silver mine in northwestern British Columbia.*

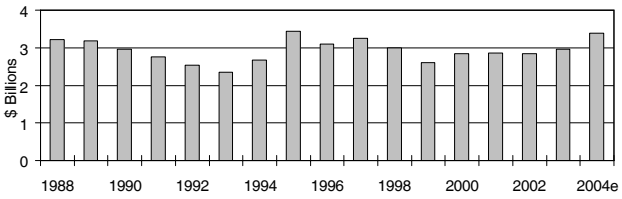

Figure 3. Solid mineral production value in British Columbia.

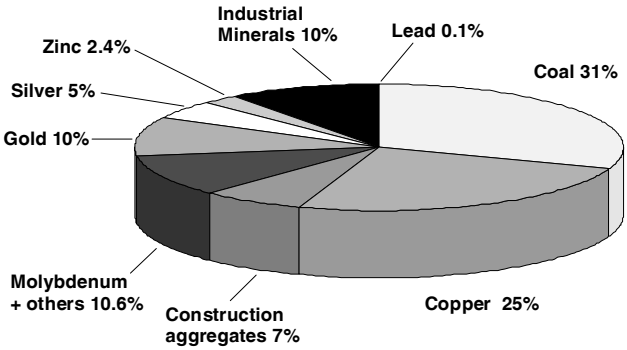

Figure 4. Forecast distribution of British Columbia mineral production by commodity – 2004.

cinder, flagstone, industrial and medical/cosmetic clays, tufa, fuller's earth, bentonite, slag, mineral wool, roofing granules, graphite, and gemstones. There are at least 20 major sites throughout the province where upgrading of industrial minerals into value–added products takes place.

Structural materials production, including the important construction aggregate sector, is estimated to have a value of $240 million. There are aggregate operations throughout the province and they vary from large pits which supply the major metropolitan areas to many smaller pits used locally for road construction. Placer gold production and exploration in British Columbia was concentrated in the Atlin, Dease Lake, Manson Creek, Cariboo and Fort Steele areas and small operators ran most operations.

The provincial mining industry employed a direct workforce of more than 9300 employees, as well as supporting at least as many spin-off jobs. The province has a total land base of 94.5 million hectares of which there are 27 000 hectares, or 0.028%, of disturbed mining lands which are subject to reclamation.

Northwest - Major Mines

The **Eskay Creek** underground gold-silver mine, operated by Barrick Gold Corporation, is expected to produce 9300 kg of gold and 450 000 kg of silver in 2004. It is the fifth largest silver producer in the world and among the richest in terms of value per tonne of ore. Current mine life is estimated to extend until 2008. Exploration was carried out mainly on the Deep Adrian and 22 zone areas, to the north and south of the existing mine workings, respectively.

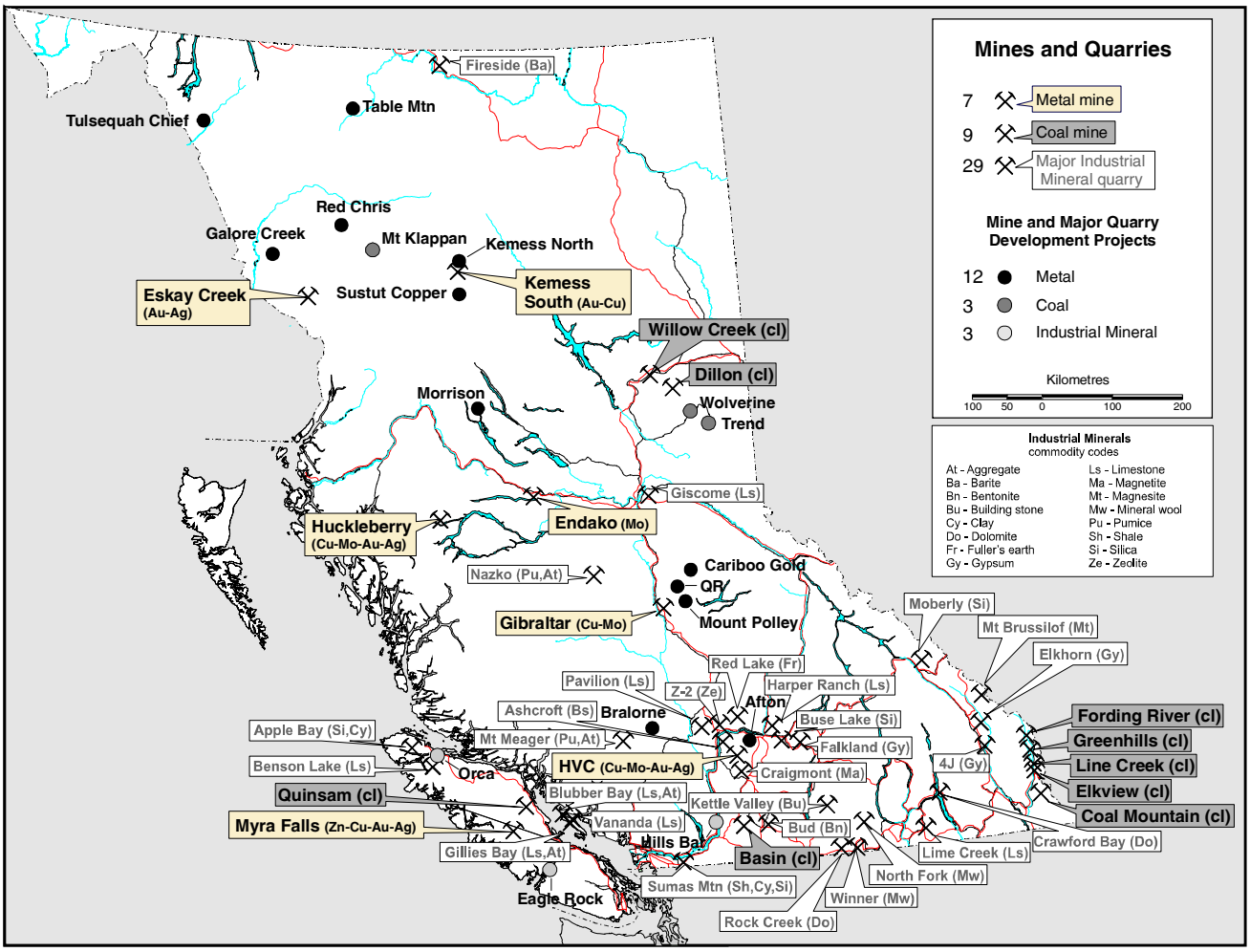

Figure 5. Operating mines and major development projects in British Columbia 2004.

The **Endako** open-pit molybdenum mine, operated by Thompson Creek Mining, has operated for 34 years and is a low-cost producer. As a result of very strong molybdenum prices, the company has embarked on a pit expansion to return to its normal production levels.

The **Huckleberry** open-pit copper-molybdenum mine, operated by Huckleberry Mines Ltd, produced ore from its East zone pit and shipped the concentrates through the port of Stewart to Japan. A large exploration program identified a new potential deposit (Northwest Target), directly north of the Main zone pit. Mine life is estimated to extend until 2007.

Northeast - Major Mines

Pine Valley Mining opened the **Willow Creek** coal mine, 45 kilometres west of Chetwynd. The company has sales of 900 000 tonnes in place through to mid-2005 and hopes to increase the tonnage to 1 to 1.5 million tonnes per year by 2006. Coal is crushed and screened and shipped raw as a pulverized coal injection (PCI) product used in steel making. Shipments in 2004 are expected to total around 400 000 tonnes.

Mine construction is in progress at the **Dillon** open pit coal mine of Western Canadian Coal Corporation, part of its Burnt River coal project. Located 20 kilometres west of Tumbler Ridge, the first shipment of PCI coal was shipped in December. In 2005, initial production is forecast at 250 000 tonnes of raw coal.

Central - Major Mines

The **Kemess South** open-pit mine, operated by Northgate Minerals Corporation, is expected to produce 9300 kg of gold and 34 000 tonnes of copper during 2004. It is the largest gold producer in the province. Existing reserves will provide mill feed until 2008, but the mine life of the operation could possibly be extended more than ten years if the **Kemess North** deposit is put into production. Exploration at Kemess South identified an additional 12 million tonnes of ore in 2004.

The **Gibraltar** open-pit mine reopened in October, 2004, under a joint venture partnership between Taseko Mines Ltd. and Ledcor Mining Ltd. The mine, located near Williams Lake, had a successful 27-year operating history and has been maintained on a stand-by basis since

TABLE 1. FORECAST MINE PRODUCTION 2004

Mine	Operator	Deposit Type / Commodity	Forecast Production	Proven and Probable Reserves (at Jan. 1, 2004)
Metals				
Endako	Thompson Creek Mining Ltd / Sojitz Moly Resources Inc	Calc-alkalic porphyry Mo	5000 t Mo	80 700 000 t at 0.063% Mo (Oct. 1, 2004)
Eskay Creek	Barrick Gold Corp	Transitional Epithermal-VMS Au-Ag	9300 kg Au, 450 000 kg Ag	840 895 t at 34.81 g/t Au and 1604 g/t Ag
Highland Valley Copper	Teck Cominco Ltd / Highmont Mining Company Ltd	Calc-alkalic porphyry Cu-Mo	170 000 t Cu, 5000 t Mo, 500 kg Au, 70 000 kg Ag	252 300 000 t at 0.42 % Cu
Gibraltar	Taseko Mines Ltd / Ledcor Mining Ltd	Calc-alkalic porphyry Cu-Mo	7000 t Cu, 34 t Mo	Sulphide: 163 500 000 t at 0.313% Cu and 0.010% Mo; Oxide: 16 500 000 t at 0.148% Acid Soluble Cu
Huckleberry	Imperial Metals Corp / Mitsubishi Material Corp / Dowa Mining Ltd / Furukawa Company Ltd	Calc-alkalic porphyry Cu-Mo	33 000 t Cu, 170 t Mo	25 018 000 t at 0.507% Cu, 0.014% Mo and 0.059 g/t Au
Kemess South	Kemess Mines Ltd (Northgate Minerals Corp)	Calc-alkalic porphyry Au-Cu	9300 kg Au, 34 000 t Cu	91 700 000 t at 0.699 g/t Au and 0.227% Cu; Kemess North (Probable) 414 000 000 t at 0.31 g/t Au and 0.16% Cu
Myra Falls	NVI Mining Ltd (Breakwater Resources Ltd)	VMS Zn-Cu-Pb-Au-Ag	56 000 t Zn, 11 400 t Cu, 790 kg Au, 22 400 kg Ag	7 747 000 t at 6.3% Zn, 1.2% Cu, 1.2 g/t Au and 40 g/t Ag
Coal				
Basin (Tulameen)	Compliance Energy Corp / Sojitz Coal	Thermal coal	40 000 t	19 000 000 t
Coal Mountain	Elk Valley Coal Partnership	Metallurgical coal	2 500 000 t	30 000 000 t
Dillon	Western Canadian Coal Corp	Metallurgical (PCI) coal	30 000 t	1 560 000 t
Elkview	Elk Valley Coal Partnership	Metallurgical coal	5 800 000 t	259 000 000 t
Fording River	Elk Valley Coal Partnership	Metallurgical coal	10 000 000 t	265 000 000 t
Greenhills	Elk Valley Coal Partnership	Metallurgical coal	5 200 000 t	103 000 000 t
Line Creek	Elk Valley Coal Partnership	Metallurgical and thermal coal	2 500 000 t (including 300 000 t thermal)	12 000 000 t metallurgical and 1 000 000 t thermal
Quinsam	Quinsam Coal Corp (Hillsborough Resources Ltd)	Thermal coal	410 000 t	23 600 000 t
Willow Creek	Pine Valley Mining Corp	Metallurgical (PCI) coal	225 000 t	15 200 000 t

Industrial Minerals

Mine	Operator	Deposit Type / Commodity	Mine	Operator	Deposit Type / Commodity
Apple Bay	Electra Gold Ltd	Geyserite	Kettle Valley quarries	Kettle Valley Stone Company	Ashlar, flagstone, thin veneer
Ashcroft	IG Machine and Fiber Ltd (IKO	Basalt roofing granules	Lime Creek	Imasco Minerals Inc	Limestone
Benson Lake	Imasco Minerals Inc.	Limestone	Moberly	Dynatec Corp	Silica sandstone
Blubber Bay	Ash Grove Cement Corp	Limestone, dolomite, aggregate	Mount Brussilof	Baymag Inc	Magnesite
Bud	Western Industrial Clay Products Ltd	Bentonite	Mount Meager	Great Pacific Pumice Inc	Pumice, pozzolan
Buse Lake	Lafarge Canada Inc	Volcanic ash (alumina-silica)	Nazko	Canada Pumice Corp	Lava rock
Craigmont	Craigmont Mines Joint Venture	Magnetite tailings	North Fork	Roxul (West) Inc	Syenite (mineral wool)
Crawford Bay	Imasco Minerals Inc	Dolomite	Pavilion	Graymont Western Canada Inc	Limestone
Elkhorn	BPB Canada Inc	Gypsum	Red Lake	Western Industrial Clay Products Ltd	Diatomaceous earth, leonardite
Falkland	Lafarge Canada Inc	Gypsum	Rock Creek	Mighty White Dolomite Ltd	Dolomite
Fireside	Fireside Minerals Inc	Barite	Sumas Mountain	Clayburn Industries Ltd	Shale, sandstone, clay, fireclay
Four J	Georgia-Pacific Canada Inc	Gypsum	Vananda	Imperial Limestone Company Ltd	Limestone
Gillies Bay	Texada Quarrying Ltd (Lafarge Canada Inc)	Limestone, aggregate	Winner	Roxul (West) Inc	Diorite (mineral wool)
Giscome	Pacific Lime Products Ltd	Limestone	Z-2	Industrial Minerals Processors	Zeolite
Harper Ranch	Lafarge Canada Inc	Limestone			

1998. The 12-year mine plan includes production from several zones. Anticipated annual production is 32 000 tonnes of copper and more than 400 tonnes of molybdenum. Once the mine reaches full capacity, the owners will investigate the feasibility of reopening its extraction-electrowinning leach plant, as well as constructing a hydrometallurgical plant onsite for longer term operations.

The **Nazko** lava rock quarry near Quesnel, operated by Canada Pumice Corporation, doubled its production level over the past year and plans a further expansion and new marketing program for 2005.

*Photo 3. The **Gibraltar** mine reopened in October, 2004 after a closure of more than 5 years.*

Kootenays - Major Mines

Elk Valley Coal Corporation in southeastern British Columbia operates 5 coking coal mines, **Fording River, Greenhills, Line Creek, Elkview** and **Coal Mountain**, providing it with flexibility to blend coals from different mines to meet customer needs. The company expects to produce about 26 million tonnes in 2004. The Corporation, 62% owned by Fording Canadian Coal Trust and 38% by Teck Cominco Limited, is the world's second-largest supplier of metallurgical coal. In late December, 2004, Elk Valley Coal Corporation signed letters of intent with two of the world's largest steelmakers, Japan's Nippon and South Korea's Posco, for 10-year sales contracts worth $50 million.

Silica is produced by Dynatec Corp from the **Mt. Moberly** mine, located near Golden. Northeast of Radium Hot Springs, Baymag Inc. produces high-quality magnesite from its **Mount Brussilof** open-pit mine. Production in 2004 was projected to be 190 000 tonnes.

Further south, BPB Canada Inc. operates the **Elkhorn** gypsum mine, east of Windermere, and Georgia-Pacific Canada Inc. produces gypsum from the **Four J** mine, southeast of Canal flats. Production at the Elkhorn and Four J mines for 2004 was projected to be approximately 560 000 and 225 000 tonnes, respectively. Imasco Minerals Inc. produces a variety of crushed and ground rock products at its Creston Operations plant near Sirdar. These products are derived from rock from an underground dolomite mine at **Crawford Bay**, a limestone quarry at **Lime Creek** east of Salmo and a granite quarry at Sirdar. Mighty White Dolomite Ltd. produces a range of crushed and ground dolomite products from its quarry and plant at **Rock Creek**. The **Winner** quarry near Greenwood shipped diorite to the Roxul (West) Inc. mineral wool manufacturing plant in Grand Forks.

*Photo 4. The **Fording River** coal mine in the Elk Valley, southeastern British Columbia.*

Thompson-Okanagan - Major Mines

The **Highland Valley Copper** open-pit mine near Kamloops, operated by Teck Cominco Ltd. and Highmont Mining Company, is Canada's largest base metal mine. It is the fifth largest open-pit mining operation in the world, with a daily mill throughput averaging 135 000 tonnes of rock. Production in 2004 is expected to be 170 000 tonnes of copper, 5000 tonnes of molybdenum and minor byproduct gold and silver. The mine is scheduled to close in mid-2009; however, the partners are studying the possibility of deepening the Valley pit, which could extend the mine-life to 2013.

Compliance Energy Corporation and Sojitz Coal Development (Canada) Ltd. mined about 40 000 tonnes of raw thermal coal from the **Basin** property, near Tulameen. The coal was trucked and washed at its Similco mine site.

Over 250 people are employed at industrial minerals quarries and processing plants in the Thompson-Okanagan region. The **Kamloops** cement plant and **Harper Ranch** limestone quarry of Lafarge Canada Inc. were expected to operate close to capacity in 2004. Near Cache Creek, Graymont Western Canada Inc. operates the **Pavilion** limestone quarry and lime plant. Employing mainly First Nations workers, the operation produces lime used in pulp mills, mines and other industrial processes. The **Ashcroft** basalt quarry and roofing granule plant east of Ashcroft, operated by IG Machine and Fiber Ltd., produces about 250 000 tonnes of roofing granules in ten distinct colours. Craigmont Mines Ltd. processes and recovers about 70 000 tonnes of magnetite annually from its **Craigmont** tailings operation near Merritt. The magnetite is used in most coal washing plants in western Canada.

Western Industrial Clay Products Ltd. manufactures a variety of products at its plant in Kamloops, using raw materials from its **Red Lake** (diatomaceous earth) quarry northwest of Kamloops and its **Bud** (bentonite) quarry at Princeton. Zeolite was mined from Industrial Mineral Processors' **Z2** quarry near Cache Creek and processed at a plant in Ashcroft. At Princeton, Zeo-Tech Enviro

Corporation crushed and stockpiled zeolite material from its **Zeo** quarry, to provide material for mill start-up and trucking to market in 2005. Okanagan Opal Inc. produces attractive fire opal gemstones and jewelry from its **Klinker** property, west of Vernon. Decorative rock and dimension stone are produced at numerous small quarries throughout the region (*e.g.* **Nipple Mountain** and **Begbie** quarries) by small companies, including Kettle Valley Stone Company in Kelowna.

Southwest - Major Mines

The **Myra Falls** underground mine west of Campbell River, operated by NVI Mining Ltd., a subsidiary of Breakwater Resources Ltd., has been in operation since 1966. Approximately 1 million tonnes of ore are currently processed annually in the mill producing copper, zinc, silver and gold concentrates. The company is in the process of optimizing the mining plan and is considering the addition of a lead circuit. In 2004, the company conducted exploration in the H-W and 43 zones and work on the Marshall East zone is planned.

The largest limestone production centre in the province is **Texada Island**, where three quarries, **Gillies Bay**, **Blubber Bay** and **Vananda**, traditionally ship 5 to 6 million tonnes annually. White calcium carbonate is produced from **Gillies Bay** and also from the **Benson Lake** quarry on northern Vancouver Island. **Texada Island** limestone producers are capitalizing in the rapidly expanding market for crushed rock, the natural byproduct of their limestone operations. Lehigh Northwest Cement Limited ships aggregate from its facility at **Sechelt** to the San Francisco Bay area.

Clayburn Industries Ltd. processes clay from its **Sumas Mountain** operation and Clayburn, Lafarge Canada Inc. and Lehigh Northwest Cement Ltd. produce shale and sandstone from their **Sumas** quarry. Ironwood Clay Company Inc. produces cosmetic/medical clay seasonally from its **De Cosmos Lagoon** quarry on Hunter Island, west of Bella Coola.

*Photo 5. The **Blubber Bay** operation, one of the large limestone producers on Texada Island near Powell River.*

Westcoast Granite Manufacturing Inc., Margranite Industries and Matrix Marble Corporation operate stone-processing plants. Dimension stone is quarried from several locations, including **Gordon River**, **Whistler**, **Hisnet Inlet**, **Tahsis Inlet**, **Hardy Island** and **Haddington Island**. Great Pacific Pumice Ltd. ships a variety of pumice-based products from its **Pum** property on Mount Meager, north of Pemberton.

Electra Gold is developing its **Apple Bay** chalky geyserite (silica and alumina) property, west of Port Hardy to supply cement plants in Vancouver and Seattle.

Hillsborough Resources is forecast to produce 410 000 tonnes from its **Quinsam** thermal coal mine on Vancouver Island. A small exploration drilling program was conducted at the Quinsam mine.

MAJOR DEVELOPMENT PROJECTS

The **Mount Polley** copper-gold mine near Williams Lake and the **Wolverine** coal mine near Tumbler Ridge will be opening in early 2005. They may be joined by other mines over the next couple of years (*see* Table 2).

Northwest - Major Development Projects

During 2004, Redcorp Ventures completed a large underground drilling program on its **Tulsequah Chief** project, south of Atlin. An updated resource calculation and feasibility study will be forthcoming. East of Dease Lake, Western Keltic Mines completed a large drilling program aimed at evaluating its **Kutcho Creek** deposits for possible underground exploitation of the higher-grade core, along with the adjacent Esso West deposit. A feasibility study is expected to be initiated in 2005.

Fortune Minerals Limited continued to conduct various studies to outline a number of possible development scenarios for its **Klappan** anthracite coal property, 75 kilometres southeast of Dease Lake. The company may also benefit from some of the data acquired by Shell Canada's coal bed methane drilling that took place on the property during 2004.

The largest exploration program in the province was at the **Galore Creek** gold-copper-silver project, located 125 kilometres northwest of Stewart. Utilizing five drill rigs, NovaGold Resources expanded the previously identified resources and discovered the high-grade, near-surface West Fork zone. On the adjacent **Copper Canyon** copper-gold target, NovaGold (under an option agreement with Eagle Plains Resources) also encountered significant mineralization in drilling.

A large in-fill drilling program on bcMetals' **Red Chris** copper-gold project east of Iskut was completed, and a feasibility study was released in November. A

*Photo 6. Logging drill core in the **Galore Creek** camp, looking south.*

Memorandum of Understanding between bcMetals and Outokompu Technology of Finland outlines arrangements for an onsite copper production facility, as part of its proposed mine operation.

In the Babine camp, Pacific Booker Minerals continued to study the feasibility of advancing its **Morrison/Hearne Hill** copper-gold project to production.

Northeast - Major Development Projects

The Burnt River property includes the Dillon mine and the nearby 32-million tonne **Brule** deposit owned by Western Canadian Coal Corporation. Western Canadian is expected to apply for an Environmental Assessment Certificate for this deposit in 2005, in preparation for mine development. They also continued exploration on their Perry Creek deposit (**Wolverine**) coal mine, about 20 kilometres west of Tumbler Ridge. Perry Creek may start producing in 2005. Northern Energy and Mining Inc. (NEMI) continued exploration on its **Trend** property, 25 kilometres south of Tumbler Ridge. It hopes to begin production of 240 000 tonnes per year in 2005 from the L-Seam.

TABLE 2. MAJOR PROJECTS UNDER CONSIDERATION FOR MINE DEVELOPMENT IN BRITISH COLUMBIA

Project Name	Owner/Operator	Commodities
Apple Bay	Electra Gold Ltd	Silica, Kaolin
Bralorne	Bralorne Gold Mines Ltd	Au
Brule	Western Canadian Coal Corp	Coal
Bingay Creek	Hillsborough Resources Ltd	Coal
Cariboo Gold Quartz	International Wayside Gold	Au
Elk (Siwash North)	Almaden Minerals Ltd	Au
Galore Creek	NovaGold Resources Inc	Cu-Au-Ag
Greenwood Gold	Merit Mining Corp	Cu-Au
Hills Bar	Qualark Resources Inc	Aggregate
J&L (McKinnon Ck.)	BacTech Mining Corp	Au-Ag-Cu-Zn-Pb
Kemess North	Northgate Minerals Corp	Au-Cu
Kutcho Creek	Western Keltic Mines Inc	Cu-Zn-Au-Ag
Morrison/Hearne Hill	Pacific Booker Minerals Inc	Cu-Au
Mount Klappan	Fortune Minerals Ltd	Coal
Mt. Milligan	Placer Dome Inc	Au-Cu
Orca	Polaris Minerals Corp	Aggregate
Prosperity	Taseko Mines Ltd	Cu-Au
QR	Cross Lake Minerals Ltd	Au
Red Chris	bcMetals Corp	Au-Cu
Sustut Copper	Northgate Minerals Corp	Cu-Ag
Table Mountain	Cusac Gold Mines Ltd	Au
Trend	Northern Energy and Mining	Coal
Tulsequah Chief	Redfern Resources Ltd	Cu-Au-Zn-Ag-Pb
Turnbull North Pit	Fording River Operations	Coal
Willa/LH	Bethlehem Resources Corp	Cu-Au
Wolverine (Perry Ck.)	Western Canadian Coal Corp	Coal

Au=gold; Ag=silver; Cu=copper; Pb=lead; Zn=zinc

Central - Major Development Projects

Northgate Minerals Corporation's **Kemess North** project, near its Kemess South mine, is being reviewed by the British Columbia Environmental Assessment Office. If approved, the combined operations of the mine and the Kemess North deposit could extend the mine life to 2020.

Northgate Minerals Corp also acquired the **Sustut** copper property in 2004. It hopes to mine the deposit on a seasonal basis, with the ore being processed at its nearby Kemess South mine 40 kilometres to the north.

The significant expansion of mineralization in the Northeast zone, and below the Springer deposit, at the **Mount Polley** gold-copper mine, northeast of Williams Lake, has led Imperial Metals to announce the re-opening of the mine in early 2005. The positive results have highlighted the potential for gold-copper open-pit mines throughout the province.

Cross Lake Minerals is expected to announce the reopening of its **QR** gold mine, east of Quesnel, in 2005. It continued to drill for additional resources, especially in the North zone.

Placer Dome re-drilled its **Mt. Milligan** gold-copper project, west of Mackenzie. It plans to update its previous feasibility study in 2005; this might lead to an application for an amendment to its existing Mine Development Certificate.

International Wayside Gold Mines extracted a 10 000-tonne underground bulk sample from its Bonanza Ledge zone on its **Cariboo Gold Quartz** project, near Wells, and had it processed at the nearby Mount Polley mine.

Thompson-Okanagan - Major Development Projects

In the Kamloops region, DRC Resources commenced a major underground exploration program on its **Afton** copper-gold-silver deposits in December. The deposit sits directly beneath an open pit that produced from 1977 to 1988. It is a higher-grade zone that would have to be mined from underground, if proven to be economically feasible.

Southwest - Major Development Projects

In recent years, the most significant industrial minerals trend in British Columbia has been an increasing export of crushed stone and natural aggregate to urban centres along the west coast of the United States and higher sales within British Columbia's Lower Mainland. These markets are becoming very competitive as industry identifies new potential for development. A good example

*Photo 7. Diamond drill core from the copper-gold Northeast zone at the **Mount Polley** mine.*

*Photo 8. Aerial view of the **Afton** open pit that is currently being explored for the potential to become an underground mine (courtesy of DRC Resources Corp).*

of this is the $100-million construction aggregate complex (**Eagle Rock Quarry**) and ship-loading facility planned for development near Port Alberni. Other significant development projects include **Orca** sand and gravel near Port McNeil and **Hills Bar** aggregate near Yale.

Figure 6. Selected major exploration projects in British Columbia in 2004.

MINERAL EXPLORATION

There were 170 exploration projects in British Columbia with budgets in excess of $100 000 (selected projects listed in Table 3 and shown in Figure 6), up 95% from 2003. This includes 30 projects with expenditures in excess of $1 million. The number of drilling programs and the total metres drilled rose significantly, with over 170 projects aggregating approximately 521 000 metres. More than 80% of exploration spending was on advanced projects, while there were very few grassroots programs (Figure 7). The targets sought, by deposit type, are shown in Figure 8. Twenty-two bulk sample programs were completed in 2004, including sampling on the **Apple Bay**, **Bralorne**, **Cariboo Gold Quartz**, **Getty North**, **J&L**, **Kutcho Creek** and **Trend** projects.

Coal tenure acquisitions increased dramatically in 2004, fueled by the high coal prices, particularly in the northeast. Provincial exploration expenditures for coal more than doubled to $5.8 million in 2004. In addition, $700 000 were spent on development drilling (~ 13 000 metres) on mine sites in active pits. Exploration expenditures on industrial minerals projects are estimated at $1.5 million. Ten drilling projects with an aggregate of approximately 4400 metres were completed.

At least 24 new mineral discoveries were reported in 2004 (Figure 9).

TABLE 3. SELECTED MAJOR EXPLORATION PROJECTS IN BRITISH COLUMBIA IN 2004

Property	Operator	Minfile (NTS)	Commodity	Deposit Type	Work Program	Region
3Ts	Southern Rio Resources Ltd	093F 055, 068	Au-Ag	Epithermal Vein	G; P; OB; DD (~5500 m)	C
Adanac	Adanac Moly Corp	104N 052	Mo	Calc-alkalic Porphyry	IP; A; DD (9022 m); EN	NW
Afton (Ajax)	DRC Resources Corp	92INE023	Cu, Au, Pd, Ag	Alkalic Porphyry	UG; FS; DD (~2000 m)	TO
Afton Area	Abacus Mining and Exploration Corp	92INE028, 030, 026	Cu, Au, Ag, Pd	Alkalic Porphyry	IP; DD (~27,500 m)	TO
Ann North	GWR Resources Inc	92P 002, 115, 034	Cu, Au, Ag	Alkalic Porphyry	TR; DD (~3000 m)	TO
Atty	Finlay Minerals Ltd	094E 119, 022	Cu-Au	Alkalic Porphyry	G; IP; MG; DD (1653 m)	C
Bear	Imperial Metals Corporation	094D 068	Cu-Mo	Calc-Alkalic Porphyry	DD (1704 m)	C
Bingay Creek	Hillsborough Resources Ltd	082JSE011	Metallurgical coal	Sedimentary	RC (1316 m); EN	K
Bralorne	Bralorne Gold Mines Ltd	92JNE164, 001	Au-Ag	Mesothermal Vein	BU; MS; UG; DD (‘3000 m)	TO
Brenda	Northgate Minerals Corporation	094E 147	Au-Cu	Calc-alkalic Porphyry	A; DD (1446 m)	C
Brett	Mosquito Cons. Gold Mines Ltd	82LSW110, 131, 084, 047, 132, 130	Au, Ag	Epithermal Vein	TR; GC; G; A; DD (2743 m)	TO
Burnt Ridge	Elk Valley Coal Corp	082JSE001	Metallurgical Coal	Sedimentary	RC (8843 m)	K
Burnt River (Dillon & Brule)	Western Canadian Coal Corp	093P007, 008	Metallurgical (PCI) Coal	Sedimentary	RD (2416 m); DD (462 m); down-hole GP; BU (680 kg); CQ; GT; EN; PF; FS	NE
Camp Lake	Better Resources Ltd	(92K/04E)	Cu-Au-mag	Skarn	G; P; GC; MG; DD (576 m)	SW
Cariboo Gold Quartz (incl. Bonanza Ledge)	International Wayside Gold Mines Ltd	093H 019	Au	Replacement, Mesothermal Vein	A; DD (14 142 m); BU (10 000 t); PF; EN	C
Copper Canyon	NovaGold Resources Inc	104G 017	Cu, Au	Alkalic Porphyry	AB-MG/RD; DD (3017 m)	NW
Copper Creek	Firesteel Resources Inc	104J 005	Cu, Au	Alkalic Porphyry	G; GC; TR; DD (1555 m)	NW
Corey	Kenrich Eskay Mining Corp	104B 011, 355	Au, Ag	Epithermal VMS	G; GC	NW
Decor Pit (Hat Creek)	Pacific Bentonite Ltd	92INW047, 084	Burnt shale (alumina rock and landscape rock)	Industrial Mineral	BU (~7000 t)	TO
Del Norte	Lateegra Resources Corp	104A 161, 176	Au, Ag	Mesothermal vein	DD (4816 m)	NW
Elizabeth	J-Pacific Gold Inc	92O 012	Au, Ag	Mesothermal Vein	TR; G; GC; UG; DD (~3000 m)	TO
Elk (Siwash North)	Almaden Minerals Ltd	92HNE096	Au, Ag	Mesothermal Vein	EN; DD (10,265 m)	TO
Eskay Creek	Barrick Gold Corp	104B 008	Au, Ag	Epithermal VMS	DD (18 055 m)	NW
Fire Mountain	bcMetals Corp Ltd	104N 067	Mo	Calc-alkalic Porphyry	DD (3379 m)	NW
Foremore	Roca Mines Inc	104G 148	Au, Ag, Cu, Zn	VMS (Kuroko)	G; P; GC; UT; MG; DD (5900 m)	NW
Frank Creek, SCR, Ace	Barker Minerals Ltd	093A 142, 143, 153	Cu-Zn-Pb-Au-Ag	VMS; Mesothermal Vein	G; GC; GP; TR; DD (1881 m)	C
Friendly Lake	Lithic Resources Ltd	92P 134, 006, 007	Cu, Mo, Pb, Zn, Au, Ag, Pd, Pt	Alkalic Porphyry; Vein	AB-MG; IP; G; DD (~2400 m)	TO
Galore Creek	NovaGold Resources Inc	104G 090, 091, 095, 097	Cu, Au, Ag	Alkalic Porphyry	G; AB-MG/RD; IP; DD (23 000 m); EN; PF	NW
Getty North	Getty Copper Inc	92INE038	Cu	Calc-alkalic Porphyry	BU; MS; IP; DD (~5000 m)	TO
GJ (Kinaskan)	Canadian Gold Hunter Corp	104G 034, 177	Cu, Au	Alkalic Porphyry	G; P; TR; DD (4267 m)	NW
Golden Crown	Gold City Industries Ltd	082ESE032, 033	Au	Mesothermal Vein	TR; MG; EM; GC; DD (230m)	K
Goldstream (Spire & Boutwell)	Orphan Boy Resources Inc	82M 278	Cu, Zn, Au, Ag	VMS (Besshi)	GP; G; GC; TR; DD (1952 m); FS	TO
Huckleberry	Imperial Metals Corporation	93E 037	Cu, Mo	Calc-alkalic Porphyry	G; IP; DD (~8000 m)	NW
Kalum	Eagle Plains Resources Ltd	103I 019, 174, 213	Au, Ag	Pluton-Related Vein	G; AB-EM/MG, DD (1958m)	NW
Kaza	Northern Hemisphere Development Corp	093M 111	Cu-Au	Skarn	A; TR; DD (1077 m)	C
Kemess North & area	Northgate Minerals Corporation	094E 021	Au-Cu	Calc-alkalic Porphyry	G; GC; IP; TR; DD (7561 m)	C
Kemess South	Northgate Minerals Corporation	094E 094	Au-Cu	Calc-alkalic Porphyry	DD (7307 m);	C
Kutcho Creek	Western Keltic Mines Inc	104I 060	Cu, Zn, Ag, Au	VMS (Kuroko)	DD (7691 m); MS	NW
Lawyers	Bishop Gold Inc	094E 068	Au-Ag	Epithermal Vein	A; GC; MG; VLF; TR	C
Lexington	Gold City Industries Ltd	082ESE041, 042	Au	Mesothermal Vein/Polymetallic Vein	TR; DD (4847 m); RC	K
Lorraine-Jajay	Eastfield Resources Ltd	093N 002, 066, 224	Cu-Au	Alkalic Porphyry	A; G; GC; IP; DD (4439 m)	C
Louise Lake	Firestone Ventures Inc	93L 079	Cu, Au	Calc-alkalic Porphyry	DD (1675 m)	NW
Lustdust	Alpha Gold Corp	093N 009	Au-Ag-Cu-Zn-Pb	Skarn; Manto; Mesothermal Vein	GC; DD (6010 m)	C

TABLE 3 CONT. SELECTED MAJOR EXPLORATION PROJECTS IN BRITISH COLUMBIA IN 2004

Property	Operator	Minfile (NTS)	Commodity	Deposit Type	Work Program	Region
Marten Wheeler	Elk Valley Coal Corp	082GNE006	Metallurgical Coal	Sedimentary	RC (1596 m)	K
McKinnon Creek (J&L)	BacTech Mining Corp	82M 003	Au, Ag, Cu, Zn, Pb	Stratiform; Mesothermal vein	PF; EN; MS; UG-BS (5 t); UG-DD (~2300 m)	TO
Mosquito Creek Gold	Island Mountain Gold Mines Ltd	093H 010	Au	Replacement; Mesothermal Vein	GC; TR; DD (859 m)	C
Mount Polley	Imperial Metals Corporation	093A 008, 164	Cu-Au-Ag	Alkalic Porphyry	G; TR; IP; DD (~ 40 000 m) on Northeast zone; DD (~6000 m) on Bell pit; DD (~10,000 m) on Springer pit; MS; FS; EN; R	C
Mt. Milligan	Placer Dome Inc	093N 191, 194	Au-Cu	Alkalic Porphyry	G; DD (~2200 m); MT; FS	C
Murphy Lake	Candorado Operating Co. Ltd	93A 044, 073, 113, 063, 92P 004	Cu, Au	Alkalic Porphyry	G; TR; DD (1604 m)	TO
Myra Falls	NVI Mining Ltd (Breakwater Resources Ltd)	92F 330, 071, 072, 073	Cu, Zn, Pb, Au, Ag	VMS (Kuroko)	DD (8500 m)	SW
New Polaris	Canarc Resource Corp	104K 003	Au	Mesothermal Vein	DD (~2000 m)	NW
North Valley	Highland Valley Copper	092INW040, 011, 030, 029, 053, 085, 005	Cu, Mo, Au, Ag	Calc-alkalic Porphyry	IP; DD (~6500 m)	TO
Northstar (Fred)	Northern Hemisphere Development Corp	094D 032	Cu	Volcanic Redbed Copper	A; TR; DD (~1000 m)	C
Old Nick	Jantri Resources Inc	082ESW055	Ni, Co	Magmatic	GC; DD (2152 m)	K
Panda-Payday	Klondike Gold Corp	082FSE110	Zn, Pb, Ag	Sedex	DD (2733 m)	K
Panorama Ridge	Goldcliff Resource Corp	82ESW052, 259	Au	Skarn	TR; GC; G; DD (2277 m)	TO
Pil North	Finlay Minerals Ltd	094E 029, 083, 213, 216	Au-Cu	Calc-alkalic Porphyry; Epithermal vein	A; G; GC; IP; TR; DD (6168 m)	C
QCM	Canadian Gold Hunter Corp	093N 200	Au	Mesothermal Vein	IP; TR; DD (1190 m)	C
QR	Cross Lake Minerals Ltd	093A 121	Au	Skarn	G; DD (~4000 m); PF; FS	C
Rain (Sorcerer)	Orphan Boy Resources Inc	82M 156	Cu, Zn, Pb, Au, Ag, Mo, W	VMS; Skarn; Porphyry; Vein	GC; G; TR; DD (2500 m)	TO
Randi	Locke Goldsmith	092ISW054	Au, Ag, Cu	Mesothermal Vein	DD (~10,000 m)	TO
Red Chris	bcMetals Corp Ltd	104H 005	Cu, Au	Alkalic Porphyry	DD (4848 m); GD (1279 m); CD (779 m); EN; FS	NW
Ruddock Creek	Cross Lake Minerals Ltd	82M 082, 83	Zn, Pb, Ag	Stratiform	GP (AB, DH); DD (1839 m)	TO
Seel	Grayd Resource Corp & Gold Reach Resources Ltd	93E 105	Cu, Au	Calc-alkalic Porphyry	G; R; GC; IP; DD (~2000 m)	NW
Shasta	Sable Resources Ltd	094E 050	Au-Ag	Epithermal Vein	DD (1075 m)	C
Sickle Creek	Stealth Minerals Ltd	094E 237	Au-Ag; Cu-Au	Epithermal Vein; Calc-alkalic Porphyry	G; P; GC; IP; DD (3870 m)	C
Silver Coin	Pinnacle Mines Ltd	104B 095	Au, Ag	Epithermal Vein	DD (3000 m)	NW
Spanish Mountain	Skygold Ventures Ltd/Wildrose Resources Ltd	093A 043	Au	Mesothermal Vein	G; TR; GC; RC (~2500 m)	C
Star	Minterra Resources Corp	094C 090	Cu-PGE	Magmatic	DD (1044 m)	C
Sullivan Deeps	Stikine Gold Corporation	82F/16E	Zn, Pb, Ag	Sedex	DD (2766m in SD#04-01 Phase 1); UT	K
Summit Lake	Tenajon Resources Corp	104B 034	Au	Intrusion-related Vein	DD (1280 m)	NW
Table Mountain	Cusac Gold Mines Limited	104P 070	Au	Orogenic Vein	DD (6478 m)	NW
Thorn	Rimfire Minerals Corp & Cangold Limited	104K 031	Ag, Au	High Sulphidation Epithermal Vein	IP; EM; DD (1810 m)	NW
Todd Creek	Lateegra Resources Corp	104A 001	Au, Cu	Epithermal Vein	DD (750 m)	NW
Trend	NEMI Northern Energy & Mining Inc	093I 030	Metallurgical Coal	Sedimentary	A; G; TR; DD (2724 m); RT (4531 m); BU (9 t); CQ; EN; PF; R	NE
Tulsequah Chief	Redfern Resources Ltd	104K 002	Cu, Pb, Zn, Ag, Au	VMS (Kuroko)	UG (160 m); R; DD (30 444 m); EN	NW
Turnagain	Hard Creek Nickel Corp	104I 119, 120, 051	Ni, Cu, Co	Magmatic	AB-EM/MG; DD (7645 m)	NW
Willa/LH	Bethlehem Resources Corporation	082FNW071, 212, 213	Au, Cu, Ag	Calc-alkalic Porphyry	P; G; GC; GP; DD (6500m)	K
Wolverine (Perry Creek)	Western Canadian Coal Corp	093P 015, 025	Metallurgical Coal	Sedimentary	DD (1000 m); BU; GT; CD; PF	NE
Woodjam	Fjordland Exploration Inc / Wildrose Exploration Ltd	093A 078, 124	Au-Cu	Alkalic Porphyry	G; DD (~4000 m)	C
Yellowjacket	Muskox Minerals Corp	104N 043	Au	Orogenic Vein	AB-EM/MG; DD (~3750 m)	NW

Work program abbreviations:

A = access; trail, road construction on claims; AB-EM = airborne electromagnetics; AB-MG = airborne magnetics; AB-RD = airborne radiometrics; BU (X tonnes) = bulk sample (weight in tonnes if known); CD = condemnation drilling; CQ = coal quality testing; CT = carbonization test (coal); DD (Xm) = diamond drilling totaling X metres; EN = environmental baseline studies/monitoring, remediation work; FS = feasibility studies; G = geology, mapping, etc; GC = geochemical sampling (rock, soil, silt, etc); GD = geotech drilling; GP = geophysics (general); IP = Induced Polarization; 3D-IP; MG = magnetics; MK = marketing-primarily for industrial mineral products; MS = metallurgical studies; OB = overburden drilling; P = prospecting; PD = percussion drilling; PF = pre-feasibility studies; R = reclamation; RC = reverse circulation drilling; TR = trenching, UG (X m) = X metres of underground development; UG-BU = underground bulk sample; OP-BU = open-pit bulk sample; UT = UTEM; VLF; WT = washability test (coal)

Regions: C = central - office in Prince George; K = Kootenay - office in Cranbrook; NE = Northeast - office in Prince George; NW = Northwest - office in Smithers; SW = Southwest - office in Vancouver; TO = Thompson-Okanagan - office in Kamloops

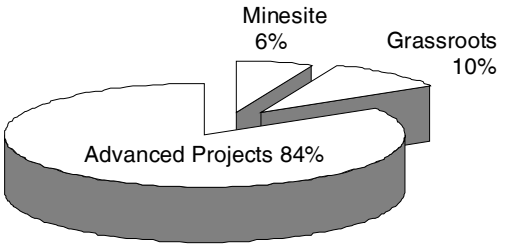

Figure 7. Exploration expenditures by type of program – 2004.

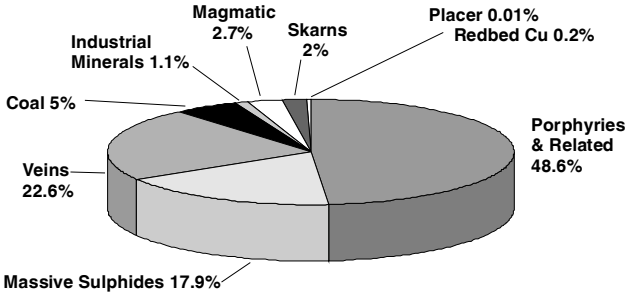

Figure 8. Percentage of project expenditures, focused on specific deposit types in 2004.

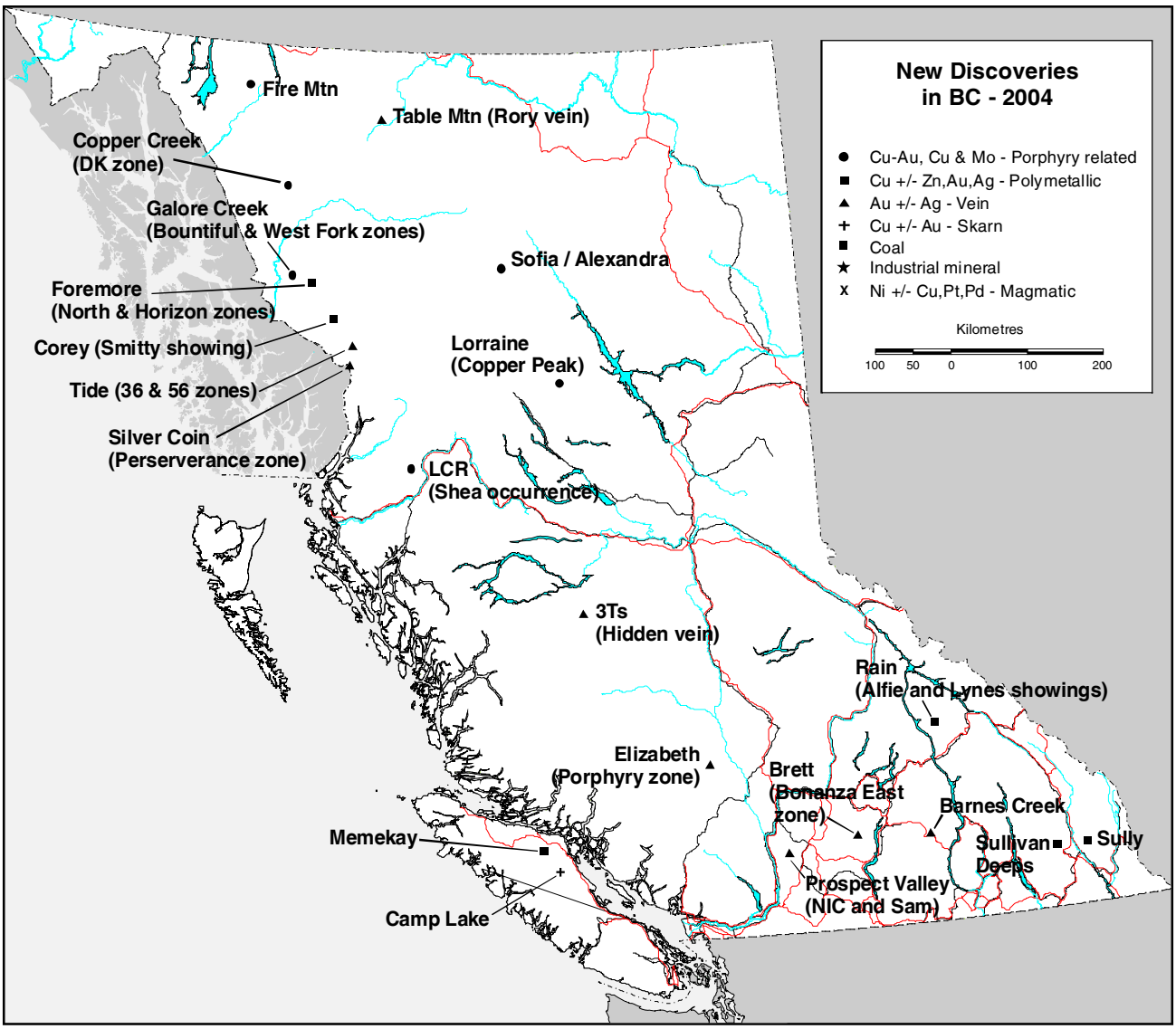

Figure 9. New mineral discoveries in British Columbia.

Northwest - Major Exploration Projects

In the Atlin region, the most advanced programs were carried out by Adanac Moly Corporation on its **Adanac (Ruby Creek)** molybdenum property and by Muskox Minerals who drilled along the Pine Creek fault structure on its **Yellowjacket** gold project. Fifty-two kilometres east of Atlin, bcMetals Corp discovered porphyry molybdenum mineralization during a deep drilling program.

Southwest of Atlin, Cangold Limited and Rimfire Minerals drilled the Oban Breccia polymetallic zone, as well as several other untested anomalies on their **Thorn** property.

Drilling by Cusac Gold Mines at its **Table Mountain** gold mine, in the Cassiar region, resulted in the discovery of the Rory vein. Underground mining on both the Rory and East Bain veins is being contemplated. Hard Creek Nickel Mines continued drilling on its Horsetrail and Cub zones and the newly identified DJ zone on its **Turnagain** nickel-copper-platinum group elements property, west of Dease Lake.

Canadian Gold Hunter extended the strike length of its copper-gold mineralization to over 1100 metres on its Donnelly zone at its **Kinaskan (GJ)** project, west of Iskut. Firesteel Resources drill tested the newly discovered DK prospect on its **Copper Creek** copper-gold property, northwest of Telegraph Creek.

On the **Foremore** property, west of Bob Quinn Lake, Roca Mines drill tested several targets; the North VMS and Horizon Gold skarn zones were two new discoveries. Kenrich-Eskay Mining discovered the **Smitty** epithermal VMS showing on its Corey property, south of the Eskay Creek mine. Pinnacle Mines Ltd. discovered significant epithermal gold-silver mineralization in the Perseverance zone on its **Silver Coin** property, 20 kilometres north of Stewart. Rimfire Minerals discovered gold-silver mineralization in the 36 and 56 zones on its **Tide** property, 36 kilometres north of Stewart.

Tenajon Resources reported significant results from its underground drilling program on its **Summit Lake (Scottie Gold)** gold mine, north of Stewart. South of Stewart, Ascot Resources is exploring a significant sand and gravel deposit at **Swamp Point**. Northern Continental Resources discovered porphyry copper-molybdenum mineralization in the Shea showing on its **LCR** property, 50 kilometres north-northwest of Terrace.

Northeast - Major Exploration Projects

Coal exploration on 8 projects in the Peace River coalfields totalled approximately $3.6 million and included approximately 13 000 metres of drilling. Western Canadian Coal Corporation and NEMI will join forces in 2005 and spend up to $20 million to explore and develop the **Saxon** and **Belcourt** coal projects near Tumbler Ridge. Both properties have had feasibility reports prepared in the past but were never developed. The mines would need approximately 100 kilometres of rail extension to connect to the existing CN line.

Kennecott Canada Exploration Pty Ltd. acquired the **Goodrich** coal property in the Pine Pass area west of Chetwynd, drilled two holes late in the season and plan to resume drilling in early 2005. Aurora Coal & Minerals Ltd. completed a modest drilling program on its **Wapiti** property, 30 kilometres north of Tumbler Ridge.

Central - Major Exploration Projects

In the Toodoggone region, Stealth Minerals and Finlay Minerals completed large drilling programs on their new epithermal gold-silver vein discoveries – **Sickle Creek** and **Pil North**, respectively. Stealth Minerals also discovered porphyry copper-molybdenum mineralization in the **Sofia** and **Alexandra** showings on its Sickle Creek property.

Alpha Gold drilled its large **Lustdust** skarn property, northwest of Fort St. James. Minterra Resources drilled its **Star** copper-platinum group elements property, northwest of Germansen Landing.

Eastfield Resources continued drilling on its large **Lorraine** copper-gold property, northwest of Fort St. James, and reported several mineralized intervals and new discoveries over a strike length of over four kilometres.

Southwest of Vanderhoof, Southern Rio Resources continued resource definition drilling of the Tommy and Ted veins on its **3Ts** gold-silver property. It also discovered the Hidden vein.

South of the Mount Polley mine, Fjordland Exploration (under a joint venture agreement with

*Photo 9. In the Toodoggone mining camp, Stealth Minerals explored a large property for precious metals and copper, including this area near Quartz Lake (**Sickle Creek**).*

Wildrose Resources) discovered potentially significant gold-copper mineralization on the Megabuck zone at the **Woodjam** property, south of Horsefly.

Skygold Resources (under an option with Wildrose Resources) drilled the sediment-hosted **Spanish Mountain** gold target near Likely.

Kootenays - Major Exploration Projects

Near Silverton, Bethlehem Resources completed an underground drilling program on its **Willa/LH** copper-gold breccia deposit. It hopes to commence mining in 2005, including trucking the ore northwards to its Goldstream mill for processing. At the **Kena** intrusion-related gold project near Nelson, Sultan Minerals completed a modest drilling program, testing newly identified structural corridors.

The **Max** porphyry molybdenum deposit, northeast of Nakusp, was drilled by Roca Mines. A follow-up underground exploration program is planned for early 2005.

Exploration spending on 6 coal projects totalled approximately $1.7 million, including some 19 700 metres of drilling. Exploration was conducted on or adjacent to the **Elkview**, **Fording River** and **Line Creek (Burnt Ridge)** mines, as well as on the **Marten-Wheeler** property 15 kilometres south of Sparwood and on the **Bingay Creek** deposit, 30 kilometres north of Elkford. On the latter, Hillsborough Resources plans to collect a bulk sample to test market conditions in 2005.

Northwest of Kimberley, Stikine Gold Corp drilled a single deep hole (more than 2700 metres) which resulted in the discovery of layered lead-zinc mineralization on its **Sullivan Deeps** project. Phase 2 of the project, which includes follow-up drilling, commenced in November. Also in the east Kootenay region, Klondike Gold drill tested several lead-zinc targets (*e.g.* **Payday**, **Panda**, **Fran**, **Davent** and **Pakk**), all in the search of another deposit like Sullivan. Klondike Gold also discovered layered lead-zinc mineralization on its **Sully** property, 20 kilometres northeast of Cranbrook.

In the Greenwood camp, Gold City Industries drilled its **Lexington** and **Golden Crown** gold-copper deposits. It plans to extract bulk samples from both properties in 2005 and process the material at its proposed new Zip mill.

Thompson-Okanagan - Major Exploration Projects

Surrounding the Afton mine, Abacus Minerals conducted a large drilling program for copper and gold on its Afton area deposits (**Rainbow**, **DM**, **Audra**). In the northern part of the Highland Valley, Getty Copper completed further drilling at its **Getty North** copper deposit and is investigating the potential use of solvent

*Photo 10. Large drill rig on the **Sullivan Deeps** property, northwest of Cranbrook.*

extraction-electrowinning on the near-surface mineralization. On its adjoining **North Valley** property to the west, Teck Cominco completed a large drilling program.

In the Revelstoke area, Orphan Boy Resources completed drilling programs on its polymetallic **Goldstream** and **Rain** properties. It also discovered vein and manto mineralization in the Alfie and Lynes showings on the Rain property. BacTech Mining completed an underground drilling program on its **J & L (McKinnon Creek)** precious metal-bearing deposit. It plans to initiate a feasibility study in 2005.

At the former **Bralorne** mine at Goldbridge, Bralorne Gold Mines processed a bulk sample from its Loco property and continued to complete mill and tailings construction. J-Pacific Gold drilled its **Elizabeth** gold property, 60 kilometres northwest of Lillooet. It also discovered a zone of porphyry copper-molybdenum mineralization.

In the Okanagan region, Almaden Minerals completed a large drilling program on its past-producing **Elk** gold-silver property west of Peachland. It plans to produce a new resource estimate, and will examine the feasibility of re-opening the mine. In the Merritt area, Almaden discovered several new epithermal gold-silver showings on its **Prospect Valley** property. Mosquito Consolidated Gold drilled its **Brett** gold property, 35 kilometres west of Vernon. A new zone of epithermal

mineralization, Bonanza East, was located sub-parallel to the Main zone. Near Okanagan Falls, Ecstall Mining continued to explore its **Vault** and **Dusty Mac** gold properties. Columbia Yukon Explorations Ltd discovered vein gold-silver mineralization on its **Barnes Creek** property, 69 kilometres southeast of Vernon.

Goldcliff Resources continued to drill its **Panorama Ridge** auriferous skarn property, adjacent to the former Hedley gold mine.

Southwest - Major Exploration Projects

North Pacific Alloys Limited continued post feasibility study work on its **Cogburn** magnesium project, near Hope. It submitted a pre-application to the Environmental Assessment Office for consideration in November. Better Resources Ltd drilled the newly discovered **Camp Lake** magnetite-copper skarn property, 25 kilometres west of Campbell River. Mainland Resources discovered VMS/skarn (?) mineralization on its **Memekay** property, 10 kilometres south of Sayward.

BRITISH COLUMBIA EXPLORATION AND MINING INITIATIVES

During 2004, the Government of British Columbia continued a number of measures to assist mineral resource planning, exploration and development, including a provincial Mining Plan.

- In early January 2005, a comprehensive mining plan for British Columbia was released outlining actions to support a thriving, globally competitive, safe and environmentally-responsible exploration and mining sectors that will significantly benefit British Columbians.
- The *British Columbia Mining Exploration Tax Credit Program*, in conjunction with the federal tax credit and the existing Canadian Exploration Expense deduction, is equivalent to a 139% tax deduction. The federal government's flow-through shares incentives program continues to be strongly supported by the provincial government to promote exploration and development of British Columbia's mineral resources.

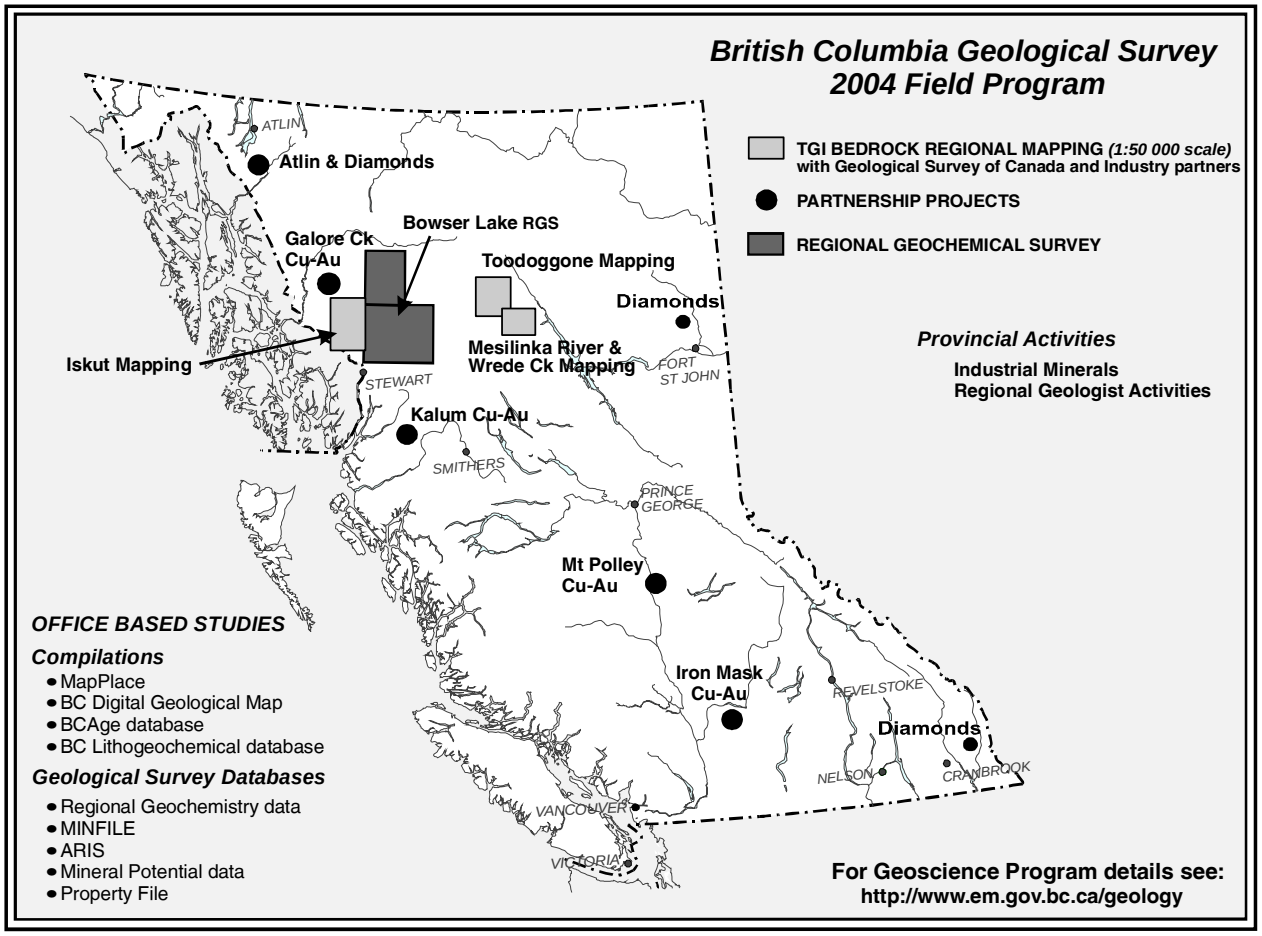

Figure 10. Field geoscience surveys carried out by the British Columbia Geological Survey – 2004.

- Mineral Titles Online, an internet-based mineral tenure system, was instituted in early January 2005.
- Geoscience surveys completed with partners in the Iskut River, Toodoggone mining camp, Terrace, Quesnel, Kamloops and several other areas (*see* Figure 10).
- A regional geochemical survey was carried out northeast of Stewart (NTS 104A) in partnership with the Geological Survey of Canada.
- Over the past year, the Ministry of Energy and Mines published 17 Open Files, 4 Geoscience Maps, 13 Geofiles, 1 Paper, 7 Information Circulars, together with *Geological Fieldwork 2003* (32 manuscripts) and *Exploration and Mining in British Columbia – 2003.*
- MapPlace, MINFILE, CoalFile and Assessment Report databases upgraded and made more accessible to clients: **www.em.gov.bc.ca/geology**.
- Staff completed marketing projects in Vancouver, Toronto, Calgary and New York to attract global mineral industry investment to British Columbia.

MINERAL EXPLORATION AND DEVELOPMENT OUTLOOK FOR 2005

The positive trends in exploration spending, drilling programs, successes at advanced exploration projects, and the number of significant property acquisitions all bode well for a very busy 2005 exploration season in British Columbia. Several companies already have raised significant funds for 2005 projects. Coal, gold and copper open-pit mining and bulk-mineable and bonanza gold targets will continue to be a focus of exploration throughout the province. Regional programs in the Nation Lakes, Toodoggone and Cariboo regions are expected to intensify.

Most metal prices are expected to continue at high values into 2005. Coal, gold, copper, molybdenum, zinc, lead and platinum will be the main commodities attracting mineral exploration attention in the province. The dramatic increase in the molybdenum price could lead to re-evaluations of 'stand alone' molybdenum projects.

The **Mount Polley** and **QR** mines are scheduled to reopen in 2005. Many advanced exploration projects have commenced a feasibility study or plan to do so in 2005 (*e.g.* **Brule**, **Perry Creek**, **Trend**, **Klappan**, **Bralorne**, **Willa/LH**, **Elk**, **Table Mountain** and **Lexington** and **Golden Crown**). Run-of-river hydro project proposals throughout the province may provide the additional infrastructure necessary to enable mine developments in remote areas (*e.g.* the Forrest Kerr hydroelectric project in the northwest). The revival of coal exploration and developments in the northeast will help revitalize the Ridley Island terminal near Prince Rupert.

The strengthening of the international coal markets is expected to continue. Production, development and exploration activities in the northeast (*e.g.* **Brule**, **Perry Creek**, **Trend, Goodrich** and **Lossan**) and southeast (**Bingay Creek** and **Lodgepole**) will continue to increase. In the northwest, the **Klappan** anthracite coal deposit is being considered for development.

The high-grade **Eskay Creek** gold-silver mine continues to attract attention, particularly in the northwest, where there is good potential for similar precious metal deposits (*e.g.* **RDN**, **Corey**, **Sib**). The advancement of the polymetallic **Tulsequah Chief** and **Kutcho Creek** deposits will continue to continue to draw attention to these deposit types elsewhere in the province. With the strong zinc and lead prices, the search for Sullivan-type deposits in the southeast corner of British Columbia is expected to intensify.

Industrial minerals production continues to grow steadily through developing additional markets and mining more commodities. In 2005, it is anticipated that industrial clays, limestone and aggregate sales will improve. Sulphur sales are expected to be particularly strong again.

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Barry Ryan	Coal Geologist	Victoria	250-952-0418	Barry.Ryan@gems4.gov.bc.ca
George Simandl	Industrial Minerals Geologist	Victoria	250-952-0413	George.Simandl@gems2.gov.bc.ca

Major Projects with Reserves and Resources in British Columbia - December 2004

Project Name	Company Name	Commodity		Estimated Tonnes	Grade (g/t or %) / Prod. rate for coal	Resource / reserve category and cutoff
Development Projects						
Apple Bay	Electra Gold Ltd	Geyserite (Si,Al)		5000	83.26%SiO2, 12.90%Al2O3	Geological potential
Mount Polley	Imperial Metals Corp	Au,Cu		40 700	0.432%Cu, 0.309g/tAu	Proven & probable
QR	Cross Lake Minerals Ltd	Au		900	3.1g/tAu	Proven & probable
Table Mtn.	Cusac Gold Mines Ltd	Au,Ag		40	16.9g/tAu	Indicated
Trend (Roman Mtn.)	Northern Energy & Mining Inc	Coal		79 000		Inferred
Wolverine (Perry Creek)	Western Canadian Coal Corp	Coal		17 000	1600 t/yr	Measured & indicated
Zeo / Bromley	Zeo-Tech Enviro Corp	Zeolite		350.2		Measured
Advanced Exploration Projects						
3Ts	Southern Rio Resources Ltd	Au,Ag	*Ted vein*	273.8	2g/tAu, 133g/tAg	Inferred
			Tommy vein	552.5	6.82g/tAu, 60.9g/tAg	Inferred (@ 0.43g/tAu cutoff)
Adanac (Ruby Creek)	Adanac Moly Corp	Mo		151 971	0.063%Mo	Measured & indicated
Afton	DRC Resources Corp	Au,Cu,Ag,Pd		68 700	1.08%Cu, 0.85g/tAu, 2.62g/tAg, 0.12g/tPd	Measured & indicated (@ 0.7%Cu-equiv cutoff)
Bingay Creek	Hillsborough Resources Ltd	Coal		7560		Measured & indicated
				2680		Inferred
Bralorne	Bralorne Gold Mines Ltd	Au	*Above 800 level*	406.6	10.6g/tAu	
			Upper Peter Vein	26.1	9.6g/tAu	
Burnt River (Brule)	Western Canadian Coal Corp	Coal		32 000		
Cariboo Gold Quartz	International Wayside Gold	Au		3100	2.95g/tAu	
Copper Canyon	Eagle Plains Resources Ltd	Au,Cu		32 400	0.75%Cu, 1.17g/tAu, 17.1g/tAg	Inferred
Elk (Siwash North)	Almaden Minerals Ltd	Au		668.3	9.66g/tAu	Measured & indicated
				1317	4.91g/tAu	Inferred
Fir	Commerce Resources Corp	Ta,Nb,P		5600	203.1g/tTa2O5, 1047g/tNb2O5, 3.5%P2O5	Indicated
Galore Creek	NovaGold Resources Inc	Au,Cu,Ag		285 900	0.73%Cu, 0.44g/tAu, 5.7g/tAg	Indicated
				98 800	0.54%Cu, 0.37g/tAu, 4.8g/tAg	Inferred
Getty North	Getty Copper Inc	Cu		72 100	0.31%Cu	Inferred
Golden Crown	Gold City Industries Ltd	Cu,Au		30.7	17.9g/tAu, 0.8%Cu	Indicated (@ 0.6g/tAu equiv cutoff)
				74.2	12.7g/tAu, 0.6%Cu	Inferred
Kemess North	Northgate Minerals Corp	Au,Cu		414 000	0.16%Cu, 0.31g/tAu	Probable
Kena	Sultan Minerals Inc	Au	*Gold Mtn. zone*	5490	1.04g/tAu	Measured & indicated
				10 710	0.967g/tAu	Inferred
			Kena Gold zone	6330	0.969g/tAu	Measured & indicated
				1440	1.216g/tAu	Inferred
Klappan	Fortune Minerals Limited	Coal		107 900		Measured
				109 500		Indicated
				91 500		Inferred
Kutcho Creek	Western Keltic Mines Inc	Cu,Zn,Ag,Au	*Kutcho zone*	14 900	1.85%Cu, 2.62%Zn, 31.6g/tAg, 0.37g/tAu	Measured & indicated
			Esso West zone	1500	3.37%Cu, 5.71%Zn, 63.4g/tAg, 0.54g/tAu	Indicated
Lexington	Gold City Industries Ltd	Cu,Au		152.6	10.3g/tAu, 1.6%Cu	Indicated (@ 0.6g/tAu equiv cutoff)
				58.3	10.2g/tAu, 1.7%Cu	Inferred
Lorraine	Eastfield Resources Ltd	Cu,Au		32 000	0.66%Cu, 0.17g/tAu	
Lossan	Cline Mining	Coal		2279		Measured
				3656		Indicated
				14 157		Inferred
Louise Lake	Firestone Ventures Inc	Cu,Au,Mo		50 000	0.3%Cu, 0.3g/tAu, 0.02%Mo	Geological potential
Max	Roca Mines Inc	Mo		42 940	0.2%MoS2	Measured & indicated (@ 0.1% MoS2 cutoff)
McKinnon Ck (J&L)	BacTech Mining Corp	Au,Ag		3600	7.24g/tAu, 81g/tAg	
Morrison / Hearne Hill	Pacific Booker Minerals Inc	Cu,Au		62 100	0.46%Cu, 0.22g/tAu	Measured & indicated (@ 0.3%Cu cutoff)
Mt. Milligan	Placer Dome Inc	Cu,Au		408 450	0.18%Cu, 0.4g/tAu	Measured & indicated
New Polaris	Canarc Resource Corp	Au,Ag		3270	13.7g/tAu	Geological potential
Red Chris	bcMetals Corp	Au,Cu		276 000	0.349%Cu, 0.266g/tAu	Proven & probable
Ruddock Creek	Cross Lake Minerals Ltd	Zn,Pb,Ag	*E-zone*	1500	8.4%Zn, 1.6%Pb	Inferred
Saxon	Western Cdn Coal Corp /	Coal		53 300		Indicated
				167 300		Inferred
Schaft Creek	Copper Fox Metals Inc	Cu,Mo,Au,Ag		464 700	0.25g/tAu, 0.36%Cu, 0.02%Mo, 1.99g/tAg	Inferred (@ 0.35%Cu cutoff)
Summit Lake (Scottie Gold)	Tenajon Resources Corp	Au,Ag		132.3	19.2g/tAu	Geological resources
Sustut	Northgate Minerals Corp	Cu,Ag		4871	1.7%Cu, 6.11g/tAg	Measured
				2761	1.61%Cu	Indicated (@ 0.7%Cu-equiv cutoff)
Tulsequah Chief	Redfern Resources Ltd	Cu,Zn,Pb,Ag,Au		5940	1.42%Cu, 6.72%Zn, 1.24%Pb, 2.59g/tAu, 107.41	Measured & indicated
				3000	2.42g/tAu, 107.86g/tAg, 1.10%Cu, 6.38%Zn,	Inferred
Turnagain	Hard Creek Nickel Corp	Cu,Ni,Pt,Pd	*Horsetrail zone*	43 300	0.32%Ni	Inferred
			Cub zone	5000	0.55%Ni	Inferred
Vault	Ecstall Mining Corp	Au,Ag	*North vein*	152	14g/tAu	Indicated
			Main zone	1550	2.49g/tAu	Indicated
Verity	Commerce Resources Corp	Ta,Nb,P		3060	196g/tTa2O5, 646g/tNb2O5, 3.2%P2O5	Indicated
Willa/LH	Orphan Boy Resources Inc	Cu,Au		1830	4.77g/tAu, 0.68%Cu, 9.2g/tAg	(@ 2.5g/tAu cutoff)

Note: Reserves / resources are from a variety of sources and may not be compliant with National Instrument 43-101

NORTHWEST REGION

By Paul Wojdak, PGeo
Regional Geologist, Smithers

SUMMARY AND TRENDS

Mineral exploration activity increased sharply in 2004 and high metal prices were a boon to mines in the region. Exploration spending in the Northwest jumped to $55 million, more than double the amount in 2003 (see Figure 2-1). Exploration drilling, primarily a measure of work on advanced properties, climbed to about 167 000 meters (see Figure 2-2). Most of the activity was distributed among 41 large projects, 35 of which included drilling. Three major mines operated in the region. All three benefited from high metal prices but the low-cost Endako open pit mine fared particularly well as molybdenum soared to more than $30 per pound. Buoyed by the strong price, Endako began a large waste rock-stripping program to access more ore and prolong mine life. The rich Eskay Creek underground mine continued to be a major producer of gold and silver but the supply of high-grade ore that is shipped to smelters will be exhausted in early 2005. Eskay Creek will continue to mine and treat lower grade ore for several more years. The open pit Huckleberry mine maintained its output of copper and by-product molybdenum, and carried out a major exploration program in hope of continuing mine life beyond 2007. Mine data, including annual production and reserves, is shown in Table 2-1.

Highlights of exploration and pre-development work include

- At Red Chris near Iskut, completion of a positive feasibility for a 30 000 tonne per day open pit copper-gold mine, and submission of a Project Report to the Environmental Assessment Office. Project economics are based on extension of the British Columbia power grid.
- At Galore Creek, west of Bob Quinn, completion of a major exploration program with results that will significantly enhance near-surface copper-gold resources. Positive results included discovery of a spectacular zone with +10% copper. The Galore Creek project entered the Environmental Assessment process with proposed development of a 30 000 to 60 000 tonne per day open pit mine. Possible access road and mill site locations were investigated for a pre-feasibility analysis.
- At Tulsequah Chief, south of Atlin, a major drilling program to confirm and expand the copper-zinc-silver-gold resource for an updated feasibility study of a 2500 tonne per day underground mine
- At Copper Creek, near Telegraph Creek, preliminary exploration drilling confirmed surface samples and discovered a substantial zone of copper-gold porphyry mineralization that is open to expansion and includes a supergene enrichment zone
- At GJ near Iskut, step-out drilling significantly extended the known limits of a porphyry copper-gold zone, which remains open to further expansion
- At Kutcho Creek, east of Dease Lake, drilling reappraised the copper-zinc-silver-gold deposit for an optimal grade resource and extracted a sample for metallurgical study
- At Adanac, near Atlin, a large drilling program to validate resources in a porphyry molybdenum deposit, to be followed by a pre-feasibility study
- The Klappan anthracite open pit coal project entered the Environmental Assessment process
- At Morrison, near Granisle, mineable copper-gold resources were estimated and the project continues in the Environmental Assessment process

Table 2-2 lists all exploration projects in the region where expenditures exceeded $100 000 and their locations are shown in Figure 2-3. The most popular

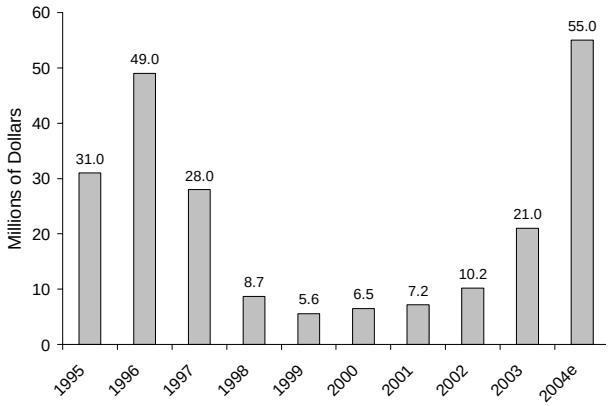

Figure 2-1. Exploration Expenditures in Northwest BC.

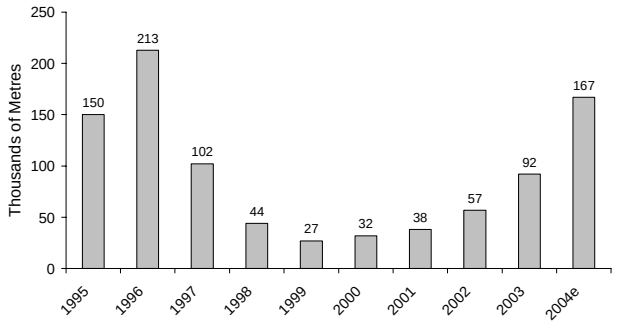

Figure 2-2. Exploration Drilling in Northwest British Columbia.

targets were porphyry copper-gold prospects. Volcanogenic massive sulphide deposits, gold veins and porphyry molybdenum deposits were also sought. An important trend continues to be reactivation of work at past mines and properties with indicated or inferred resources. Successful drilling programs were conducted at three former gold mines, Table Mountain, Summit Lake and New Polaris. Significant mineralization was intersected in drilling on new zones at Foremore, Tide, and Fire Mountain. Bedrock showings that warrant follow up were reported at RDN, Corey and LCR.

Looking ahead to 2005, current levels of activity are expected to continue or increase. Environmental approval of the Red Chris project could occur as early as May 2005 and, if followed by a decision to start mine construction, may spur exploration in the area. At Galore Creek, eight drill rigs are scheduled for an enormous program of definition drilling, engineering and environmental work required for a full feasibility study. Among the many continuing exploration projects listed above, large drilling programs are expected at Copper Creek and GJ to test the extent of porphyry copper-gold mineralization. Work is planned on additional advanced-stage porphyry copper and molybdenum prospects including Schaft Creek and Eaglehead in the Telegraph Creek - Dease Lake area, and Poplar, Lucky Ship and Yorke-Hardy in the Houston-Smithers area.

MINES AND QUARRIES

METAL MINES

The **Eskay Creek** underground gold-silver mine, owned by Barrick Gold Corporation, is expected to produce 9300 kg of gold and 450 000 kg of silver in 2004. Eskay Creek comprises a series of volcanogenic massive sulphide deposits with exceptional gold and silver content that occur in mudstone and footwall rhyolite at the top of the early Jurassic Hazelton Group. Scheduled mine production is 670 tonnes per day at an average grade of 46.3 g/t gold and 2225 g/t silver. Gold production cost for 2004, net of silver credits, is estimated at $US 100 per ounce. Including contractors, the mine employs 320 people. Forecast mine output is 135 000 tonnes of direct shipping ore and 110 000 tonnes of milling ore. Direct shipping ore comes from the stratiform 21B orebody and is richer than average in gold and silver but also contains high levels of mercury, antimony and arsenic that require it to be shipped to smelters for treatment. The 21B zone consists of clastic beds in the Contact Mudstone of sphalerite, tetrahedrite – freibergite, lead-sulphosalts (including boulangerite, bournonite, jamesonite), stibnite, galena, pyrite, electrum and amalgam. The cut-off grade for shipping ore is 30 g/t gold equivalent. Ore that is treated in the on-site mill comes from the NEX zone, the northern extension of 21B, and from Hanging Wall and Footwall zones. Hanging wall ore is stratiform sulphide layers in mudstone intercalated with basalt above the Contact Mudstone. Footwall ore occurs in the underlying rhyolite and consists of gold enrichment along faults and in areas of silica and sericite alteration.

Endako is a porphyry molybdenum deposit within the early Cretaceous Francois Lake granite batholith. Thompson Creek Mining Ltd owns 60%. of the operation and Sojitz Moly Resources Inc. owns 40%. The Endako open pit mine has operated for 34 years and is a low-cost

TABLE 2-1. MINE PRODUCTION AND RESERVES, NORTHWEST REGION

Mine	Operator	Employment	Production (2004 Estimate)	Reserves
Endako	Thompson Creek Mining Ltd. & Sojitz Moly Resources Inc.	252	5000 t molybdenum	Endako Pit, 32.8 mt at 0.071% Mo; Denak Pit, 22.7 mt at 0.069% Mo; Stockpile, 25.2 mt at 0.047% Mo (Oct. 1, 2004)
Eskay Creek	Barrick Gold Corp.	320	9300 kg gold, 450 000 kg silver	Shipping ore, 248 264 t at 56.40 g/t Au, 3015 g/t Ag; Milling ore, 592 631 t at 25.77 g/t Au, 1013 g/t Ag (Jan 1, 2004)
Huckleberry	Huckleberry Mines Ltd. (50% Imperial Metals Corp.)	230	33 000 t copper 170 t molybdenum	25.0 mt at 0.507% Cu, 0.014% Mo, 0.059 g/t Au, 2.97 g/t Ag (Jan 1, 2004)
Fireside	Fireside Minerals Inc.	20 (seasonal)	9000 t barite	Not available

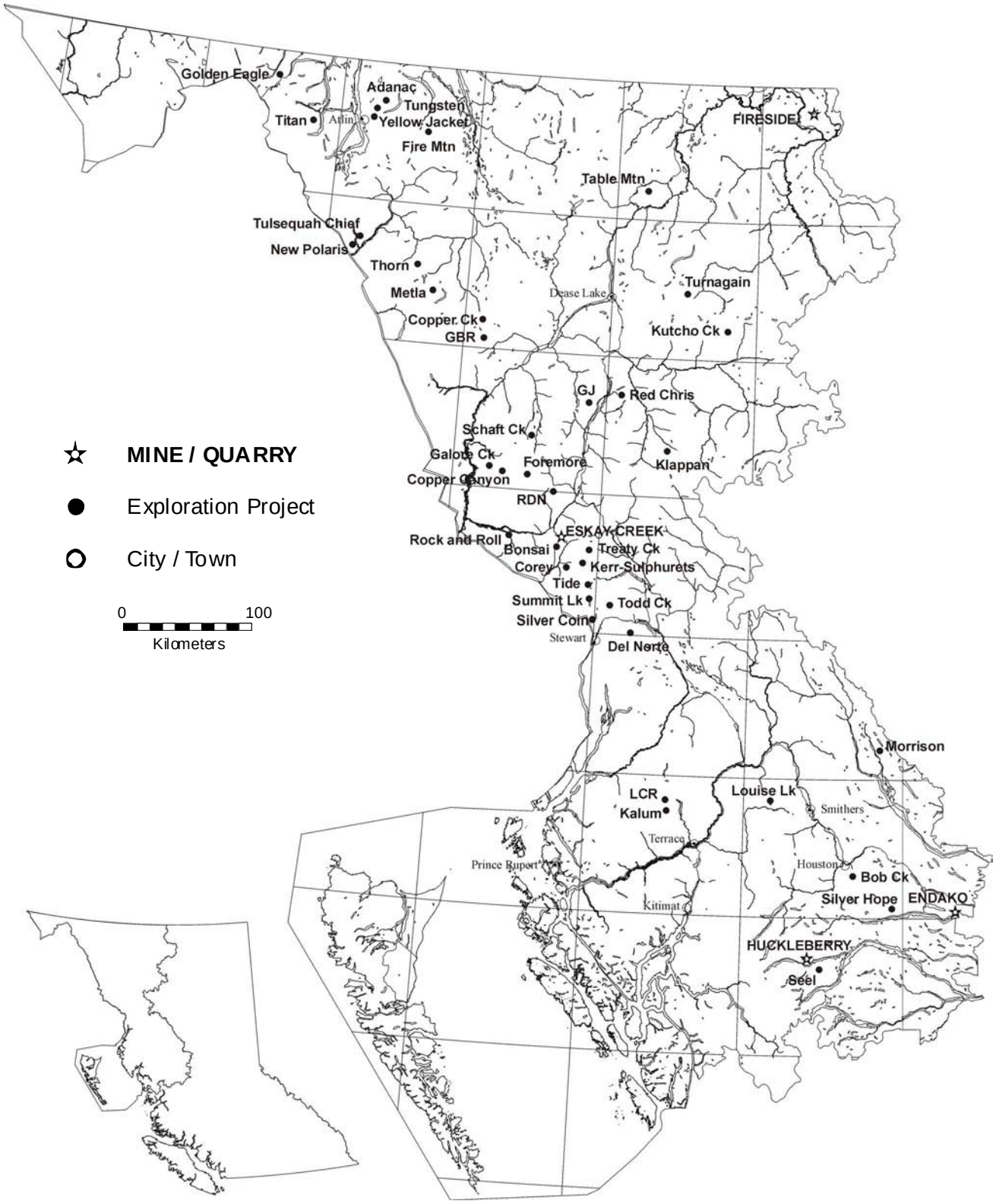

Figure 2-3. Location map, Mines and Exploration Projects in Northwest British Columbia, 2004.

TABLE 2-2. MAJOR EXPLORATION PROJECTS IN NORTHWEST REGION - 2004

Property	Operator	Minfile	Commodity	Deposit Type	Work Program
Adanac (Ruby Creek)	Adanac Moly Corp.	104N 052	Mo	Porphyry	IP; A; DD (9022 m); EN
Bob Creek	Canadian Gold Hunter Corp.	93L 009	Au, Ag	Epithermal	DD (1415 m)
Bonsai & Treaty Creek	Heritage Explorations Limited	104B 078, 383	Au, Ag	Epithermal VMS, Porphyry	AB-EM/MG; DD (674 m)
Copper Canyon	NovaGold Resources Inc.	104G 017	Cu, Au	Alkalic Porphyry	AB-MG/RD; DD (3017 m)
Copper Creek	Firesteel Resources Inc.	104J 005	Cu, Au	Porphyry	G; GC; TR; DD (1555 m)
Corey	Kenrich Eskay Mining Corp.	104B 011, 355	Au, Ag	Epithermal VMS	G; GC
Del Norte	Lateegra Resources Corp.	104A 161, 176	Au, Ag	Epithermal Vein	DD (4816 m)
Endako Mine	Thompson Creek Mining Ltd.	93K 006	Mo	Porphyry	DD (1370 m)
Eskay Creek	Barrick Gold Corp.	104B 008	Au, Ag	Epithermal VMS	DD (18 055 m)
Fire Mountain	bcMetals Corp.	104N 067	Mo	Porphyry	DD (3379 m)
Foremore	Roca Mines Inc.	104G 148	Au, Ag, Cu, Zn	VMS	G; P; GC; UT; MG; DD (5900 m)
Galore Creek	NovaGold Resources Inc.	104G 090, 091, 095, 097	Cu, Au	Alkalic Porphyry	G; AB-MG/RD; IP; DD (22 959 m); EN; PF
GBR	Amarc Resources Ltd.	104J 059	Cu, Au	Porphyry	G; GC; IP
GJ	Canadian Gold Hunter Corp.	104G 034, 177	Cu, Au	Porphyry	G; P; TR; DD (4267 m)
Golden Eagle	Marksmen Resources Ltd.	104M 085	Au	Skarn, Vein, VMS	AB-EM/MG/RD
Huckleberry	Imperial Metals Corp.	93E 037	Cu, Mo	Porphyry	G; IP; DD (8000 m)
Kalum	Eagle Plains Resources Ltd.	103I 019, 174, 213	Au	Pluton-related Vein	G; AB-EM/MG, DD (1958 m)
Kerr-Sulphurets	Noranda Inc.	104B 173, 180	Cu, Au	Porphyry	G; R; IP
Kutcho Creek	Western Keltic Mines Inc.	104I 060	Cu, Zn, Ag, Au	VMS	DD (7691 m); MS
LCR	Northern Continental Resources Ltd.	103I 021	Cu, Mo, Au	Porphyry	G; P; GC; AB-EM/MG; DD (484 m)
Louise Lake	Firestone Ventures Inc.	93L 079	Cu, Au	Porphyry	DD (1675 m)
Metla district	Solomon Resources Limited	104K 113	Au	Vein	G; GC
Morrison	Pacific Booker Minerals Inc.	93M 007	Cu, Au	Porphyry	EN; PF
New Polaris	Canarc Resource Corp.	104K 003	Au	Mesothermal Vein	DD (2767 m)
RDN	Northgate Minerals Corp. & Rimfire Minerals Corp.	104G 144	Au, Ag	Epithermal VMS	G; P; DD (2499 m)
Red Chris	bcMetals Corp.	104H 005	Cu, Au	Porphyry	DD (4848 m); GD (1279 m); CD (779 m); EN; FS

TABLE 2-2. CONTINUED

Property	Operator	Minfile	Commodity	Deposit Type	Work Program
Rock and Roll & Phiz	Conquest Resources Ltd.	104B 377, 165	Au, Ag, Cu, Zn	VMS, Vein	G; GC
Schaft Creek	Copper Fox Metals Inc.	104G 015	Cu, Mo	Porphyry	MS
Seel	Gold Reach Resources Ltd. & Grayd Resource Corp.	93E 105	Cu, Au	Porphyry	G; R; GC; IP; DD (1500 m)
Silver Coin	Pinnacle Mines Ltd.	104B 095	Au, Ag	Epithermal Vein	DD (3000 m)
Silver Hope	Canadian Empire Exploration Corp.	93L 256	Ag, Cu, Au	Epithermal Vein	DD (1800 m)
Summit Lake	Tenajon Resources Corp.	104B 034	Au	Pluton-related Vein	DD (1280 m)
Table Mountain	Cusac Gold Mines Limited	104P 070	Au	Orogenic Vein	DD (6478 m)
Thorn	Cangold Limited & Rimfire Minerals Corp.	104K 031	Ag, Au, Cu	Epithermal Vein, Breccia	DD (1810 m)
Tide	Serengeti Resources Inc.	104B 129	Au, Ag	Pluton-related Vein	DD (500 m)
Titan	Eagle Plains Resources Ltd.	104M/8W	Mo	Porphyry	DD (314 m)
Todd Creek	Lateegra Resources Corp.	104A 001	Au, Cu	Vein	DD (750 m)
Tulsequah Chief	Redfern Resources Ltd.	104K 002	Cu, Pb, Zn, Ag, Au	VMS	UG (160 m); R; DD (30 444 m); EN
Tungsten	Adanac Gold Corp.	104N 006, 053	Au	Vein	DD (375 m)
Turnagain	Hard Creek Nickel Corp.	104I 119, 120, 051	Ni, Cu, Co	Magmatic	AB-EM/MG; DD (7645 m)
Yellow Jacket	Muskox Minerals Corp.	104N 043	Au	Orogenic Vein	AB-EM/MG; DD (3750 m)

producer. The ore body is a 3.5-kilometer long stockwork zone that is elongated to the west-northwest and dips about 50º south to a depth of 330 meters. In 2004, ore from a low-grade stockpile continued to supplement pit production. The average grade supplied to the mill was about 0.066% Mo. Narrow mining width in the pit coupled with wall instability that interrupted mining led to a 10% reduction in the tonnage milled. The mill normally processes 27 000 tonnes per day and recovers about 78% of the molybdenum sulphide, all of which is converted to molybdic oxide. In June, Endako ceased co-production of Ultrapure, its trademarked molybdenum sulphide product, in favour of producing more oxide because of its greater profitability. Employment increased to 252 persons including 17 temporary personnel who are mainly involved in a pit expansion program.

Pit expansion comprises a major push back of the south wall and a less extensive set back of the north wall that will enable a return to the scheduled rate of molybdenum production. The company has embarked on the first two stages of a three-phase program on the south wall to access ore and improve wall stability. Stripping of 10.1 million tonnes of waste rock will open up 9.1 million tonnes of ore for mining. The third phase, not approved yet, comprises removal of 20.3 million tonnes of waste to access 15 million tonnes of ore. On the north wall, a contractor began mining 1.3 million tonnes of waste and 700,000 tonnes of ore thereby alleviating wall instability and protecting access to the in-pit crusher. Ten exploratory holes were drilled southeast of the Endako pit to follow up on a mineralized intercept.

The **Huckleberry** copper mine, operated by Huckleberry Mines Ltd., is owned 50% by Imperial Metals Corp. and 50% by a group of Japanese companies, Mitsubishi Material Corp., Dowa Mining Ltd. Furakawa Company Ltd. and Marubeni Corp. The mine is located at the foot of Huckleberry Mountain, 125 kilometers by road from Houston. Huckleberry is a porphyry copper deposit

related to the late Cretaceous Bulkley intrusions. Copper mineralization, which occurs in two zones one kilometer apart, is developed within a granodiorite stock and related dike, and also in adjacent hornfelsed and fractured volcanic rocks. The East zone dike is controlled by a fault that trends 110°. All the ore mined in 2004 came from the East pit, the Main zone was mined out in 2002. Through the first three quarters the mill processed 20 757 tonnes of ore per operating day grading 0.473% copper and 0.014% Mo. Copper recovery averaged 85.4% but molybdenum recovery was just 18.3%. Copper concentrate is trucked to the port of Stewart for shipment to Japan. Mining of the East zone requires removal of potentially acid generating waste rock that is dumped into the Main pit to be flooded when the mine closes. The high wall of the East pit was stabilized by drilling a series of holes, inclined at +5°, to drain water dammed behind the main, 110° fault. A large exploration program, comprising about 8000 meters of drilling, focused on an area north of the Main zone. An area northeast of the East pit was a secondary target. No results are available.

INDUSTRIAL MINERALS

Fireside Minerals Ltd. produced 9 000 tonnes of barite from the Bear quarry on the **Fireside** property (94M 003), which is 125 km east of Watson Lake. Coarse, white barite occurs as a fault-controlled vein within rocks of the lower Paleozoic Kechika Group. The vein strikes east northeast, dips steeply north and is up to 10 meters wide. To the north, the vein is bounded by buff-brown phyllite and on the south by black siltstone and quartzite that is fractured and in-filled by quartz and calcite. Run-of-mine material was concentrated using jigs at the mine site, then trucked to Watson Lake where the barite was ground, bagged and sold to the western Canadian oil and gas drilling industry. Exploration drilling below the Bear pit and on other targets is planned early in the 2005 season.

MINERAL EXPLORATION

ATLIN AREA

The **Adanac** molybdenum deposit (104N 052) was staked in 2001 by a predecessor company of the current owner, Adanac Moly Corp., to explore the porphyry prospect for gold and tungsten. Instead, results of an economic scoping study prompted a major program in 2004 to bring the molybdenum resource into compliance with NI 43-101. In 1981, Placer Development Limited estimated a mineable reserve of 152 million tonnes grading 0.063% molybdenum based on 32 000 meters of diamond drilling, 1100 meters of underground development and milling of a 9500 tonne bulk sample, but Adanac Moly was not able to obtain enough of the original data to verify this work. The current 9000-meter program included twinning 5% of the old holes, in-fill holes and exploration holes outside of the previously determined pit limit (Photo 1). The deposit is a quartz-molybdenite stockwork occurring in a multi-phase quartz monzonite stock that is a satellite of the highly evolved Surprise Lake batholith. Molybdenite veins are predominantly gently dipping and are preferentially located in a flat-lying aplite (R. Pinsent, pers. comm.). Drilling enlarged the mineralized zone at depth and laterally, in particular north of the Adera fault, a structure that was previously thought to limit the zone. Prior to drilling, the fault was mapped by a three-dimensional IP survey. The company will commission a new resource calculation and contemplates a feasibility study of the renamed Ruby Creek molybdenum project. Environmental and socio-economic studies were initiated, to update work done by Placer Dome when the project was in the mine development review process. Adanac Moly also drilled 4 holes on the adjacent **Tungsten** property; one hole tested the **Black Diamond** prospect (104N 006) and three targeted gold in quartz veins and a skarn zone along Boulder Creek, near the contact of the quartz monzonite stock with Cache Creek strata.

The **Fire Mountain** molybdenum property (104N 067) was explored by bcMetals Corporation for a porphyry deposit similar to that at Henderson, Colorado. A hornfels zone two kilometers in diameter is developed in chert and siliceous argillite of the Cache Creek Terrane. Pyrite-sericite alteration overprints the hornfels and is cut by quartz-feldspar porphyritic rhyolite dikes, though these are not abundant. Molybdenite occurs on fractures and in locally developed quartz stockwork veining. These features, along with tungsten and fluorine geochemistry, suggest the presence of a molybdenum-bearing stock at depth. Three vertical holes were drilled to depths of more than 1100 meters but did not locate the source intrusion. Dikes with steep and flat contacts are more abundant at

Photo 1. Robert Pinsent, Exploration Manager for Adanac Moly Corp. discusses Adanac core with visitors from Ministry of Energy and Mines.

depth, comprising up to 15% of the core. The dikes contain varying proportions of quartz, K-feldspar and plagioclase, and closely resemble fine and medium grained phases of the Surprise Lake pluton. Quartz veining occurs in dikes and hornfels. The best hole, FM04-01, returned an intercept of 0.058% Mo over 399.3 meters beginning at 716 meters below surface. Wavy banded quartz veinlets, known informally as 'brain rock', are well developed over a few short intervals. Fluorite occurs in quartz veinlets in hornfels up to 300 meters above the mineralized zone.

Kobex Resources Ltd. drilled three short core holes on the **Titan** molybdenum property under an earn-in agreement with Eagle Plains Resources Ltd. At the Titan showing, recently exposed by glacial retreat, molydenite rosettes occur in Cretaceous granite near the contact with metasedimentary rocks. Two IP anomalies, 300 to 350 meters from the showing were targeted by the drill holes. The holes intersected disseminated pyrite, and a 0.2 meter interval of disseminated molybdenite and chalcopyrite. The Titan showing remains untested.

Muskox Minerals Corporation continued to drill the **Yellow Jacket** (104N 043) gold prospect in the heart of the Atlin placer gold district. Gold at Yellow Jacket occurs in listwanite-altered fault zones near the contact between serpentinized ultramafic and mafic volcanic rocks of the oceanic Cache Creek terrane. Drill programs in the 1980's by Canova Resources Ltd. and Homestake Mineral Development Corp. yielded intercepts of 10-35 g/t gold over widths up to 4 meters but continuity could not be shown. Drilling by Muskox is focused in the same 250 meter interval along Pine Creek. Two of twelve holes encountered coarse gold that returned assay intercepts similar to those obtained by previous explorers. A structural model was developed to guide further exploration. Results of approximately 20 additional holes have not been released. Muskox contracted an airborne electromagnetic and magnetic survey to identify new targets for drilling.

Marksmen Resources Limited carried out a 670 km airborne survey on its **Golden Eagle** property (formerly Pavey) near Bennett Lake, recovering EM, magnetic and gamma ray spectrometry data. Gold is associated with arsenic, antimony and base metal sulphides in a series of vein, disseminated and skarn zones (104M 044, 085) near the faulted contact between Stuhini Group volcanic rocks and Boundary Range metamorphic rocks. Marksmen is pursuing an Eskay Creek deposit analogy in its evaluation of drill targets.

TULSEQUAH-TAKU AREA

Redfern Resources Ltd., a wholly owned subsidiary of Redcorp Ventures Ltd., conducted a major program of in-fill and step-out drilling to confirm and expand resources at the **Tulsequah Chief** deposit (104K 002). Three drills recovered over 30 000 meters of core in 54 holes and include some of the highest grades obtained over the life of the project. In the 1950's Cominco Ltd. mined 575 000 tonnes from Tulsequah Chief. Exploration up to 1994 by Cominco and Redfern determined a measured and indicated resource of 5 940 000 tonnes grading 1.42% copper, 1.26% lead, 6.72% zinc, 107 g/t silver, 2.59 g/t gold and an additional 3 million tonnes of inferred resources at similar grade. In 2004, the 5400 level drift was extended 160 meters and all drilling was conducted from three underground stations (Photo 2). Tulsequah Chief is a volcanogenic massive sulphide deposit found in the hinge zone and limbs of a steeply plunging syncline within Mississippian strata. Sulphide lenses are stacked near the base of a rhyolite-dominated sequence overlying a quartz-pyrite-sericite-cordierite alteration zone in a thick accumulation of mafic volcanic rocks. The most important part of the deposit, the H lens, forms a steep pipe, or lens, that is about 100 meters long, up to 31 meters in true thickness and was delineated by the current program to 800 meters below previous mining. At that level, a fault zone was encountered that caused several drill holes to be lost. Holes that were completed through the fault penetrated intense alteration and the company suggests that the H lens bends to the east toward the 5300E fault. Drilling also targeted the G zone, which is a faulted offset of the H deposit on the east side of the 5300E fault. Geologic modeling and calculation of a new resource estimate are in progress. Equipment and construction cost estimates were obtained for an updated feasibility study. Redfern installed a pilot plant to treat acidic water draining from old mine workings. The company also completed a geotechnical study of a fan at the mouth of Shazah Creek that concluded the fan is not subject to debris flows and is therefore a safe site to dispose of mine tailings. The Tulsequah Chief project has a Project Approval Certificate from the B.C. government and is being reviewed by the federal government under the Canadian Environmental Assessment Act (CEAA).

At the **New Polaris** gold property, across the Tulsequah River from the Tulsequah Chief project, Canarc Resource Corp. began an in-fill drilling program

Photo 2. Underground drilling at Tulsequah Chief

near the end of the year. Gold is associated with disseminated arsenopyrite in conjugate, shear-controlled quartz-ankerite vein stockworks and listwanite alteration developed within Devonian mafic volcanic rocks. The shear zone is a splay of the 220 kilometer-long Llewellyn fault. A previous resource estimate of 3.26 million tonnes grading 12.3 g/t gold is not compliant with Canadian policy NI 43-101. The objective of the current program is to block out proven and probable resources in the C vein by reducing the spacing between drill intercepts from 60 to 30 meters, beginning down dip of two old stopes in the former Polaris-Taku mine. The first four holes returned a weighted average of 25.6 g/t gold over a 5.3-meter core length. True width is estimated to be 85 to 90% of the core length.

Cangold Limited performed geophysics and core drilling on the **Thorn** gold-silver prospect (104K 031) under an earn-in agreement with Rimfire Minerals Corporation. Intensely altered Upper Cretaceous volcanic rocks and a related biotite-quartz-feldspar porphyry stock underlie the property. The primary targets are pyrite-tetrahedrite-enargite quartz veins up to 5 meters wide that containing significant to bonanza grades of silver, copper and gold. The Oban breccia zone, discovered by drilling in 2003, contains about 1 g/t gold and 100 to 200 g/t silver across widths of a few tens of meters. Float samples suggest it may contain silver and gold locally of much higher grade. An IP survey over the Oban breccia detected a pronounced anomaly over known mineralization. The response is interpreted to show a 300-meter continuation of the zone and a similar target one kilometer to the south. A forest fire interrupted geophysical work and delayed drilling. Drilling comprised 12 holes and totaled 1810 meters. Four holes tested the Oban zone along strike and at depth and five holes tested the IP anomalies. Three holes explored the continuity of high-grade gold-silver-copper mineralization in massive sulphide veins along the 1.5 kilometer-long Camp Creek structural zone. Results were not available.

Solomon Resources optioned the **Metla** (104K 113) property from Clive Aspinall and James Dawson to explore for the source of gold-rich boulders exposed by recent glacier retreat. Solomon also acquired the In-Law (104K 078), La Veta (104K 075) and Tatsa (104K 037) showings located nearby. Geological work and sampling did not locate new targets and the company concluded that previous operators adequately tested known showings and anomalies.

Copper Ridge Explorations Inc. reacquired claims on the **Joss'alun** copper prospect (104N 136) from Imperial Metals Corporation. An agreement was made with Consolidated Norsemont Ventures Ltd., which performed an 8-kilometer IP survey.

CASSIAR AREA

Exploration drilling at the shutdown **Table Mountain** gold mine (104P 070) resulted in discovery of a new vein by Cusac Gold Mines Ltd. Gold at Table Mountain occurs in steeply dipping quartz-sulphide veins over a wide area but with limited vertical extent, within listwanite-altered ultramafic rocks and underlying mafic volcanic rocks. The veins terminate against overlying argillaceous sedimentary rocks emplaced by a thrust fault in an imbricated, gently dipping succession known as the Sylvestor allocthon. All past-productive veins strike at 070° but the Rory vein trends 020° and dips steep to the west. It was found north of the Jennie and Bear veins in a prospective but relatively unexplored portion of the property. The Rory vein averages 3 meters in true width over a length of 130 meters and dip extent of 45 meters, and is 25 meters above a main haulage drift. Indicated resources were calculated to be 19 958 tonnes at 12.17 g/t gold. The Rory and East Bain veins contain a combined total Indicated resource of 40 059 tonnes at 16.9 g/t gold. Five kilometers south of the Rory discovery, four holes were drilled to test for an eastern extension of the Hot vein. More drilling is planned in this area in 2005.

TURNAGAIN-UPPER STIKINE AREA

Western Keltic Mines Inc. acquired the dormant **Kutcho Creek** property (104I 060) and revived exploration and evaluation of the volcanogenic massive sulphide deposit. The host rocks are dacite to rhyolite pyroclastic rocks of Permo-Triassic age. Previous operators discovered a series of three deposits over a strike length of 3.5 kilometers; Kutcho, which contains an indicated resource of 14.9 million tonnes grading 1.85% copper, 2.62% zinc, 31.6 g/t silver, 0.37 g/t gold, Sumac West, which contains 10 million tonnes at sub-economic grade and Esso West, which contains 1.5 million tonnes grading 3.37% copper, 5.71% zinc, 63.4 g/t silver, 0.54 g/t gold. Work in 2004 on the Kutcho lens comprised 21 drill holes that improved definition of higher-grade areas, slightly extended limits of the deposit and extracted a sample for metallurgical study (Photo 3). The best intercept was near the margin of the Kutcho lens, 8.3 meters grading 5.34% copper, 5.94% zinc, 138 g/t silver, 2.28 g/t gold. Work in the Esso West lens comprised 9 drill holes that expanded the deposit. Hole 04-27b1, 50 meters beyond the previous western limit of the lens, intersected 5.2 meters grading 3.03% copper, 18.6% zinc, 65.4 g/t silver, 0.93 g/t gold. New resource estimates will be calculated and a prefeasibility study is anticipated in 2005.

Hard Creek Nickel Corporation (formerly Canadian Metals Exploration Ltd.) continued exploration for a bulk-tonnage nickel deposit on the **Turnagain** property, 110 kilometers east of Dease Lake. The program included a 1600-line kilometer airborne EM and magnetic survey, a

Photo 3. Transporting drill core by helicopter at Kutcho Creek.

soil geochemical survey over a 115-kilometer grid and 49 diamond drill holes totaling 7645 meters. The 3 by 8 kilometer Turnagain serpentinized ultramafic body contains variably disseminated pyrrhotite and, locally, minor pentlandite and chalcopyrite. Based on work prior to 2004, the company announced an Inferred resource of 48.3 million tonnes averaging 0.34% nickel in the Horsetrail zone (104I 119) and 5.0 million tonnes averaging 0.55% nickel in the Cub zone (104I 120). Much of the 2004 drilling comprised in-fill holes in the Horsetrail zone and a new resource estimate is anticipated in early 2005. Nickel is contained in sulphide and silicate minerals and on-going metallurgical study is investigating recoverable nickel, copper, cobalt and platinum group elements. The soil survey covered the ultramafic body northwest of the Horsetrail zone up to tree line and found elevated levels of copper, nickel, cobalt, platinum and palladium. Some twenty drill holes, located to test the soil response, intersected hornblendite and magnetite-bearing clinopyroxenite locally containing 100 to 500 parts per billion platinum and palladium.

At the **Eaglehead** porphyry copper prospect (104I 008), John Poloni completed a soil survey and struck an agreement with Carmax Explorations Ltd. to carry out further exploration in 2005. Previous exploration includes 59 core holes that intersected six mineralized areas along a 10 km trend. One of the last holes drilled in the East zone cut 0.94% copper over 63 meters.

TELEGRAPH CREEK AREA

Firesteel Resources carried out a program of geological mapping, backhoe trenching, soil geochemistry and drilling on the **Copper Creek** property 50 km northwest of Telegraph Creek and 8 km from the Golden Bear mine road. Work focused on the DK zone (104J 035), one of three zones of porphyry copper and skarn mineralization. Monzonite, probably an apophysis of the Kaketsa pluton, intrudes mafic volcanic rocks and bedded tuffs of the Stuhini Group. Trenches were dug along old dozer trails by a portable machine that was transported to the property by helicopter. A trench cut obliquely across the intrusive contact returned 0.38% copper and 0.23 g/t gold over 270 meters, the entire length of the trench (Photo 4). The rock is strongly fractured and cut by quartz veinlets. Malachite is present locally but along most of the trench copper minerals are difficult to recognize. Drilling determined that chalcopyrite is the principal copper mineral at depth but is essentially absent near surface where copper oxides and/or chalcocite comprise a zone of supergene enrichment. Drill holes collared along the trench began and ended in copper mineralization. The best hole of the program, CUCR 04-05 was angled to the north and cut 0.44% copper and 0.32 g/t gold averaged over its full length of 242 meters, the top 52.3 meters of the hole averaged 0.80% copper and 0.73 g/t gold. Hole CUCR 04-02, fifty meters away and angled south, averaged 0.42% copper and 0.21 g/t gold over its length of 173 meters. The tenor of the hypogene zone is about 0.2 to 0.3% copper and 0.06 to 0.2 g/t gold. The extent of copper mineralization remains to be determined but may extend 300 meters south where a trench returned 0.51% copper and 0.41 g/t gold over its full length of 20 meters.

Amarc Resources acquired the **GBR** property, 40 kilometers northwest of Telegraph Creek, to explore for a porphyry copper deposit. The claims straddle the Golden Bear mine road. Previous exploration, to evaluate a gold vein (104J 059), also identified a 1.0 by 1.5 kilometer copper and gold soil anomaly that was not explored. Amarc conducted geological mapping and 51 kilometers of induced polarization surveying that determined Triassic to Jurassic intrusive rocks on the property are unlikely to contain significant porphyry mineralization.

Copper Fox Metals Inc. agreed to acquire the **Schaft Creek** porphyry copper deposit (104G 015) from 955528 Alberta Ltd. Old core, stored on the property in a weatherproof building, was sampled to conduct metallurgical test work.

Photo 4. Copper Creek channel sample graded 0.38% copper and 0.23 g/t gold over 270 meters.

KINASKAN AREA

At the **Red Chris** copper-gold porphyry deposit (104H 005), bcMetals Corporation concluded definition drilling and most other field studies, and prepared a feasibility analysis. The BC Environmental Assessment Office accepted the Red Chris Project Report for review by Provincial and Federal agencies, with a decision expected in May 2005. bcMetals completed the purchase of minority interests in the property held by Teck Cominco Limited, thereby consolidating title after more than 30 years of fractured ownership. The copper-gold deposit is in the Red stock, a body of monzonitic composition that is 4.5 kilometers long and up to 1.2 kilometers wide, elongated along an east-northeast structure named the East Zone fault. The stock consists of two compositionally similar phases; the 'Main Phase' is a medium-grained, weakly to intensely altered plagioclase-hornblende porphyritic monzonite that hosts most of the copper-gold mineralization and comprises about three quarters of the stock. The 'Late Phase' is thought by the company to include both unaltered and barren Main Phase and post-mineral dikes with indistinct contacts, which are remarkably similar in composition and texture to very weakly altered Main Phase rocks. The deposit, 1.7 kilometers long, occurs along the central axis of the stock and comprises two distinct zones. The East zone is 60 to 200 meters wide, sharply defined and dips steeply southeast. Copper-gold grade correlates closely with the intensity of quartz-sulphide stockwork veining, which is controlled by the East Zone fault. The Main zone is 150 to 650 meters wide with irregular areas of internal waste. In the Main zone, the continuation of the East Zone fault curves and branches into several sub-vertical splays and the quartz-sulphide stockwork is disrupted by younger faults and reactivated structures. Mineable reserves at Red Chris, excluding low-grade stockpile material, are estimated at 185.4 million tonnes at 0.414% copper and 0.325 g/t gold and, if mine development proceeds, would supply a 30 000 tonne per day mill for a period of 17 years. The East and Main zone pits would merge as mining progresses. Stockpile material is estimated to be 92.4 million tonnes grading 0.216% copper and 0.145 g/t gold and could extend milling an additional 8 years. The initial waste to ore ratio is 2.3, declining to 1.1 after processing the stockpile material. Mill recoveries are expected to average 87.2% for copper and 50.3% for gold. Capital costs are estimated to be $228.5 million. The feasibility study assumes that a 230-kilometer extension of the Provincial power grid will be built by BC Hydro along Highway 37. A new 22-kilometer road would connect the mine to Highway 37. bcMetals Corporation, in conjunction with Outokumpu Technology, is considering the production of metallic copper and gold on-site at Red Chris by a new hydrometallurgical process of chloride leaching of copper sulphide concentrate. Testwork is being conducted on a 24 tonne sample of drill core material.

Canadian Gold Hunter Corp. conducted a 20-hole drilling program on the **GJ** (Kinaskan) property to explore the poorly exposed Groat monzonite stock for a porphyry copper-gold deposit. A series of 200-meter step out holes in the Donnelly zone (104G 086) significantly enlarged the known extent of mineralization to an area 1100 meters long by 100 to 300 meters wide (Photo 5). The zone remains open along trend to the east and in width to the north. Drill hole 04-02, angled across the zone, is representative of the results; it intersected 0.34% copper and 0.35 g/t gold over 252 meters with a higher grade central interval of 168 meters that graded 0.41% copper and 0.44 g/t gold. Chalcopyrite is disseminated in medium-grained monzonite and in a weakly developed quartz vein stockwork. K-feldspar occurs in the groundmass and as vein envelopes. The Donnelly zone contains little pyrite and does not produce a strong IP response. A broad IP chargeability high adjacent to the Donnelly zone may be due to pyrite in volcanic country rocks. In a separate zone, ten drill holes tested the north contact of the Groat stock near an area that was hand-trenched in 2003 (see *Exploration and Mining in BC – 2003*). Most holes encountered Stuhini Group volcanic rocks. Here too, drilling was guided by a broad IP chargeability high and copper mineralization was intersected mainly in holes along the south flank of the anomaly, closer to the pluton. The best intercept was 81.6 meters in hole 04-07 that averaged 0.29% copper and 0.22 g/t gold in a zone of quartz veins enveloped by K-feldspar and epidote. Elsewhere on the property, trenching of a gold-bearing quartz vein on Trevor Peak did not yield significant assays but prospecting 2.5 km north of the Donnelly zone resulted in discovery of a new copper showing called the YT zone.

Freegold Ventures Limited staked the **Compass** and **Ram** properties in the Kinaskan area to cover areas with geology correlative to Eskay Creek and new mineral occurrences found by the B.C. Geological Survey Branch

Photo 5. Project Geologist David Mehner at the only outcrop of the Donnelly zone on the GJ property. Copper-gold mineralization continues at least 1100 meters on the plateau in the background.

(see *Geological Fieldwork 2003*). Prospecting, silt and rock geochemistry were carried out, focusing on mineral occurrences on the claims.

ISKUT DISTRICT

At **Galore Creek**, NovaGold Inc. conducted a major exploration drilling program to augment copper-gold reserves and performed engineering and baseline environmental studies to consider development of a large open-pit mine (Photo 6). Drilling totaled nearly 26 000 meters in 69 holes. A key strategy of the exploration program is to delineate 100 million tonnes of material grading 1% copper and 1 g/t gold that can be mined during the initial years of production to offset high development cost of the proposed mine. A preliminary economic assessment of the project, based on historic data and drilling in 2003, estimated the Main and Southwest deposits (104G 090, 095) contain an 'indicated resource' of 70.0 million tonnes grading 1.15% copper and 0.99 g/t gold, plus 10.4 million tonnes of 'inferred resource' at slightly lower grade. This represents most of the high-grade development objective and is contained within a lower grade 'indicated resource' of 285.9 million tonnes grading 0.73% copper and 0.44 g/t gold together with an 'inferred resource' of 98.8 million tonnes grading 0.54% copper and 0.37 g/t gold. No resources were assigned to other mineralized areas. Drilling in 2004 tested the southeast margin of the 2 kilometer-long Main deposit and the 0.5 kilometer 'Gap zone' between the Main and Southwest deposits. Other targets include the Junction (104G 091), West Fork (104G 097), Grace and Copper Canyon zones (104G 017) and geophysical targets. Results were not available for about one-third of the holes at the time of writing. Bornite and chalcopyrite in the Main deposit is disseminated in volcanic breccias that are cut by sub-horizontal alkaline intrusions, so that the deposit consists of a series of stacked tabular zones. Drilling in 2003 through a barren sill discovered disseminated chalcopyrite and pyrite, the Bountiful zone, below and to the east of the Main deposit. Step-out holes in 2004 extended the zone but did not find its limits, either to depth or to the east. A deep sensing IP geophysical survey was performed over the Main deposit and surrounding area. Parallel chargeability anomalies were found east and west of the Main deposit. A deep response that corresponds with the Bountiful zone is interpreted to link the east anomaly with the Main deposit.

Work in the West Fork zone at Galore Creek, 1 kilometer south of the Main deposit, provided impressive results. Semi-massive to massive bornite, chalcopyrite and magnetite was intersected near surface in at least three drill holes and returned exceptionally high assays, e.g. 14.8% copper, 88.6 g/t silver and 2.05 g/t gold over a 33.6 meter core length. The results of additional holes to investigate the geometry and extent of this zone are pending. A flat-lying zone of more typical disseminated mineralization averaging 50 metes thick was intersected about 100 meters below the high-grade zone. It has been defined over an area of 500 by 400 meters and is open toward the Southwest deposit. Initial results from the Gap zone include a newly recognized style of mineralization close to surface. Hole GC04-462 intersected 38.4 meters grading 3.20 g/t gold with only trace copper values in a late-stage silicified fault zone. Drilling in the Junction zone also returned favourable results. The Junction zone, 1.2 kilometers west of the Main deposit, is an area 500 meters by 1 kilometer long delineated by 35 previous drill holes. The first hole drilled by NovaGold intersected 2.20% copper, 20.0 g/t silver and 1.66 g/t gold over 56.4 meters. At Copper Canyon, located 8 km further west of the Main deposit, mineralization begins at surface and occurs as a relatively flat-lying, roughly 50 to 270 meter thick tabular zone. Malachite and azurite are prominent in a cliff near the base of the valley wall above the toe of Copper Canyon glacier (Photo 7). Eight holes were completed to augment data from 21 prior holes. Mineralization is related to syenite and monzonite that intrudes alkalic volcanic rocks. Disseminated chalcopyrite

Photo 6. Logging core at Galore Creek. Rugged mountains and glaciers that challenge ground access to the property are displayed in the background.

Photo 7. Geologist Bruce Otto studies the malachite and azurite-stained cliffs at Copper Canyon, part of the Galore Creek project.

and pyrite occur with biotite, garnet and K-feldspar in the matrix of what is interpreted to be an orthomagmatic breccia. Assay intercepts range up to 0.88% copper, 0.77 g/t gold over 172.4 meters.

NovaGold submitted a pre-application report to the Environmental Assessment office, to begin the mine development approval process. Engineering work at Galore Creek focused on consideration of mill and tailings sites and two possible road routes to Highway 37. Difficult access has been the critical impediment for decades to development of Galore Creek. A direct route, 81 kilometers long, follows More Creek, West More and Sphaler creeks and requires three tunnels, with lengths of 3.3, 1.0 and 14 kilometers. An alternative route that is 150 kilometers long follows the Iskut valley (using the exisiting Eskay Creek mine road) and the Stikine valley. It requires a single tunnel, 3 kilometers long. The Tahltan Nation Development Corporation and Rescan Environmental Services formed a new joint company to carry out environmental and access studies.

Barrick Gold Corporation completed 18 055 meters of drilling in 54 holes in exploration around the **Eskay Creek** mine. The 22 zone, two kilometers south of the mine, was a focus of work in 2003 and was the first area to be investigated in 2004. Gold occurs with arsenopyrite along a northwest structure in the Eskay footwall rhyolite and base metal sulphides were intersected where the structure intersects a permeable amygdaloidal dacite deeper in the footwall succession. Significant gold values were found to be limited to a small area near surface and no further work is anticipated (D. Gale, pers. comm., 2004). Additional holes evaluated the footwall rhyolite on the western limb of the Eskay Creek anticline for structurally controlled gold and base metal veins like the 22 zone. North of the Eskay Creek deposit, in the Deep Adrian area, long holes were drilled in search of a mudstone and clastic sulphide-filled basin analogous to the Contact mudstone that contains the 21B and NEX gold-silver ore zones. In the mine area, long drill holes tested stratigraphically lower mudstone horizons in proximity to the Pumphouse fault, which channeled hydrothermal fluids on the margin of the Eskay graben. Massive, polymetallic sulphide with modest gold enrichment was intersected in the Betty Creek mudstone. Geological mapping, focusing on a rhyolite facies analysis, was combined with silt, soil and rock geochemical sampling throughout the Eskay Creek area.

Northgate Minerals Corporation acquired the **RDN** property (104G 144), 40 km north of the Eskay Creek mine, and completed 2499 meters of drilling in nine holes. Rocks underlying the RDN property are similar to those that host the Eskay Creek deposit and exhibit a comparable geochemical signature (see *EMBC-2001*, page 65-71). Drilling in the Wedge zone followed up on anomalous gold that was found by a previous operator at the contact between felsic volcanic and sedimentary rocks. Significant intersections in the 2004 holes were restricted to altered dacite volcanic rocks, occurring in quartz-carbonate veins and a brecciated sulphide shear zone. The values ranged from 1.43 g/t gold over 5 meters to 9.18 g/t gold over 2 meters with anomalous silver, copper, lead and zinc. A single hole in the Jungle gold-arsenic soil anomaly reached a depth of 336 meters entirely within argillite, siltstone and minor mafic volcanic rocks thought to be correlative with the hanging wall sequence at the Eskay Creek deposit. Anomalous values of gold (58 to 649 parts per billion) and arsenic (102 to 664 parts per billion) near the top of the hole are considered the likely source of the anomalous soil geochemistry. Two holes at the Marcasite Gossan zone targeted two stacked dacite flow-domes, which are cut by stockwork alteration and veining and overlain by shallow marine sedimentary rocks and pillow basalt. Both holes encountered elevated antimony and mercury values in the dacite, without significant gold values. Prospecting resulted in two new areas of interest that will be investigated in 2005. The Blind fault area is highest priority. Grab samples over a 200-meter interval along the contact between chlorite-altered rhyolite and sedimentary rocks returned values from 140 g/t to 363 g/t silver. The silver-enriched horizon is associated with disseminations and veinlets of base metals. At Eskay Creek, chlorite alteration in rhyolite is proximal to stratiform ore.

Roca Mines Inc. continued to explore for the source of volcanogenic massive sulphide boulders on the **Foremore** property (104G 148). Prospecting, geophysics and a 37-hole drill program focused along a 3.5 km length of folded Devono-Mississippian volcanic and sedimentary rocks in the North zone that contains the BRT showing, discovered in 2003. Semi-massive to massive base metal sulphides were intersected in six holes collared close to the BRT outcrop but additional holes drilled in 2003 and 2004 indicate BRT mineralization is restricted in extent. The thickest intercept was in drill hole FM04-04, 3.1 meters that averaged 14.6 g/t gold, 1114 g/t silver, 0.2% copper, 1.2% lead and 6.6% zinc. The mineral horizon, represented by pyritic phyllite near the contact between felsic and overlying mafic volcanic rocks, was traced 1.6 km north and tested with holes spaced 200 to 400 meters apart (Photo 8). Several holes encountered multiple layers of massive sulphide, each 0.3 to 1.2 meters thick, over a 300-meter interval within the felsic sequence. Visible gold was noted in FM04-32 in a 0.8 meter-wide sulphide band and assayed 26.5 g/t gold, 85 g/t silver, 2.2% copper, 1.3% lead, 8.6% zinc. Other sulphide bands contain generally lower metal grades. A 20-kilometer UTEM survey was completed over the projected extent of the mineralized sequence in More Creek valley. Roca also explored areas outside the North zone. Two drill holes on strike of the SG lead-zinc-silver-gold showing determined graphite to be the cause of an EM conductor surveyed in 2003. A single drill hole at the Sunday zone did not intersect significant gold in an area of fracture veins filled by arsenopyrite, spalerite and galena. Roca also delineated ground magnetic and gold-in-soil anomalies over an area of skarn developed near the contact between limestone, volcanic and intrusive rocks. Sampling of a

Photo 8. Helicopter-supported drilling at Foremore, in the North zone.

hand-dug trench returned an average assay of 18.7 g/t gold, 15.3 g/t silver and 0.52% copper.

Heritage Explorations Ltd. continued exploration of its extensive mineral claim holdings surrounding the Eskay Creek mine with a large geophysical survey and two drill holes. A 2600 line-kilometer airborne survey was carried out late in the field season, recovering time-domain electromagnetic and magnetic data. Target follow up will occur in 2005. One hole was drilled at **Bonsai** (104B 383) to test the strike extension of a pyrite zone in rhyolite for Eskay Creek type mineralization but returned low gold and silver values. A drill hole at **Treaty Creek** (104B 078) explored a porphyry system and did not encounter significant mineralization.

On the **Corey** property, 10 km south of Eskay Creek, Kenrich-Eskay Mining Corporation conducted a program of geological mapping, rock and silt geochemistry in search of new targets for a precious metal-enriched massive sulphide deposit. The claims cover the southern portion of the Eskay bimodal volcanic rift sequence. Smitty is a new mudstone-hosted bedded sulphide showing that was discovered in a five kilometer-long area of multi-element geochemical anomalies that extends south of the VMS-style Cumberland showing (104B 011). Four chip samples on the Smitty showing spaced one metre apart average 0.75% copper, 0.18% lead, 7.98% zinc and 204 g/t silver across 0.65 meters. Gold was not reported. Drilling is anticipated in 2005.

Conquest Resources Limited and Newcastle Minerals Ltd. formed a joint venture to acquire and explore the **Rock and Roll** property (104B 377) near the former Snip gold mine. Newcastle already held claims on the adjoining Phiz gold vein showing (104B 165). Previous work at Rock and Roll by Prime Resources outlined an inferred mineral resource of volcanogenic massive sulphide mineralization, the Black Dog zone, of 675 000 tonnes at an average grade of 1.75 g/t gold, 234 g/t silver, 0.4% copper, 0.5% lead, 2.2% zinc. Geological mapping and a soil geochemical survey were carried out primarily in the area between the two prospects. Some 1400 soil samples were analyzed for mobile metal ions (MMI) in the hope of detecting a 'blind' southeast extension of the Black Dog zone and/or extensions of the Phiz zone. Weak anomalies in zinc and gold were found, not much different than were identified by an earlier conventional B-horizon soil survey. No follow up work was done to determine their significance.

At the **Kerr-Sulphurets** property Noranda Exploration Inc. carried out geological mapping and an IP survey focused on the North Mitchell (104B 180) and Iron Cap (104B 173) areas, and reclaimed roads and trenches at the Kerr deposit. At Iron Cap and North Mitchell, felsic intrusions are associated with quartz veining and sericite-pyrite alteration from which previous operators have obtained drill intercepts of about 0.3% copper and 0.3 g/t gold over 100 meters (Photo 9).

STEWART DISTRICT

Tenajon Resources Corporation reactivated exploration at its **Summit Lake** (Scottie) underground gold mine (104B 034), which operated from 1981 to 1984 producing 160 000 tonnes of ore at an average grade of 16.2 g/t gold. The mine closed due to high operating cost following closure of the Granduc copper mine. At shutdown, prior to NI 43-101, geological resources were estimated at 120 000 tonnes at an average grade of 19.2 g/t gold. Gold occurs in a series of en echelon quartz-pyrrhotite-pyrite-calcite veins near the margin of the Summit Lake granodiorite stock. Fourteen holes were drilled from the mine workings to confirm historic drill intersections and to extend the L, M and N zones. Intercepts range from 2 to 40 g/t gold over apparent widths of 0.3 to 4 meters, sufficiently encouraging for drilling to continue in 2005.

Serengeti Resources drilled four holes on the **Tide** property (104B 129), 36 km north of Stewart, to test two surface showings and two soil anomalies for gold mineralization. The targets derive from work by Rimfire

Photo 9. Geologist Mike Saville examines the North Mitchell zone on the Kerr-Sulphurets property.

Minerals Corporation and previous explorers. A 200 to 1000 meter wide hornblende-feldspar porphyry sill complex, an offshoot of the lower Jurassic Summit Lake stock, intrudes Hazelton Group volcanic rocks. The most encouraging results came from one of two holes that tested porphyry-style mineralization. The 36 zone comprises an east-west fracture zone in volcanic rocks that is mineralized with pyrite, arsenopyrite and lesser pyrrhotite, and a corresponding gold in soil anomaly. Closely fractured and veined rocks were encountered over the full length of a 168-meter hole, the top 129.4 meters averaged 1.0 g/t gold. Gold distribution is fairly uniform, only one sample interval contained over 5 g/t gold. Holes in the Arrow and South Pit zones, where moderate to high-grade gold was recorded in veins on surface, returned lower grade intercepts of 1 to 2 g/t gold over widths of 1 to 3 meters. Prospecting two kilometers northeast of the 36 zone drill hole discovered a quartz-pyrite-arsenopyrite vein with high-grade gold. Named the 52 zone, the average of two closely-spaced samples across a width of 0.5 meters is 476 g/t gold and 11 314 g/t silver. Nine grab samples of other veins along the 400 meter length of the host structure returned values ranging from 0.85 g/t to 4.59 g/t gold and 4.4 to 95 g/t silver. The 52 zone is within a gold soil anomaly that measures 600 by 450 meters.

On the **Del Norte** property 34 km east of Stewart, Lateegra Resources Corporation continued to drill the LG gold-silver vein (104A 161). Thirty-six holes were completed in a series of two to four-hole fans targeting a one-meter thick quartz-calcite breccia vein. Sulphosalt minerals occur in the vein with pyrite, sphalerite and galena. The intersection in hole 2004-01 is representative of the tenor, 9.25 g/t gold and 958 g/t silver over 0.7 meters. Lateegra has not estimated the true thickness of intercepts but wider assay intervals may be due to oblique intersection of the vein. Drilling in 2004 in-filled the area tested in 2003, delineating the LG vein over a horizontal distance of 750 meters, but a series of step-out holes along strike to the north did not locate the structure. Lateegra believes the vein may be faulted and plans to continue a search for the offset. Exploration is also planned to the south across an icefield where the LG vein likely correlates with the wider Kosciuszko vein (see *Exploration and Mining in BC – 2002, 2003*).

Lateegra Resources Corporation tested a gold-bearing quartz breccia vein, the South zone, with five drill holes on the **Todd Creek** property (104A 001). The late-stage, north-striking vein is up to 3 meters wide and contains coarse chalcopyrite and hematite. Hemlo Gold Mines Inc. explored the property by drilling 57 holes in 1988 and 1989 and estimated an inferred resource in the South zone of 207 000 tonnes grading 5.48 g/t gold. Drill hole SZ04-04 of the current program obtained the deepest intersection drilled in the South zone, 8.55 g/t gold and 0.67% copper over a true width of 1.25 meters. Step-out drilling intersected the gold-bearing vein 500 meters north of previous drilling.

Lateegra Resources Corporation completed a 6-kilometer IP and magnetic survey on the **Poly** claims in the Bear Pass, 42 kilometers northeast of Stewart. The claims are underlain by pyrite and pyrrhotite-bearing hornfels adjacent to a Tertiary pluton. Talus samples of polymetallic vein material contain appreciable precious metals. IP anomalies will be tested by drilling for the source of the mineralized talus.

Pinnacle Mines Ltd. conducted a drilling program on the **Silver Coin** property, 24 km northwest of Stewart, under an agreement with Mountain Boy Minerals Ltd. Silver Coin adjoins the Silver Butte property (104B 150) where previous operators identified five irregular vein stockwork and breccia zones containing gold, silver and base metals. The zones are disrupted by cross-faults and current drilling by Pinnacle in the 'Perseverance zone' may be an extension of one of these zones. Mining in the 35 zone by Westmin Resources Ltd. in 1991 produced 105 000 tonnes of ore grading 7.86 g/t gold and 23.4 g/t silver. In 1995 (prior to NI 43-101) Westmin calculated resources in the Kansas/West Kansas (KWK) zone to be 1 774 000 tonnes grading 2.20 g/t gold based on drilling, underground development and three bulk samples. Pinnacle acquired the Kansas crown grant claim, internal to the Silver Coin property, and subsequently reported a series of drilling results, for example, drill hole #32 intersected 11.8 g/t gold, 32.9 g/t silver, 1.13% zinc over 3.05 meters. No information is available on hole locations, orientation or true thickness of the mineralized zone.

Clarence Brent mined 600 tonnes from a gold-bearing quartz vein on the **Lloyd** property (also known as Mobile, 103P 069) and proposes to process the material in a pilot mill.

TERRACE-KITIMAT AREA

Eagle Plains Resources Ltd. continued exploration for an intrusive-related gold deposit on the 540-unit **Kalum** property 35 km northwest of Terrace. A series of gold-silver vein showings and soil anomalies are related to the contact of Cretaceous plutonic rocks with sedimentary rocks of the Bowser Lake Group. The program comprised a 1500-line kilometer airborne geophysical survey, on-the-ground evaluation of targets and the drilling of 19 holes, totaling 1958 meters. The geophysical survey recovered magnetic and time-domain electromagnetic data. The Rico vein, discovered by Eagle Plains in 2003, is in a contact-parallel fault zone that trends NNW up the steep valley wall north of Mayo Creek (Photo 10). Five holes targeted the vein, hole KRC04005 intersected 11.6 g/t gold over a length of 0.9 meters, beginning at 0.9 meters from surface. At the Misty showing (103I 213), three holes were drilled to test quartz veins in a zone of strongly fractured and sheared granodiorite. Broken rock resulted in difficulty completing the holes and there was one significant

Photo 10. Drill platform under construction at the Rico gold vein showing on the Kalum property.

intersection, 29.7 g/t gold across 0.6 meters. Six holes tested the Chris gold-bearing quartz-arsenopyrite vein (103I 174) over a strike length of about 150 meters, east of previous drilling. One significant intersection was obtained, 16.3 g/t gold over 0.3 meters. Five holes at the Kalum prospect (103I 019) returned a best intercept of 16.6 g/t gold in a 1.1 meter-wide vein.

Northern Continental Resources Inc. acquired the **LCR** claims, located immediately north of the Kalum property, from Eagle Plains Resources to explore for gold in an area previously explored by Amax of Canada Limited for porphyry-type mineralization (103I 021). Northern Continental extended the Kalum geophysical survey by 500 line-kilometers and followed up the results with ground surveys and drilling. A strong copper-molybdenum soil anomaly occurs over an area measuring 1 kilometer long by 400 meters wide and overlies a partly unroofed body of quartz monzonite. A quartz vein stockwork, sparsely mineralized with chalcopyrite and molybdenite, is developed in the intrusion and in adjacent siltstone and greywacke. Three drill holes collared from one site penetrated the quartz-veined sedimentary rocks but did not intersect the intrusion. Previous work and the magnetic data show the stock is located further east. Chalcopyrite is present throughout the holes but overall copper content is low, few samples exceed 1000 parts per million copper, and no gold values were reported. The Shea copper showing was discovered 1.5 km east of the current target area and, based on the magnetic survey, is related to a separate intrusion. Northern Continental plans further drilling of the soil anomaly.

Trade Wind Ventures Inc. conducted soil geochemical and magnetic surveys over the Dardanelle prospect (103I 107), a small past producer of gold ore located on the north side of the Copper River. Quartz veins are developed along both contacts of an aplite dike, the offshoot of a granodiorite pluton. Results of the work are unknown.

SMITHERS-HAZELTON AREA

Firestone Ventures Inc. optioned the **Louise Lake** copper-gold porphyry prospect (93L 079) from Bernard Kreft and drilled six core holes. Previous drilling by Canadian Superior Exploration and New Canamin Resources identified a tabular mineralized zone estimated to contain 50 million tonnes grading 0.3% copper and 0.3 g/t gold. Host rocks are altered felsic volcanic rocks and interbedded conglomerate belonging to the Cretaceous Skeena Group. Firestone intersected copper-gold mineralization in all six holes. Two holes indicate a modest increase in strike extent of the zone and two holes extend the zone below previous drilling. A confirmation hole within the previously known resource returned the best intersection of the program, 0.408% copper, 0.014% molybdenum and 0.401 g/t gold over 158 meters. Firestone plans to complete a new inferred resource calculation and to continue exploration drilling.

Amarc Resources optioned the **Natlan** claims from Lyle West, and staked additional claims, to explore for a porphyry copper deposit. A recently built logging road uncovered an altered and veined Bulkley granodiorite stock.

NDT Ventures Ltd. acquired the **Zymo** porphyry copper prospect (93L 324) 50 km west of Smithers and performed an airborne electromagnetic and magnetic survey late in the year.

BABINE AREA

Pacific Booker Minerals Inc. continued to collect environmental baseline data and contracted a preliminary economic study related to potential development of the **Morrison** porphyry copper deposit (93M 007). The Morrison-Hearne Hill project is in the Environmental Assessment Process. Optimized open pit resources were estimated at 86,892,000 tonnes grading 0.45% copper and 0.257 g/t gold. Waste rock is estimated at 125 million tonnes giving a waste to ore ratio of 1.44. Approximately 97% of the mineral resources are classified as measured and indicated, and the remainder is inferred. Included in the waste is 28,152,000 tonnes grading 0.278% copper and 0.123 g/t gold that would be placed on a low-grade stockpile and processed subject to prevailing metal prices. The optimal milling rate was determined to be 25,000 tonnes per day. A preliminary assessment estimated capital costs at $175.2 million and the project would generate an after tax rate of return of 14.7% based on an operating (mining and milling) cost of $6.07 per tonne, copper price of US$1.10 per pound and gold price of US$385 per ounce. Geotechnical drill holes and test pit excavations will begin early in 2005 in the proposed tailings storage site, waste rock dumps and open pit. Pacific Booker signed an agreement with Noranda Inc. to buy out all Noranda's interest in the property by making staged payments that total $3.5 million.

HOUSTON-TAHTSA AREA

Canadian Gold Hunter Corp. drilled five holes at the **Bob Creek** epithermal gold-silver prospect (93L 009) aimed at confirming gold assays from prior drilling. Core could not be located from two holes drilled by Royalstar Resources Ltd. that intersected 0.79 g/t gold over 156.1 meters in one hole and 23.7 g/t gold over 3.0 meters in another. Current drilling intersected felsic tuff and feldspar-quartz porphyry dikes; both lithologies are altered to clay sericite and pyrite, and are cut locally by vuggy quartz-base metal sulphide veins. Assay results were not available.

Canadian Empire Exploration Corp. acquired the **Silver Hope** (93L 256) property immediately south of the past-producing Equity copper-silver-gold mine. Previous exploration traced an extension of the Equity Southern Tail zone over a 2-kilometer strike length in the Hope, Superstition and Gaul zones. An estimated 1800-meter drilling program began in November to test below previous shallow drill holes, in particular a hole that graded 7.88% copper and 105 g/t silver over 3.8 meters, and to test a 400 meter-long copper-silver-mercury geochemical anomaly.

Gold Reach Resources Ltd. explored the **Seel** property (93E 105), 110 km south of Houston, under an earn-in agreement with Grayd Resource Corporation. An IP survey delineated an anomaly that is 1 km wide and at least 1.2 km long. In the northeast part of the anomaly, a previous operator drilled shallow holes, typically 20 to 30 meters deep, into a quartz porphyry stock and breccia zone intersecting up to 1.59% copper and 0.64 g/t gold over 18 meters. A 10-hole, 1500-meter drilling program began in December.

Amarc Resources Ltd. purchased the **Buck** claims 20 km south of Houston. A reconnaissance IP survey in 2003 identified two high contrast anomalies near a RGS gold anomaly. Bedrock is poorly exposed but comprises Tertiary intrusions and volcanic rocks.

Manson Creek Resources Ltd. optioned the **CR** porphyry copper-gold prospect (93L 268, 269) on the west slope of Morice Mountain from Wesley Moll. Backhoe trenching in the South zone exposed mineralized granodiorite that graded 0.25% copper and 0.031% molybdenum over 18 meters. Immediately west, and on strike, a coincident magnetic and copper in soil anomaly may indicate a continuation of the mineralized zone. Work in the North zone also outlined soil and magnetic anomalies centred over outcrops of a copper-bearing intrusion.

Lorne Spence and Ed Westgarde explored the area between two related, porphyry-style occurrences (93L 010 and 93L 011) near Dungate Creek. Previous explorers found chalcopyrite and molybdenite in a Tertiary quartz-feldspar porphyry intrusion and chalcopyrite, sphalerite and galena in a weak but extensive quartz stockwork in pyroclastic rhyolite. Using the same percussion drill, Spence completed three holes on the LS claims and Westgarde completed two holes on the adjoining Lake claims.

Steve Bell drilled a 72-meter hole on the Palomino property (93L 019) to test a geophysical anomaly. Copper mineralization occurs nearby, as porphyry and vein occurrences. The top of the hole intersected silicified Hazelton volcanic rocks with sparse chalcopyrite.

Barry Hofsink drilled two holes south of the Carrier Road (Silver Streak) silver-copper showing but failed to extend the zone. Gary Thompson completed an IP survey on the Rox claim, under an option agreement with a private company.

Huckleberry Mines Ltd. carried out an 8-kilometer IP and soil geochemical survey on its **Whiting Creek** porphyry molybdenum prospect (93E 112).

INDUSTRIAL MINERALS AND GEMSTONES

Nephrite jade was recovered from waste rock at the former **Cassiar** chrysotile asbestos mine (104P 005) by Cassiar Jade Contracting Ltd. Polar Gemstones Ltd. mined nephrite jade on the **Polar Jade** property (104I 083) near Serpentine Lake. The Jade West Group markets all the jade, mainly to Chinese and Korean buyers.

Hyder Gold Inc. conducted prospecting and sampling on the **Hid** property, 130 kilometers northeast of Dease Lake. The Hid claims were acquired to cover ultramafic diatremes to evaluate their potential to contain diamonds. Four diatremes were located, from 30 to 80 meters in width. Petrographic work concluded these are ultramafic lamprophyres. Probe analysis of 150 chromite grains determined they are unlikely to be associated with diamonds. Chrome diopside, a diamond indicator mineral, is present but scarce. Examination of stream sediment samples indicate that chromites and chrome diopside found in the stream sediment samples are likely derived from the known diatreme exposures and similar occurrences, so that the potential for diamonds is considered low.

COAL PROJECTS

Fortune Minerals Limited submitted a Project Description report to the British Columbia Environmental Assessment office describing plans to mine coal from the **Mount Klappan** property. The proposed surface mining operation is planned for 1.75 million tonnes per year of product for 20 years, which will require mining of 2.6 million tonnes of run-of-mine coal annually. Measured plus indicated resources in the Lost Fox deposit total 217.4 million tonnes of coal. Anthracite coal is a high-value specialty product used for water purification, cooking and heating briquettes and as a reductant in metallurgical processing. Transportation options include

the BC Rail line, which requires 70 kilometers of construction and upgrading of existing track, or a 90 kilometer road to link with Highway 37 at the Bell-Irving River. Shell Canada holds coal-bed methane rights at Klappan and drilled three wells to begin evaluation of the gas resource.

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The author gratefully acknowledges the contributions made by mine staff, exploration geologists and prospectors working in northwest B.C. and for their hospitality while visiting their projects. This report also benefited from the input of co-workers Doug Flynn and Bruce Graff.

CENTRAL REGION

By Bob Lane, PGeo
Regional Geologist, Prince George

SUMMARY AND TRENDS

Mineral exploration activity in the Central Region reached its highest level since 1989. High precious and base metal commodity prices, strong demand for minerals and a buoyant investment climate enabled many companies to raise new capital for exploration, deposit appraisal and development. As a result, exploration expenditures doubled to an estimated $33 million (Figure 3-1) and the amount of exploration drilling increased by more than 75%, to approximately 160 000 metres (Figure 3-2). In all, there were 38 major exploration projects, 19 more than in 2003.

Operating mines, major exploration projects and smaller exploration projects with regional significance are shown on Figure 3-3. Forecast production for mines in the Central region is listed in Table 3-1.

The Kemess South open pit gold-copper mine was the only major operating mine in the region at the start of the year. The 50 000 tonnes per day mine operated smoothly and because of high copper prices was able to dramatically reduce its mining cost per ounce of gold. The strong base metal markets also provided the opportunity for the Gibraltar porphyry copper-molybdenum mine to reopen in October, after a six-year hiatus. Reactivation of two other idle mines in the Cariboo, the Mount Polley copper-gold mine and the QR gold mine, are planned for early to middle 2005.

There were 38 major exploration projects conducted (i.e., those which involved mechanical disturbance and expenditures in excess of $100 000) in the Central Region in 2004. Seventeen major programs evaluated gold-enriched porphyry copper systems, ten programs explored epithermal or mesothermal gold deposits, two projects targeted copper-molybdenum mineralization, and three others targeted auriferous skarn mineralization. One program focused on massive sulphide deposits, one on platinum group elements and another on a volcanic redbed copper deposit.

Exploration in the Central Region focused on areas with known potential for bulk tonnage porphyry copper-gold+/-molybdenum mineralization. Activity was principally within rocks of the Quesnel Terrane, a northwest trending sequence of volcanic island arc rocks that extend the length of the region. Exploration outside of the Quesnel Terrane focused mainly on epithermal and mesothermal gold targets.

Exploration drilling programs in the Toodoggone camp tested porphyry gold-copper deposits and epithermal gold-silver systems associated with the Early Jurassic Black Lake suite of intrusions.

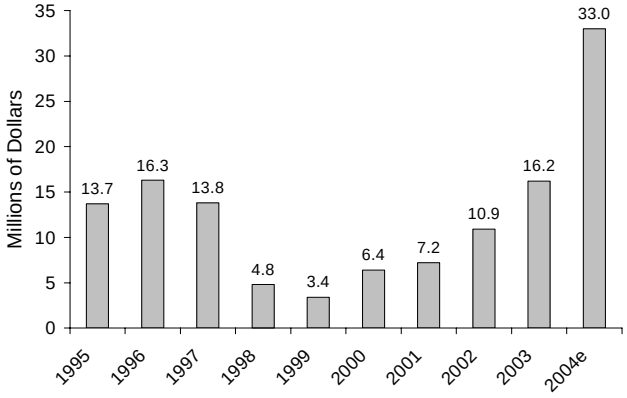

Figure 3-1. Annual Exploration Expenditures, Central Region (Expenditures for 1995–2003 are for the Northeast and Central regions combined).

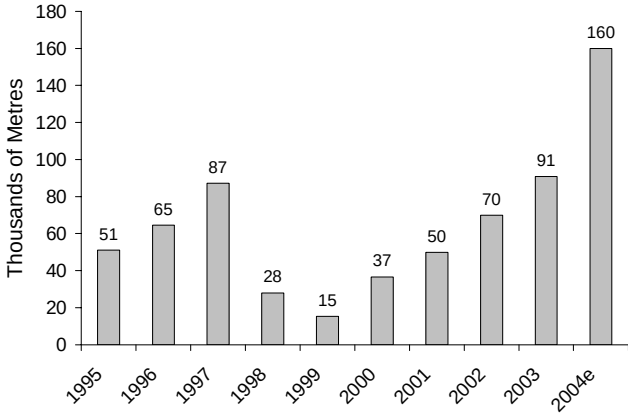

Figure 3-2. Annual Exploration Drilling, Central Region (Drilling totals for 1995–2003 are for the Northeast and Central regions combined).

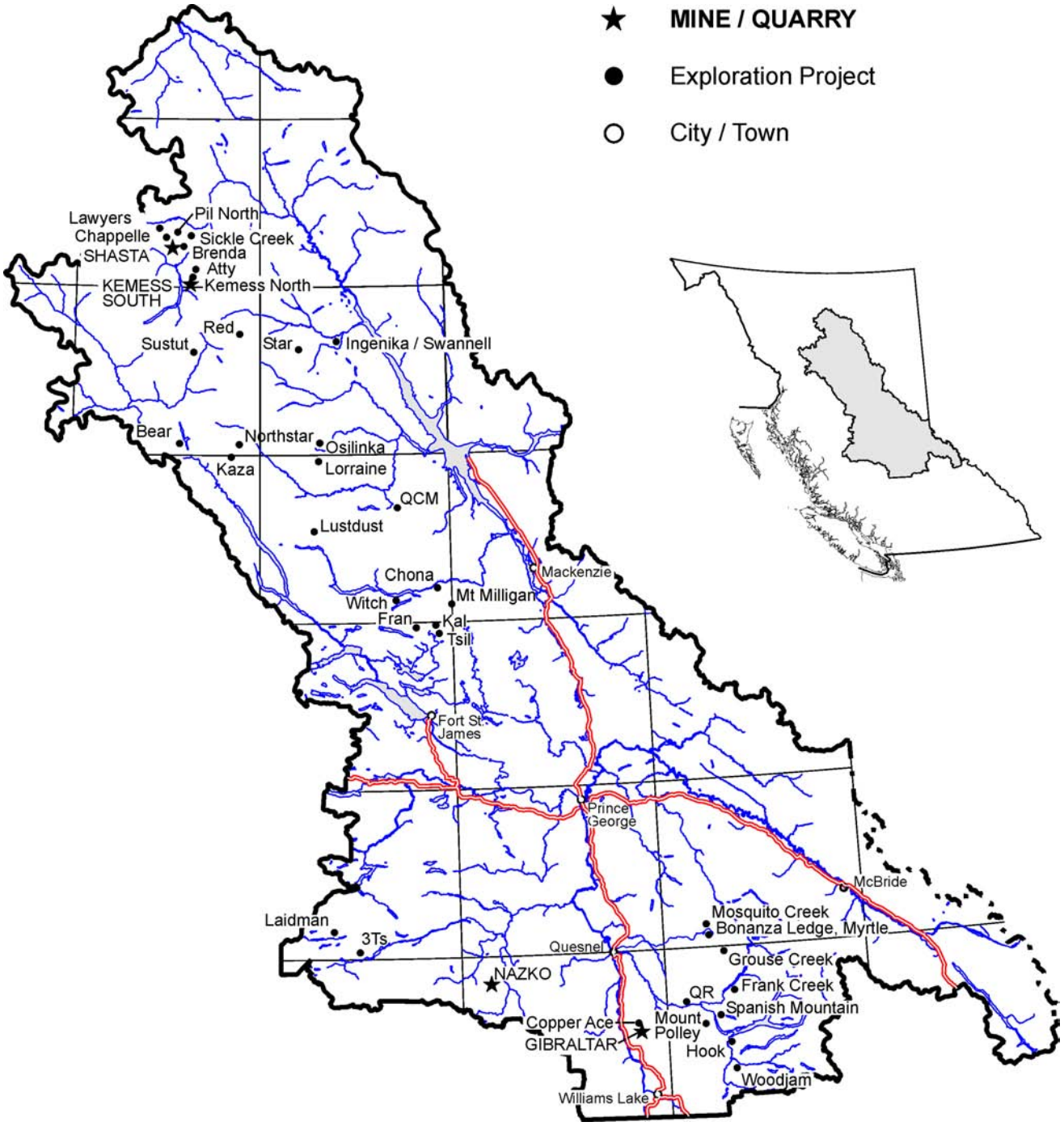

Figure 3-3 Operating mines, major exploration programs and selected smaller exploration projects in the Central Region.

In the Central Omineca Mountains, drilling targeted promising porphyry copper-gold+/-molybdenum prospects (*i.e.*, Lorraine-Jajay), some of which had not been explored for many years (*e.g.*, Bear and Cat Mountain), and two interesting gold-bearing skarn systems (*i.e.*, Kaza and Lustdust).

Activity in the Nation Lakes area picked up dramatically as numerous companies reviewed existing data and staked ground prospective for bulk tonnage copper–gold mineralization. The exploration programs that followed were generally of a grassroots nature, and

TABLE 3-1. PRODUCTION AND RESERVES FOR OPERATING MINES, CENTRAL REGION

Mine	Operator	Deposit Type / Commodity	Forecast Production in 2004 (tonnes or kilograms)	Proven and Probable Reserves (at Jan. 1, 2004)
Metals				
Gibraltar	Taseko Mines Ltd / Ledcor Mining Ltd	Calc-alkalic porphyry Cu-Mo	7000 t Cu, 34 t Mo	Sulphide: 163.5 million tonnes grading 0.313% Cu & 0.010% Mo; Oxide: 16.5 million tonnes grading 0.148% Acid Soluble Cu
Kemess South	Kemess Mines Ltd (Northgate Minerals Corp)	Calc-alkalic porphyry Au-Cu	9300 kg Au, 34 000 t Cu	91.7 million tonnes grading 0.699 g/t Au & 0.227% Cu; Kemess North (Probable) 414 million tonnes grading 0.31 g/t Au & 0.16% Cu
Shasta	Sable Resources Ltd	Epithermal Vein Au-Ag	80 kg Au (Au equivalent)	n/a
Industrial Minerals				
Giscome	Pacific Lime Products Ltd	Limestone		
Nazko	Canada Pumice Corporation (Crystal Graphite Corporation)	Lava rock		

included bedrock mapping, line-cutting, grid-based soil geochemical sampling, and magnetic and IP surveys. However, limited diamond drilling proceeded on some of the new ground as well as on some well-established deposits, including the Mt. Milligan property.

In the Nechako Plateau, an impressive deep-drill intersection and the discovery of several new veins on the 3Ts epithermal gold-silver vein property led to an expanded diamond drilling program.

Exploration activity in the Cariboo continued to increase during 2004 with bulk tonnage porphyry targets attracting most of the attention. Imperial Metals Corporation continued to produce exciting results from its exploration drilling program on the Northeast zone, which enabled the company to establish a mineable reserve for the new deposit. At the Woodjam property, drilling intersected a long interval of promising bulk tonnage gold-copper mineralization which increased interest in the economic potential of that area. These very encouraging exploration results coupled with data from a Rocks to Riches funded helicopter-borne multiparameter geophysical survey encouraged new staking activity in the Cariboo and attracted several new companies. In the Wells-Barkerville gold belt, the level of exploration for gold-bearing mesothermal quartz vein and auriferous pyrite replacement mineralization, was maintained. There were several key projects, including the completion of a 10 000 tonne underground bulk sample program on the Bonanza Ledge high-grade gold deposit on the Cariboo Gold Quartz property.

An administrative change has divided the former Northeast-Central region into a Central Region and a Northeast Region. The new Central Region includes a broad area that extends northward from about 150 Mile House to the Omineca Mountains and includes parts of the Interior Plateau and Gataga-Kechika Trough areas. The Northeast Region encompasses the northeast quadrant of the province and includes the Peace River Coalfields. Activity in the Northeast Region is presented in a separate report.

MINES AND QUARRIES

The **Kemess South** (Minfile 094E 094) gold-copper mine, located in the Toodoggone region about 300 km northwest of Mackenzie, is owned and operated by Northgate Minerals Corporation (formerly Northgate Exploration Ltd). The 50 000 tonne per day open pit mine has been in operation since 1998 and currently employs close to 400 workers. For the first three quarters of 2004 daily mill throughput averaged 50 340 tonnes per day. Metal production for the first nine months of 2004 totaled 6494 kg of gold and 2689 tonnes of copper from milling 14.5 million tonnes of ore. Production for calendar 2004 is expected to reach approximately 9300 kg of gold and 34 000 tonnes of copper. Proven reserves at

TABLE 3-2. MAJOR EXPLORATION PROJECTS, CENTRAL REGION

Property	Operator	Minfile (NTS)	Commodity	Deposit Type	Work Program
3Ts	Southern Rio Resources Ltd	093F 055, 068	Au-Ag	Epithermal vein	G; P; OB; DD (4860 m)
Atty	Finlay Minerals Ltd	094E 119, 022	Cu-Au	Calc-alkalic Porphyry	G; IP; MG; DD (1653 m)
Bear	Imperial Metals Corporation	094D 068	Cu-Mo	Calc-alkalic Porphyry	G; DD (1704 m)
Brenda	Northgate Minerals Corporation	094E 147	Au-Cu	Calc-alkalic Porphyry	A; DD (1446 m)
Cariboo Gold Quartz (incl. Bonanza Ledge)	International Wayside Gold Mines Ltd	093H 019	Au	Replacement, Mesothermal Vein	A; G; TR; DD (14,142 m); BU (10,000 t); CD; GT; PF; EN
Chappelle (Baker mine area)	Sable Resources Ltd	094E 026	Au-Ag	Epithermal Vein	IP; DD (949 m)
Chona	Amarc Resources Ltd	(93N/01, 08)	Cu-Au	Alkalic Porphyry	IP; DD (~3000 m planned)
Copper Ace	Bell Resources Ltd	093B 061, 062	Cu-Mo	Calc-alkalic Porphyry	G; DD (1497 m)
Fran	Yankee Hat Industries Corp	093N 207	Au-Cu	Alkalic Porphyry	G; GC; AB-MG/RD
Frank Creek, SCR, Ace	Barker Minerals Ltd	093A 142, 143, 153	Cu-Zn-Pb-Au-Ag	VMS; Mesothermal Vein	G; GC; GP (Titan); TR; DD (1881 m)
Golden Cariboo (Cariboo Hudson, Craze, Ham)	Golden Cariboo Resources Ltd	093A 071, 090, 091, 093	Au	Replacement; Mesothermal Vein	G; GC; MG; SP; TR; DD (1259 m)
Hook	Amarc Resources Ltd	(93A/06)	Cu-Au	Alkalic Porphry	IP; MG; GC; DD (~200 m)
Ingenika - Swannell	Cross Lake Minerals Ltd	094C 002-005, 086	Zn-Pb-Ag	Manto	G; 3D-IP; MG
Kal	Amarc Resources Ltd	(93K/16)	Cu-Au	Alkalic Porphyry	IP; DD (800 m planned)
Kaza	Northern Hemisphere Development Corp	093M 111	Cu-Au	Skarn	A; TR; DD (1077 m)
Kemess North & area	Northgate Minerals Corporation	094E 021	Au-Cu	Calc-alkalic Porphyry	G; GC; IP; TR; DD (7561 m); GT; CD; EN; FS
Kemess South	Northgate Minerals Corporation	094E 094	Au-Cu	Calc-alkalic Porphyry	DD (7307 m)
Lawyers	Bishop Gold Inc	094E 068	Au-Ag	Epithermal vein	A; GC; MG; VLF; TR
Lorraine-Jajay	Eastfield Resources Ltd	093N 002, 066, 224	Cu-Au	Alkalic Porphyry	A; G; GC; IP; DD (4439 m)
Lustdust	Alpha Gold Corp	093N 009	Au-Ag-Cu-Zn-Pb	Skarn; Manto; Mesothermal Vein	GC; DD (6010 m)
Mosquito Creek Gold	Island Mountain Gold Mines Ltd	093H 010	Au	Replacement; Mesothermal Vein	GC; TR; DD (859 m)
Mount Polley - Mine Lease	Imperial Metals Corporation	093A 008	Cu-Au-Ag	Alkalic Porphyry	DD (5981 m) on Bell pit; DD (10,456 m) on Springer zone
Mount Polley - Northeast Zone	Imperial Metals Corporation	093A 164	Cu-Au-Ag	Alkalic Porphyry	G; TR; IP; DD (~50,000 m); MS; FS; EN; R
Mt. Milligan	Placer Dome Inc	093N 191, 194	Au-Cu	Alkalic Porphyry	G; DD (2200 m); MT; FS
Myrtle	International Wayside Gold Mines Ltd	093H 025	Au	Mesothermal Vein	TR; DD (861 m)

TABLE 3-2. CONTINUED

Property	Operator	Minfile (NTS)	Commodity	Deposit Type	Work Program
Northstar (Fred)	Northern Hemisphere Development Corp	094D 032	Cu	Volcanic Redbed Copper	A; TR; DD (~1000 m)
Osilinka (Cat)	Lysander Minerals Corporation	094C 069	Au-Cu	Alkalic Porphyry	A; G; TR; DD (1157 m)
Pil North	Finlay Minerals Ltd	094E 029, 083, 213, 216	Au-Cu	Calc-alkalic Porphyry	A; G; GC; IP; TR; DD (6168 m)
QCM	Canadian Gold Hunter Corp	093N 200	Au	Mesothermal Vein	IP; TR; DD (1190 m)
QR	Cross Lake Minerals Ltd	093A 121	Au	Skarn	G; DD (~4000 m); PF; FS
Red	Gitennes Exploration Inc	094D 034	Au-Cu	Calc-alkalic Porphyry	G; GC; IP; DD (449 m)
Shasta	Sable Resources Ltd	094E 050	Au-Ag	Epithermal Vein	DD (1075 m)
Sickle Creek	Stealth Minerals Ltd	094E 237	Au-Ag; Cu-Au	Epithermal Vein; Porphyry	G; P; GC; IP; DD (3870 m)
Spanish Mountain	Skygold Ventures Ltd / Wildrose Resources Ltd	093A 043	Au	Mesothermal Vein	G; TR; GC; RC (~2500 m)
Star	Minterra Resources Corp	094C 090	Cu-PGE	Magmatic	DD (1044 m)
Tsil	Amarc Resources Ltd	(93K/16)	Cu-Au	Alkalic Porphyry	IP; DD (800 m planned)
Witch	Amarc Resources Ltd	093N 084, 164	Au-Cu	Alkalic Porphyry	IP; DD (2000 m planned)
Woodjam	Fjordland Exploration Inc / Wildrose Resources Ltd	093A 078, 124	Au-Cu	Alkalic Porphyry	G; DD (~3500 m)

Kemess South as of December 31, 2003, stood at 91.7 million tonnes grading 0.699 g/t Au and 0.227% Cu.

The deposit occurs within the Early Jurassic Maple Leaf pluton, a gently southeast-dipping body of quartz monzonite that has a faulted basal contact and is overlain by epiclastic rocks of the Toodoggone formation. Approximately 80% of the deposit is hypogene ore with the remainder being either supergene, leached cap or material that is transitional between hypogene and supergene ore. In 2004, exploration and infill drilling on the margin of the pit resulted in the addition of 11.8 million tonnes of ore grade material being added to the reserve base of the Kemess South deposit. Existing reserves will provide mill feed until 2008, but the mine life of the operation could be extended to 2020 if the Kemess North deposit is put into production. A full feasibility was completed on the Kemess North gold-copper deposit and the project formally entered the harmonized federal-provincial environmental assessment process. The estimated capital cost of the project has been revised upwards to US$190 million.

The **Gibraltar** (Minfile 093B 006. 007, 011-013, 051) open pit copper-molybdenum mine (Figure 3-4), located near McLeese Lake, reopened in October after being on care-and-maintenance since 1998. Taseko Mines Ltd owns the mine and developed a joint venture partnership between its wholly owned subsidiary, Gibraltar Mines Ltd, and operator Ledcor Mining Ltd. The Gibraltar deposits, of which there are at least seven, occur within 'Mine Phase' tonalite, part of the Late Triassic Granite Mountain batholith. The batholith intrudes Cache Creek Group rocks between the Pinchi and Fraser River fault systems. The 12-year mine plan includes development of the Pollyanna stage IV pit, followed by mining of the Granite Lake pit (stages III and IV), the Pollyanna-Gibraltar East Connector zone and the 98 Oxide zone. Stripping of waste rock from the Pollyanna stage IV pit began in the summer and refitting of the 35 000 tonne per day mill was completed in early

*Figure 3-4. Development of the Pollyanna stage IV pit at **Gibraltar** copper-molybdenum mine*

October and continuous milling operations commenced on October 7, 2004. A new cable shovel and five new haul trucks were purchased to work with the existing equipment in the Pollyanna pit. Anticipated annual production is 32 000 tonnes of copper and more than 400 tonnes of molybdenum. The capital cost of the restart was approximately US$50 million. The mine, which directly employs about 270 workers, is a tremendous boost to the economy of central Cariboo and in particular the William's Lake area. Sulphide and oxide reserves are listed in Table 3-1.

The **Shasta** (Minfile 094E 050) mine, a small intermittent gold and silver producer north of the Kemess mine, is owned and operated by Sable Resources Ltd. Underground workings and a narrow open pit are developed on a quartz-calcite epithermal vein and vein breccia system that cuts quartz phyric dacite ash-flow tuffs of the Toodoggone formation. In 2004, diamond drilling of JM and Creek zones produced a number of bonanza-grade intersections, including 4.57 metres grading 18.19 g/t Au and 845 g/t Ag in hole 04-01, within wider, lower grade mineralized intervals. Close–spaced drilling of the latter zone helped define a small tonnage of epithermal gold-silver ore that was accessed by the development of a small open cut (Figure 3-5). Approximately 10 000 tonnes of ore was extracted and trucked to the nearby Baker mill for processing. A workforce of ten included two workers from the village of Tsay Keh.

Canada Pumice Corporation produced and sold approximately 15 000 cubic metres of screened and sized tephra from its **Nazko** (Minfile 093B 060) quarry west of Quesnel. The principal uses of the material are as a lightweight aggregate ("Tephralite"™) in masonry concrete products, various geotechnical applications and landscaping. Other products include Anti-Slip®, a fine granular product and growing and filtration media. During the year the company merged with Crystal Graphite Corporation and worked towards expanding the markets for its lava rock products both locally and abroad. Construction of a bagging plant in Quesnel is planned for 2005.

*Figure 3-5. Stripping waste rock from the Creek zone open cut, **Shasta** gold-silver mine.*

PLACER OPERATIONS

The level of placer activity in 2004, as in the past few years, was quite low. Strong precious metal prices were offset by a higher Canadian dollar and higher fuel prices. The majority of small-scale or recreational placer operations were in the traditional gold producing drainages in the Wells-Barkerville, Likely, Hixon and Omineca placer camps. There were relatively few major programs; the largest program was in the Slate Creek area near the village of Manson Creek.

EXPLORATION SUMMARY

TOODOGONE CAMP

Northgate Minerals Corporation continued to explore the large tenure block which encloses its operating Kemess South gold-copper mine. The company's **Kemess North** (Minfile 094E 021) porphyry gold-copper deposit, located 5.5 km north, is progressing through a joint federal-provincial panel review. A decision to award the project an Environmental Assessment Certificate is anticipated for 2005. Work in 2004 included exploration, infill, geotechnical and condemnation drilling and environmental studies. The 'mineable resource' for the Kemess North deposit is 414 million tonnes grading 0.31 g/t Au and 0.16% Cu. The proposed development schedule outlines infrastructure development in 2005, pre-stripping of the deposit in 2006 with mining of ore commencing by late 2006. The Kemess North and Kemess South deposits would be mined concurrently until reserves at Kemess South are exhausted (2009). Mining at Kemess North would continue to 2020. The estimated capital cost of the project is $190 million.

Northgate also drilled several other targets in the vicinity of the Kemess North deposit. Seven holes were drilled into the Nugget porphyry gold-copper zone in an attempt to expand on encouraging near-surface mineralization intersected in 2003 (hole KN-03-12 intersected 419 m averaging 0.38 g/t Au and 0.13% Cu that began at a depth of just 24 metres). The Kemess Centre porphyry gold-copper prospect, Duncan Ridge polymetallic skarn target and Hilda structurally-hosted gold occurrence were also drilled with mixed results. The Bear claim group covers a 70 km^2 area immediately south and adjoining the Kemess South property. Approximately 64 line-kilometres of IP were completed over the claims. Follow-up diamond drilling is expected in 2005.

Northgate Minerals Corporation completed a five-hole drill program on the **Brenda** (Minfile 094E 147) porphyry gold-copper property, located 25 km northwest of the Kemess mine. Andesite lavas of the Takla Group underlie the property. Mineralization occurs primarily in propylitically altered andesite and is associated with quartz-magnetite veinlets and stockwork zones. A swarm of pale pink, unaltered monzonite dikes cut mineralization. Northgate optioned the property from Canasil Resources Inc in 2002, and since that time has drilled 14 holes totaling 4580 m. The work focused mainly on the White Pass zone, a prospective area marked by intense alunite(?) alteration. The best assay of the three-year program was encountered in drill hole BR-03-07 that intersected 161.6 metres averaging 0.565 g/t Au and 0.079% Cu. After review of the 2004 data, Northgate returned the property to the vendor.

Finlay Minerals Ltd developed road access to its **Pil North** property (Minfile 094E 029, 083, 213 & 216), centered approximately 35 km north of the Kemess mine. Work included a 26-hole diamond drilling program (Figure 3-6). The property is underlain predominantly by monzonite and quartz monzonite phases of the Black Lake Intrusive Suite and andesitic volcanic rocks of the Toodoggone formation. The Pillar fault, a northwest-trending regional structure, dissects the property. Earlier exploration by Finlay Minerals outlined a 4 kilometre-long IP chargeability high that coincides with a number of gold-copper or multi-element geochemical anomalies. Some of the gold-copper anomalies correspond with strong propylitic and phyllic altered rocks and are regarded as targets for porphyry mineralization (e.g. Northwest, Central-Milky Creek and Northeast zones). In some cases anomalies with a polymetallic signature correspond with quartz+/-barite+/-sulphide veins (i.e. WG zone). The best drill intersection was encountered in hole PN-04-09 that graded 0.128% Cu over 57.95 metres. Elsewhere on the property, grab samples of siliceous breccia from the north-northwest trending Atlas zone and nearby Atlas East zone produced assays up to 3.22 g/t Au and 80.6 g/t Ag.

On its **Atty** property, located immediately north of the Kemess North deposit, Finlay drilled seven holes to test a coincident IP chargeability and gold-copper geochemical anomaly coupled with a pronounced magnetic high. The drilling intersected breccia comprised of angular clasts of augite phyric basalt (Takla Group) cemented by magnetite, pyrite, minor silica and later carbonate. No assays had been released at the time of writing.

Stealth Minerals Ltd carried out an extensive exploration program focused mainly on the northern half of its Pine property, now referred to as the Sickle Creek project. The property is located in the Finlay River area north of the Kemess mine. Last year's prospecting program discovered the **Sickle-Griz** (Minfile 094E 237) epithermal vein system, an impressive set (the 570A to 570E veins) of parallel banded quartz-calcite-sulphide veins. The veins trend at about 155º and dip 65º to the west and cut grey-green andesite lavas that correlate with the Metsantan member of the Toodoggone formation (Diakow, pers. comm., 2004). Several of the most prominent veins (570A and 570B) reach widths of up to 12 metres and are exposed over a continuous strike length of more than 100 metres (Figure 3-7). However, the vein system has been traced in outcrop discontinuously over a

*Figure 3-6. Examining core at the **Pil North** exploration camp.*

*Figure 3-7. Banded quartz-carbonate-sulphide 570A vein, **Sickle Creek** property.*

length of more than three kilometres. In 2004, this new prospect was the subject of a 23-hole diamond drilling program. Most of the holes intersected one or more veins and produced encouraging intersections, particularly from the footwall portions of the veins where sulphides appear in notably higher concentrations. For example, hole SG04-04 intersected 4.1 metres grading 6.38 g/t Au and 55 g/t Ag. Galena, sphalerite, tetrahedrite, chalcopyrite and pyrite occur as fine disseminations, patchy aggregates and semi-massive to massive bands up to several centimeters wide in a gangue of white sparry calcite, milky to grey quartz, chalcedony, minor amethyst and lesser adularia.

Stealth continued its regional prospecting program in 2004 and examined eleven properties in all. Two promising bulk tonnage copper-gold porphyry prospects were discovered north of the Sickle-Griz veins. The **Sofia** (Minfile 094E 238) porphyry gold-copper showing is on the west bank of the Toodoggone River, 2.7 kilometers west of the mouth of Jock Creek. The showing consists of sheeted magnetite veinlets and later quartz-magnetite-sulphide stockwork, enveloped by K-feldspar alteration and hosted by medium to coarse-grained monzonite and andesite flows. Grab samples assayed up to 0.22 g/t Au and up to 0.05% Cu. The **Alexandra** porphyry prospect is centred on a ridge 3.3 kilometres west-southwest of the confluence of Jock Creek and Toodoggone River. The showing consists of intensely bleached, clay-altered andesitic volcanic rock cut by quartz-magnetite stringers. The alteration zone covers an 800 by 250 metre area and is coincident with elevated gold, copper and silver values in soil. The showing lies within about 300 metres of monzonite that is outcropping in Jock Creek, and also downslope to the north and east of the ridge. Exploration south of the Finlay River on the **Fog-Mess** property identified two sheeted epithermal gold-silver vein systems that warrant further evaluation.

Sable Resources Ltd drilled two targets on its **Chappelle** (Minfile 094E 026) property that encompasses the Baker mining lease. Five holes were drilled on the North Quartz zone, an epithermal vein target, and three holes tested the Black Gossan zone, a large area of oxidized pyritic andesite of the Takla Group, that may be indicative of a buried porphyry system.

Bishop Gold Inc completed a large trenching program on the former **Lawyers** (Minfile 094E 066) epithermal gold-silver property. The company focused its program on the plateau west of the Cliff Creek portal where prospecting in 2003 located high-grade gold-silver vein float. Trenching exposed four zones of epithermal quartz veining, brecciation and silicification, one to ten metres wide, over a northwest-trending strike length of about 400 metres. Results from chip sampling include 1.5 metres grading 5.71 g/t Au and 65.8 g/t Ag.

OMINECA MOUNTAINS

Northgate Minerals Corporation purchased the **Sustut** (Minfile 094D 063) volcanic redbed copper property, located 40 km south of the Kemess South mine, from Doublestar Resources Ltd. The company is investigating mining plans for the remote deposit and the feasibility of trucking crushed ore to the Kemess mill for processing. Reserves for the Southeast zone, a gently inclined tabular ore body, total 5.2 million tonnes grading 1.87% Cu and 6.11 g/t Ag (at a 0.8% Cu cut-off).

The **Red** (Minfile 094D 034) porphyry copper-gold prospect, located 40 km south-southeast of the Kemess mine, was explored by Gitennes Exploration Inc. The company completed 20 line-kilometres of IP on the property that is underlain by intermediate volcanic rock of the Takla Group and an Early Jurassic diorite intrusion. Two holes were drilled into a strong IP chargeability zone which coincides with a 450 by 2400 metre copper geochemical anomaly. Hole R04-14 intersected multiple intervals of copper-gold mineralization throughout its length including 24.23 metres grading 0.19% Cu and 0.12 g/t Au.

To the east in the Finlay Ranges south of Ingenika River, Bard Ventures Ltd and Cross Lake Minerals Ltd pursued carbonate-hosted silver-zinc-lead mineralization on the **Ingenika-Swannell** (Minfile 094C 002- 005, 086) and **Wasi Creek** (Par; Minfile 094C 024) properties. The joint-venture completed more than 80 line-kilometers of IP on several grids on the Ingenika-Swannell property and conducted mapping, prospecting and soil sampling on the Wasi Creek property. Drilling is anticipated during the 2005 field season.

Minterra Resource Corp drilled eight holes on the **Star** magmatic copper-PGE prospect. The property is about 100 kilometres north of Germansen Landing in the Lay Range and is underlain by phases of the Polaris Ultramafic Complex. Elevated levels of platinum and palladium are associated with interstitial chalcopyrite and pyrrhotite within gently dipping layers of olivine clinopyroxenite and pyroxenite.

Wildrose Resources Ltd and partner MaxTech Ventures Ltd completed an airborne magnetic and radiometric survey over its **Carruthers Pass** (Minfile 094D 172) volcanogenic massive sulphide prospect, located 160 kilometres north of Smithers. The program produced very encouraging assay results. The five-hole helicopter-supported drill program intersected broad intervals of pyrite-chalcopyrite-molybdenite mineralization in quartz veins and stockwork within potassically altered, Eocene quartz monzonite porphyry. A 295.5-metre intercept in hole BD04-18 averaged 0.059% Mo and 0.27% Cu.

Northern Hemisphere Development Corp completed a modest diamond drilling program on its **Kaza** (Minfile 093M 111) copper-gold-silver skarn property, located 30 kilometres due north of Takla Lake. Drilling targeted the

Hornblendite and Main Trend zones where calcsilicate skarn mineralization is mainly developed along the contact between andesite flows of the Telkwa formation and monzonitic dikes. Hole KZ04-01 intersected 4.8 metres grading 0.246% Cu, 2.4 g/t Ag and 0.30 g/t Au. Drilling by Northern Hemisphere on its adjoining **Northstar** (Minfile 094D 032) property intersected disseminated and fracture-controlled bornite and chalcocite in feldspar phyric flows, tuffs, and related sediments of the Takla Group. Hole NS-04-02 intersected 138.3 metres grading 0.55% Cu.

Eastfield Resources Ltd completed more than 4400 metres of drilling in 24 holes at the **Lorraine-Jajay** (Minfile 093N 002, 066, 224) alkalic porphyry copper-gold property, in the Swannell Ranges northwest of Germansen Landing. The work outlined a continuous 4-kilometer long northwest trending zone of mineralization that includes the previously identified Upper Main, Lower Main, Bishop and Weber prospects. The zone is at least 2 kilometers in width and corresponds in part with a weak to moderate IP chargeability anomaly. Typical mineralization is comprised of disseminated chalcopyrite and lesser bornite in syenitic and biotite pyroxenite phases of the Early Jurassic Hogem Intrusive Suite. Hole 04-80-A, drilled near the Bishop zone, intersected 88.39 metres grading 0.51% Cu and 0.15 g/t Au. The company is planning to resume drilling in 2005.

Just to the north on Cat Mountain, Lysander Minerals Corporation explored the **Osilinka** (Cat Mountain; Minfile 094C 069) porphyry gold-copper prospect. The property straddles the contact between monzonitic intrusions of the Hogem Intrusive Suite and andesitic volcanics of the Takla Group. In 2004, two diamond drill holes, each more than 540 metres in length, were drilled to confirm information obtained by other workers in 1989 and the early 1990s. Previous exploration identified a well-mineralized gold-copper system associated with magnetite stringers within sheared and propylitically altered augite phyric flows near the intrusive contact (i.e., drill hole C94-1 intersected 99.66 metres averaging 1.37 g/t Au and 0.15% Cu). Drill hole 04-8 intersected magnetite-rich, potassically altered volcanic breccia that graded 0.14% Cu nad 1.24 g/t Au over 39.0 metres.

Alpha Gold Corp drilled skarn and manto targets on its **Lustdust** (Minfile 093N 009) polymetallic prospect, located 210 kilometres north-northwest of Prince George. The property is underlain by deformed oceanic rocks of the Cache Creek Terrane and is just west of the Pinchi fault zone. The Eocene Glover stock, an elongate body of monzonite and related feldspar megacrystic dikes and sills, is genetically and spatially related to the mineralization. Most of the drilling focused on the Canyon and Canyon Extension polymetallic skarn zones. Results from the 2004 program have not yet been released.

The **QCM** bulk tonnage gold property, centred seven kilometers northwest of the village of Manson Creek, was evaluated by Canadian Gold Hunter Corp. The property includes the QCM (Minfile 093N 200), Motherlode (Minfile 093N 024) and AJ (Minfile 093N 136) occurrences. Previous exploration by Anaconda Canada Exploration Ltd established that anomalous gold values were associated with pervasively carbonate-altered wackes and tuffaceous sedimentary rocks of the Slate Creek Succession (Takla Group). The altered rocks contain up to 10% cubic pyrite and abundant ankerite and are cut by a network of narrow quartz stringers. Canadian Gold Hunter completed a 34 line-kilometre Induced Polarization survey that outlined a north-northwest trending zone with low chargeability and high resisitivity characteristics. Five diamond drill holes tested a 375-metre strike length of the coincident anomaly. Three of the five holes drilled in 2004 intersected low grade gold mineralization over broad intervals (i.e. 141 metres grading 0.8 g/t Au) and, locally, narrow high-grade zones (i.e. 1.5 metres grading 173 g/t Au).

Placer Dome Inc re-visited its **Mt. Milligan** (Minfile 093N 191, 194) porphyry gold-copper deposit, 85 kilometres northeast of Fort St. James, and drilled a dozen HQ bore holes to provide core for metallurgical testing. The Main and Southern Star zones comprise the deposit and collectively have a measured and indicated resource of 408 million tonnes grading 0.18% Cu and 0.4 g/t Au. The Mt. Milligan deposits occur within porphyritic monzonite of the Early Jurassic MBX and Southern Star stocks and the enclosing permeable intermediate volcanic rocks of the Witch Lake formation (Takla Group). Most of the copper and gold mineralization at Mt. Milligan has an affinity with a biotite-rich subzone of the strongly potassically altered core of the deposit. The potassic core is enveloped by widespread propylitic alteration comprised of epidote, chlorite, albite, calcite and pyrite. Placer Dome plans to complete a full feasibility study on the project in 2005.

Serengeti Resources Inc acquired five properties with bulk tonnage potential in the Mt. Milligan to Kemess belt of the Quesnel Terrane. The most advanced of these is the **Choo** (Mitzi; Minfile 093N 096, 218) property, 25 kilometres west of the Mt. Milligan deposit, where previous shallow drilling of a 2100 metre by 700 metre IP anomaly produced indications of a well-mineralized porphyry system.

Amarc Resources Ltd staked a large area east of Chuchi Lake called the **Chona** property and employed several line-cutting and IP crews on the claims. Drilling of high priority targets was expected to commence in December. The company also staked and explored several other claim groups in the area including the **Kalder**, **M3**, **M4**, **M5**, **Tsil** and **Witch** (Minfile 093N 084, 164, 219) properties. Reconnaissance drilling was conducted on Kalder and Tsil under a joint venture agreement with Rockwell Ventures Inc. Results from the programs are not yet available.

The **Fran** (Minfile 093N 207) porphyry gold-copper property, located near the east end of Inzana Lake, about 70 km north of Fort St. James, was explored by Yankee

Hat Industries Corp. The property covers a high-level porphyry system that is associated with an Early Jurassic granodiorite to quartz diorite stock and hornfelsed volcaniclastics and cherty argillites of the Inzana Lake succession (Takla Group). Yankee Hat completed a property-scale program that included silt, soil and rock geochemical sampling, geological mapping and a low-level airborne magnetic and radiometric survey. Soil sampling outlined two >100 ppb gold, east to southeast trending anomalous zones that measure about 3 by 2.5 kilometres. Previous drilling conducted by Navasota Resources Ltd in 2001 and 2002 intersected numerous vein and structural zones, particularly at intrusion-hornfels contacts, that produced multi-gram gold grades.

NECHAKO PLATEAU

The **3Ts** property (Minfile 093F 055, 068) of Southern Rio Resources Ltd encompasses a northerly-trending, low sulphidation epithermal gold-silver quartz vein system. Multiple discrete quartz-dominated veins cut variably welded rhyolite flows of the Early Jurassic Naglico formation. A Late Cretaceous flat-lying microdiorite sill cuts the veins. Systematic diamond drilling has established resources, compliant with National Instrument 43-101, for a portion of the Tommy and Ted veins above the sill. The drill indicated resource for an 800-metre long section of the Tommy vein is 552 500 tonnes grading 6.82 g/t Au and 60.9 g/t Ag. The drill indicated resource for a 350-metre long section the Ted vein is 273 800 tonnes grading 2.0 g/t Au and 133 g/t Ag.

A deep hole drilled to intersect the Tommy vein beneath the sill cut 11.31 metres of the vein that grades 8.83 g/t Au and 62.6 g/t Ag. This is the highest grade intersection encountered below the sill so far. Diamond drilling up ice from the Ringer boulder anomaly discovered the narrow Hidden and H-East veins. Prospecting identified the new Taken Ridge float anomaly. Exploration is expected to include follow-up work on the Ringer and Taken Ridge anomalies and drilling of the Tommy and Ted veins along strike and at depth beneath the sill.

Bard Ventures Ltd completed a three-hole diamond drill program on the **Laidman** (Minfile 093F 067) gold prospect south of Vanderhoof. Drilling targeted two high-level IP chargeability anomalies that are coincident with an elevated gold geochemical anomaly and with areas of quartz-pyrite stockworks within quartz monzonite of the Cretaceous Capoose Batholith. Results were not released, however, and the property was returned to the vendor.

CARIBOO

Imperial Metals Corporation conducted the largest exploration program in the Central Region on its **Mount Polley** (Minfile 093A 008) property, southwest of Likely. The **Northeast** (Minfile 093A 164) zone, an alkalic copper-gold-silver porphyry deposit that Imperial discovered in August, 2003, is less than two kilometres from the company's idle Mount Polley mine (Figure 3-8). An expanded diamond drilling program continued to intersect impressive intervals of chalcopyrite and bornite mineralization within 'crackled' to brecciated intensely K-feldspar altered monzonite and plagioclase porphyry, phases of the Early Jurassic Polley stock. The work identified a structurally offset extension of the deposit and lengthened the overall northwest strike of the zone to more than 500 metres. In August, 2004, Imperial released a mineral reserve (NI 43-101 compliant) for the Northeast zone of 6.2 million tonnes grading 0.978% Cu, 0.324 g/t Au and 6.978 g/t Ag. The calculation was based on information obtained up to July, but drilling continued to evaluate the zone up until mid-December, producing significantly more data for a revision to the initial reserve figure. Drilling identified a normal fault that drops the northwest extension of the zone from surface to a depth of about 200 metres. Intersections from this deeper part of the deposit include 227.3 metres in hole WB04-102 that graded 1.11% Cu, 0.41 g/t Au and 7.52 g/t Ag.

Figure 3-8. Pat McAndless, VP of Exploration for Imperial Metals Corporation and Tom Schroeter, Senior Regional Geologist for the B.C. Ministry of Energy and Mines, examining core from the ***Northeast*** *zone.*

Late in the year Imperial announced that it will re-open the 20 000 tonne per day Mount Polley copper-gold mine in the first quarter of 2005. The Northeast zone, which will be called the Wight Pit when developed, is an integral part of the mine restart. The mine last operated from 1997 to 2001 producing approximately 60 800 tonnes (134 million lbs) of copper and 11 517 kilograms (370,300 oz) of gold. Deep drilling on the mine lease of the Springer zone and the partly mined Bell pit produced

many well-mineralized intersections (e.g. 68.6 metres grading 0.86% Cu and 0.67 g/t Au in hole BD04-05). The recognition of this deeper mineralization enhances the overall resource of the property and may lead to expanded pit development. The present reserve base for the three zones (Bell, Springer and Northeast) is 40.7 million tonnes grading 0.432% Cu and 0.309 g/t Au.

Cross Lake Minerals Ltd purchased the dormant **QR** gold mine (Minfile 093A 121), located 58 kilometres southeast of Quesnel, from Kinross Gold Corporation in April, 2004. The company also completed a pre-feasibility study that supports reopening the 800 tonne per day operation. The study identified the need for stringing approximately 29 kilometres of three-phase power line from the Gavin Lake sub-station to the minesite. Mineralization at QR occurs primarily in pyritic, propylitically altered basaltic fragmental volcanics of the Late Triassic Nicola Group peripheral to an Early Jurassic diorite stock. Kinross operated the mine from 1995 to 1998 producing 3733 kilograms (120,030 oz) of gold from open pit mining of the Main and West zones and underground development of the Midwest zone. The remaining on-site resource is contained mainly in the Northwest, West and Midwest zones and totals an estimated 903 510 tonnes grading 3.1 g/t Au.

Exploration in 2004 focused on the partly mined Midwest deposit and the North zone, a faulted extension of the mined Main zone. A seven-hole drill program on the Midwest deposit successfully intersected a deeper projection of the zone and yielded some encouraging assays that may lead to an expansion of the deposit. For instance, hole CL-04-39 intersected 6.4 metres grading 5.20 g/t Au within a 24.1 metre interval grading 3.10 g/t Au. Drilling by Cross Lake and others has intersected the North zone over a strike length of more than 1000 metres, but at depths of between 200 and 400 metres. The company plans to develop a decline next year in order to conduct detailed deposit appraisal drilling of the zone, a target that has the potential to significantly add to the resource base of the property.

Copper Ridge Resources optioned its **Copper Ace** property, immediately north of the Gibraltar mine, to Bell Resources Corporation. Bell drilled eight holes to test the Bysouth prospect (Minfile 093B 061) and one hole to evaluate a nearby magnetic anomaly within altered quartz diorite of the Granite Mountain batholith.

Skygold Ventures Ltd and Wildrose Resources Ltd completed a trenching and reverse circulation drilling program (Figure 3-9) within a coincident gold geochemical and Induced Polarization chargeability anomaly on the **Spanish Mountain** (Minfile 093A 043) mesothermal gold prospect east of Likely. The property is prospective for both bonanza–grade veins and bulk tonnage stockwork mineralization. The anomaly is about 1500 metres long and follows a northwesterly trend that includes the LE zone that Imperial Metals Corporation test-mined in 2000. The anomaly coincides with pyrite and quartz- pyrite veins, stringers and stockworks within

*Figure 3-9. Reverse circulation drilling on the **Spanish Mountain** gold property.*

phyllitic black shales and dark grey siltstones of the basal Nicola Group (Takla equivalent). Trenching identified higher grade gold mineralization that follows a trend of 030 degrees, crosscutting the broader zone of lower grade mineralization. Highlights of the trenching program include a 23-metre interval in trench TR-29 that grades 2.68 g/t Au. The best assay from the first 16 of 34 holes drilled in 2004 came from hole 216 that intersected 57.8 metres grading 1.11 g/t Au.

Fjordland Exploration Inc and Wildrose Resources Ltd produced an exciting intersection in the first hole of their 2004 drill program on the **Woodjam** (Minfile 093A 078) gold-enriched alkalic porphyry prospect, south of Horsefly. Mineralization at Woodjam is associated with a subvolcanic quartz monzonite intrusion, part of the Early Jurassic Takomkane batholith, in proximity to intermediate flows of the Nicola Group. Diamond drillhole 04-32 tested the depth extent of gold-copper mineralization on the Megabuck Zone and intersected 361.2 metres grading 0.84 g/t Au and 0.12% Cu (including 274.9 metres grading 1.03 g/t Au and 0.14% Cu). During followup drilling the hole was extended and the revised intersection is 378.0 metres averaging 0.81 g/t Au and 0.12% Cu. This impressive drill intersection led to an expanded program and additional investment in the

project by Imperial Metals. Follow-up drilling took place on 50-metre step-outs from hole 04-32 and additional bulk tonnage gold-copper intersections were encountered, including 233.2 metres averaging 1.01 g/t Au and 0.14% Cu in hole 04-37. The impressive grades and continuity of mineralization found at Woodjam have contributed significantly to the renewed level of interest in the southern Quesnel Trough.

Barker Minerals Ltd conducted a "Titan" geophysical survey over part of its **Frank Creek** (Minfile 093A 152) volcanogenic massive sulphide (VMS) prospect located southeast of Cariboo Lake. Results from this survey, coupled with information from earlier surveys by the company, provided trenching and drilling targets that were tested late in 2004. Trenching exposed a zone of polymetallic, base metal sulphide mineralization in stringers and semimassive bands within metasedimentary rocks of the Paleozoic Snowshoe Group. Assays of grab samples typically graded in excess of 1% copper with anolmalous silver, zinc and lead. The company also discovered stringer and semi-massive to massive sulphide showings on its SCR and Rollie Creek prospects in the Cariboo Lake area.

At Wells, International Wayside Gold Mines Ltd extracted a 10 000 tonne underground bulk sample on the high-grade gold Bonanza Ledge zone at its **Cariboo Gold Quartz** property (Minfile 093H 019). The mineralized zone is up to 30 metres across and occurs within an overturned, northeast dipping sequence of metamorphosed turbidites, carbonates and tuffaceous rocks of the Paleozoic Snowshoe Group. Bonanza Ledge mineralization consists of multiple semi-massive to massive bands of fine to medium-grained pyrite that has preferentially replaced the carbonate layers within laminated, tan-coloured muscovite-rich phyllite. Ore was stockpiled prior to being trucked to the Imperial Metals Mount Polley mill for processing. The head grade of the bulk sample was approximately 23 g/t Au.

The company also continued to drill the Bonanza Ledge zone from an underground exploration drift and from surface using a tightly-spaced pattern. In all more than 14 000 metres of drilling was completed on the Bonanza Ledge trend. International Wayside intends to apply for a Mines Act permit to develop a small open pit mine on the remainder of the deposit. Resource figures (using a cut-off grade of 0.7 g/t Au) for both Bonanza Ledge and for the BC Vein were released by the company late in 2002. The indicated resource for the Bonanza Ledge zone was 337 500 tonnes grading 8.12 g/t Au. The indicated resource for the BC vein, a massive quartz±carbonate±pyrite vein, on the hanging wall of the Bonanza Ledge zone, was 296 000 tonnes grading 5.31 g/t Au.

International Wayside also drilled 5 holes on the **Myrtle** (Minfile 093H 025) property, immediately northeast of Bonanza Ledge. The target on Myrtle is a series of auriferous quartz-pyrite veins that are orthogonal to the northwest trending BC vein. Assays from the 2004 program have not been released, but drilling in 2002 by the company was encouraging (e.g. 17.68 metres grading 9.12 g/t Au).

Golden Cariboo Resources Ltd explored three gold targets south of Barkerville near the confluence of Peter's Gulch and Cunningham Creek on its Golden Cariboo project.. The area is underlain by metasedimentary rocks of the Paleozoic Snowshow Group. Two drillholes tested an area of the **Cariboo Hudson** (Minfile 093A 071) property for bonanza-grade mesothermal veins; three holes were drilled on the **Craze** (Nugget Mountain; Minfile 093A 090) property to intersect the down dip projection of a carbonate-hosted massive sulphide prospect called the A zone; and four drillholes evaluated the **Ham** claims for 'Bonanza Ledge-type' replacement mineralization. Drilling was completed late in the year and assay results are not expected until early in the new year.

About 1.5 kilometres west of Wells near the former **Mosquito Creek Gold** mine (Minfile 093H 010), Island Mountain Gold Mines Ltd completed a modest diamond drilling program on the Fender Bender zone where trenching and drilling encountered high-grade gold mineralization in both replacement lenses and mesothermal veins. For example, hole IGM03-15 intersected an auriferous quartz vein grading 15.9 g/t Au over 2.5 metres. Much of the work focused on areas underlain by 'Bonanza Ledge' stratigraphy, structurally below the property's 'Mine Trend' where mining of carbonate-hosted replacement mineralization took place at the Island Mountain, Aurum and Mosquito Creek Gold mines.

OUTLOOK FOR 2005

Dramatically higher precious metal and base metal prices are expected to continue to drive grassroots and advanced exploration for both high-grade and bulk tonnage deposits throughout the Central Region. Two metal mines, Mount Polley and QR, are expected to reopen.

The level of placer gold testing and mining will likely increase in each of the region's traditional placer camps.

ACKNOWLEDGMENTS

The author gratefully acknowledges the many contributions provided by mine staff, exploration geologists and prospectors working throughout the region. Without their cooperation compilation of this report would not be possible. The manuscript benefited from editorial comments provided by Ken MacDonald and Brian Grant.

THOMPSON-OKANAGAN REGION

By Mike Cathro, PGeo
Regional Geologist, Kamloops

SUMMARY AND TRENDS

Exploration activity increased sharply in 2004 throughout the Thompson-Okanagan region, formerly called the South-Central region. Exploration spending is estimated at about $21 million, up from $7.5 million in 2003 (Figure 4-1). This is the highest spending level since 1996, and is approaching the exploration activity levels of the late 1980s and early 1990s. Drilling activity was also up sharply to about 110 000 metres, versus 45 000 metres in 2003 (Figure 4-2). The number of major projects, *i.e.*, those with drilling or trenching and over $100 000 in spending, is estimated at 29, compared with 17 in 2003 (Figures 4-3 and 4-4). These indicators highlight a strong resurgence in exploration and mine development, brought on by increased commodity prices, improved profitability for mining, a better climate for junior company financing, and an overall strengthening of the BC economy.

New exploration activity continues to be led by junior companies which were responsible for over 90% of the investment. These companies are primarily targeting bulk-mineable copper-gold and copper-molybdenum porphyry deposits, high-grade gold-silver veins, and stratiform polymetallic massive sulphide deposits. More than sixty percent of the work comprises detailed drilling, bulk sampling, and engineering and metallurgical studies, as part of feasibility or resource definition programs on advanced-stage projects such as **Afton**, **Bralorne**, **Elk**, **Brett**, **McKinnon Creek** and **Ruddock Creek**. A lesser, but still significant amount of work, can be considered grassroots exploration, such as at the **North Valley**, **Ann North**, **Barnes Creek**, **Rain**, **Murphy Lake**, and **Friendly Lake** projects. In addition, early stage prospecting and claim staking appears to be picking up, particularly for porphyry copper-gold deposits in the Cariboo, gold-silver vein deposits in the Merritt area, and polymetallic deposits in the Goldstream area north of Revelstoke.

High metal prices provide an opportunity for custom milling or mine re-openings at several dormant mine-mill complexes in the region. Many of these "brownfield" sites have existing permits and substantial infrastructure, including tailings ponds, power and water supplies, camp and office buildings, loading facilities and intact or partially intact mills. The first to re-open may be the **Goldstream** copper-zinc mill north of Revelstoke. Orphan Boy Resources Inc is studying the feasibility of

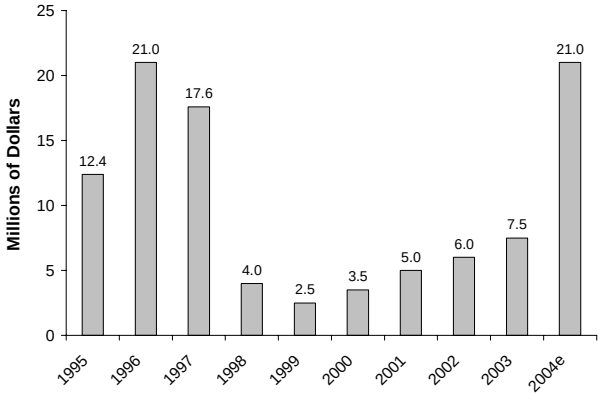

Figure 4-1. Annual exploration spending, in millions of dollars, Thompson-Okanagan region.

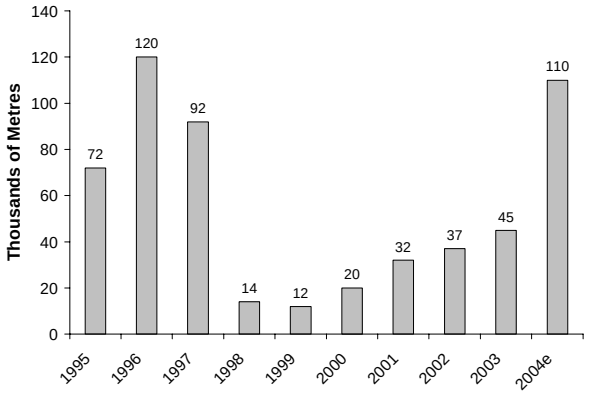

Figure 4-2. Annual exploration and development drilling, in thousands of metres, Thompson-Okanagan region.

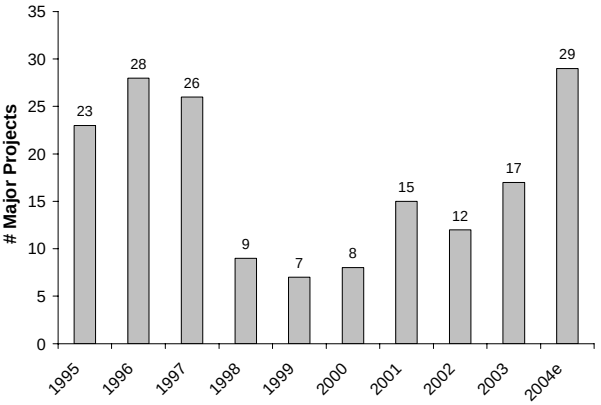

Figure 4-3. Number of major exploration projects per year, Thompson-Okanagan region.

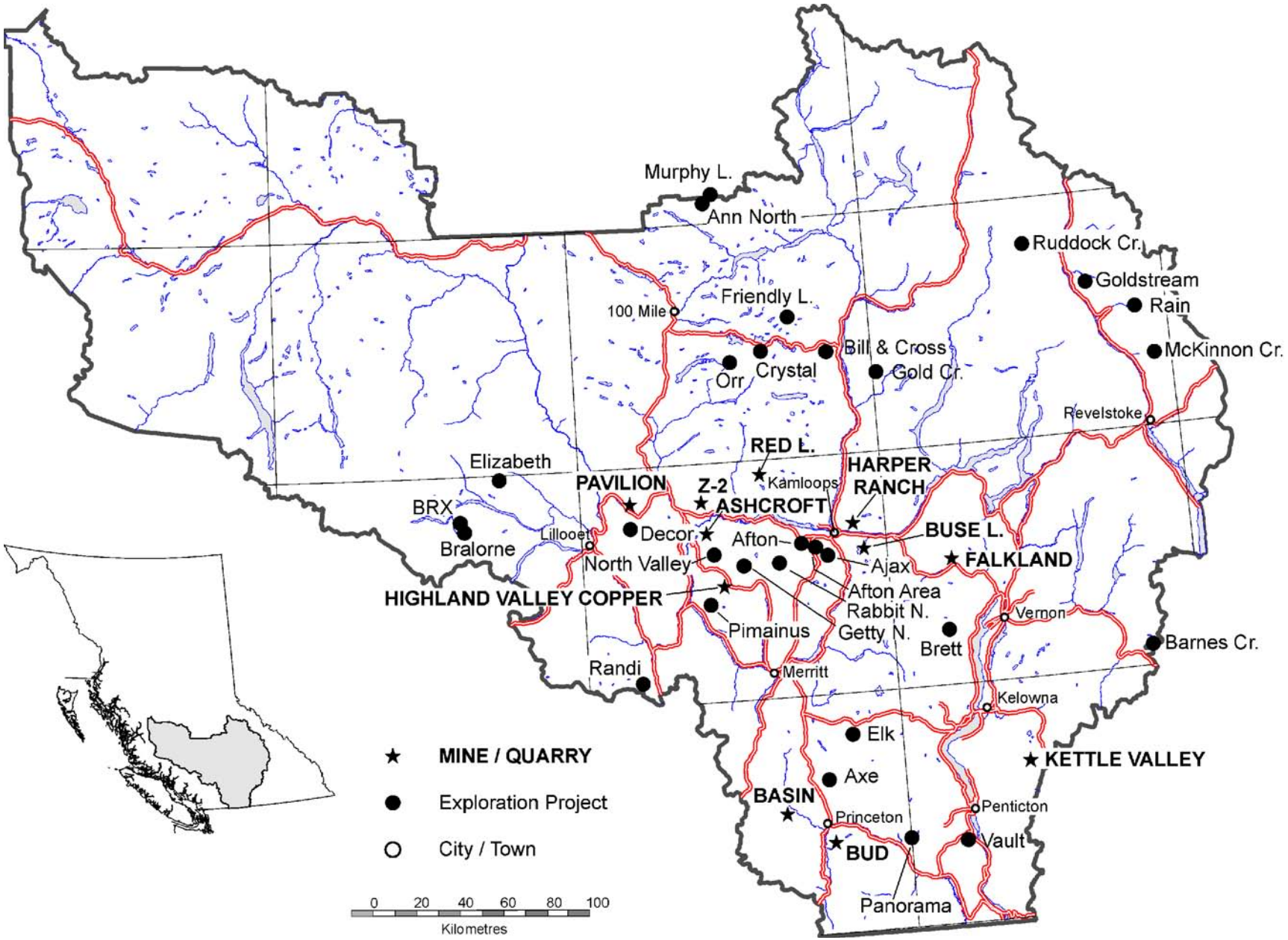

Figure 4-4. Mines, quarries and major exploration projects, Thompson-Okanagan region, 2004.

starting the mill in 2005 to treat copper-gold ore from the Willa project, located near New Denver. Other dormant sites include **Afton**, **Blackdome** and **Similco**.

Two small industrial minerals projects and a coal mine moved closer to commercial production. Construction began on a micronizing mill at Princeton, which will process zeolite from the **Zeo** quarry of Zeo-Tech Enviro Corp. An application for a small mine permit was filed for the **Decor** quarry of Pacific Bentonite Ltd, following successful test mining and marketing over the last two years. The mine is located at Hat Creek, near Cache Creek, and will produce burnt shale for cement-making and for landscaping uses. Production more than doubled at the small **Basin coal** mine near Princeton. The wash plant is being moved to the mine site and the company is evaluating the feasibility of a 50 megawatt wood-waste and coal-fired generating station.

Finally, the huge **Highland Valley Copper** mine was highly profitable during the year due to higher copper and molybdenum prices. The mine is currently slated to close in 2009; however, the possibility of extending the mine life to 2013 is being studied.

All of the operating mines in the region are listed in Table 4-1 and shown on the map (Figure 4-4). In addition, the major exploration projects are listed in Table 4-2.

MINES AND QUARRIES

METALS

Highland Valley Copper (HVC; Figure 4-5), Canada's largest metal mine, is on track for an exceptionally profitable year due to higher metal prices. Located southwest of Kamloops, the mine employs about 890 people and is owned by a partnership of Teck Cominco Ltd (97.5%) and Highmont Mining Company (2.5%). Average daily mill throughput has averaged about 135 000 tonnes per day (or 50 million tonnes per year) in recent years. The mine is developed on calc-alkalic porphyry copper-molybdenum deposits within the Early Jurassic Guichon Creek batholith. Most ore comes from the Valley pit, augmented by a small amount from the Lornex pit.

Production at HVC in 2004 is forecast at about 170 000 tonnes of copper, 5000 tonnes of molybdenum and minor by-product gold and silver. Copper production in 2004 is expected to be slightly lower than in recent years due to lower head grades. However, molybdenum production and sales will be up strongly due to higher grades and improved recoveries. Teck Cominco reported that their share of operating profit was $125 million in the third quarter ending September 30th, of which molybdenum sales contributed $69 million.

Proven and probable ore reserves at the beginning of 2004 were 252.3 million tonnes grading 0.42% copper. Although the mine is scheduled to close in mid-2009, the partners are studying the possibility of deepening the Valley pit, which would extend the mine-life to 2013. A decision is not expected until 2006.

In terms of exploration, HVC had a relatively busy year, exploring numerous targets. A joint venture with Getty Cooper Inc enabled HVC to conduct a large, induced polarization survey and to drill test several grassroots targets on the **North Valley** property, located north and northwest of the Valley pit. In addition, the company drilled three holes on induced polarization targets, south of the mine in the **Pimainus** area.

Several other mine-mill complexes remain on care-and-maintenance status. Many of these have been closed since the mid-1990s, awaiting higher metal prices and/or discovery of additional ore. They have permits and substantial infrastructure in place and represent excellent opportunities for renewed mining or custom milling. Orphan Boy Resources Inc owns the **Goldstream** copper-zinc mine-mill complex north of Revelstoke. In 2004 the company conducted an aggressive exploration project on their extensive "Big Bend" property holdings, and continued to study the feasibility of using the 1360 tonne-per-day Goldstream mill to process copper-gold ore

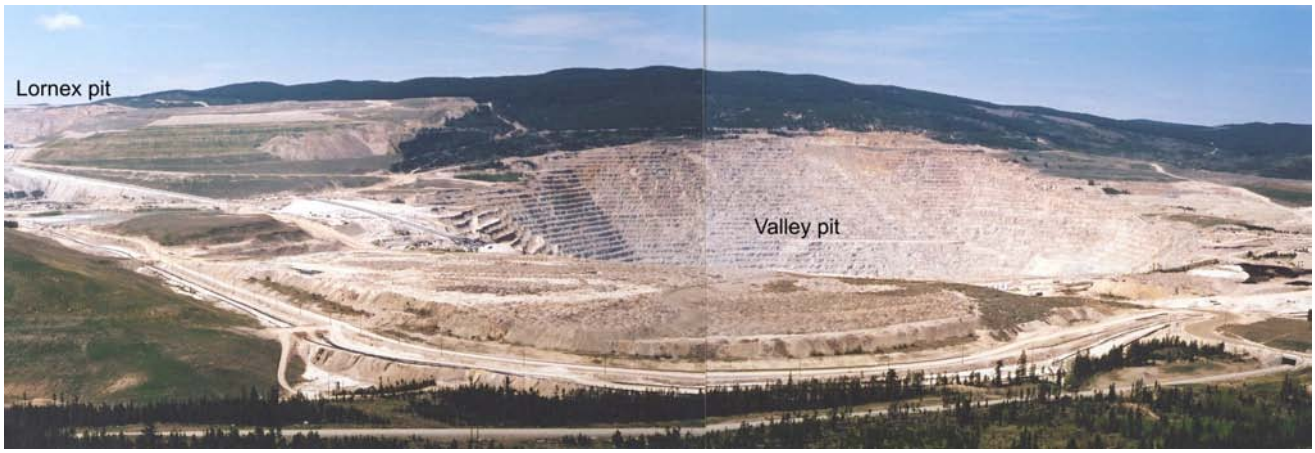

*Figure 4-5. View looking southwesterly over the Valley pit, **Highland Valley Copper**. Lornex pit is in the upper left.*

TABLE 4-1 – THOMPSON-OKANAGAN FORECAST MINE PRODUCTION 2004.

Mine	Operator	Deposit Type / Commodity	Forecast Production in 2004 (tonnes or kilograms)	Number of Employees	Proven and Probable Reserves (at Jan. 1, 2004)
Metals					
Highland Valley Copper	Teck Cominco Ltd / Highmont Mining Company Ltd	Calc-alkalic porphyry Cu-Mo	170 000 t Cu, 5000 t Mo, 500 kg Au, 70 000 kg Ag	890	252,300,000 t at 0.42 % Cu
Coal					
Basin (Tulameen)	Compliance Energy Corp / Sojitz Coal Development Ltd	Thermal coal	40,000 t	~8	
Industrial Minerals					
Ashcroft	IG Machine and Fiber Ltd (IKO Industries Ltd)	Basalt (roofing granules)		55 (plant & quarry)	
Bud	Western Industrial Clay Products Ltd	Bentonite		see Red Lake	
Buse Lake	Lafarge Canada Inc	Volcanic ash (alumina-silica)		see Harper Ranch	
Craigmont	Craigmont Mines Joint Venture	Magnetite tailings		~30 (plant; seasonal)	
Falkland	Lafarge Canada Inc	Gypsum		see Harper Ranch	
Harper Ranch	Lafarge Canada Inc	Limestone		32 (plant & 3 quarries)	
Kettle Valley quarries	Kettle Valley Stone Company	Ashlar, flagstone, thin veneer		~40 (plant & quarries)	
Pavilion	Graymont Western Canada Inc	Limestone		~40 (plant & quarry)	
Red Lake	Western Industrial Clay Products Ltd	Diatomaceous earth, leonardite		45 (plant & 3 quarries)	
Z-2	Industrial Minerals Processors	Zeolite		~3 (plant and quarry; intermittent)	

TABLE 4-2. MAJOR EXPLORATION PROJECTS, THOMPSON-OKANAGAN REGION, 2004.

Property	Operator	Minfile (NTS)	Commodity	Deposit Type	Work Program
Afton	DRC Resources Corp	92INE023	Cu, Au, Pd, Ag	Alkalic Porphyry	UG; FS; DD (~2000 m)
Afton Area	Abacus Mining and Exploration Corp	92INE028, 030, 026	Cu, Au, Ag, Pd	Alkalic Porphyry	IP; DD (~27,500 m)
Ajax	DRC Resources Corp	92INE012, 013	Cu, Au	Alkalic Porphyry	DD (2,015 m)
Ann North	GWR Resources Inc	92P 002, 115, 034	Cu, Au, Ag	Alkalic Porphyry	TR; DD (~3000 m)
Axe (Adit Zone)	Bearclaw Capital Corp	92HNE143, 040, 142	Cu, Au	Alkalic Porphyry	IP; DD & PD (~900 m)
Barnes Creek	Columbia Yukon Explorations Inc	82L/01W	Au	Vein?	TR; G; DD (~300 m)
Bill & Cross	New Cantech Ventures Inc / Providence Diamond Corp	92P 169	Cu, Au, Mo, Pb	Veins? Porphyry?	TR; A; DD (1421 m)
Bralorne	Bralorne Gold Mines Ltd	92JNE164, 001	Au-Ag	Mesothermal Vein	BU; MS; UG; DD (~3000 m)

TABLE 4-2. CONTINUED

Property	Operator	Minfile (NTS)	Commodity	Deposit Type	Work Program
Brett	Mosquito Cons Gold Mines Ltd	82LSW110, 131, 084, 047, 132, 130	Au, Ag	Epithermal Vein	TR; GC; G; A; DD (2776 m)
BRX	Mill Bay Ventures Inc / Levon Resources Ltd	092JNE020	Au, Ag	Mesothermal Vein	UG-BU
Crystal	Amarc Resources Ltd	92P/07W	Cu, Au	Alkalic Porphyry	IP; DD (~400 m)
Decor Pit (Hat Creek)	Pacific Bentonite Ltd	92INW047, 084	Burnt shale (alumina rock and landscape rock)	Industrial Mineral	BU (~7000 t)
Elizabeth	J-Pacific Gold Inc	92O 012	Au, Ag	Mesothermal Vein	TR; G; GC; UG; DD (~3000 m)
Elk (Siwash North)	Almaden Minerals Ltd	92HNE096	Au, Ag	Mesothermal Vein	EN; DD (10,265 m)
Friendly Lake	Lithic Resources Ltd	92P 134, 006, 007	Cu, Mo, Pb, Zn, Au, Ag, Pd, Pt	Alkalic Porphyry; Vein	AB-MG; IP; G; DD (~2400 m)
Getty North	Getty Copper Inc	92INE038	Cu	Calc-alkalic Porphyry	BU; MS; IP; DD (~5000 m)
Gold Creek (Enargite)	Navasota Resources Ltd	82M 065	Au, Ag, Pb, Zn	Vein	GC; G; DD (~1000 m)
Goldstream (Spire & Boutwell)	Orphan Boy Resources Inc	82M 278	Cu, Zn, Au, Ag	VMS (Besshi)	FS; GP; G; GC; TR; DD (1952 m)
Iron Lake	Argent Resources Ltd / Eastfield Resources Ltd	92P 132	Cu, Au, Pd, Pt	Alkalic Porphyry	GP-AB; DD (~300 m)
McKinnon Creek (J&L)	BacTech Mining Corp	82M 003	Au, Ag, Cu, Zn, Pb	Stratiform; Mesothermal vein	PF; EN; MS; UG-BS (5 t); UG-DD (~2300 m)
Murphy Lake	Candorado Operating Co Ltd	93A 044, 073, 113, 063, 92P 004	Cu, Au	Alkalic Porphyry	G; TR; DD (1604 m)
North Valley	Highland Valley Copper	092INW040, 011, 030, 029, 053, 085, 005	Cu, Mo, Au, Ag	Calc-alkalic Porphyry	IP; DD (~6500 m)
Orr	Amarc Resources Ltd	92P/07W	Cu, Au	Alkalic Porphyry	IP; DD (~600 m)
Pimainus	Highland Valley Copper	92ISW046	Cu, Mo	Porphyry	DD (802 m)
Panorama Ridge	Goldcliff Resources Corp	82ESW052, 259	Au	Skarn	TR; GC; G; DD (2277 m)
Rabbit North & South	Ballad Gold and Silver Ltd / Auterra Ventures Inc	92INE147, 045, 130, 114, 071	Cu, Au	Alkalic Porphyry, Vein	DD (811 m)
Rain (Sorcerer)	Orphan Boy Resources Inc	82M 156	Cu, Zn, Pb, Au, Ag, Mo, W	VMS; Skarn; Porphyry; Vein	GC; G; TR; DD (~2500 m)
Randi	Locke Goldsmith	092ISW054	Au, Ag, Cu	Mesothermal Vein	DD (~10,000 m)
Ruddock Creek	Cross Lake Minerals Ltd	82M 082, 83	Zn, Pb, Ag	Stratiform	AB-GP; DD (1839 m)
Vault	Ecstall Mining Corp	82ESW173	Au, Ag	Epithermal Vein	G; DD (1310 m)

Work program abbreviations:
A = access; trail, road construction on claims; AB-EM = airborne electromagnetics; AB-MG = airborne magnetics; AB-RD = airborne radiometrics; BU (X tonnes) = bulk sample (weight in tonnes if known); CD = condemnation drilling; CQ = coal quality testing; CT = carbonization test (coal); DD (Xm) = diamond drilling totaling X metres; EN = environmental baseline studies/monitoring, remediation work; FS = feasibility studies; G = geology, mapping, etc; GC = geochemical sampling (rock, soil, silt, etc); GD = geotech drilling; GP = geophysics (general); IP = Induced Polarization; 3D-IP; MG = magnetics; MK = marketing-primarily for industrial mineral products; MS = metallurgical studies; OB = overburden drilling; OP-BU = open-pit bulk sample; P = prospecting; PD = percussion drilling; PF = pre-feasibility studies; R = reclamation; RC = reverse circulation drilling; TR = trenching, UG (X m) = X metres of underground development; UG-BU = underground bulk sample; UT = UTEM; VLF; WT = washability test (coal)

from the Willa property, located 230 kilometres south near the town of Silverton. The company hopes to begin shipping Willa ore to Goldstream in mid-2005.

Exploration near the Goldstream mine included the **Spire** and **Boutwell** Besshi-type massive sulphide copper-zinc targets. At Spire, massive and semi-massive sulphide horizons are interpreted to be at or near the Goldstream "mine horizon". Trenching and drilling has encountered copper-zinc-lead massive sulphide mineralization with grades and thicknesses approaching those at the mine. The **Rain** property, located about 50 kilometres by road southeast of Goldstream, was the subject of extensive surface work and drilling. The property has a wide variety of mineralization styles, including Besshi or Goldstream-style massive pyrrhotite with traces of zinc and copper, skarn and stockwork or porphyry molybdenum-tungsten (Ruger or Sorcerer Creek prospect, MINFILE 82M 156), and polymetallic veins, manto and skarn mineralization hosted by marble. The latter include the **Alfie** and **Lynes** showings discovered late in the year. Orphan Boy also has several other promising base-metal prospects in the Big Bend area, including the stratiform, **Rift** zinc-lead-copper deposit.

The dormant **Blackdome** gold-silver mine and mill of J-Pacific Gold Inc located northwest of Clinton also remains on care and maintenance. This is an underground mine that operated in the 1980s and again briefly from October 1998 to May 1999. Mineralization consists of narrow, high-grade epithermal quartz veins. The 200 tonne-per-day mill is intact and the property has an inferred mineral resource of 124 120 tonnes grading 12.8 g/t gold and 33.7 g/t silver. In 2004, J-Pacific commissioned a structural geology study of the mine area and conducted drilling at the **Elizabeth** property (Figure 4-6) located 32 kilometres to the south. If sufficient high-grade ore can be defined, it would not be technically difficult to connect existing roads to allow trucking to the Blackdome mill. Narrow, high-grade mesothermal gold-quartz veins are the principal target at Elizabeth. Free gold and spectacular grades have been found by surface trenching and drilling in 2003 and 2004. Interesting intrusion-hosted, stockwork mineralization with copper, molybdenum and gold values was also encountered in several drill holes. This new discovery is called the "Porphyry zone".

The **Similco** (Copper Mountain-Ingerbelle) copper-gold mine at Princeton remains on care and maintenance. When it shut down in 1996, the Similco mine was reported to have a resource of 142 million tonnes grading 0.397% copper (plus unreported gold) in the area of Pits 2 and 3 on the Copper Mountain side of the property. The property was sold in 2002 to Envirogreen Technologies Ltd, a company involved in the remediation of special wastes, which has set up a plant on a small portion the mine site. Compliance Energy Corp has also been using a small portion of the minesite for its coal wash plant (Figure 4-7), and has an option to purchase part of the site from Envirogreen, including the mill building. Compliance is studying the feasibility of building a coal and wood-waste fired generating station on the site.

COAL

At the **Basin** coal mine, production of clean thermal coal more than doubled in 2004 to about 40 000 tonnes. Located near the town of Coalmont, the operation is a joint venture of Compliance Energy Corp (65%) and Sojitz Coal Development Ltd (35%). The Basin project has measured and indicated resources of 19 million tonnes and a permit for up to 250 000 tonnes of annual coal production. The high volatile, bituminous B and C rank coal is sold mainly to cement plants and small greenhouse growers in southern BC.

Since opening in 2003, raw coal has been trucked about 45 kilometres, on a seasonal basis, to a wash plant at the Similco site near Princeton (Figure 4-7). Late in 2004 the partners began moving the wash plant to the minesite and purchased a fleet of mining equipment in preparation for a January, 2005 restart. A thickener tank will be added to the plant and power will be supplied by generators. Production is forecast to be 150 000 tonnes of

*Figure 4-6. Rob Montgomery and Warner Gruenwald, consultants to J-Pacific Gold Inc, and BC Geological Survey geologist Tom Schroeter examine drill core at the **Elizabeth** property.*

*Figure 4-7. Coal wash plant of Compliance Energy Corp, located on the site of the dormant **Similco** copper-gold mine near Princeton.*

clean coal in 2005. The Similco site will continue as a load-out for highway trucks, and could become the location for a proposed $125 million, 50-megawatt coal and wood-fired generating station, currently undergoing feasibility studies.

INDUSTRIAL MINERALS

Over 250 people are employed at industrial minerals quarries and processing plants in the region. These operations are important providers of stable employment in smaller communities such as Cache Creek, Ashcroft, Princeton and Merritt. Of note were two small operations, **Decor** and **Zeo**, which were under development during the year. They should enter commercial production in the near future. There are very good opportunities for additional growth in this sector due to the wide variety of rock types and deposits in the region, excellent transportation infrastructure, proximity to growing markets in western North America, and the relative ease of permitting.

The **Kamloops** cement plant and **Harper Ranch** limestone quarry of Lafarge Canada Inc, with an annual capacity of about 220 000 tonnes of cement, benefited from an improving economy and busier construction industry in western Canada. The plant operated at about 70% capacity in 2004 and should be at this level, or higher, in 2005. Lafarge also draws materials from the **Falkland** and **Buse Lake** quarries, which provide gypsum and alumina-silica rock respectively. There are 24 permanent positions at the plant, with another eight contractors working in the quarries.

Lafarge also purchased about 7000 tonnes of alumina-rich burnt shale from Pacific Bentonite Ltd for use in cement-making. The material was mined under a bulk sample permit at the **Decor** pit (Figure 4-8; formerly called Ben or Hat Creek), located near Cache Creek. Late in 2004, Pacific Bentonite applied for a mine lease and a 35 000 to 50 000 tonne per year quarry permit, and

*Figure 4-8. **Decor** pit of Pacific Bentonite Ltd (courtesy John Dormer).*

expects that larger quantities can be supplied to Lafarge in the coming years. Once the quarry permit is in place, the company intends to further develop landscaping and decorative markets for the shale. In addition, the property hosts a large bentonite deposit which is being investigated for municipal engineering and tile manufacture applications.

Also near Cache Creek, Graymont Western Canada Inc operates the **Pavilion** limestone quarry and lime plant on the Pavilion Indian Reserve (Figure 4-9). Employing more than 35 people, mainly First Nations, the operation produces lime used in pulp mills, mines and other industrial processes. The plant has rated capacity of 180 000 tonnes of lime per year. Graymont has been studying the feasibility of a change in the surface mining system that could incorporate a raise and glory hole.

East of Ashcroft, IG Machine and Fiber Ltd, a subsidiary of IKO Industries Ltd, operates the **Ashcroft** basalt quarry and roofing granule plant. The plant produces about 250 000 tonnes of roofing granules in ten distinct colours. The granules are shipped by rail and truck to IKO asphalt shingle plants in Calgary, Alberta; Sumas, Washington; Chicago, Illinois and elsewhere in North America. About 55 people are employed.

Farther along the Thompson River to the northeast, the **McAbee** and **Walhachin** quarries supply railroad ballast for the Canadian National and Canadian Pacific railways, respectively. The railroads also have several other quarries in the region.

Craigmont Mines Ltd operates the **Craigmont** magnetite tailings operation located near Merritt. Tailings from the old Craigmont copper mine are processed to recover up to 70 000 tonnes of magnetite annually. The plant operates on a seasonal basis (March to December), employing about 30 people. The magnetite is used in all coal washing plants in western Canada, plus the Centralia mine in Washington State. The company is investigating the feasibility of adding a new mill circuit to recover hematite, which could be used in steel or cement manufacturing. In 2004, an option agreement was signed with Christopher James Gold Corp to purchase 50% of

*Figure 4-9. Graymont's **Pavilion** limestone quarry and lime plant, located near Cache Creek.*

the operation for $3.5 million. Christopher James Gold is also interested in exploring for base and precious-metal deposits in and around the underground and open-pit Craigmont copper mine, which closed in 1982.

At its plant in Kamloops, Western Industrial Clay Products Ltd manufactures cat litter, barn deodorizer, industrial absorbents, and carriers for agricultural products. These are prepared from diatomaceous earth mined from the **Red Lake** quarry northwest of Kamloops, and bentonite mined from the **Bud** quarry at Princeton. About 45 people are employed at the company's various sites.

The **Z1** (Ranchlands) zeolite quarry near Cache Creek was dormant in 2004. It is a small-scale, intermittent producer owned by the Mineral Products Division of Dynatec Corporation. The company continues to market agricultural and absorbent products, produced from stockpiled zeolite at its plant in Lethbridge, Alberta.

Zeolite was mined from the nearby **Z2** quarry for processing at a plant in Ashcroft. The quarry and plant are owned by Industrial Mineral Processors, a private company based in Calgary. The plant produces industrial absorbents for oil field clean-up, soil conditioner, barn deodorizers, feed binders, and cat litter.

At Princeton, Zeo-Tech Enviro Corp owns the **Zeo** (Bromley Vale) zeolite quarry where a 4000 tonne bulk sample was blasted in 2002. The deposit is reported to have a measured resource of 350 218 tonnes, an indicated resource of 214 310 tonnes, and an inferred resource of 297 000 tonnes. In 2003, Zeo-Tech and partner C2C Zeolite Corp formed an operating company, United Zeolite Products Ltd, which in turn signed a five-year, five million-dollar supply contract with Hallibuton Energy Services Inc. The zeolite will be used to produce lightweight cement for oil and gas wells. United began construction in 2004 of a zeolite micronizing plant at Princeton. Late in 2004, Zeo-Tech conducted crushing and stockpiling of zeolite to provide material for mill start-up and trucking to Halliburton over the winter.

Okanagan Opal Inc produces attractive fire opal gemstones and jewelry from the **Klinker** property, located west of Vernon. Opal occurs as fracture and vesicle-fillings in andesitic to basaltic laharic breccia of the basal Kamloops Group (Eocene). Small-scale mining took place in 2004 to meet growing demand. Presently the gemstone jewelry is marketed from a retail store in Vernon (Figure 4-10) and is aimed at the BC tourist market; however, the company aims to develop other North American markets.

Decorative rock and dimension stone are produced at numerous small quarries throughout the region. The best known producer is the **Kettle Valley Stone Company** of Kelowna which sells flagstone, ashlar, facing stone and landscape rock mined from the **Nipple Mountain**, **Kettle Valley, Canyon** and **Gemini** quarries. Kettle Valley's workforce has grown to about 40 people year round, mainly employed in the Kelowna processing facility (Figure 4-11). The products include dacite ash, gneiss and basalt, and are mainly used in high-end residential and commercial developments in the western U.S.A. and in the Vancouver-Whistler area.

South of Revelstoke, D.G. Olsson produces, by hand, small amounts of micaceous-quartzite flagstone and facing stone at the **Begbie** quarry. Other small, hand-operated flagstone quarries exploit micaceous quartzite in the North Thompson area.

Figure 4-10. Retail store of Okanagan Opal Inc at Vernon.

*Figure 4-11. Facing stone and flagstone at the production facility of **Kettle Valley Stone** at Kelowna.*

BBF Resources Inc continued marketing studies on a 180 tonne bulk sample of perlite collected from the past producing **Frenier** quarry located west of Clinton. The material is being tested for use in horticulture and building materials. A resource of 375 000 tonnes is reported from previous drilling.

EXPLORATION HIGHLIGHTS

KAMLOOPS-HIGHLAND VALLEY

The Iron Mask batholith near Kamloops enjoyed its best year for exploration in a long time, with about $6 million in expenditures by two operators, and substantially more work is expected in 2005. The **Afton** alkalic porphyry copper-gold-silver-palladium project of DRC Resources Corp is the subject of a 13-month, $18 million feasibility study that began in fall 2004. A recent, advanced scoping study indicated favourable economics, moderate capital requirements and low environmental concerns for a 9000 tonne-per-day underground panel (block) caving operation, with a mine life of nearly 18 years. The advanced scoping study proposed a mine plan that would exploit a resource of 51.5 million tonnes grading 1.72% copper equivalent (1.13 % copper, 0.85 g/t gold, 2.55 g/t silver and 0.11 g/t palladium), producing about 522 000 tonnes copper (1.15 billion pounds) and 39 200 kilograms gold (1.26 million ounces) over the mine life. This is part of an overall measured and indicated resource totaling 68 700 000 tonnes grading 1.68% copper equivalent (1.08% copper, 0.85 g/t gold, 2.62 g/t silver and 0.12 g/t palladium), using a cutoff of 0.7% copper equivalent. An additional 7.45 million tonnes is inferred to exist at a slightly lower grade.

The Afton-Ajax complex was operated by a subsidiary of Teck Cominco Ltd between 1977 and 1997, with the Afton pit in operation from 1977 to 1987 (Figure 4-12). DRC is exploring the extension of the Afton deposit beneath and to the southwest of the Afton pit. Mineralization has been found at least 500 metres below the elevation of the pit-bottom and the zone is open to depth and along strike. The current development work will include a 2000 metre-long decline, 20 000 metres of underground drilling, bulk sampling, and metallurgical and engineering studies. Procon Mining and Tunnelling Ltd has been contracted to do the underground work.

Despite encouraging results in 2003, no work was done by DRC on the **Pothook gold zone** located south of the Pothook pit. Several 2003 drillholes cut bulk tonnage-type gold mineralization such as 156 metres grading 0.72 g/t gold, and drilling nearby by Teck, in 1996, encountered up to 35 g/t gold and 0.12% copper over 6 metres. Additional exploration is expected on this encouraging zone, which may be an extension of the **Coquihalla** zone, drilled by Abacus Mining and Exploration Corp late in 2004.

DRC also owns claims between the **Ajax** East and West pits, which provided mill-feed to the Afton concentrator prior to closure in 1997. The pits are located about 10 kilometres southeast of the Afton site. Three of five drill holes encountered encouraging mineralization

*Figure 4-12. Aerial view of the **Afton** mine complex with the Afton pit in the centre with mill/office buildings to the east (right) and the Pothook pit to the southeast. The Afton main zone extends in a southwesterly direction from the bottom of the pit towards the tailings pond in the lower left. The Trans-Canada Highway curves around the north side of the pit. (Courtesy DRC Resources Corp)*

between the two pits. Abacus Mining has an option from Teck Cominco Ltd for the main claims covering the Ajax pits; however, they have not done any drilling in this area.

Abacus Mining conducted a very aggressive exploration program on their large **Afton area** property, optioned from Teck Cominco Ltd. Work included a large 3-D induced polarization survey and more than 27 000 metres of drilling, split between the **Rainbow** deposit, the **DM-Audra-Crescent** area, and the Coquihalla zone.

At **Rainbow**, a resource of 15 900 000 tonnes grading 0.528% copper with undefined gold, silver, molybdenum and palladium values was reported from previous Teck work. The 2004 drilling attempted to extend the higher grade mineralization in the Rainbow #2 and #22 zones to depth.

Previous drilling on the **DM** zone, located three kilometres east of the Afton pit, had defined a resource of 2.685 million tonnes grading 0.38% copper and 0.27 g/t gold (MINFILE). Abacus' work in this area had several encouraging drillholes including 308.9 metres grading 0.42% copper and 0.20 g/t gold in a hole through the DM deposit, and 98 metres grading 0.45% copper and 0.60 g/t gold in a hole at **Audra**. The latter is located between the DM deposit and the Crescent pit, where Teck mined a small amount of ore in 1988-89. Mineralization at DM and Audra contains abundant bornite and chalcopyrite in a strongly potassic-altered breccia.

Farther southwest, midway between the Afton and Highland Valley Copper mines, Auterra Ventures Inc and Ballad Gold and Silver Ltd drilled seven holes on the **Rabbit North** property. The holes encountered porphyry copper-gold on the edge of a large induced polarization anomaly, and gold-bearing quartz-pyrite mineralization. North of Kamloops, Zappa Resources Ltd acquired the **Heff** (Mesabi) copper-gold skarn prospect near Heffley Lake, and were considering a small drill program at year end.

In the Highland Valley, Getty Copper Inc drilled several geophysical targets in the vicinity of the **Getty North** porphyry copper deposit. Previous work at Getty North defined a drill indicated and inferred resource of 72.1 million tonnes grading 0.31% copper, including 10.0 million tonnes of oxide grading 0.40%. Getty also collected bulk samples for metallurgical studies. The ELSAmetal continuous vat leaching process is being considered for treatment of the Getty North oxides.

Finally, on the **Stump Lake** property, 38 kilometres south of Kamloops, Maximum Ventures Inc conducted trenching and sampling in the search for gold-silver vein mineralization.

SOUTHERN CARIBOO-CHILCOTIN

Afton or Mt. Polley-style bulk-mineable porphyry copper-gold-silver-palladium deposits were the target of several significant exploration projects in the southern Cariboo. These projects primarily targeted known showings and grassroots geophysical or geochemical anomalies within the Late Triassic-Early Jurassic "Quesnel Trough". The deposits are associated with magnetic alkaline diorite-syenite intrusions into the co-magmatic Nicola Group volcanic arc.

Lithic Resources' **Friendly Lake** property, located northwest of Little Fort, was the subject of a comprehensive program of airborne and surface geophysics, geochemistry, geological mapping, prospecting and drilling. The work defined broad copper, gold, silver and lead-in-soil anomalies, partly coincident with geophysical anomalies within an area underlain by Nicola Group volcanic, sedimentary and intrusive rocks. Closer to Little Fort, New Cantech Ventures Inc drilled the **Bill** (gold-copper) and **Cross** (copper-gold) prospects with disappointing results. Near Bridge Lake, Amarc Resources Ltd staked the **Crystal** and **Orr** properties to cover grassroots porphyry targets in the Nicola rocks, and conducted induced polarization surveys and drilling.

The **Ann North** porphyry copper-gold property, located northeast of Lac La Hache, was the subject of several waves of drilling and trenching by GWR Resources Inc. Positive results were reported from several drillholes in a strongly potassic-altered quartz monzonite intrusion. The best hole was #04-19 which cut 26 metres grading 0.50% copper and 1.23 g/t gold at shallow depths, and 107.3 metres grading 0.29% copper and 0.33 g/t gold deeper down in the hole. GWR Resources also optioned some of their property holdings to Candorado Operating Company Ltd which staked additional claims to the north. Candorado completed surface surveys and drilled several holes on the **Murphy Lake** copper prospect where previous drilling returned up to 1.14% copper over 9.3 metres.

An airborne magnetic-electromagnetic survey was flown over Argent Resources' **Iron Lake** property located northeast of 100 Mile House. This grassroots property has a large soil anomaly, and float sampling has returned encouraging values in copper, gold and platinum group metals in an area underlain by pyroxenite.

The largest potential development in the region is the **Prosperity** porphyry gold-copper deposit of Taseko Mines Ltd, located southwest of Williams Lake. The project is on-hold but the most recent information from the company gives an estimated measured and indicated resource of 491 million tonnes grading 0.22% copper and 0.43 g/t gold.

GOLD BRIDGE

Mesothermal gold-quartz veins were the subject of several significant exploration projects in the famous Gold Bridge camp, British Columbia's most prolific gold district with over 4.1 million ounces produced historically. The most advanced project is the **Bralorne mine** of Bralorne Gold Mines Ltd which operated from

1987 to 1971. A Mine Development Certificate was issued for a new mine in 1995, however, since then low gold prices have delayed development. Resource calculations reported at that time gave 406 584 tonnes at a grade of 10.6 g/t gold above the 800 level in the Bralorne mine, and 26 115 tonnes grading 9.6 g/t gold for the Upper Peter vein on the Loco property.

In 2004 Bralorne completed construction of a tailings pond to allow five years of production, and began test milling using a small (~100 tonne-per-day) gravity/flotation pilot plant. As of mid-August more than 10 000 tonnes had been processed through the plant, producing about 141 dry tonnes of concentrate. Most of the material processed was from low-grade stockpiles with some additional material coming from the Upper Peter vein (4230 adit) on the Loco (or Cosmopolitan) property. At small amount of dore gold was produced on-site, and about 20 tonnes of flotation concentrate was shipped to the Jerritt Canyon mine in Nevada for further processing.

Bralorne also did underground development to prepare a stope on the Peter vein on the 800 level of the King mine workings, and drove a decline from the 4230 level to access a new level 30 metres deeper. Surface drilling returned encouraging results from the 51B vein in the gap between the Bralorne and Pioneer mine workings, and a new 180-metre long adit is being driven to access this area.

On the nearby **BRX** property, Mill Bay Ventures Inc drove a cross-cut to access the California vein for grade determination and extraction of a bulk sample. Menika Mining's **Reliance** property, to the east, was tested by three drillholes with encouraging results, such as 33.5 metres grading 7.54 g/t gold. Avino Silver and Gold Mines Ltd drilled several holes on mesothermal gold targets on the **Olympic** property, five kilometres northeast of Gold Bridge.

OKANAGAN

Exploration work in the Okanagan focused almost exclusively on epithermal and mesothermal gold-quartz veins in 2004.

A resource calculation was released in May 2004 for the **Elk** project of Almaden Minerals Ltd, located 45 kilometres southeast of Merritt, and just 2 kilometres south of Highway 97. This project produced 1609.6 kilograms gold (51 750 ounces) from 16 700 tonnes of direct-shipping ore from open-pit and underground operations between 1992 and 1995. Grades were consistently high, averaging about 96 g/t gold.

The new resource was calculated using drill data for the Siwash B and WD veins, just two of eight known mesothermal vein structures on the property. Global (bulk-tonnage and underground mineable) measured and indicated resources were reported to total 668 300 tonnes grading 9.66 g/t gold (207 600 ounces) plus an additional 1,317,200 tonnes grading 4.91 g/t gold (207 800 ounces) in the inferred category. Included in the global figures is a higher grade, underground-mineable resource totaling 164 000 tonnes grading 33.69 g/t gold in the measured and indicated category, plus another 195 200 tonnes grading 16.38 g/t gold in the inferred category.

Almaden followed up with an aggressive drilling campaign in summer and fall 2004 to further increase resources. More than 10 000 metres of drilling in 44 holes was directed at the Siwash B, WD and Bullion Creek veins. The company also conducted some environmental monitoring work in preparation for possible permitting of a small mine and mill in the future. Last year the company purchased a 110 tonne-per-day, modular, gravity-flotation mill in Alaska and moved it to a site near the property for storage.

Directly south of the Elk property, International Tower Hill Mines Ltd drilled its **Siwash** gold property, a porphyry and vein-style gold-silver-copper target.

Ecstall Mining's **Vault** and **Dusty Mac mine** properties near Okanagan Falls host low-sulphidation, epithermal gold-silver vein and breccia deposits in Tetiary volcanic rocks; a geological setting similar to the productive Republic and Curlew districts in Washington State. The **Vault Main** zone is reported to have a resource of 1.55 million tonnes grading 2.49 g/t gold. Ecstall drill-tested the western end of this structure in early 2004, encountering good gold values at shallow depths (*e.g.* 9 metres grading 2 g/t gold). The Vault property also contains the **Vault North** vein, a narrow quartz-carbonate-adularia vein with an indicated resource of 152 000 tonnes grading 14 g/t gold. The nearby Dusty Mac gold-silver mine produced 93 372 tonnes of quartz breccia ore from a small open pit in 1975 and 1976. The average recovered grade was 6.49 g/t gold and 113 g/t silver. Ecstall will conduct a seismic reflection survey in 2005 to help locate a postulated underlying feeder vein.

Southwest of Vernon, the **Brett** epithermal gold-silver property was acquired and explored by Mosquito Consolidated Gold Mines Ltd and Running Fox Resources Corp. This property was extensively explored in the 1980s and early 1990s but has been relatively dormant since 1996 because of litigation. The property is underlain by Tertiary volcanic rocks and gold mineralization occurs in north-northwest-trending, steeply dipping shear zones, quartz veins, and altered, flat-lying tuffaceous horizons. The Bonanza area of the Main Shear has been the focus of most of the previous work including over 10 000 metres of diamond drilling, 2800 metres of reverse circulation drilling and 459 metres of underground development. The property boasts one spectacular intersection in a 1988 reverse circulation hole drilled down-dip on the Main Shear, which returned 69.6 g/t gold over 71.65 metres. A small amount of surface mining was done in 1995 and 1996, resulting in a 291 tonne shipment to the Trail smelter in 1996, with an

average recovered grade of 27.74 g/t gold and 63.7 g/t silver.

The 2004 work included soil surveys, trenching, geological mapping, prospecting, re-sampling of old core, and 17 drillholes. This work resulted in discovery of several new soil anomalies and mineralized zones. The most exciting new area appears to be the Bonanza East zone located about 50 metres east of the Main Shear, where a hole intersected 1.31 metres grading 162 g/t gold (176.3 g/t by check metallic fire assay), plus two lower grade sections hosted by tuff.

Solomon Resources Ltd controls the **Bouleau** property, located north and east of Brett, where narrow, high-grade quartz-gold veins are hosted by intrusive rocks.

Columbia Yukon Explorations Inc conducted a small amount of drilling on the **Barnes Creek** grassroots gold target, located in the Monashee Pass area east of Vernon. Late in 2003 the company completed excavator trenching and discovered several new showings comprising narrow, gold-bearing quartz veins in black shale. Several creeks in the area carry placer gold and the company also outlined several large gold and arsenic-in-soil anomalies. Prospecting within these anomalies led to the discovery of quartz-pyrite float boulders with promising gold-silver assays in late 2004.

FRASER RIVER-MERRITT

Locke B. Goldsmith explored the **Randi** property, northwest of Boston Bar, with major drilling campaigns in both in 2003 and 2004. The target is mesothermal gold veins, however, results are not available.

The **Duke** (Copper Canyon) porphyry copper-gold-silver prospect southwest of Merritt was expected to be drilled in late 2004 or early 2005 by partners Southern Rio Resources Ltd and Freegold Ventures Ltd. Drilling in 1963 returned encouraging copper values (*e.g.* 0.63% copper over 57.9 metres). However, gold was not included in the assay work at that time and little work has taken place since. Recent surface grab sampling by Southern Rio has shown gold values in the range of 0.21 to 0.48 g/t gold.

To the south and east of Duke, Almaden Minerals Ltd and joint venture partner Consolidated Spire Ventures Ltd continued grassroots prospecting for low sulphidation epithermal gold-silver-arsenic-antimony-mercury-molybdenum mineralization in intermediate volcanic rocks of the Cretaceous Spences Bridge Group. Spire optioned the **PV** and **NIC** claims from Almaden in early 2004, staked a large number of additional claims, and defined four new gold and pathfinder element stream sediment anomalies to the north of PV. Previous Almaden work at PV had discovered numerous float boulders of quartz grading up to 43.34 g/t gold and 130.7 g/t silver. On the **NIC** claims on the eastern side of the large property, Almaden discovered a bedrock showing of brecciated quartz veins in late 2003. Chip samples returned values such as 9.24 g/t gold over 0.5 metres and 2.26 g/t gold over 1.4 metres, with silver values in grab samples as high as 209.1 g/t. Spire followed up with a soil survey that outlined several gold-in-soil anomalies.

Farther west, near the town of Spences Bridge, Almaden conducted grassroots work on the **SAM** claims where an epithermal gold discovery was made in late 2003. Twenty-two grab samples of quartz averaged 0.82 g/t gold. 2004 work comprised soils, prospecting and hand trenching.

Epithermal gold-silver mineralization is also the target on the **Blustry Mountain** (Rand) project of Wyn Developments Ltd. Located west of Cache Creek, the property is underlain by volcanics of the Spences Bridge Group which host a large alteration zone with a coincident polymetallic soil anomaly. Wyn conducted induced polarization surveys and prospecting in 2004.

South of the town of **Merritt**, Forum Development Corp plan to drill a 455-metre hole in late 2004 or early 2005 to test coal and coalbed methane potential in the Middlesboro collieries area.

REVELSTOKE

The **McKinnon Creek (J & L)** polymetallic deposit, located 45 kilometres north of Revelstoke, was acquired by BacTech Mining Corp in late 2003. The J & L Main zone comprises an arsenopyrite-bearing massive sulphide body with a reported potential resource of 3.6 million tonnes grading 7.24 g/t gold, 81 g/t silver, 3.0% lead and 3.83% zinc. In 2004 the company began a $1.6 million pre-feasibility study involving underground drilling, collection of a 5-tonne bulk sample from underground, and metallurgical and environmental studies. The overall goal is to advance the project towards a production decision. The conceptual plan is for underground mining with production of lead and zinc flotation concentrates for smelting, and a separate gold-silver flotation concentrate for bioleaching. BacTech may try to submit an environmental assessment report in 2005, and to complete project approvals in 2006.

The **Ruddock Creek** sedimentary exhalative zinc-lead deposit was optioned by Cross Lake Minerals Ltd from Doublestar Resources Ltd. The deposit is located about 100 kilometres north of Revelstoke and was explored previously by Falconbridge Ltd and Cominco Ltd, who reported an inferred mineral resource of 1.5 million tonnes grading 8.4% zinc and 1.6% lead within the “E zone”. Cross Lake drilled 11 holes in 2004 (Figure 4-13) to expand the E zone to the west and north. Mineralization is hosted within siliceous calc-silicate and quartzite in a westerly-plunging fold-nose. Cross Lake also owns the **LJ**, **Kneb** and **Ghost** stratiform base-metal massive sulphide prospects in the Goldstream region.

*Figure 4-13. Drilling on the **Ruddock Creek** E zone zinc-lead deposit. (Courtesy Cross Lake Minerals Ltd)*

SHUSWAP-NORTH THOMPSON

Metallurgical studies continued on the **Fir** carbonatite-hosted tantalum-niobium property north of Blue River. Owner Commerce Resources Corp reported on testwork conducted by SGS Lakefield Research Ltd which showed that gravity and flotation separation can produce a high-grade concentrate (58-59% Ta_2O_5 + Nb_2O_5) with minimal losses. The Fir deposit is reported to contain an indicated resource of 5.65 million tonnes grading 203 g/t Ta_2O_5 and 1074 g/t Nb_2O_5 with an additional inferred resource of 6.74 million tonnes at the same grade. Commerce also owns the **Verity** deposit, located a few kilometres to the north, which is reported to have a resource of 3.06 million tonnes grading 196 g/t Ta_2O_5, 646 g/t Nb_2O_5 and 3.2% P_2O_5.

North of Barriere, Molycor Gold Corp drilled three holes and did a small induced polarization survey on the **Windpass mine** property. Between 1916 and 1944, the Windpass mine produced 93 435 tonnes of quartz-magnetite-sulphide vein material with a recovered grade of 11.47 g/t gold, along with minor silver and copper values. Drilling was also done on the **Gold Creek** property, northeast of Barriere, by Navasota Resources Ltd late in the year. The company was targeting gold-in-soil anomalies near the Enargite polymetallic vein prospect.

Several stratiform base-metal properties in the Shuswap-Adams Lake area changed hands recently. Argent Resources Ltd acquired the western side of the **Harper Creek** disseminated sulphide deposit, located south of Vavenby. The Harper Creek deposit has a historical geological resource of 96 million tonnes grading 0.41% copper. Yale Resources Ltd acquired the **Adams Plateau** copper-zinc-lead-silver project in the Nikwikwai Lake, area east of Adams Lake. The Extra High property, which includes the **Kamad 7** deposit was optioned by Lucky 1 Enterprises Inc. Kamad 7 is a Kuroko-type massive sulphide deposit, is located near the past-producing Homestake and Samatosum mines, and has an estimated resource of 375 000 tonnes grading 4.0 g/t gold, 6.1% zinc, 4.8% lead, 0.5% copper and 55 g/t silver.

ASPEN GROVE-PRINCETON-KEROMEOS

Following up on promising results, a substantial program of trenching and 22 drillholes was completed in 2004 on the **Panorama Ridge** gold skarn project of Goldcliff Resources Corp. Located a few kilometres east of the historic Nickel Plate gold mine, the property has numerous targets. At the York-Viking area, trenching exposed 77 metres grading 1.129 g/t gold, and mineralization has been found over an area of 300 by 300 metres. Drilling of the York prospect in late 2003 intersected of 77.02 metres grading 0.93 g/t gold in hole 23003.

The nearby **Bradshaw Hill** (Yuniman Ridge) project of Firestone Ventures Inc hosts high-grade gold veins and shear zones. Two new mineralized zones were identified in 2004 with grab samples reported to run up to 6.35 and 0.265 g/t tonne gold.

North of Princeton, Bearclaw Capital Corp drilled several holes on the **Axe** porphyry copper-gold deposit to confirm old results and study the oxide copper potential. Previous drilling, totaling about 14 000 metres in 185 drill holes, is reported to have defined four mineralized zones with an aggregate indicated resource of 39 100 000 tonnes grading 0.39% copper (at a 0.25% copper cut-off), along with an inferred resource of 32 000 000 tonnes at similar grade. The overall resource is said to include an inferred oxide resource of 8 500 000 tonnes grading 0.54% copper. The gold content has not been determined.

A resource calculation was released for the **Big Kidd** porphyry copper-gold property located at Aspen Grove, southeast of Merritt. Christopher James Gold Corp reported that the property contains a combined indicated and inferred resource of 122.4 million tonnes grading 0.33 g/t gold and 0.15% copper.

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KOOTENAY REGION

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SUMMARY AND TRENDS

The level of exploration activity in Kootenay Region in 2004 increased significantly over the previous year. Much of the investment in mineral exploration for metals was directed to sedimentary exhalative (sedex) zinc-lead targets, and to gold in a number of geological settings. High-profile programs included: the Sullivan Deeps deep-drilling project near Kimberley (Stikine Gold Corporation); the Greenwood Gold program (Gold City Industries Ltd); the Willa/LH program near Silverton (Bethlehem Resources Corporation); and a second deep-drilling program in the vicinity of Cranbrook (Klondike Gold Corp and/or Golden Chalice Resources Inc).

New investments in coal resulted in major projects being carried out at coal properties at some distance from the current mine production areas.

After five straight years in which exploration expenditures in the Kootenay region averaged about 7 million dollars per year, exploration expenditures in 2004 saw a significant jump to approximately 11.5 million dollars (Figure 5-1). The portion of this total devoted to metals exploration was about 81%; the remainder was for coal (15%) and industrial minerals (4%). Exploration for metals almost doubled that of the previous year, from $4.9 million to $9.3 million.

An estimated 61,000 metres of exploration drilling was carried out in the Kootenay region in 2004, a healthy increase of about 30% over the previous year (Figure 5-2). The year-to-year increases in drilling and related expenditures are actually even more pronounced, because in-pit development drilling at the five coal mines has not been included in the exploration totals for 2004, as they had been for previous years.

Of the estimated 61,000 metres of exploration drilling in 2004, an estimated 18, 654 metres, or 31%, was for coal, while 880 metres was for industrial minerals. The remainder of the drilling was for metals. Not included in the exploration totals is an additional 13 000 metres of reverse circulation, in-pit drilling at coal mines

There were 29 major mineral exploration projects in the Kootenays (defined as programs with greater than $100,000 in expenditures with ground disturbance). This number is over double the thirteen similar projects noted for 2003. Four of these major programs in 2004 were for coal, one was for barite, and the remaining were for metals.

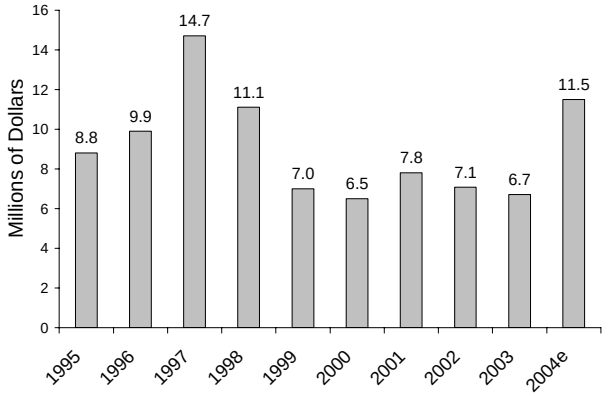

Figure 5-1: Annual exploration spending, in millions of dollars, Kootenay Region.

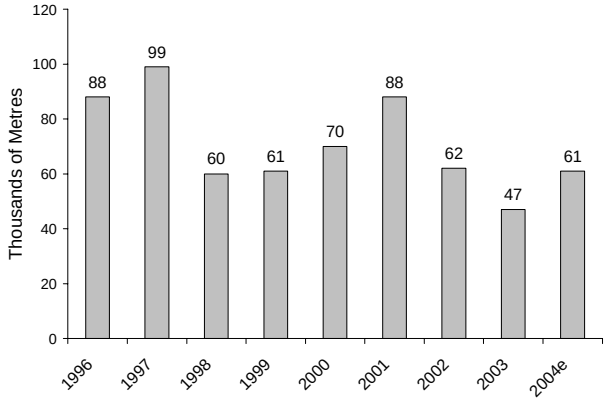

Figure 5-2: Annual exploration drilling, in thousands of metres, Kootenay Region.

As a result of staffing changes in the Kootenay Regional Office during 2004, time available to monitor regional exploration activity by the Regional Geologist was significantly reduced. Consequently, the write-up for 2004 is much less comprehensive and detailed than is normally expected for the regional review of mining and exploration.

OPERATING MINES AND QUARRIES

Current major producing mines and quarries in the Kootenay Region are shown on Figure 5-3 and Table 5-1.

Figure 5-3: Mines, quarries and major exploration projects, Kootenay Region, 2004.

TABLE 5-1: PRODUCING MINES AND QUARRIES, KOOTENAY REGION, 2004.

	Mine	Operator	Deposit Type / Commodity	Forecast Production in 2004 (tonnes or kilograms)	No. of employees	Proven and Probable Reserves (at Jan. 1, 2004)
Metals						
Coal						
	Coal Mountain	Elk Valley Coal Partnership	Metallugical coal	2,500,000 t	176	30,000,000 t
	Elkview	Elk Valley Coal Partnership	Metallugical coal	5,800,000 t	698	259,000,000 t
	Fording River	Elk Valley Coal Partnership	Metallugical coal	10,000,000 t	825	265,000,000 t
	Greenhills	Elk Valley Coal Partnership	Metallugical coal	5,200,000 t	470	103,000,000 t
	Line Creek	Elk Valley Coal Partnership	Metallugical and thermal coal	2,500,000 t (including 300,000 t thermal)	290	12,000,000 t metallurgical and 1,000,000 t thermal
Industrial Minerals						
	4J	Georgia-Pacific Canada Inc	Gypsum		8 to 9	
	Crawford Bay	Imasco Minerals Inc	Dolomite			
	Elkhorn	BPB Canada Inc	Gypsum		21	
	Lime Creek	Imasco Minerals Inc	Limestone			
	Moberly	Dynatec Corp	Silica sandstone		13	
	Mount Brussilof	Baymag Inc	Magnesite		25	
	North Fork	Roxul (West) Inc	Monzonite (mineral wool)			
	Rock Creek	Mighty White Dolomite Ltd	Dolomite		15	
	Winner	Roxul (West) Inc	Diorite (mineral wool)			

METALS

The Kootenay Region had no metal mines operating during 2004.

COAL

Elk Valley Coal Corporation, the world's second-largest supplier of metallurgical coal, operates five large open pit coal mines in the Elk valley area. Elk Valley Coal Corporation is currently 62% owned by the Fording Canadian Coal Trust and 38% by Teck Cominco Limited. Teck Cominco, as managing partner, is responsible for directing the management of the corporation.

Coal mines in the Kootenay Region benefited from strong international markets and high prices in 2004, as well as the efficiencies derived from their recent merger. Projected coal production at the Coal Mountain, Elkview, Line Creek (Figure 5-4), Greenhills and Fording River mines is shown in Table 5-1. Total coal production for the region for 2004 is forecast to be 26.0 million tonnes, an

*Figure 5-4: Elk Valley Coal Corporation's **Line Creek** mine, looking west from Horseshoe Ridge, with the edge of the Burnt Ridge exploration area in the middle-distance on the right side of the photograph.*

increase of 3.5 million tonnes from 2003; the significant component of this production is metallurgical coal.

INDUSTRIAL MINERALS

The Kootenay Region continues to be an important source of a variety of industrial minerals, including magnesite, gypsum, silica, dolomite, limestone, graphite, tufa, flagstone, slate, dimension stone and aggregate. Highlights of this production follow (*also see* Table 5-1 and Figure 5-3).

Baymag Inc produces high-quality magnesite from its open pit mine near **Mount Brussilof** (Minfile 082JNW001), northeast of Radium (Figure 5-5). The 2004 production of 190,000 tonnes of magnesite was transported by truck to Exshaw, Alberta where the company has facilities for producing calcined and fused magnesia (MgO).

Figure 5-5: Baymag Inc's magnesite mine east of Radium

*Figure 5-6: BPB Canada Inc's **Elkhorn** gypsum operation near Invermere.*

There are two gypsum producers in the Kootenay region. BPB Canada Inc operates the **Elkhorn mine** east of Windermere (Minfile 082JSW021; Figure 5-6), and Georgia-Pacific Canada Inc operates the **Four J** mine (Minfile 082JSW009) southeast of Canal Flats. Production at the Elkhorn mine was projected to be between 560,000 and 570,000 tonnes for 2004. Production for the Four J mine was projected to be between 200,000 and 250,000 tonnes.

Silica is produced by Dynatec Corp from the Mt. **Moberly Mine**, north of Golden (Minfile 082N001; Figure 5-7). 2004 production was predicted to be 63,000 tonnes.

Imasco Minerals Inc produces a variety of crushed and ground rock products at its Creston Operations Plant at Sirdar; rock types include limestone, dolomite, granite and quartzite. Raw sources for these products include the underground dolomite mine at **Crawford Bay** (Minfile 082FNE113), the Lime Creek limestone quarry at **Lost Creek**, east of Salmo (Minfile 082FSW307) and a granite quarry at **Sirdar** (Minfile 082FSE072).

Figure 5-7: Dynatec Corporation's silica operation north of Golden.

Mighty White Dolomite Ltd produces a range of crushed and ground dolomite products from its quarry (Minfile 082ESE200) and plant at **Rock Creek**.

Stock-piled material was shipped from the **Winner** diorite quarry west of Grand Forks (Minfile 082ESE265) to the Roxul (West) Inc mineral wool manufacturing plant in Grand Forks. At the North Fork quarry, north of Grand Forks, about 30,000 tonnes of syenitic-monzonitic rock was crushed and stockpiled in preparation for shipment to the same plant.

Crystal Graphite Corporation announced the commencement of shipments of high-purity flake graphite from its **Black Crystal** property and mill, west of the Slocan valley.

EXPLORATION HIGHLIGHTS

Major 2004 mineral and coal exploration projects in the Kootenay Region are listed in Table 5-2. These 29 major exploration programs (Figure 5-3) involved expenditures in excess of $100,000 on work that included ground disturbance, *e.g.* drilling, trenching, bulk sampling, underground drifting. The following descriptive material is organized by geographic area and provides summary of activities for those major and other programs considered significant for the region. Much of the following information was extracted from relevant company press releases.

EAST KOOTENAYS

Mineral exploration for metals in the East Kootenays in 2004 was dominated by programs targeting the Middle Proterozoic Purcell Supergroup. The bulk of work was focussed on sedex targets, analogous to the closed oSullivan Mine.

The successful first phase of the Sullivan Deeps deep-drilling project (Stikine Gold Corporation), near Kimberley, was completed by early fall. Diamond drillhole SD#04-01 (Figure 5-8) intersected its target, a UTEM geophysical anomaly, at a drill depth of 2735.9 metres. The target was identified as the predicted concentration of sulphide minerals located along the Sullivan horizon within the Aldridge Formation (Figure 5-9), the stratigraphic interval hosting the **Sullivan Mine** zinc-lead-silver deposit (Minfile 082FNE052), approximately 4 km to the southeast. The newly discovered sedex-style mineralization includes five discrete bands of laminated or massive sulphides over an interval of 10.5 metres. Phase 2 was commenced in late 2004, and will include a down-hole UTEM survey, a wedge hole from the first hole, and a second hole sited 1.5 km to the northeast. The purpose of Phase 2 is to test the hypothesis that the sulphide-rich interval discovered in SD#04-01 is part of a new sedex deposit located within the same Sullivan structural basin, and to the north of the Sullivan mine.

Klondike Gold Corp (and/or, related company Golden Chalice Resources Inc on some projects) continued their major campaign of deep drilling to locate sedex-style mineralization in the Purcell Supergroup near Cranbrook. The foci of their activities are structural basins in the Aldridge Formation, similar in characteristic to the Sullivan basin. Drillholes in the Payday and Panda basins did not penetrate to the Sullivan horizon, and will be deepened during 2005. Two holes were drilled in the Fran-Davent basin. The first, on the Fran property, at the north end of Moyie Lake, intersected a stratigraphically thickened Sullivan horizon with disseminated pyrrhotite and sphalerite. At the Davent property to the north (Figure 5-10) a thickened and mineralized sequence was also intersected. A drillhole to test a new target on the Pakk property had to be temporarily discontinued because of weather but will be extended in 2005. Work on the Sully property, near Fort Steele, included drilling four holes to test a gravity anomaly apparently located within the Middle Aldridge Formation. Stringers and laminae of sulphide minerals recovered within long intervals within the Sully drill cores are encouraging.

Eagle Plains Resources carried out airborne geophysical surveys and autumn drilling programs on the Bohan and Iron Range properties east of Creston. Drilling on the **Bohan** property (Minfile 082FSE125) was

Figure 5-8: Sullivan Deeps phase 1 drill.

TABLE 5-2. MAJOR EXPLORATION PROJECTS, KOOTENAY REGION, 2004

Property	Operator	MINFILE	NTS	Commodity	Deposit Type	Work done	Metres of drilling (estimated in some cases)	Riding
Bingay Creek	Hillsborough Resources Ltd	082JSE011	82J/02W	coal	sedimentary	RC EN	1316	East Kootenay
Bohan	Eagle Plains Resources Ltd	082FSE125	82F/07E	Pb, Zn	sedex	DD AB-MG, AB-EM	522	Nelson-Creston
Burnt Ridge	Elk Valley Coal	082JSE001	82G/15W	coal	sedimentary	RC	8843	East Kootenay
Davent	Golden Chalice Resources		82G/05W	Zn, Pb, Ag	sedex	DD	1040	East Kootenay
Elkview	Elk Valley Coal	082GNE013	82G/15W	coal	sedimentary	RC	4457	East Kootenay
Fran	Klondike Gold Corp		82G/05W	Zn, Pb, Ag	sedex	DD	963	East Kootenay
GK	Bitterroot Resources Ltd	082ESE175	82E/07W	Au, Ag	intrusive-related Au-Ag; polymetallic veins	G DD GC IP, MG	1500	West Kootenay-Boundary
Gold Canyon	Columbia Yukon Explorations Inc	-	82F/13W	Au, Ag, Pb	polymetallic skarn	A TR GC AB-MG, AB-EM IP, MG DD	396	Nelson-Creston
Golden Crown	Gold City Industries Ltd	082ESE032, 033	82E/02E	Au	mesothermal vein	TR MG, EM GC DD	230	West Kootenay-Boundary
Iron Range	Eagle Plains Resources Ltd	082FSE014-028	82F/01W	Cu, Au; Pb, Zn, Ag	IOCG; sedex	G DD AB-MG, AB-EM GC	1000	Nelson-Creston
IXL	New Cantech Ventures Inc	082ENE033	82E/09W	Au, Ag, Cu	porphyry/skarn	TR IP, MG DD	1830	West Kootenay-Boundary
Jazz	Emgold Mining Corporation	082FSW229	82F/06W	Au, Ag, Cu, Pb, Zn	polymetallic veins	G GC DD	600	Nelson-Creston
Kena	Sultan Minerals Inc	082FSW237, 331, 332, 379	82F/06W	Au	intrusive-related Au	G DD	600	Nelson-Creston
Lapin Barite	Rock Creek Minerals	082ESW256	82E/03E	Barite	veins	DD	408	West Kootenay-Boundary
Lexington	Gold City Industries Ltd	082ESE041, 042	82E/02E	Au, Cu	mesothermal vein/ polymetallic vein	DD, RC TR	5100	West Kootenay-Boundary
Marten-Wheeler	Elk Valley Coal	082GNE006	82G10/W	coal	sedimentary	RC	1596	East Kootenay
Max	Roca Mines Inc	082KNW003, 004	82K/12E	Mo	porphyry	A, G DD	1134	Nelson-Creston
Old Nick	Jantri Resources Inc	082ESW055	82E/03E	Ni, Co	magmatic	GC DD	2152	West Kootenay-Boundary
Pakk	Golden Chalice Resources/Klondike Gold Corporation	082FNE115, 117	82F/08E	Zn, Pb, Ag	sedex	A DD	1062	East Kootenay
Panda-Payday	Klondike Gold Corporation	082FSE110	82F/08E	Zn, Pb, Ag	sedex	DD	2733	East Kootenay
Remac	Redhawk Resources Inc	082FSW024	82F/03W	Zn	oxide	DD	346	Nelson-Creston

TABLE 5-2. CONTINUED

Property	Operator	MINFILE	NTS	Commodity	Deposit Type	Work done	Metres of drilling (estimated in some cases)	Riding
Ruth Vermont	Jasper Mining	082KNE009	82K/15W	Ag, Pb, Zn, Au	vein, sedex	GP DD	2000	Columbia River-Revelstoke
Sullivan Deeps	Stikine Gold Corporation	-	82F/16E	Zn, Pb, Ag	sedex	DD UT	2800	Columbia River-Revelstoke
Sully	Klondike Gold Corp	-	82G/12E	Zn, Pb, Ag	sedex	G GP DD	1630	East Kootenay
Tam O'Shanter	Kettle River Resources	080ESE130	82E/02E	Au	Epithermal vein	DD	1415	West Kootenay-Boundary
Union Mine	Solitaire Minerals	082ENE003, 009	82E/09W	Au	epithermal vein	G GC TR DD	1643	West Kootenay-Boundary
Wildrose	Mineworks Resources Corp	082ESE116	82E/02E	Au	Mesothermal veins	UG	0	West Kootenay-Boundary
Willa/LH	Bethlehem Resources Corporation	082FNW071, 212, 213	82F/14W	Au, Cu, Ag	porphyry	P, G GC GP DD (ug & sfc.)	6500	Nelson-Creston
Zip Mill Site	Gold City Industries Ltd	-	82E0/2E			G TR GC	200	West Kootenay-Boundary

intended to test a geochemically anomalous zone for sedex or manto-style mineralization within the upper strata of the Purcell Supergroup. The **Iron Range** (Minfile 082FSE014 to 028) has potential for iron ore copper-gold mineralization, associated with the Iron Range fault, and sedex mineralization, associated with the mapped trace of the Sullivan horizon. Only the potential for copper-gold mineralization was tested during the 2004 drilling campaign.

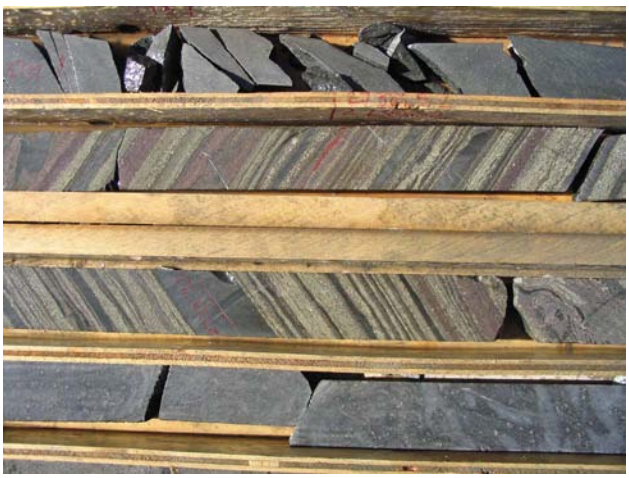

Figure 5-9: Laminated and massive sulphides in Sullivan Deeps SD#04-01 drill-core.

*Figure 5-10: Drilling on the **Davent** property.*

Other interesting projects in the East Kootenays in 2004 included those carried out by Klondike Gold Corp, or its related company Sedex Mining Corp, on gold targets in the Purcell Supergroup near Cranbrook and Kimberley. These included drilling programs on the Thea, MW and St. Joe properties. Industrial minerals programs included drilling for additional gypsum resources at the Elkhorn West Extension area at BPB Canada Inc's Elkhorn Mine near Windermere.

EAST KOOTENAY COALFIELDS

In-pit development drilling at the five Elk Valley Coal Corporation mine sites was not included in the exploration drilling category in this report. There were four major coal exploration projects in 2004 (Table 5-2). Three of these were at locations not immediately adjacent to active mining areas.

Hillsborough Resources Ltd carried out a drilling program on the Bingay Creek property in the Elk Valley Coalfield north of Elkford (Figure 5-11). The company also began environmental and technical studies in preparation for bulk sampling and possible production in 2005.

Also in the Elk valley coalfield, Elk Valley Coal Corporation undertook a large drilling program on Burnt Ridge, northeast of Sparwood and on-strike to the north with coal seams at Line Creek mine (Figure 5-4). Resources identified at this location would become part of Line Creek Operations.

In the Crowsnest coalfield (Fernie Basin), Elk Valley Coal Corporation carried out a drilling program on the Marten-Wheeler property southeast of Sparwood (Figure 5-12). This area is considered a potential source for future reserves for the Coal Mountain Operation.

*Figure 5-11: Drilling on the **Bingay Creek** coal property. Photo courtesy of Steve Gardner, Hillsborough Resources Ltd.*

*Figure 5-12: Drilling on the **Marten-Wheeler** coal property.*

WEST KOOTENAYS

Gold was the main, but not sole, focus in the West Kootenays in 2004. The region may see its first operating metal mine in some time, the Willa, put into production during 2005.

Underground and surface diamond drilling was carried out at Bethlehem Resources Corporation's **Willa/LH** property (Minfile 082FNW071 and 213) near Silverton (Figure 5-13). The underground drilling program at the Willa totalled 5284 metres, and was designed partly to update a 2003 resource calculation and earlier feasibility study. This gold-copper-silver deposit is hosted by an intrusive breccia within a Rossland Group roof pendant within Nelson intrusives. The Willa/LH is a component of parent company Orphan Boy Resources Inc's Big Bend Metals Project (*also see* Cathro, this volume). Ore mined from the Willa/LH at a rate of 500 t/day, will be trucked to the company's Goldstream mill 75km north of Revelstoke. A feasibility study was due at the beginning of December 2004.

Roca Mines Inc released a resource estimate for its **Max** molybdenum property near Trout Lake (Minfile 082KNW003 and 004; formerly the Trout Lake deposit). A total measured-plus-indicated resource of 42.94 million tonnes, grading 0.20% molybdenite at a cut-off grade of 0.10% molybdenite, was calculated. At a cut-off grade of

*Figure 5-13: 1025 level portal, Bethlehem Resources Corporation's **Willa/LH** project near Silverton.*

0.50% molybdenite, the total measured-plus-indicated resource is calculated to be 1.01 million tonnes grading 1.01 % molybdenite. An initial surface diamond-drilling program will be followed by fill-in underground diamond drilling during 2005.

Emgold Mining Corporation carried out a diamond-drilling program on the Jazz property, west of Ymir, and its adjacent **Stewart** property, Minfile 082FSW229, is considered part of this project. Drilling was designed to test geophysical and geochemical anomalies in the Craigtown Creek area. Polymetallic veins are the main targets on the Jazz property.

Sultan Minerals Inc carried out structural mapping and a diamond-drilling program on its **Kena** property south of Nelson (Minfile 082FSW237, 331, 332, 379). The target is gold related to the Silver King porphyry intrusion. Earlier in the year, initial resource calculations for portions of the property were released, based on the extensive drilling results acquired previously. The resource totals, in the measured and indicated categories, are 5.49 million tonnes containing 1.04 g/tonne gold and 6.33 million tonnes containing 0.960 g/tonne gold in the Gold Mountain and Kena Gold zones, respectively, using a 0.5 g/t gold cut-off grade. A new structural interpretation may enhance the economics of the property.

Columbia Yukon Explorations Inc carried out trenching and diamond drilling on its Gold Canyon property east of Burton and near Tillicum Mountain. The drilling was designed to test potential extensions of known mineralization indicated by the geophysical and geochemical surveys carried out earlier in the year. Sulphides containing gold and silver are within a polymetallic skarn-type and replacement setting.

Redhawk Resources Inc conducted a diamond-drilling program on its **Remac** Zinc property, which includes the site of the closed Reeves-McDonald Mine (Minfile 082FSW024) south of Salmo. The targets here are both zinc oxides (weathered zones) and zinc sulphides.

Other interesting gold exploration projects in the West Kootenays in 2004 included the Auremex Resource Corp drilling program on the **Summit** and **Oldtimer** property near Ymir (Minfile 082FSW081, 313), the Cream Minerals Ltd mapping and sampling program on the **Goldsmith** property near Poplar Creek (Minfile 082KSW087, 088), and the Kootenay Gold Corp mapping and sampling program on the JJ property northwest of Rossland. Work was also carried out at the Wonderful property, part of Klondike Gold Corp's holdings in the Sandon silver-lead-zinc camp.

Industrial minerals programs in the West Kootenays included the **Rosswoll** wollastonite (Minfile 082FSW341) diamond-drilling project north of Rossland by Grid Capital Corporation, and the Superior graphite mapping and sampling (including a bulk sample) program west of Winlaw by Worldwide Graphite Producers Ltd. The Kootenay Gemstone beryl (emerald) property near Salmo was sampled and mapped by Cream Minerals Ltd.

BOUNDARY DISTRICT

The Grand Forks-Greenwood-Rock Creek area was arguably the busiest sector of the Kootenay Region in 2004. Gold was the most sought-after commodity, and the most active company was Gold City Industries Ltd. All of Gold City's assets in British Columbia were to be transferred to Jantri Resources Inc by the end of 2004.

Gold City Industries Ltd's Greenwood Gold project, which incorporates the **Lexington** (Minfile 082ESE041, 042) and **Golden Crown** (Minfile 082ESE032, 033) properties, was extremely active again in 2004. Trenching and diamond drilling were carried out at both sites, which are between Grand Forks and Greenwood. The company also received permission to construct a 200-tonne per day mill on the Zip property, in the same area. Following commissioning of the mill, a 10 000-tonne bulk sample will be collected from the Lexington property via the Grenoble deposit adit. Mineralization on both properties is vein-hosted. A positive production decision is anticipated in 2005 following processing of the Lexington bulk sample.

Work at the Lexington in 2004 included 4847 metres of diamond drilling, some of which resulted in a significant extension to the length of the Grenoble deposit. Work on the Golden Crown (which includes the JD and Winnipeg properties) included trenching and diamond drilling.

Two programs explored gold-bearing quartz veins in the Greenwood area. Mineworks Resources Corp carried out 60 metres of underground drifting on the **Wildrose** property (Minfile 082ESE116). On the nearby **Tam O'Shanter** property (Minfile 082ESE130) Kettle River Resources Ltd carried out a diamond drilling program.

The Wildrose Zone, which includes one to three veins, and is associated with a shear structure on the Tam O'Shanter property, was a target on both properties.

There were two major programs in the Franklin Camp, north of Grand Forks. Work on the **IXL** property (Minfile 082ENE033) by New Cantech Ventures Inc, included trenching, geophysics and diamond drilling. The targets on this property are gold, silver and copper associated with both skarn and copper-gold porphyry mineralization. On the nearby **Union Mine** property (Minfile 082ENE003, 009) Solitaire Minerals Corp carried out a program of mapping, trenching, sampling and diamond drilling, in part to attempt to locate the faulted-off extension of the gold-bearing polymetallic Union vein

Jantri Resources Inc carried out a diamond-drilling program on the **Old Nick** property (082ESW055) farther to the west in the Bridesville area. The drilling on this nickel-cobalt property was successful in providing better definition to, and extending the known mineralization along strike as well as identifying new mineralized areas. Economic mineralization appears related to hydrothermal alteration associated with faults in sedimentary rocks.

Bitterroot Resources Ltd carried out a program of mapping, geophysics, geochemistry and diamond drilling on the **GK** property (Minfile 082ESE175) east of the community of Beaverdell in the Beaverdell camp. Drilling was intended to test coincident IP and soil geochemical anomalies on this intrusive-related gold-silver property.

Rock Creek Minerals carried out diamond drilling at its Lapin Barite property near Bridesville.

OUTLOOK FOR 2005

All indications are that 2005 will be an even busier year for exploration in the Kootenays. Many of the major metals exploration programs will continue, which means significant levels of activity in the East Kootenays, West Kootenays and Boundary District. In the East Kootenays the positive results of Phase 1 from the Sullivan Deeps project will ensure it is continued and accelerated, and will attract additional interest to Purcell Supergroup potential in general, especially to the other, relatively untested structural basins associated with potential sedex-style mineralization within the Aldridge Formation.

Exploration for gold in the Cranbrook area is also expected to expand. There are anticipated increases in activity at properties near Nelson, Ymir, Salmo and Kaslo, as well as at the Sandon camp, in the West Kootenays. Similarly, positive results in 2004 in various parts of the Boundary District should spur heightened activity levels, especially in the Greenwood-Grand Forks area.

There is a strong possibility that production decisions will be made in 2005 with respect to the Willa/LH (Bethlehem Resources Corporation) and Greenwood Gold (Gold City Industries Ltd/Jantri Resources Inc) projects, which may provide the first metal production in the region since the closure of the Sullivan Mine in 2001.

Production will continue to increase at the five Elk Valley Coal Corporation mines, which can take advantage of the strong markets for metallurgical coal. A possible sixth coal mine, Hillsborough Resources Ltd's Bingay Creek project, may come on stream in 2005. There should also be increased exploration for coal at sites which are well removed from current operational areas, including Cline Mining Corporation's Lodgepole property.

ACKNOWLEDGMENTS

I would like to thank the many exploration and mine company staff who kindly provide data and information, and who graciously welcome provincial government geologists to their project sites. Barry Ryan of the BC Ministry of Energy and Mines compiled the information related to coal exploration and production in southeast BC.

SOUTHWEST REGION

By Jamie Pardy, PGeo
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SUMMARY AND TRENDS

The Southwest region hosts one metal mine, one coal mine, numerous industrial mineral quarries and sand and gravel and crushed aggregate quarries.

Exploration activity indicators for Southwestern British Columbia were positive for 2004. The total exploration expenditures and the number of major exploration projects started during the period are up from the previous year. Exploration spending for 2004 is estimated to be $3.8 million, up approximately 25% over 2003 (Figure 6.1). However, the Southwest region has not seen the significant increases in activity over the past 5-year period as in the province overall.

At year's end 2004, twelve major exploration projects started in 2004 compared to nine major projects for the region in 2003. There were 20 drilling projects for a total amount of about 22 000 metres, down from the 40 000 estimated for 2003 (Figure 6.2). The amount of drilling at the Myra Falls operation alone accounts for a good portion of the difference in metres drilled. The region's major exploration projects are shown in Figure 6.3 and are listed in Table 6.2.

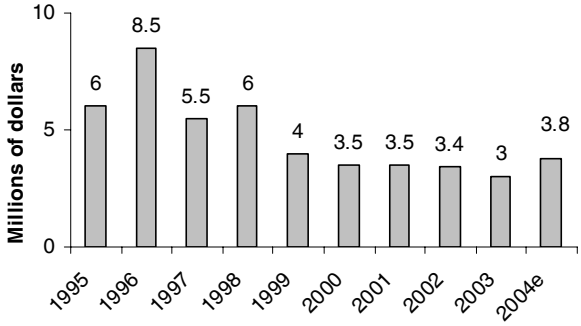

Figure 6.1. Annual exploration spending, in millions of dollars, Southwest British Columbia.

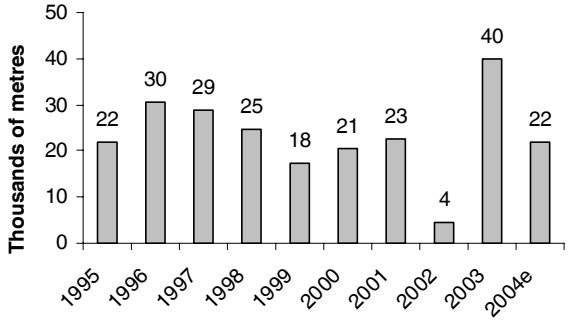

Figure 6.2. Annual exploration and development drilling, in thousands of metres, Southwest British Columbia.

MINES AND QUARRIES

Major mines and quarries are shown in Figure 6.3 and major mines and quarries are listed in Table 6.1.

Production remained steady at the Myra Falls zinc-copper-gold-silver mine through a change in ownership from Boliden Westmin (Canada) Ltd to Breakwater Resources Ltd in July, and increased 21% at the region's Quinsam Coal mine. The three quarries on Texada Island, locale of significant western North America limestone production, produced more than 5 million tonnes again this year, despite 4 months of shutdown of operations at the Blubber Bay quarry of Ash Grove Cement Corporation. Rounding out major non-aggregate quarries in the region, the Sumas Mtn quarry, nearing its 100th year of operation in 2005, produced clay, shale and sandstone. Extraction also continued at the Benson Lake limestone quarry and the Mount Meager pumice quarry. The Monteith Bay geyserite quarry of Lehigh Northwest Cement Limited, normally on the list of major quarries, was quiet in 2004 with no production recorded. The Apple Bay geyserite quarry of Electra Gold Ltd joined the rank of major quarries in 2004 with approximately 100 000 tonnes mined.

Metals

The **Myra Falls** zinc-copper-gold-silver mine, in operation since 1966, is now owned and operated by NVI Mining Ltd, a subsidiary of zinc producer Breakwater Resources Ltd, through acquisition from Boliden Westmin (Canada) Ltd in July 2004. In excess of 24 million tonnes of massive sulphide copper-zinc-gold-silver ore has been mined over the past 28 years from several orebodies within the known 6-kilometre deposit trend. Ore mined to date has averaged 5.0% zinc, 1.8% copper, 2 g/t gold and 52 g/t silver. The Myra Falls operation will continue to employ approximately 400.

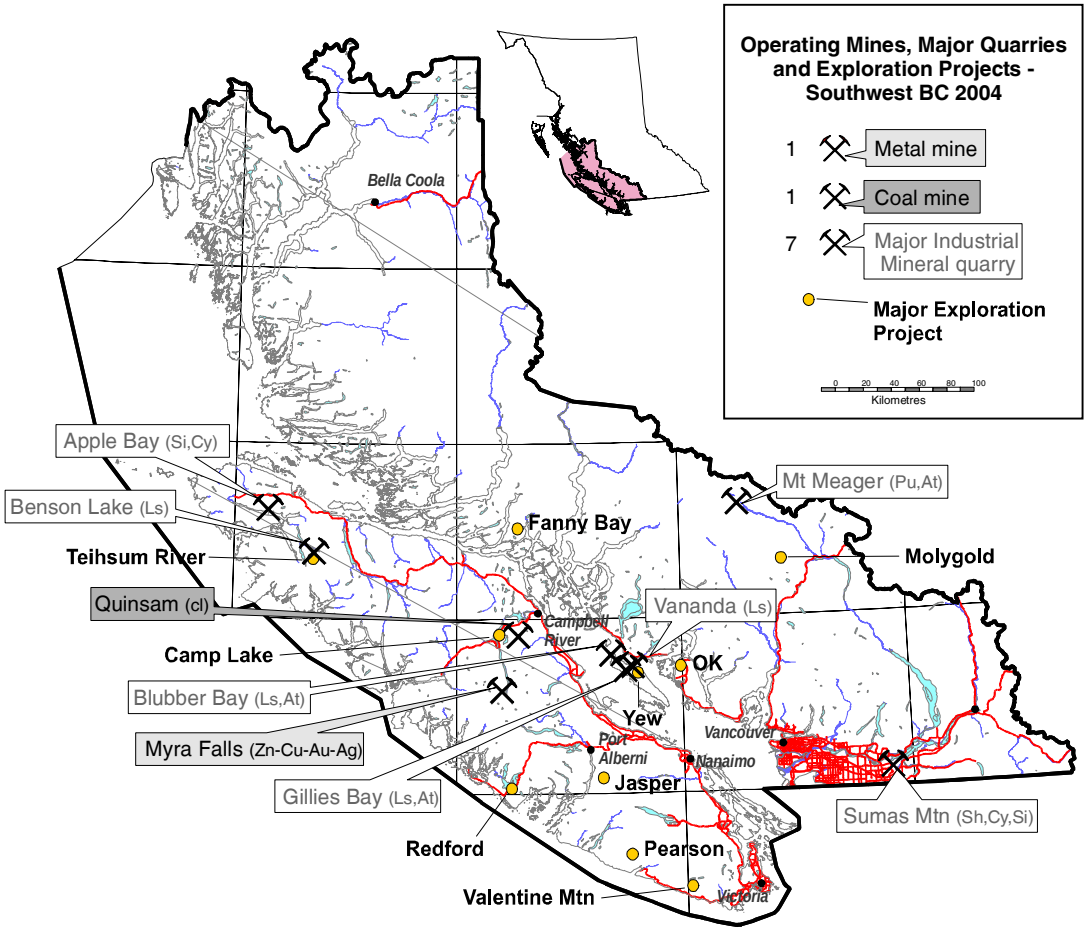

Figure 6.3. Mines, quarries and major exploration projects – Southwest British Columbia 2004.

TABLE 6.2. MAJOR EXPLORATION PROJECTS – SOUTHWEST BRITISH COLUMBIA 2004

Property	Operator	Minfile (NTS)	Commodity	Deposit Type	Program	Electoral Region
Camp Lake	Better Resources Ltd	(92K/04E)	Cu-Au-magnetite	Skarn	G; P; GC; MG; DD (576m)	North Island
Fanny Bay	Castillian Resources Corp	092K 023, 028	Au-Ag	Mesothermal Vein	A; TR; GC; 3D-IP, DD(1198m)	Powell River-Sunshine Coast
Jasper	Inspiration Mining Corp	092F 080, 081	Cu-Pb-Zn-Ag-Au	Massive sulphide	G; P; GC; MG; VLF	Alberni-Qualicum
Molygold	TTM Resources Inc	092JW 007, 017, 018	Mo-Cu / Au-Ag	Porphyry ? / vein	G; P; GC; UTEM; AB-MG/EM	West Van-Garibaldi
Myra Falls mine	NVI Mining Ltd (Breakwater Resources Ltd)	092F 330, 071, 072, 073	Zn-Cu-Pb-Au-Ag	VMS	DD (8500 m)	North Island
OK	Goldrush Resources Ltd	092K 008, 057	Cu-Mo±Ag ±Au	Porphyry	AB-MG/EM	Powell River-Sunshine Coast
Pearson	Emerald Field Resources Ltd	092C 025 and others	Cu-Ni-PGE	Magmatic	DD (300m)	Malahat-Juan de Fuca
Quinsam mine	Quinsam Coal Corp (Hillsborough Resources Ltd)	092F 319	Coal	Sedimentary (thermal coal)	DD (470m)	North Island
Redford	Logan Resources Ltd	092F 001, 004, 454...	Au-Cu-Co	Int-related gold / Skarn	DD (930m)	Alberni-Qualicum
Teihsum River	Red Lake Resource Ltd	092L 350	Au-Cu-Zn	Epi vein / Cu skarn	GC; MG; P; DD (1000m)	North Island
Valentine Mtn	Beau Pre Explorations Ltd	092B 108	Au-Ag	Mesothermal Vein	DD (1200m)	Malahat-Juan de Fuca
Yew	555 Corporate Ventures Inc	092F 516	Au-Cu-Ag	Epi vein / Cu skarn	DD (1800m)	Powell River-Sunshine Coast

A = access; trail, road construction on claims; AB-EM = airborne electromagnetics; AB-MG = airborne magnetics; BU (X tonnes) = bulk sample (weight in tonnes); DD (Xm) = diamond drilling totaling X metres; EN = environmental baseline studies/monitoring, remediation work; G = geology, mapping, etc; GC = geochemical sampling (rock, soil, silt, etc); GP = geophysics (general); IP = Induced Polarization; 3D-IP; MG = magnetics; MS = metallurgical studies; P = prospecting; TR = trenching, UG (X m) = X metres of underground development; UT = UTEM

TABLE 6.1. MAJOR MINES AND QUARRIES – SOUTHWEST BRITISH COLUMBIA 2004

Mine / Quarry Operator	Location / community	Commodities	Production in 2004	Employment -person years	Reserves as of January 1, 2004
Myra Falls NVI Mining Ltd (Breakwater Resources Ltd)	Campbell River	Zn-Cu-Au-Ag	56 000 t Zn, 11 400 t Cu, 790 kg Au, 22 400 kg Ag	400	7.747 M t at 6.3% Zn, 1.2% Cu, 1.2 g/t Au, 40 g/t Ag (p/p)
Quinsam Quinsam Coal Corp (Hillsborough Resources Ltd)	Campbell River	Thermal coal	410 000 t clean coal	40	23.6 M t proven and probable
Apple Bay Electra Gold Ltd	Northern Van Island	Geyserite	~ 100 000 t		5 million t
Benson Lake Imasco Minerals Inc	Northwest Van Island	Limestone	32-36 000 t	3	100+ years
Blubber Bay Ash Grove Cement Corp	Texada Island	Limestone, dolomitic lst, lst aggregate	981 150 t		
Gillies Bay Texada Quarrying Ltd (Lafarge Canada Inc)	Texada Island	Limestone, lst aggregate	4.03 million t	72	100+ years
Vananda Imperial Limestone Company Ltd	Texada Island	Limestone	236 000 t	8.5	50 years
Monteith Bay Lehigh Northwest Cement Ltd	Northwest Van Island	Geyserite	0 t in 2004 51 000 t in 2003		
Mount Meager Great Pacific Pumice Ltd	Pemberton	Pumice	14 000 cubic metres	4	100+ years
Sumas Mtn Clayburn Industries Ltd	Abbotsford	Clay, shale and sandstone	~ 500 000 t	10-20	

Approximately 1 million tonnes of ore from the H-W, 43 and Battle-Gap zones are currently processed in the mill each year producing a copper concentrate, zinc-silver concentrate and a gold concentrate. A small amount of high-grade ore is also being recovered from the Lynx pit, the mine's original production area, before this surface site is sterilized with on-going tailings impoundment and reclamation work. NVI Mining Ltd is in the process of optimizing the mining plan and is considering the addition of a lead circuit to gain production value from lead, increase recovery of silver and also reduce penalties incurred from the presence of lead in the zinc and copper concentrates currently shipped to smelters.

Reported by the company in a July 2004 news release, proven and probable mineral reserves as of December 31, 2003 were 7.747 million tonnes grading 6.3% zinc, 1.2% copper, 1.2 g/t gold and 40 g/t silver, sufficient for 7 more years of production. Measured and indicated resources reported should account for an additional 5 years of production. Measured and indicated resources at the end of 2003 were 10.388 million tonnes at 7.8% zinc, 1.4% copper, 1.7 g/t gold and 56 g/t silver (including the proven and probable reserves noted above) and inferred resources were 2.284 million tonnes at 4.9% zinc, 1.1% copper, 1.4 g/t gold and 57 g/t silver.

In 2004, approximately 8500 metres of core drilling was completed adjacent to the H-W and 43 zones now in production and a drill program targeting the Marshall East area was being considered by the company late in the year. Drifting toward the Marshall East zone to provide drilling stations was completed in 2003. The company has a significant number of exploration targets identified, some of which are located adjacent to active mining zones and others located apart from current mining areas.

Coal

Hillsborough Resources Ltd through its wholly owned subsidiary Quinsam Coal Corporation, increased production at its **Quinsam** underground thermal coal mine located west of Campbell River. The mine expects to produce 410 000 tonnes of clean coal in 2004 up 21% from the 340 000 tonnes extracted in 2003. The mine employs a work force of about 40 people.

In 2004, the company drilled 470 metres at the mine property in the search for more coal that resulted in an addition to its resource base. Quinsam Coal Corporation also explored outside the mine site for coal this year in the Kootenay region of BC at the Bingay Creek property (see Kootenay region report).

Limestone / Dolomitic Limestone

Triassic Quatsino Formation limestone is a significant resource on **Texada Island**, where three quarries, Gillies Bay, Blubber Bay and Vananda, generate approximately 5 million tonnes of product annually. Texada Quarrying Ltd (Lafarge Canada Inc) operates the **Gillies Bay** limestone quarry, Ash Grove Cement Corporation operates the **Blubber Bay** limestone/dolomitic limestone quarry and Imperial Limestone Company Ltd operates the **Vananda** limestone quarry.

At the **Blubber Bay** quarry, Ash Grove Cement Corporation was faced with cessation of production in September due to loss of contracts for approximately one-half of its production. From January to September 2004, Ash Grove Cement Corp shipped a total of **981 150 tonnes** from the Blubber Bay quarry: 18 150 tonnes of dolomitic limestone for agricultural use (a new product for 2004), 66 000 tonnes of chemical-grade limestone, 316 000 tonnes of cement limestone, 106 000 tonnes of limestone for agricultural use, 66 000 tonnes of limestone for industrial remediation use, and 409 000 tonnes of crushed limestone aggregate. Mining operations will resume at the Blubber Bay quarry in 2005 at a reduced level. The company expects to extract approximately 400 000 tonnes of crushed limestone aggregate and increase the level of dolomitic limestone production to continue to supply its new agricultural product and also expand its marketing into the glass-making industry.

The **Gillies Bay** quarry of Texada Quarrying Ltd (Lafarge Canada Inc) is the largest of the three Texada Island quarries. Late in 2004 it added 7 employees bringing the total employed to 72. A total of **4.03 million tonnes** of rock is forecast to be produced in 2004 consisting of 3 086 520 tonnes of cement limestone, 590 070 tonnes of chemical-grade limestone, and 354 042 tonnes of riprap and crushed aggregate.

*Figure 6.4. **Blubber Bay** limestone, crushed aggregate quarry, photo courtesy of Ash Grove Cement Corporation.*

At its **Vananda** quarry, Imperial Limestone Company Ltd estimates that **236 000 tonnes** of chemical-grade limestone will be extracted and marketed for use in the Seattle building market. A similar level of production is anticipated in 2005.

Aggregate

The large local demand for aggregate generated by the southwest population base and opportunities in the western North America market support a number of sand and gravel and crushed stone quarries. Two of the three Texada Island limestone producers have in the past few years expanded into the crushed stone market as well.

Construction Aggregates Ltd's (Lehigh Northwest Cement Limited) **Sechelt** operation has a renewed mine plan to produce 7.5 million tonnes of sand and gravel per year, making it the largest operation of its kind in Canada. Its reserve of 250 million tonnes would last until year 2035 at current mining rates.

A significant operation in the Lower Mainland is the **Cox** crushed stone quarry of Mainland Sand & Gravel Ltd located along the south side of the Fraser River at the base of Sumas Mountain. About 95% of the average annual production of 1.4 million tonnes is shipped by barge to company depots down river or directly to large local customers. The remaining aggregate is trucked from the site. With construction booming this year, the company estimates that 1.7 million tonnes will be produced in 2004. Mainland Sand & Gravel have resources on an adjacent property estimated at 160 million tonnes.

There are several additional large quarries that have permits pending or are in the project review stage. Eagle Rock Materials Ltd (Polaris Minerals Corp) have received a Project Approval Certificate for the **Eagle Rock** aggregate operation near Port Alberni designed to produce 3 to 6 million tonnes per year and employ as many as 80. Qualark Resources Inc and the Yale First Nation have proposed the **Hillsbar** project, located across the Fraser River from the Village of Yale, as an 8 million tonne-per-year aggregate operation with a placer gold recovery plant. Orca Sand & Gravel Ltd (Polaris Minerals Corp) has proposed the 4 to 6 million tonne per year **Orca** sand and gravel operation near Port McNeil. Orca Sand & Gravel and its partner the Namgis First Nation are seeking a project arrangement with the Kwakiutl First Nation.

Silica-alumina and Silica Rock

Silica-alumina and silica rock is used in cement-making. Lehigh Northwest Cement Limited did not produce any geyserite as a silica-alumina product from its quarry at **Monteith Bay** on western Vancouver Island in 2004; 51 000 tonnes were produced from Monteith Bay in 2003. At the **Apple Bay** quarry located west of Port Hardy on Vancouver Island, Electra Gold Ltd joined the

rank of producers and mined and sold approximately 100 000 tonnes of geyserite in 2004 as silica-alumina product to Ash Grove Cement Corporation as part of a 5-year contract. The company also quarried and shipped a 7200 tonne bulk-sample of silica product to Lehigh Northwest Cement Limited. Silica-alumina and silica product is also produced at the Sumas Mountain shale, clay and sandstone quarry described below.

Shale, Clay and Sandstone

Production of shale, clay and sandstone continued at the **Sumas Mountain** quarry located about 8 km east of Abbotsford. Clay is utilized in the manufacture of brick and other clay products at the Clayburn Industries Ltd plant located near old downtown Abbotsford and also by Sumas Clay Products Ltd in the production of fluline pipe and facing bricks. Raw material from this quarry is also now used in the manufacture of cement. Shale is used as a source of silica-alumina and sandstone as silica by local manufacturers of cement, making the mineral resource of this quarry well utilized. Approximately 500 000 tonnes of clay, shale and sandstone are now annually mined from this quarry site located on the east slope of McKee Peak.

Ironwood Clay Company Inc mines cosmetic/medical clay seasonally from its **De Cosmos Lagoon** on Hunter Island located west of Bella Coola. In 2004, the company did not extract any clay, instead relying on its inventory of 850 tonnes produced in 2003.

Carrie Cove Cosmetics Inc also markets clay for cosmetic/medical application, primarily to the international health spa industry. The company uses a mined inventory of approximately 1200 tonnes from its **Carrie Cove** site in the Comox Valley.

Dimension Stone / Construction Rock

The profile of dimension stone quarrying has changed over the last several years reflecting current market preferences in the construction sector. There has been a decrease in production in the Southwest region of lighter-coloured granites and increase in the amount of basalt quarried and marketed primarily for landscape wall construction rock.

Local stone processing plants have been cutting more imported stone this year to meet demand for currently popular dark and orange-brown coloured products. Margranite Industries Ltd of Surrey relied on its inventory of BC stone and did not quarry at its **East Anderson River**, **Beaverdell** and **Skagit Valley** quarries in 2004.

Huckleberry Stone Supply Ltd of Burnaby produced basalt, primarily for application in landscape wall construction, from five small quarries in the Whistler and Squamish areas. Total production from its **Spumoni, Cabin, Freeman, Rubble and Huckleberry** quarries (MINFILE 092GNW100 and others) amounted to approximately 11 500 tonnes in 2004.

Mountain High Properties Ltd held the historic **Jervis Inlet** slate quarry (MINFILE 092JW 029), and the **Spike** basalt and **Gunsight** phyllite quarries in the Whistler area until a change in ownership sometime in 2004. Total 2004 production from these quarries was unknown at the time of writing.

Matrix Marble and Stone Corporation processes imported and domestic materials at its plant near Duncan, and extracts marble from three quarries on Vancouver Island for marketing to the high-end building industry. In 2004, the company quarried 194 tonnes of 'Black Carmanah' marble from its **Gordon River** site (MINFILE 092C 086) and will quarry between 260 to 350 tonnes total of 'Island White' and 'Tlupan' Blue' marbles from its **Hisnet Inlet** (MINFILE 092E 020) and **Tahsis Inlet** (MINFILE 092E 070) quarries respectively.

Hardy Island Granite Quarries Ltd extracted 2600 tonnes of medium to coarse-grained light grey granodiorite from the **Hardy Island** quarry (MINFILE 092F 425) this year and about 600 tonnes of fine-grained andesite from the **Haddington Island** quarry (MINFILE 092L 146). Both of these sites are known as the source of dimension stone utilized in the construction of historic buildings in the province.

Pumice, Tephra and Lava Rock

Great Pacific Pumice Ltd produced approximately 14 000 cubic metres of pumice from its **Mount Meager** site north of Pemberton.

EXPLORATION TRENDS

The Southwest region hosts one metal mine, one coal mine, numerous industrial mineral quarries and sand and gravel and crushed aggregate quarries.

Exploration activity indicators for Southwestern British Columbia were positive for 2004. The total exploration expenditures and the number of major exploration projects started during the period are up from the previous year. Exploration spending for 2004 is estimated to be $3.8 million, up approximately 25% over 2003 (Figure 6.1). However, the Southwest region has not seen the significant increases in activity over the past 5-year period as in the province overall.

At year's end 2004, twelve major exploration projects started in 2004 compared to nine major projects for the region in 2003. There were 20 drilling projects for a total amount of about 22 000 metres, down from the 40 000 estimated for 2003 (Figure 6.2). The amount of drilling at the Myra Falls operation alone accounts for a good portion of the difference in metres drilled. The region's major exploration projects are shown in Figure 6.3 and are listed in Table 6.2.

EXPLORATION PROJECTS

North Island

Part of the **Merry Widow** camp located 40 km southwest of Port McNeil on Vancouver Island was optioned by Vancouver based junior Grande Portage Resources Ltd Exploration work planned for 2004 had not started as of early December. The Merry Widow (MINFILE 092L 044), classed as an iron skarn, and associated deposits produced almost 1.7 billion kilograms of iron in the 1950s and 1960s. The nearby Old Sport (MINFILE 092L 035) mine, classed as a precious metal-bearing copper skarn, produced 506 million kilograms of iron, 41 million kilograms of copper and 3.84 million grams of gold and 11.7 million grams of silver.

Immediately south of the Merry Widow and Old Sport occurrences is the **Teihsum River** gold-copper-zinc (MINFILE 092L 350) occurrence being explored by Red Lake Resources Inc Mineralization is reported to be similar to the base and precious metal-bearing sulphide mineralization of the Merry Widow camp and to the gold vein deposits of the Zeballos camp. Starting late in the year, the company tested a number of known precious and base metal-bearing sulphide showings with geophysical surveys, sampling and 1000 metres of core drilling in 10 holes.

Campbell River

Better Resources Ltd optioned the **Camp Lake** property from Minland Resources located 25 km west of Campbell River. There are numerous showings of copper-gold-magnetite in volcanic rocks. Triassic Karmutsen Formation and Bonanza Formation volcanic rocks and intrusive rocks occur on the claims. These showings are one of the new discoveries in BC this year. Better Resources conducted geological mapping, minor hand-trenching, rock and soil sampling and a ground-based magnetics survey and 576 metres of drilling in 7 holes.

Minland Resources is also active further north on Vancouver Island between Sayward and Campbell River on a number of different showings and properties, including the Memekay and Thunder Mtn. The **Memekay** is a previously undocumented showing of copper-zinc-bearing massive sulphides in metasedimentary rocks discovered by prospecting. The showing was recently mapped and sampled with grab sample values reported up to 34077 ppm copper, 61885 ppm zinc, 85.6 ppm silver and 28741 ppm copper, 88956 ppm zinc, and 50.5 ppm silver. Additional massive sulphide mineralization in float is also reported to have been recently found.

Also in the Campbell River area another private company vended to Compliance Energy Corporation, the known Hamilton Lake coal deposit (MINFILE 092F 313)

*Figure 6.5. Better Resources Ltd optioned and completed work on the **Camp Lake** property to test new showings of copper, gold and magnetite in volcanic rocks.*

with a 1986 reported indicated reserve of over 11 million tonnes of coal. Compliance Energy refers to this as its **Bear** metallurgical coal project. The company will complete a trenching and sampling program in late 2004 to test low strip ratio areas of the known coal deposit to define a 70 000 tonne open-pit bulk sample area. Bulk sampling and drilling are planned for 2005.

At the **Myra Falls** zinc-copper-gold-silver mine approximately 8500 metres of core drilling was completed adjacent to the H-W and 43 zones now in production and a drill program targeting the Marshall East area was being considered by the company late in the year. Drifting toward the Marshall East zone to provide drilling stations was completed in 2003. The company has a significant number of exploration targets identified, some of which are located adjacent to active mining zones and others located apart from current mining areas.

In 2004, Quinsam Coal Corporation drilled 470 metres at its Quinsam mine property in the search for more coal that resulted in an addition to its resource base. The company also explored outside the mine site for coal this year in the Kootenay region of BC at the Bingay Creek property (see Kootenay region report).

Ucluelet / Port Alberni

Logan Resources Ltd completed a major program at its **Redford** property located 20 km northeast of Ucluelet. The property includes twenty documented MINFILE occurrences and the newly outlined Seamus zone that has characteristics similar to intrusion-related gold deposits. The other occurrences include iron skarns, copper skarns and limestone. The Brynnor mine (MINFILE 092F 001), a past producer of magnetite and limestone is one of the documented occurrences. Logan Resources completed 930 metres of core drilling in 6 holes at the Seamus zone and may conduct further drilling to test for downdip extension. The company is also targeting sulphide mineralization at the Tony copper skarn occurrence

(MINFILE 092F 004) where chip sampling over 5 metres is reported to have returned 0.559% copper, 0.0464% Co and 0.164 g/t gold.

Barry Hanslit worked his **Big Southeaster** property located 15 km southeast of the town (MINFILE 092F 078, 285, 444) by testing for precious metal bearing veins within shears and faults. Geological mapping, rock sampling, surveys of showings and 2 drillholes totalling 150 metres were completed in 2004. The drillholes targeted geophysical anomalies identified by previous operators.

SYMC Resources Limited continued its commitment to exploration and development in the Port Alberni area with its Dauntless, Mactush, MC and Cameron Valley properties. The Dauntless property has a 2002 reported inferred mineral resource of 27 750 tonnes grading 22.3% copper, 44.60 g/t silver and 1.30 g/t gold (SYMC News Release July 12, 2002). In 2004, SYMC completed roadwork, trenching, sampling and mapping at the **Dauntless** property and planned to follow up with 1000 metres of drilling to further test vein targets. The company also reports numerous undocumented audits on the property north of the Dauntless occurrence (MINFILE 092F 168).

On the **Mactush** property (MINFILE 092F 012), SYMC Resources reports copper-silver bearing stockwork veins and soil geochemical anomalies in the 'Bowl zone' that warrant further exploration. No exploration work was completed at Mactush in 2004.

Inspiration Mining Corporation has prospective copper-zinc-lead-silver-gold massive sulphide targets on its **Jasper** property located southeast of Port Alberni. The company completed GPS grid control surveys, soil and rock sampling, prospecting and ground magnetics and VLF geophysical surveys and reported that eleven showings of sulphide mineralization were discovered and/or documented in addition to three MINFILE occurrences. The company has identified three main target areas with up to 15 showings of mineralization within a 4-km belt of volcanic rocks. Anomalous base metal soil geochemistry with precious metal values are reported in priority areas.

Port Renfrew / Jordan River / Sooke

Located 10 km northwest of Port Renfrew, the **Pearson** project comprises several documented Fe skarn occurrences including MINFILE 092C 025 and mafic intrusive rocks that are being explored for copper-Ni-PGE by private company Emerald Field Resources Ltd under an option agreement with a local prospector. The company completed 300 metres of drilling in 7 short holes. Emerald Field also optioned a nearby property known as **Karen**, where it completed geological mapping and sampling.

Also in the Port Renfrew area, San Juan Quarries,

*Figure 6.6. A massive sulphide occurrence on the **Jasper** property of Inspiration Mining Corporation.*

owned by Industrial Stone Supply Ltd of Nanaimo, conducted bulk-sampling on its **Melanie** slate quarry.

Beau Pre Explorations Ltd began a 4000 metre drilling program in late November to continue work on its **Valentine Mountain** gold-silver project (MINFILE 092B 108) located near Sooke, west of Victoria. The company expects to complete 1200 metres of the drilling by year-end in phyllites and schists of the Leech River Formation. Samples of narrow quartz veins cutting both metasedimentary and metavolcanic rocks have returned high gold values.

Beau Pre also optioned the **Sunro** copper property (MINFILE 092C 073) located near Jordan River also west of Victoria for its known copper resource and to investigate its potential for gold-nickel-cobalt.

Texada Island

On Texada Island, several companies completed drilling programs to test limestone. Texada Quarrying Ltd completed approximately 900 metres of drilling at Gillies Bay for geochemical testing of part of its large mineral resource. Lehigh Northwest Cement Limited and Chemical Lime Company of Canada Inc completed approximately 700 m and 500 m of drilling respectively on a jointly held property on the Island. 555 Corporate Ventures Inc completed approximately 1800 m of drilling on its **Yew** property (MINFILE 092F 516) to test for gold-copper and silver on this known precious metal-bearing copper skarn occurrence.

Pathfinder Resources Ltd optioned the **Dude** porphyry Cu ± Mo ± Au property (MINFILE 092F 276) and completed rock and soil sampling to verify results of previous work as part of its initial assessment of the prospect.

Coastal Mainland

On Phillips Arm, Castillian Resources Corp executed a 2-phase exploration program on its **Fanny Bay** property that includes the past-producing Doratha Morton and Alexandria gold-silver-copper mines (MINFILE 092K 023 and 028). In four years over the period 1898 to 1934, the Doratha Morton produced 143.9 kilograms of gold, 333.9 kilograms of silver and 1094 kilograms of copper from 9319 tonnes of ore. At the Alexandria mine, 1694 tonnes were mined and milled to yield 22.2 kilograms of gold, 40.6 kilograms of silver and 1761 kilograms of copper. The gold-bearing quartz veins occur within a sheared contact between diorite and metamorphosed rocks. Phase 1 was completed mid-year and consisted of compilation of historical data, rehabilitation of access road, construction of a camp, establishment of 26.5 km of grid, a 3D-IP geophysical survey and 235 m trenching with rock sampling. Phase two consisted of the completion of seven core drillholes totalling 1198 m to test geophysical anomalies in the Camp zone that is on strike and within a trend that includes the past producing mines.

To the north of the Fanny Bay project, Interactive Exploration Inc started work on its **Shamrock** silver-copper-zinc-gold property (MINFILE 092K 112) located on Longborough Inlet, and Goldnev Resources Inc acquired an option on the nearby **Hayden Bay** gold-silver occurrence (MINFILE 092K 038). At the Shamrock property, Interactive Exploration completed magnetics and VLF-EM geophysical surveys over known soil geochemistry anomalies to better define drill targets and completed 608 metres of drilling in 3 holes. The drilling component of the program was cut short due to logging activity in the immediate target area. Goldnev Resources completed a property visit at Hayden Bay in order to help assess the area and outline next steps.

Pacific Topaz Resources Ltd conducted geological mapping, rock and soil sampling and a VLF-EM geophysical survey on its **Nugget Queen** property (MINFILE 092L 187) located on the coastal mainland about 35 km northeast of Port Hardy. During four years of operation, this past producer generated 20.9 kilograms of gold and 44.9 kilograms of silver with copper, lead and zinc from 610 tonnes. The company reported that the 2004 surveys have defined coincident geochemical and geophysical anomalies along extensions to the known mineralization.

Goldrush Resources Ltd conducted an airborne geophysical survey on its optioned **OK** property that includes the OK North and OK South Cu-Mo porphyry occurrences (MINFILE 092K 008 and 057) located approximately 40 km north of Powell River. One resource estimate for OK North includes 228 400 000 tonnes grading 0.32% Cu and 0.020% Mo at a 0.20% Cu cut-off (CanQuest Resource Corporation, 1989 report).

Near Pemberton, TTM Resources Inc completed work on several known occurrences (MINFILE 092JW 007, 017 and 018) and on newly identified mineralization as part of its **Molygold** project. Exploration targets included molybdenum-copper in fractures and quartz veins and gold-silver in quartz veins located adjacent to a large (300 m x 5 km) quartz-sericite alteration/gossan zone, and four separate zones of base-precious metal mineralization exposed due to recent ice melt. A porphyry molybdenum-copper deposit model and base/precious metal vein model was used for the 2004 exploration program that consisted of geological mapping and sampling of the Breccia, Camp and Road zones, ground-based UTEM geophysics on portions of the Breccia and Camp zones, airborne magnetics and EM geophysical surveys over several targets totalling 843 km, and prospecting of the Red, Gold and Copper-Zinc-Gold zone.

Chilliwack / Harrison Lake / Hope

Sino Pacific Development Ltd completed a small program in the search for gold at its **Ophira** project located in the Chilliwack valley. The company tested an area with known gold-bearing veins and shears (MINFILE 092HSW063) with grid work, sampling and 375 metres of drilling. Results are yet to be reported.

In the **Harrison Lake** area, magmatic nickel +/- copper +/-PGE deposits continue to be of interest in a belt of sulphide-bearing ultramafic rocks host to the former producing Giant Nickel mine. At Giant Nickel, nickel-copper-chromium-cobalt-gold-silver-PGE were produced from the Pride of Emory (MINFILE 092HSW004), Star of Emory (092HSW093) and Giant Mascot (092HSW125).

Leader Mining International Inc announced in August 2004, a project manager for its **Cogburn** magnesium deposit (MINFILE 092HSW081) located approximately 120 km east of Vancouver and 23 km northeast of Hope. The property has a measured mineral resource of 25.5 million tonnes grading 40.5% magnesium oxide or 24.5% magnesium (News Release, July 10, 2002). An April 2003 feasibility study outlined a US$1.3 billion development producing 131,000 metric tons per annum of high-purity magnesium metal and alloys. Project development work is now being conducted through North Pacific Alloys Limited, a subsidiary of Leader Mining International Inc. A project description was submitted to the BC Environmental Assessment Office in November 2004 to initiate project review.

An option on the **Carolin** or Ladner Creek gold mine (MINFILE 092HNW007) was acquired by Century Mining Corporation in early 2004. The Carolin mine located approximately 18 km northeast of Hope, is one of five past gold producers in the Coquihalla gold belt. During three years of operation from 1982 to 1984, the mine produced 1354 kilograms of gold from 799 119 tonnes of ore, and in 1988, 12.5 kilograms of gold were

recovered from processing of tailings. Low recoveries of gold hampered production during its operation. The company planned to undertake exploration at the site, update an earlier feasibility study and rehabilitate the milling facility in 2004. As of late November the field activities had yet to begin on this prospect.

Late in the year Aries Resource Corporation acquired an option on the **Mara** property (MINFILE 092HNW029) located immediately southeast of Boston Bar. The occurrence is documented as a magmatic nickel-copper-silver showing hosted in ultramafic rocks.

OUTLOOK FOR 2005

The mineral exploration season in 2005 is projected to be an active and successful one. The Cogburn magnesium project should be well into the permitting stage. Others such as the Bear metallurgical coal, Carolin Gold, OK copper-molybdenum and Hushamu projects, are considered as having high potential for defining / confirming mineral resources. A number of exploration projects or parts of exploration projects originally planned for 2004 are now to be executed sometime in 2005. In addition, programs are anticipated on a few properties acquired by companies late in 2004. Overall exploration spending in the region should be equal to or better than in 2004. An increase in expenditures on precious metal targets and coal will likely be seen if the prices of gold and coal stay high.

Projects identified for the Southwestern region of BC that are anticipated to proceed during the 2005 field season, include:

- **Abo Gold** - drilling at the **Abo Gold** project at Harrison lake by Northern Continental Resources Ltd;
- **Bear metallurgical coal** - bulk sampling and drilling on the **Bear** metallurgical coal project (Hamilton Lake deposit) by Compliance Energy Corp;
- **Carolin Gold** - field surveys, drilling and updating a feasibility study on the **Carolin Gold** project by Century Mining Corp;
- **Cogburn magnesium –** post-feasibility work related to permitting and development of the **Cogburn** magnesium project by North Pacific Alloys Ltd, a subsidiary of Leader Mining International Inc;
- **Dauntless** & **Mactush (Bowl zone) properties** - drilling and trenching at both properties, including the newly outlined Bowl zone at Mactush, by SYMC Resources Ltd;
- **Dude property** - drilling at the **Dude** (Tex) property on Texada Island by Pathfinder Resources Ltd;
- **Fanny Bay project** - additional IP geophysical surveys and drilling at the **Fanny Bay** project of Castillian Resources Corp;
- **Harrison Lake** area - an airborne geophysical survey in the **Harrison Lake** area by Sutcliffe Resources Ltd for magmatic Ni +/-Cu +/-PGE deposits in the belt of sulphide-bearing ultramafic rocks on the east side of the lake;
- **Hushamu property** - Lumina Copper Corp announced late in 2004 a private placement with a portion of the proceeds to be directed to its **Hushamu** property in the North Island copper-gold belt;
- **Jasper property** - an airborne geophysical survey and drilling at Inspiration Mining Corp's **Jasper** property;
- **Lady A, B and C occurrences** - exploration at the known volcanogenic Lady A, B and C occurrences by Better Resources Ltd;
- **Merry Widow property** - a program by Grande Portage Resources Ltd at its **Merry Widow** property to test for base and precious metals;
- **Molygold** - geological evaluations of the Road, Camp and Breccia zones at TTM Resources Inc's **Molygold** project;
- **Myra Falls mine** - underground drilling at the **Myra Falls** operation of NVI Mining Ltd;
- **OK copper-molybdenum prospect** - drilling at the **OK** copper-molybdenum prospect by Goldrush Resources Ltd;
- **Shamrock** - completion of a drilling program on the **Shamrock** property of Interactive Exploration Inc;
- **Redford property** - drilling at the **Redford** property by Logan Resources Ltd;
- **Texada Island quarries** - further testing of limestone resources at **Texada Island** quarries and properties; and
- **Valentine Mtn.** - completion of a drilling program and bulk sampling at **Valentine Mtn.** by Beau Pre Explorations Ltd

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The author began part-time work as acting Regional Geologist of the Southwest region of British Columbia in late 2004.

NORTHEAST REGION

By Bob Lane, PGeo
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SUMMARY AND TRENDS

The Northeast Region includes the area encompassed by the Dawson Creek, Fort St. John and Fort Nelson Forest Districts. The principal area of mining interest in the region is the Peace River Coalfield and only this area is discussed. This coalfield is within the Rocky Mountain Foothills and trends northwest from the Alberta border for more than 400 km to north of Hudson Hope. Within the coalfield there are two Lower Cretaceous, coal-bearing formations of economic significance. The younger Gates Formation is known for its medium to high-volatile bituminous coal, such as was extracted at the Bullmoose and Quintette mines. The older Gething Formation hosts low-volatile bituminous coal which has a long history of exploration, but limited mining restricted to the early 1900s.

Interest in the Peace River Coalfield was revitalized by a remarkable increase in world demand for metallurgical coal, spear-headed by a dramatic rise in the requirement for steel in China. As a result, international coal commodity markets improved dramatically.

Improved international coal markets resulted in price increases for spot market metallurgical coal sales that reached well in excess of US$100 per tonne. Prices for Pulverized Coal Injection (PCI) coal (a low-volatile, high rank coal with a growing market) and thermal coal have also risen substantially (although the increases are offset in Canada by a much higher CDN:US dollar exchange rate than in 2003). These elevated prices have led directly to an injection of capital to support acquisition of coal tenure, exploration, deposit appraisal and development of numerous coal properties. The region has not witnessed this level of activity since the 1970s and 1980s when the entire coal belt was staked and was the focus of extensive exploration.

Two open pit coal mines opened in the region (Figure 7-1 and Table 7-1). The Willow Creek coal mine of Pine Valley Mining Corporation commenced commercial-scale production in July, 2004. The Dillon coal mine, part of the large Burnt River property of Western Canadian Coal Corp, began operations in December, 2004. In addition, the proposed Wolverine coal mine, another Western Canadian Coal Corp project, formally entered the provincial Environmental Assessment review process.

An estimated $3.6 million was spent on exploration within the region during 2004 (Table 7-2). Comparisons with previous years are unavailable, but 2004 stands out, versus recent years, because the work was generally of an advanced nature.. The amount of exploration drilling totaled more than 13 000 metres. There were five major exploration programs in the region (c.f. four in 2003), one of which had expenditures exceeding one million dollars. In general, the larger programs included deposit appraisal drilling in order to establish reserves and resources that are compliant with National Instrument 43-101 reporting standards. Aggressive mine planning, including pre-feasibility and feasibility studies, base line environmental data collection and analysis, was conducted on the Burnt River, Trend and Wolverine properties. Smaller programs that took place late in the year, or were planned for the winter of 2004-2005, include Goodrich, Hermann, Lossan and Wapiti. In addition to field programs, compilation and review of data on the Sukunka, Saxon, Omega, Pine Pass and Belcourt properties, among others, was carried out. The location of significant exploration projects, and smaller exploration projects believed to have regional significance, are shown on Figure 7-1.

A total of 81 coal licenses, including those in the application stage, were acquired by industry during the first eleven months of 2004. These licenses cover 36 048 hectares and represent a more than four-fold increase over the area claimed in calendar 2003 (c.f. 31 licenses covering 8636 hectares).

COAL MINES

Previous coal production came from multiple pits at the Quintette mine and from the South Fork pit at the Bullmoose mine. The two operations produced medium-volatile bituminous coal for export markets. The Quintette mine operated from 1983 to 2000 producing 68.1 million tonnes of coal. The Bullmoose mine operated from 1983 to 2003 and produced approximately 34.1 million tonnes of coal. Combined production from the Quintette and Bullmoose mines from 1984 to 1999, a period when the mines were operating at or near capacity, averaged 5.9 million tonnes of clean coal per annum.

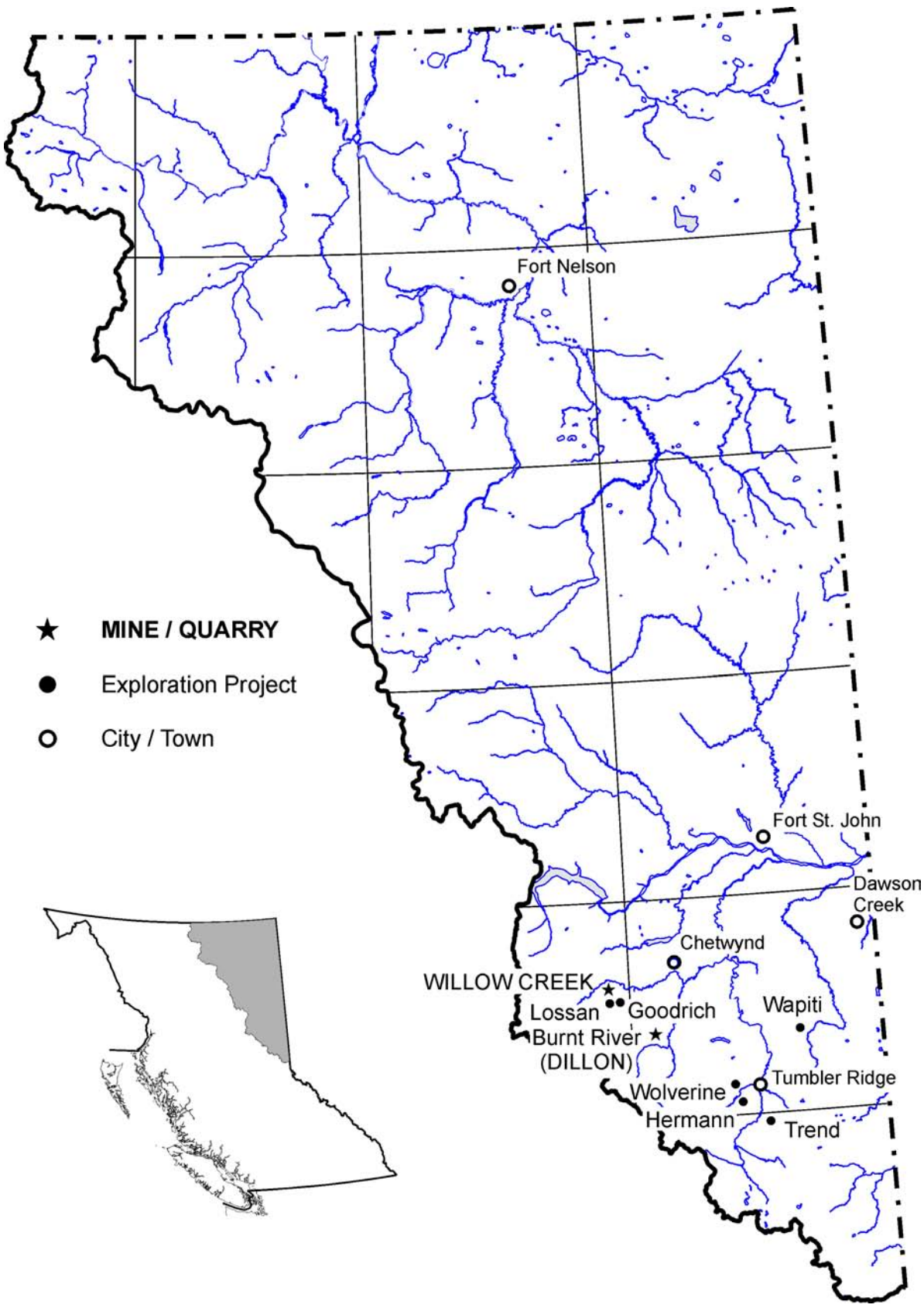

Figure 7-1. Operating mines, major exploration programs and selected smaller exploration projects in the Northeast Region.

TABLE 7-1. PRODUCTION AND RESERVES FOR OPERATING MINES, NORTHEAST REGION

Mine	Operator	Deposit Type / Commodity	Forecast Production in 2004 (tonnes or kilograms)	Proven and Probable Reserves (at Jan. 1, 2004)
Coal				
Dillon	Western Canadian Coal Corp	Metallurgical (PCI) coal	30,000 t	1,560,000 t
Willow Creek	Pine Valley Mining Corp	Metallurgical (PCI) coal	225,000 t	15,200,000 t

The opening of the Willow Creek mine in July, 2004, and the opening of the Dillon mine in December, 2004, marks a new era of coal mining in the northeast (Table 7-1). Pine Valley Mining Corp owns the Willow Creek mine and Western Canadian Coal Corp owns the Dillon mine. The two entities are among six or seven highly motivated junior mining companies which are positioned to take full advantage of the strong international coal markets.

WILLOW CREEK

Pine Valley Mining Corporation commenced commercial-scale production on July 30, 2004, at its 900 000 tonnes per year Willow Creek coal mine (Figure 7-2), 45 kilometres west of Chetwynd. Willow Creek is the first coal mine to open in the northeast since the Quintette and Bullmoose mines began production in 1983.

The Willow Creek property was explored in the early 1980s for its potential for underground mining. Interest waned as coal prices became depressed and it was not until the mid-1990s when Globaltex Ventures Ltd, the precursor to Pine Valley Mining Corporation, began to re-examine the potential of the property. A total of 84 400 tonnes of coal was mined and shipped to Japan for testing during 2001 and 2002.

Figure 7-2. Mining of coal measures from the Peninsula pit, ***Willow Creek mine****.*

The coal measures at Willow Creek occur within the Lower Cretaceous Gething Formation on the east limb of the Peace River anticline. Test results showed that coal from the 6 and 7 seams is low-volatile bituminous, high rank coal suitable for pulverization and injection into blast furnaces (Ryan et al., 2004). Current mineable reserves for the property total 15.2 million tonnes.

The use of small-scale in-pit crushing equipment, a temporary load-out and a 25-car rail siding constrained production to about 45 000 tonnes per month for the first four or five months of operation. This occurred while permanent crushing, wash plant and load-out facilities were under construction and an extension to the rail siding was being completed. All but the wash plant are expected to be complete by the end of 2004 when monthly production is expected to increase to 90 000 per month. The coal wash plant is not expected to be complete until mid-2005. The company's estimate for the total capital cost of the mine development is CDN$24 million. In 2005, Pine Valley Coal will apply for an amendment to its Mines Act permit that will allow production of up to 2.0 million tonnes of clean coal per annum. The current total mine workforce is approximately 60, but would increase to more than 100 if mine expansion proceeds. Employment during the peak of construction exceeded 110 workers.

Pine Valley Coal owns licenses that cover the nearby **Pine Pass** (Minfile 093O 007), Crassier and Fischer deposits. In 2003, a reserve of 9.5 million tonnes (NI 43-101 compliant) was calculated for part of the Pine Pass deposit, located north of the Pine River between Cleveland and Fisher creeks. Exploration is expected to proceed on one or more of these properties in 2005. Each property has potential to host an economic deposit that could supplement production at Willow Creek.

DILLON MINE

Western Canadian Coal received a Mines Act permit on September 8, 2004 for its 240 000 tonnes per annum Dillon coal mine, part of the **Burnt River** coal property (Minfile 093P 007-008). Clearing, stripping of soil and overburden, and site construction began in mid-September and continued through an unseasonably mild

TABLE 7-2. MAJOR EXPLORATION PROJECTS, NORTHEAST REGION

Property	Operator	Minfile (NTS)	Commodity	Deposit Type	Work Program
Burnt River (Dillon & Brule)	Western Canadian Coal Corp	093P 007, 008	PCI Coal	Sedimentary	RD (2416 m); DD (462 m); GP; BU (680 kg); CQ; GT; EN; PF; FS
Goodrich	Kennecott Canada Exploration Pty Ltd	093P 024	PCI / Thermal Coal	Sedimentary	RC; DD; GP; CQ planned
Hermann	Western Canadian Coal Corp		Met. Coal	Sedimentary	RD (~600 m); DD planned; CQ planned
Trend	NEMI Northern Energy & Mining Inc	093I 030	Met. Coal	Sedimentary	A; G; TR; DD (2724 m); RT (4531 m); BU (~9 t); CQ; EN; PF; R
Wapiti	Aurora Coal & Minerals Ltd	093P 021	Thermal Coal	Sedimentary	G; RT (~500 m planned); CT
Wolverine (Perry Creek & EB)	Western Canadian Coal Corp	093P 015, 025	Met. Coal	Sedimentary	DD (~1000 m); BU; GT; CD; PF

fall and early winter. Mining commenced in early December and, under a deal struck with the Bullmoose Operating Corporation, coal is trucked 94 km to the Bullmoose loadout facility for transfer onto rail cars. The first shipment of coal left the loadout on December 6, 2004. Under full-scale production the mine will produce PCI coal at a rate of 240 000 tonnes of clean coal per annum for approximately 6.5 years. At full capacity the project will employ 40 to 50 mine workers and an additional 30 will be employed to haul coal to the load out.

The Burnt River property is centered about 50 km southwest of Chetwynd. It is underlain by folded coal-bearing stratigraphy comprised of marine and non-marine shales, carbonaceous shales, siltstones and sandstones of the Gething Formation. Three main coal seams have been identified on the property and include Seam 60, Upper Seam and Lower Seam. The low-volatile, high rank coals are preserved in two northwest trending synclines. The Dillon syncline contains the Dillon deposit with established reserves of 1.56 million tonnes run-of-mine (ROM) coal with a strip ratio of 2.2:1 BCM:t ROM coal. The Upper Seam and Lower Seam are found in the Dillon deposit and have a true thickness of 2.19 metres and 6.06 metres, respectively. The much larger Owl syncline contains the Brule deposit that has an approximate coal resource of 33 million tonnes. All three seams are represented at Brule. Western Canadian Coal completed a major exploration program on the Brule deposit in 2004. The program included about 2700 metres of rotary and diamond drilling and large-diameter spot coring of coal seams to obtain a bulk sample for coal quality testing. Baseline environmental monitoring and on site pre-feasibility work was also completed. The company is designing a mine plan for the Brule deposit that, together with Dillon mine, would produce 1.5 million tonnes of clean coal annually for 12 to 15 years. Western Canadian Coal plans to submit its application for Brule to the Environmental Assessment Office in 2005.

Western Canadian Coal signed two key agreements in December that ensure its product will get to port. CN Rail has agreed to transport coal to port, and Ridley Terminals Inc, at the Port of Prince Rupert, will provide coal handling services for a minimum of 10 years.

EXPLORATION AND DEVELOPMENT PROJECTS

Western Canadian Coal Corp applied for an environmental assessment certificate for the development of the **Wolverine** metallurgical coal mine. The proposed mine includes the **Perry Creek** (Minfile 093P 025) and **Mount Spieke**r or **EB** (Minfile 093P 015) deposits. The project is located in the Wolverine Valley about 25 km northwest of Tumbler Ridge and is strategically positioned adjacent to the CN Rail Tumbler Ridge Branch Line. The province's Environmental Assessment Office (EAO) accepted the proposal in May and initiated a formal review. At the completion of the review process in mid–December, the EAO provided a summary assessment report along with the project application to the provincial ministers of Energy and Mines, Sustainable Resource Management, and Water Land and Air Protection for their decision on whether to issue an Environmental Assessment Certificate. Pending certification and permit approvals, construction could begin as early as the second quarter of 2005. Production is anticipated to commence in the fall of 2006. The mine would employ a workforce of about 200.

The coal measures of interest occur within the Lower Cretaceous Gates Formation in a gently southeast plunging open syncline. Four seams (E, F, G and J

seams) have a maximum cumulative thickness of up to approximately 15 metres and occur over a stratigraphic interval of 90 metres within the Middle Gates member. The coals have a rank of medium-volatile bituminous and are generally categorized as high quality or premium metallurgical coals. The measured plus indicated, in-place resources of immediate interest for the E, F, G and J seams at Perry Creek total 32.73 million tonnes. The Perry Creek pit is expected to produce 17.1 million tonnes of run-of-mine coal during 8 years of operation at an overall strip ratio of 5.7:1 bank cubic metres of waste per tonne run-of-mine coal (BCM:t ROM). The planned rate of production is 1.6 million tonnes of clean metallurgical coal per annum. Development of the nearby Mount Spieker deposit, containing 8.0 million run-of-mine tonnes, would likely follow adding substantially to the mine life of the project. An estimated 25 million tonnes of coal would remain following open pit mining and would be considered for possible underground development.

NEMI Northern Energy and Mining Inc completed a major exploration program on its **Trend** metallurgical coal property (093I 030), located 25 km south of Tumbler Ridge and approximately 12 km south of the dormant Quintette coal mine. The program was the largest in the region and included more than 7000 metres of rotary and diamond drilling. Large diameter coring of the seams (Figure 7-3) produced approximately 10 tonnes of coal that will be subjected to a range of coal quality tests and a washability test. Substantial environmental baseline studies provided the information required for a detailed prefeasibility study. The coal measures on the Trend property lie on the northeastern flank of Roman and Quintette mountains. Sandstones, shales, and conglomerates of the Lower Cretaceous Gates Formation and similar lithologies of the underlying Gething Formation are interbedded with multiple coal seams. The sedimentary succession forms a northwest-trending, steeply northeast dipping homocline. The coal reserves of interest are contained in five seams (D, E, F, G/I and J) in the Gates Formation. These five seams have a cumulative thickness of more than 15 metres on the South block.

*Figure 7-3. Large diameter drilling of multiple seams on the **Trend** property.*

Past exploration on the property outlined inferred resources of 30 million tonnes on the South block and 23 million tonnes on the Extension block. The Roman and Hambler blocks offer potential to greatly expand the property's overall resource.

NEMI is expected to submit a *Mines Act* permit application for a 240 000 tonne per annum coal mine in the first quarter of 2005 to the Ministry of Energy and Mines for review and approval. The small mine would be centered on the 6-metre thick 'L seam' that crops out in the central part of the South block. A trough-shaped pit, measuring 150 metres wide by 1900 metres long would allow the release of approximately 1 million tonnes of raw coal.

NEMI is also expected to apply to the EAO in mid-2005 for certification of a 2 million tonne ROM coal mine. Conceptual mine planning has identified a narrow, 8 km long pit that would be developed in several phases and release coal from both the upper Gates and lower Gething formations. An estimated 30 million tonnes ROM coal would be released over a 15-year period. Coal would be hauled a distance of about 35 km from the pit area to a rail siding and loadout facility north of the Quintette minesite.

EXPLORATION PROJECTS

The **Wapiti** thermal coal property (Minfile 093P 021) of Aurora Coal & Minerals Ltd is located 30 kilometres north of Tumbler Ridge. The property is underlain by sandstone, siltstone, mudstone and conglomerate of the Upper Cretaceous Wapiti Group. Exploration in 2004 targeted the No. 1 seam on the Heritage block, a near surface, shallow-dipping seam that ranges between 1.6 – 2.1 metres thick. A series of shallow rotary drill holes, 10 to 35 metres in depth, confirmed depth to seam and thickness of seam. Spot coring of the seam provided approximately 200 kilograms of sample for a combustion test. Previous exploration on the property outlined a surface mineable coal resource of 45.4 million tonnes at a strip ratio of 11.5:1 bank cubic metres of waste per tonne of coal (BCM:t ROM). Information from the 2004 program will enable the company to calculate a reserve for part of the deposit that conforms to NI 43-101 standards. Collection of base line environmental data also began in the summer and will continue through 2005. The company intends to complete a feasibility study in 2005 that details a one million tonne per year open pit coal mine.

Kennecott Canada Exploration Pty Ltd acquired coal licenses covering more than 30 000 hectares in the Pine Pass area west of Chetwynd. The Kennecott tenure covers the headwaters of Falling, Hasler and Highhat creeks south of the Willow Creek mine. This area is part of former **Goodrich** property (Minfile 093P 024) that Gulf Canada Resources Inc explored from 1979 to the mid-1980s. The coal measures are interbedded with

mudstones, siltstones and sandstones of the Lower Cretaceous Gething Formation. Multiple coal seams occur near the top of the formation and are medium to high volatile bituminous coals suitable for the metallurgical coal market. In 2004, Kennecott completed only two holes of a planned 12-hole rotary and core drilling program. The company will resume their efforts early in 2005.

Cline Mining Corporation used existing drill hole and bulk sample information on its **Lossan** coal property, centered about 15 km southeast of the Willow Creek mine, to calculate a NI 43-101 compliant resource. The 'surface mineable' resource is 20.02 million tonnes of medium-volatile bituminous coal in the measured, indicated and inferred categories. Lossan was once part of the Gulf Canada Resources' Goodrich property, where earlier work identified two principal coal seams within the Lower Cretaceous Gething Formation. The two seams average 4 and 8 metres in thickness and are suitable for PCI coal and metallurgical coal markets. A 10 to 20-hole drilling program, originally planned for 2004, was deferred until early in 2005.

Western Canadian Coal began an exploration drilling program in mid-December on its **Hermann** property, located south of the Wolverine River, about 5 km southeast of the proposed Perry Creek pit. The field program, including rotary drilling and spot coring of coal seams of Gates Formation seams, will extend well into the new year.

Late in the year, a joint-venture agreement was formed between NEMI and Western Canadian Coal to explore and develop the **Saxon** and **Belcourt** properties. An extensive fieldwork program is planned for both properties in 2005.

OUTLOOK FOR 2005

Completion of the wash plant and extension of the rail siding at the Willow Creek mine will permit the operation to produce at least 90 000 tonnes of clean coal per month. The small Dillon mine will reach its annual rate of 240 000 tonnes per annum while the nearby proposed Brule mine moves toward EA certification and permitting. The small 'L Seam' mine proposed for the Trend property will likely proceed through permitting and reach production before the end of the year. Coal production for 2005 is estimated to be approximately 1.5 to 2.0 million tonnes. EA certification and permitting of the proposed Wolverine coal mine will enable site clearing and mine construction to get underway.

Exploration and deposit appraisal programs that began late in calendar 2004 will likely be expanded in 2005. Advanced stage projects will be directed toward EA certification and permitting.

Many of the coal licences granted late in the year will see sizeable exploration programs in 2005. Major programs are expected on Lossan, Goodrich, Sukunka, Belcourt, Saxon and others, including the Five Cabin property of Murray River Coal Ltd. In all, exploration is expected to increase substantially over the levels witnessed in 2004.

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