

KOOTENAY REGION

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SUMMARY

Although exploration expenditures in the Kootenay region dropped approximately 6% from the \$7.08 million spent in 2002 to \$6.7 million during 2003, metal exploration expenditures actually rose to \$4.9 million from the \$3.7 spent in 2002 (Figure 1). The 2003 total also includes \$1.5 million (~22%) spent on drilling for coal at, or in the vicinity of, the five producing coal mines in the Elk Valley, a drop of 48% from 2002; and \$0.3 million (4%) spent on industrial mineral exploration (Figure 2). Formation of the Elk Valley Coal Partnership resulted in the significant drop in exploration by the coal companies. In large measure this was balanced out by the resurgence in metal exploration spending in this area of the province.

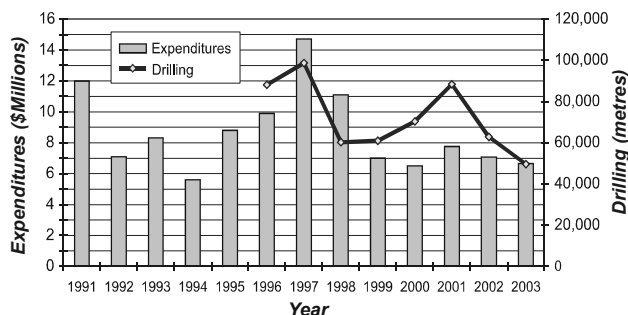


Figure 1. Exploration expenditures and metres of drilling.

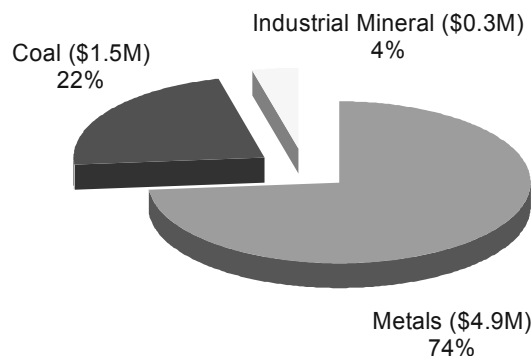


Figure 2. Exploration expenditures by commodity type.

An estimated 49 609 metres of drilling, in all categories, was carried out in the region in 2003, a decrease of 44% from 2002 levels (Figure 1). Coal companies carried out 23 182 metres of reverse circulation drilling, 39% below the amount of drilling

carried out in 2002, which itself was well below 2001 levels. Coal drilling comprised 47% of the total metres of drilling, down from 61% in 2002 (Figure 3). Metal exploration drilling continued to rebound in 2003 with 23 150 metres drilled in 197 holes, a 23% increase from 2002 levels. It accounted for 46% of the total 2003 drilling, but only 30% of the total metres drilled in 2002. An estimated 3277 metres of drilling, the remaining 6%, was carried out on industrial minerals projects, down 40% from 2002.

The total number of exploration projects worked on in the region last peaked in 1997 at 231; it has declined since then to approximately 50 in each of the past several years (Figure 4). Higher gold prices enjoyed through 2003 resulted in an ongoing focus on gold-related targets. This is illustrated by Figure 5, which shows the metal exploration expenditures for the region in 2003 broken down by target deposit type.

Gold City Industries Ltd. significantly advanced its Greenwood Gold project in the historical Greenwood mining camp in 2003. The company raised approximately

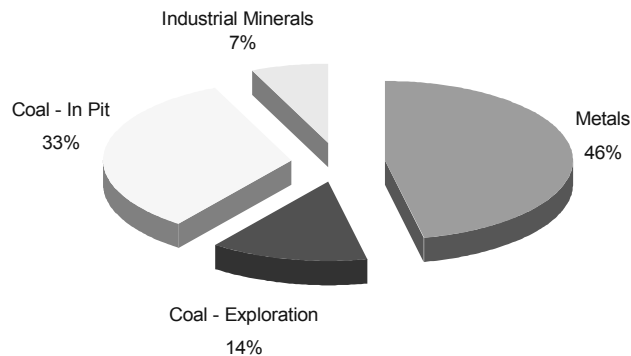


Figure 3. Drilling metres by commodity.

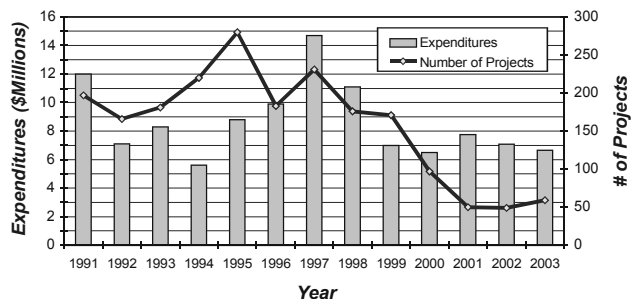


Figure 4. Exploration expenditures and number of projects.

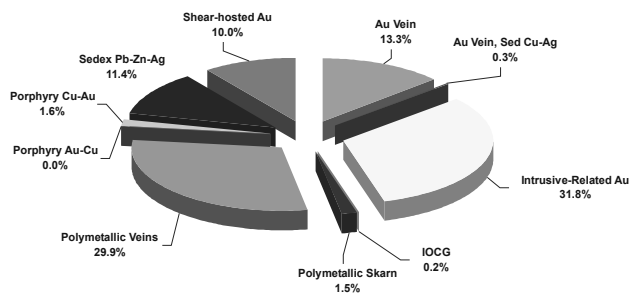


Figure 5. Metal exploration expenditures by target-type.

\$4M and carried out successful fall surface drilling programs on both the Lexington and Golden Crown Au-Cu properties, rehabilitated the portal at the Lexington property, and carried out a trenching program on the JD property, which adjoins Golden Crown. Gold City announced that they intend to construct a new 200 tonne per day mill in the Greenwood Camp to process ores from the Lexington and Golden Crown deposits.

Sultan Minerals Inc. continued to explore their Kena intrusion-related gold project near Nelson. Sultan carried out further geophysical survey, geological mapping, trenching and diamond drilling programs. Drilling on the Gold Mountain Zone, located in the northern portion of the Kena property, identified both low grade and high-grade gold mineralization, suggesting potential for both bulk tonnage and smaller bonanza-grade deposits. In 2003 work focused on testing the "magnetic corridor" structure, which was identified through geophysical surveys and tested in 2002 with several drill holes.

Orphan Boy Resources Inc. optioned the Willa Au-Cu-Ag deposit near Silverton in 2002. The company started a multifaceted feasibility study of the viability of mining the deposit underground, then trucking the ore to their Goldstream mill complex north of Revelstoke for processing. The results of a digital block model, prepared from the major amount of work carried out by previous operators, were released in the spring. In 2004 the company plans to commence a drilling program to increase reserves at Willa, complete the feasibility study, and achieve a start up mining plan for late 2004.

Metal exploration in the East Kootenay area increased again during 2003. Chapleau Resources Ltd. carried out extensive surface geochemical sampling and prospecting over their large Cranbrook Gold Project claim holdings and conducted important drill programs on their Lookout (Bar 19), Zinger and Jackleg properties. Klondike Gold Corporation continued their campaign of deep drilling to test Sullivan-type Pb-Zn-Ag targets in the Purcell Basin, and also evaluated several gold prospects. Jasper Mining Corporation carried out a surface drill program on their Vowell Creek project west of Golden, testing for extensions to mineralization mined historically at the Ruth Vermont Pb-Zn-Ag mine. To the east, in the Flathead River area, Goldrea Resources Ltd. carried out

prospecting and short drill programs on their Howell and Crowsnest intrusion-related Au properties.

Industrial minerals exploration projects declined in the region during 2003. Tiger Ridge Resources continued underground development, bulk sampling, and exploration drilling on their Jubilee Mountain barite project west of Spillimacheen, and carried out a surface drilling program on their Surelock barite property near Radium Hot Springs. Grid Capital Corporation optioned the Rosslund Wollastonite property and carried out a short drill program in the fall. As well, Zena Capital Corp. optioned the Lapin barite property near Bridesville and carried out a ground magnetics survey and a short drill program.

The giant Sullivan Pb-Zn-Ag mine closed in December 2001, after more than a century of continuous production. Since then there have been no operating metal mines in the Kootenay Region. Coal production in the Elk Valley for 2003 was approximately 22.5 million tonnes, similar to that in 2002. Early in 2003 all the metallurgical coal mines in the Elk Valley were merged into a single investment vehicle called the Fording Canadian Coal Trust. The trust also includes coal export port facilities in the Vancouver area. The entity, which will control all the coal mines in the Elk Valley, is called the Elk Valley Coal Partnership. All the major industrial mineral mines and quarries operating at the beginning of the year maintained steady production levels throughout the year; no significant change is forecast for 2004. There were no mine closures in the region during the year, and new production came from the Greenwood Slag pile.

EXPLORATION HIGHLIGHTS

Major metals, industrial minerals, and coal exploration projects carried out in the Kootenay Region during 2003 are listed in Table 1. These major projects involved expenditures in excess of \$100,000 on exploration drilling, bulk sampling, or underground exploration work. Locations of these projects, and smaller programs that are believed to be regionally important, are shown on Figure 6. There were 13 projects with reported expenditures of more than \$100,000 in the Kootenay Region this year.

Metals

In the second half of 2002, Gold City Industries Ltd. completed several major option agreements for properties in the historical Greenwood mining camp. These acquisitions provided the framework for their **Greenwood Gold Project**. The first option deal was for a 100% interest in the **Lexington-Lonestar** property (082ESE041; 082ESE042), which includes two deposits, eleven past producing mines, and a number of mineralized zones with high potential. The

Grenoble/Main Zone has a reported mineral resource of 94 923 tons grading 0.297 oz/ton (10.2 g/t) Au and 1.49% Cu (may not be National Instrument 43-101 compliant) that is accessible by means of a 300 metre decline. The deposit is open down plunge. This mineralization, which is structurally controlled, consists of a complex of pyrite-magnetite-chalcopryrite-gold veins closely associated with a serpentinite-dacite contact. Five other zones are known on the property that have similar characteristics. As well, the Lonestar deposit has disseminated and stockwork Cu-Au mineralization that supported some past production.

Through a second option, Gold City gained control of the **Winnipeg** (082ESE033) - **Golden Crown** (082ESE032) property, 5 kilometres north of Lexington-Lonestar. This property contains a number of Rosslund-type veins containing pyrrhotite>pyrite>chalcopryrite in a quartz gangue. The veins are hosted by Paleozoic diorite, greenstone, and serpentinite. Based on a 1990 study a mineral resource of 37 100 tons grading 0.999 oz/ton (31.07 g/t) Au (uncut) or 0.536 oz/ton (16.67 g/t) Au (cut) and 1.12% Cu was calculated (may not be National Instrument 43-101 compliant). The mineralization is accessible by means of a recent 1100 metre adit and also through historical workings, and is exposed in surface trenches. Significant potential exists to expand resources in the area both down-dip and along strike, and parallel veins may exist. The company also has completed option agreements to acquire rights to the adjacent **Zip**, **JD** and **Century Gold** claims.

Gold City closed a £960 000 (~C\$2.1 million) loan financing in August 2003. Subsequently the company closed a number of equity private placements that totaled approximately C\$1.9 million. On the **Lexington** property Gold City completed 906.6 metres of drilling in 6 HQ holes to attain additional information to refine resource calculations for the Grenoble deposit and for metallurgical testing. Numerous zones of pyrite-chalcopryrite veining were encountered in dacitic host rocks with impressive results, including one 4.57 metre interval that assayed 28.68 g/t Au and 1.17% Cu in hole 03GCD-01. The holes tested the part of the Grenoble deposit that is targeted for bulk sampling in early 2004. In preparation the decline portal was rehabilitated (Photo 1). In addition to the vein-style Au-Cu mineralization present in the Grenoble deposit, an overlying porphyry Cu-Mo-Au vein system was intersected. It averaged 0.2% Cu and 277 ppb Au over the 50% of the interval from surface to 112.7 metres depth in hole 03GCD-01 that was analyzed. The company plans to conduct further sampling to evaluate this style of mineralization.

On the **Golden Crown** property, 5 kilometres to the northeast, Gold City completed 2138.7 metres of drilling in 47 HQ diamond drill holes. Twenty-one of these holes comprised definition drilling of the King Vein with step out holes on approximately 15 metre centres to trace mineralization into previously untested areas. The King

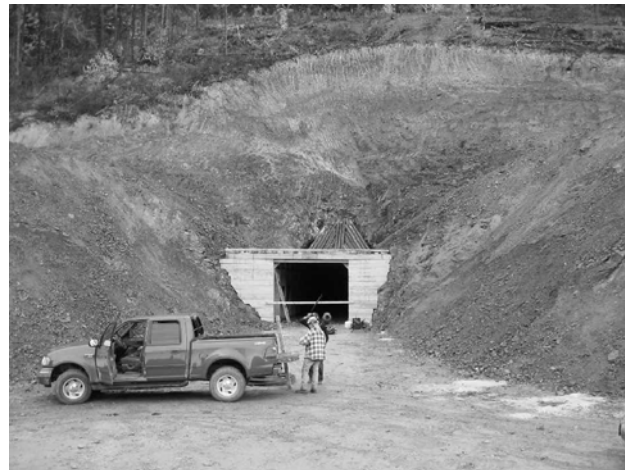


Photo 1. Rehabilitated portal to the Grenoble deposit, Lexington property.

Vein occurs within a steeply dipping and closely spaced Rosslund-type massive sulphide vein system; it is a pyrrhotite-pyrite-quartz-chalcopryrite-native gold vein. Drilling returned 19 significant intercepts of the King Vein. One intercept in hole 03CDH-01 assayed 326.82 g/t Au and 0.39% Cu over 1.86 metres. Other noteworthy intercepts include: 1.25 metres assaying 72.14 g/t Au and 1.31% Cu from 03CDH-03; 1.95 metres assaying 11.28 g/t Au and 0.71% Cu from 03CDH-15 and 2.07 metres assaying 10.43 g/t Au and 0.20% Cu from 03CDH-16.

A number of other veins on the Golden Crown property also were tested during the drill program. Four holes were completed on the Samaritan Vein, which is sub-parallel and 60 metres to the south of the King Vein, and hole 03CDH-17 intersected 0.94 metres assaying 21.73 g/t Au and 0.41% Cu. As well, a total of 14 shallow holes were completed on the Tiara Vein, which occurs at a diorite-serpentinite contact 250 metres southeast of the King Vein. The best 1 metre channel sample across the vein where it is exposed in a surface trench assayed 34 g/t Au over 1 metre. The trench exposes the vein along a 70 metre strike length. Core recoveries were poor from most of the Tiara Vein holes, however, several important intercepts were made including: 1 metre assaying 20.20 g/t Au in 03CDH-26 and 1 metre assaying 81.20 g/t Au and 0.24% Cu in 03CDH-28. Several holes also tested the Golden Crown, Portal and Calumet veins.

On the **JD** property, which adjoins the Golden Crown property to the northwest, trenching in 2003 of the Main and Hangingwall areas exposed sulphides in shear zones. The JD mineralization, which is 2.5 kilometres northwest of the Golden Crown mineralization, returned high-grade gold assays. Highlights include: 27.4 g/t Au over 1.8 metres, 12.69 g/t Au over 5 metres, 12.28 g/t Au over 5 metres, and 8.1 g/t Au over 2 metres. The trenched area is centred within a 1000 metre long gold soil anomaly. In the past, trenching tested only 90 metres of strike length within the anomaly. The current trenching program

expanded coverage to 300 metres of strike length. The company is planning an expanded trenching program to test the remainder of the 1000 metre geochemical anomaly. It will also explore the area between the JD and Golden Crown mineralized zones.

Late in the year Gold City announced that they had dropped their option to acquire the Roberts Mill, located 5 kilometres south of Greenwood. Instead, the company plans to construct a new 200 tonne per day mill closer to the mining properties. This new plan will reduce trucking costs, provide more tailings capacity for longer term production, and allow for more design flexibility.

Gold City Industries Ltd. also carried out a trenching and sampling program on their **Midway** gold property

(082ESE128) north of Midway. Work focused on sampling and expanding known mineralization in and around the widespread epithermal-textured chalcedonic quartz occurrence at Picture Rock Quarry (082ESE242). Fifteen kilometres northwest of Rock Creek, Jantri Resources Inc. expanded its biogeochemical bark sampling program on the **Caramelia** gold property, which is on option from Gold City Industries. The property encompasses the historic Camp McKinney gold camp, in which the Cariboo-Amelia mine (082ESW020) was the most prolific producer; historic production totaled 124 500 tonnes grading 20.39 g/t Au that yielded 81 600 ounces of Au. The company is directing its exploration focus toward near-surface veins in the till-covered area south of the Cariboo-Amelia vein.

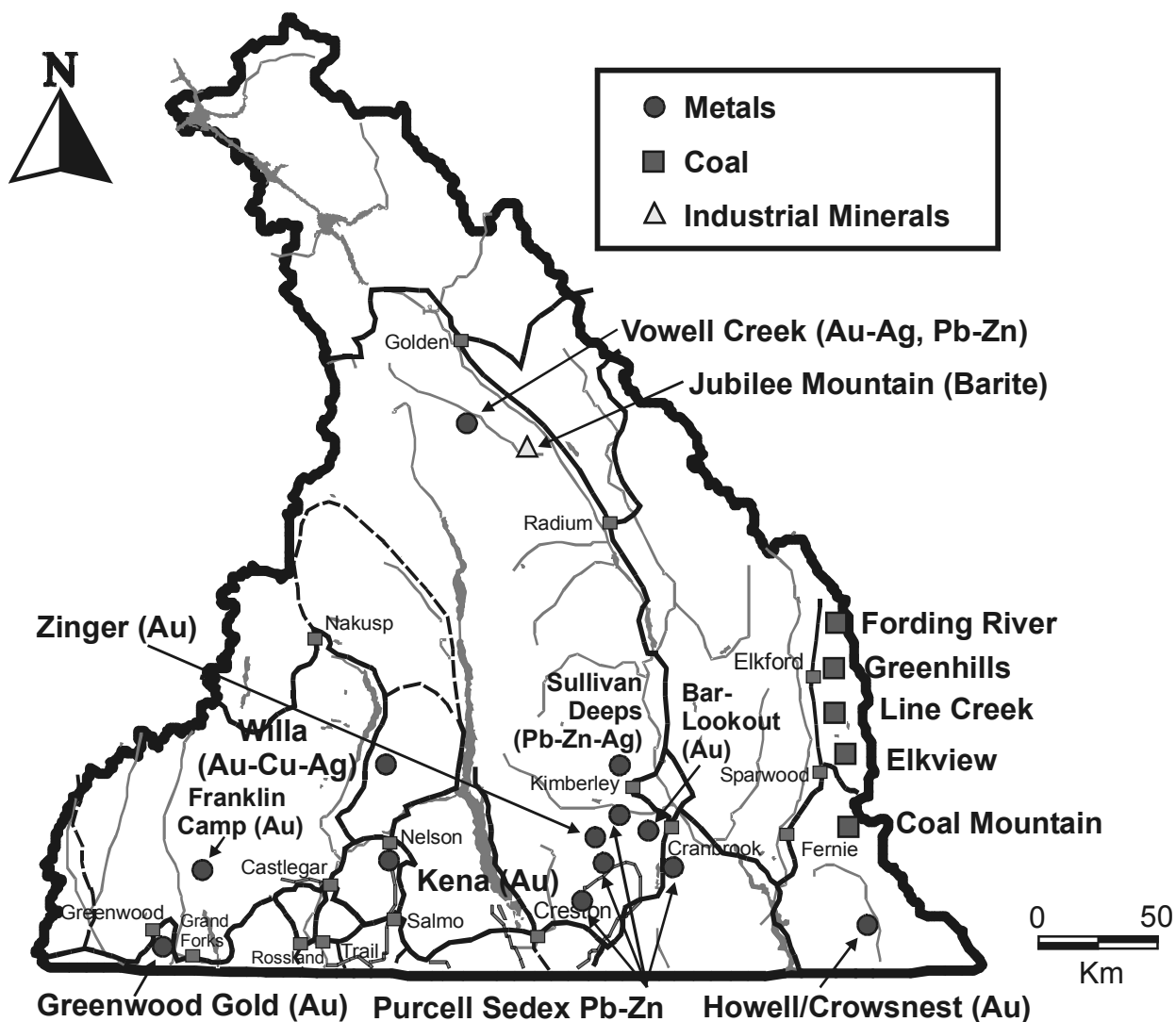


Figure 6. Noteworthy exploration projects in the Kootenay Region, 2003.

TABLE 1. MAJOR EXPLORATION PROJECTS, KOOTENAY REGION, 2003

Property	Operator	MINFILE	NTS	Commodity	Deposit Type	Work Done
Ash/Pit	Klondike Gold Corp.	082GNW070	82G/12W	Pb, Zn, Ag	Sedex	1548m diamond drilling in 4 holes
Coal Mountain Mine	Elk Valley Coal Partnership	082GSE052	82G/07E, 10E	Coal	Sedimentary	7200m RC drilling in 39 holes
Cranbrook Gold Generative	Chapleau Resources Ltd.		82F, 82G	Au	Intrusive-Related and Structurally Controlled Veins	Regional compilation, soil geochemistry and rock sampling
Fording River Mine	Elk Valley Coal Partnership	082JSE009, 010, 012	82J/02W	Coal	Sedimentary	7699m RC drilling in 84 holes
Franklin Camp	Tuxedo Resources Ltd.	082ENE051, 033, 002	82E/09W	Au	Epithermal/Mesothermal/Skarn	geochem, trenching, 491m diamond drilling in 9 holes
Golden Crown	Gold City Industries Ltd.	082ESE032, 033	082E/02E	Au, Cu	Sulphide Veins	2500m diamond drilling in 47 holes
Kena	Sultan Minerals Inc.	082FSW237, 331, 332	82F/06W	Au, Ag, Cu	Intrusive-Related	1500m diamond drilling in 22 holes; trenching; geol; geochem; geophys
Lexington	Gold City Industries Ltd.	082ESE041, 042	82E/02E	Au, Cu	Mesothermal Sulphide Veins	906m diamond drilling in 6 holes; portal rehab
Line Creek Mine	Elk Valley Coal Partnership	082GNE020, 021, 022	82G/15W, E	Coal	Sedimentary	4400m RC drilling in 33 holes
Lookout (Bar 19)	Chapleau Resources Ltd.	082GSW068	82G/05W	Au	Intrusive-Related	3358m diamond drilling in 17 holes
Vowell Creek	Jasper Mining Corporation	082KNE009, 011, 031, 037,	82K/15W	Au, Ag, Cu, Pb, Zn	Veins, Replacements	2900m diamond drilling in 21 holes
West Moyie Block	Klondike Gold Corp.		82F/08E	Pb, Zn, Ag	Sedex	1535m diamond drilling in 2 holes
Zinger	Chapleau Resources Ltd.	082FSE122	082F/08E	Au	Mesothermal Veins	3317m diamond drilling in 20 holes

During the summer, Saville Resources Inc. optioned the **Bud** property in the Greenwood camp that includes the past-producing **Morrison** mine (082ESE052). From 1901 to 1903, 2647 tonnes of ore was shipped from the Morrison mine; it yielded 19.85 kg Au, 28.32 kg Ag, and 10.7 tonnes Cu. The company completed a work program comprising surface trenching and sampling, and also rehabilitated the Morrison adit to facilitate underground mapping and sampling. Pyrrhotite-pyrite-chalcocopyrite mineralization on the property occurs along a skarned tuff contact with limestone. Poddy zones of massive sulphide mineralization returned an average grade of 1.9 g/t Au, 19.5 g/t Ag, and 1.5% Cu over an average width of 1.3 metres. A gossan zone in limestone exposed during trenching averaged 7.8 g/t Au, 9.3 g/t Ag, 2156 ppm Cu, 2691 ppm As, and 4863 ppm Zn over 1.1 metres. High gold values of 14.5 and 14.2 g/t Au came from grab samples of the gossan zone. Eighty metres northeast of this zone, quartz-pyrite-chalcocopyrite mineralization in chert assayed 51.6 g/t Au, 403 g/t Ag, and 4.16% Cu in one grab sample.

Kingsman Resources Inc. optioned the **Snowshoe** property, also in the Greenwood Camp, in 2003. The property covers part of the former **Skylark** mine (082ESE011), which has been mined intermittently over the past century, and most recently during the late 1980s. The Serp zone which the 2003 program exposed on surface is one target on the property. The zone straddles the boundary between the Snowshoe and Skylark properties. Past drill testing of this zone along 200 metres of strike length returned high grade values including 0.43 oz/t (13.37 g/t) Au over 13.5 feet from SKR 85-13 and 0.53 oz/t (16.48 g/t) Au over 7.5 feet

from SKR 85-22. Two trenches excavated in 2003 exposed the silicified sulphidic mylonite/breccia zone along 50 metres of strike length. Individual assays ranged up to a high of 14 g/t Au and 596 g/t Ag over 1 metre. Trench 03-11 averaged 1.4 g/t Au, 104 g/t Ag, 822 ppm Cu, 0.56% Pb and 0.15% Zn over a true thickness of 6.25 metres; trench 03-12 averaged 1.66 g/t Au, 112 g/t Ag, 1900 ppm Cu, 0.62% Pb, and 0.33% Zn over a true thickness of 3.25 metres. In the Surprise #3 area, 1.5 kilometres southeast of the Serp Zone, trenches exposed polymetallic veins which assayed 3.9 g/t Au, 60 g/t Ag, 2.9% As, 0.26% Cu, 1.8% Pb, and 0.2% Zn over 1.4 metres.

Over the past several years Tuxedo Resources Ltd. put together a large land position in the **Franklin Camp** area 60 kilometres north of Grand Forks. The claims cover the past-producing **Union** (082ENE003) and **Homestake** (082ENE051) mines. The Union mine produced 122 555 tonnes at an average grade of 14 g/t Au and 353 g/t Ag. A program of mapping, soil sampling, and trenching carried out during the summer was followed up in the fall by a 9 hole 491 metre diamond drill program. At the Banner Vein (082ENE002), which has been traced intermittently for 800 metres with widths up to 7.5 metres, seven channel samples across the vein along a strike length of 28 metres of the vein averaged 1.4 g/t Au, 35.3 g/t Ag, 0.3% Cu, 1.36% Pb, and 1.5% Zn over 7.4 metres (Photo 2). The best drill results for the Banner Vein came from hole FR03-5, which assayed 2.35 g/t Au over 4 metres, including a 1 metre sample assaying 5.15 g/t Au. A single drill hole tested the IXL area (082ENE033) where an 80 foot trench averaging 0.78%

Cu with elevated gold was reported from work done in 1969. The hole intersected an 18.4 metre interval assaying 1.86 g/t Au, and a 4.7 metre interval assaying 2.07 g/t Au.



Photo 2. Linda Caron and Tom Schroeter standing on the Banner Vein trench.

During 2003 Columbia Yukon Explorations Inc. optioned the **Gold Canyon** property, 7 kilometres southeast of Burton in the Tillicum Mountain camp. High-grade sulphide mineralization was discovered on the property in 2002 during construction of a new forestry road. The property is underlain by a deformed metasedimentary package within an easterly trending roof pendant that is up to 5 kilometres wide between the monzonite to diorite Goat Canyon stock and the Halifax Creek stock. Numerous dykes cut the metasediments and they are commonly associated with Au-Ag skarn and sulphide replacements. Two subparallel zones of mineralization have been identified on the property to date. A number of 2.0 metre chip samples of galena-sphalerite-pyrite-pyrrhotite-chalcopryrite mineralization were collected; the best assayed 9.98 g/t Au, 562 g/t Ag, 3.6% Pb and 4.6% Zn (Photo 3). A short 6 hole 158 metre drill program was completed to test the discovery area in the late fall. Highlights include: 2.12 metres assaying 37.58 g/t Au and 180.3 g/t Ag, including 1.12 metres assaying 70.0 g/t Au and 236 g/t Ag, from hole 03GC-6; 9.87 metres assaying 3.42 g/t Au and 110.8 g/t Ag, including 1.0 metre assaying 15.0 g/t Au and 522 g/t Ag, from hole 03GC-3; and 2.33 metres assaying 6.77 g/t Au and 9.8 g/t Ag from hole 03GC-1. The company is planning a comprehensive exploration program for the property in 2004.

Northwest of Rossland Kootenay Gold Corp., a private exploration company, discovered a new gold prospect called **Jumping Josephine** during 2003. Quartz stockworks, vein-breccias, ladder and sheeted veins occur within a shear zone approximately 25 metres in width. Individual veins exposed on surface range from 0.5 centimetres to 30 centimetres in width.



Photo 3. Massive sulphide mineralization in trench on Gold Canyon property.

The shear zone, which is accompanied by quartz-clay-sericite alteration, has been traced or projected in outcrop and float along a strike length of two kilometres. Assays from grab samples of quartz veins within the zone ranged from background up to 19 g/t Au; values in the 2 g/t Au range are common. The company also optioned the **Bunker Hill** (082FSW002) property southeast of Fruitvale. The Bunker Hill mine produced 3.2 kilograms of gold and 9.6 kilograms of silver from 340 tonnes of sulphide-bearing quartz vein between 1933 and 1942. The property also contains the Lefevere skarn, which is developed along the margin of the Bunker Hill intrusive stock; assays from grab samples of the skarn ranged up to 14.1 g/t Au. The company also acquired by staking the **Connor Creek** property, 18 kilometres southwest of Nelson, which hosts Rossland type massive pyrrhotite-chalcopryrite-arsenopyrite-sphalerite-galena veins (i.e. 082FSW235; 082FSW356; 082FSW303) and a northerly trending silicified shear zone containing disseminated to semi-massive sulphides. Grab samples collected from the shear zone mineralization range from background up to 7.3 g/t Au. At the end of 2003 all shares of Kootenay Gold Corp. were purchased by First Integrated Enterprises Limited, a publicly listed capital pool company.

Cream Minerals Ltd. carried out a surface rock sampling program on its **Goldsmith** property near Kaslo. The property covers numerous historic workings over a three kilometre trend that is underlain by altered volcanic and sedimentary rocks. Gold mineralization is associated with quartz and quartz sulphide veins ranging from several centimeters to 5 metres in width. Samples were collected from waste dump piles or bedrock veins where possible. Visible gold was observed in five samples, and grab samples assayed up to 9 902 g/t Au. The company plans to carry out further surface exploration work on the property in 2004.

In June 2003, Sultan Minerals Inc. announced that Kinross Gold Corporation was withdrawing from the **Kena** gold project option agreement entered into by the two parties in September, 2002. During the period of the option agreement Kinross spent just under \$1 000 000 exploring the property. Sultan continued exploration of the property on their own during the summer. They carried out a detailed structural mapping study, conducted further geophysical surveys, and completed a trenching program (Photo 4). Much of the work focused on a structural corridor that was defined by magnetic response and four drill holes. The corridor was recognized at the end of the 2002 work program. The best results from the trenching program came from the northern part of the "magnetic corridor" (03TR-7) where a 2.0 metre chip sample assayed 66.83 g/t Au. At this location coarse visible gold was observed in limonitic quartz veinlets within Silver King porphyry adjacent to a mafic dyke.

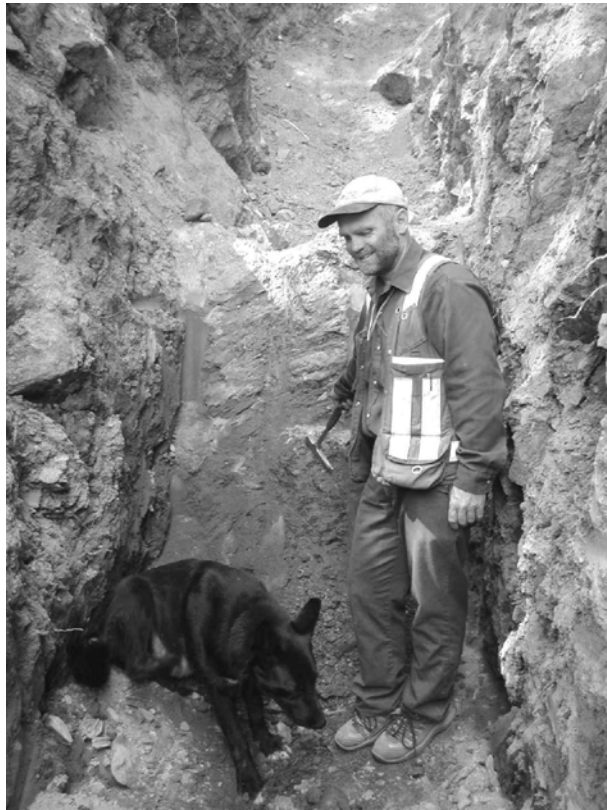


Photo 4. Jack Denny in Kena project trench.

In the Gold Mountain Zone (082FSW379) gold mineralization occurs in areas of the Silver King monzonite to diorite plagioclase porphyry that have undergone silicification and strong potassic alteration, and carry 2 to 5% disseminated and fracture-filling pyrite. Local fine-grained visible gold occurs in drill core. The low-grade mineralized zone locally extends to surface. Some typical assays from 2001 drilling of the zone are 100 metres grading 1.21 g/t Au in hole 01GM-

01, 116.05 metres grading 1.87 g/t gold in hole 01GM-03, 130 metres grading 1.14 g/t Au in hole 01GM-05, 160 metres grading 1.15 g/t Au in hole 01GM-08, and 140.38 metres grading 1.10 g/t Au in hole 01GM-28. Several bonanza-grade gold zones internal to the lower-grade areas, for example 172.1 g/t Au over 2 metres in hole 01-GM-08 and 240.1 g/t Au over 1.23 metres in hole 01-GM-03, are spatially related to the porphyry-volcanic contact. Detailed geological and structural mapping carried out in 2003 suggests that gold enrichment within the Gold Mountain zone and its northern extension is linked to a pyrite-K-Feldspar-gold porphyry system developed in the upper part of the Silver King intrusion. In later northwest-trending brittle structures, in which magnetite is reduced and pyrite occurs, gold contents are locally upgraded to form the bonanza-grade structures referred to above.

In the fall Sultan carried out a 22 hole 1500 metre drill program to further test the auriferous structural corridor and to expand and further define the gold mineralization at both the Gold Mountain and the Kena Gold zones (082FSW237) to the south. A total of 8 holes were completed on the Gold Mountain Zone; highlights include 1.15 g/t Au over 58.98 metres in hole 03GM-71, including 1 metre assaying 40.66 g/t Au, and 109.42 metres grading 0.52 g/t Au in hole 03GM-65. Gold mineralization at the Gold Mountain Zone has now been extended by drilling for 1 kilometre to the north and 0.9 kilometres to the south of the initial discovery area. A total of 14 short holes were completed on the Kena Gold Zone; highlights include 52.70 metres assaying 0.88 g/t Au in hole 03KG-05 and 47 metres grading 0.71 g/t Au in hole 03KG-11. The company is carrying out computer modeling of the Gold Mountain and Kena Gold zones and anticipates completion of preliminary resource calculations by early 2004. Sultan also announced that it has fully exercised its option agreement to acquire a 100% interest in the Kena property subject to a 3% NSR on gold and silver, and a 1.5% NSR on other metals. Since the option agreement was initiated in 1999, the company has expended a total of \$3 100 000 exploring the property.

In 2002 Cassidy Gold Corp. entered into an option agreement with related company Delta Explorations Inc. on the **Silver Lynx** (082FSW378) VMS Property, 20 kilometres west of Nelson, whereby Delta may earn a 50% to 60% interest in the property. Delta was still going through its listing process late in 2003 but undertook a program of linecutting and IP surveying. The property is underlain by a package of phyllitic felsic tuffs that are overlain by argillites and siltstones of the middle Jurassic Ymir Group. The entire sequence appears to have been folded to form a south-plunging antiform. Mineralization appears to be VMS-type; it is apparently stratabound and within 20 metres of the volcanic-sediment contact. Selected grab samples assayed up to 24.59% Zn, 22.35% Pb, 0.21% Cu, and

556.4 g/t Ag. A four-hole drill program in late 2001 intersected disseminated to semi-massive sulphide zones grading up to 6.87% Zn, 1.13% Pb, and 42.5 g/t Ag over 0.6 metres. The company is planning to drill the property early in 2004.

Orphan Boy Resources Inc. undertook a feasibility study in 2002 to examine the technical and economic viability of underground mining their **Willa** Au-Cu-Ag deposit near Silverton, which they optioned in 2002, and trucking the ore to their **Goldstream** mill complex, which is 75 kilometres north of Revelstoke, for processing. The Willa deposit is hosted by an intrusive breccia pipe (Photo 5) within a large roof pendant of metavolcanic rocks in the Nelson Batholith. The property was explored during the 1980s by joint venture partners Rio Algom Exploration Inc., BP Minerals Ltd. and Northair Mines Limited. During this period 14 300 metres of surface core drilling, 1550 metres of underground development and 15 000 metres of underground drilling were carried out. In March the company released an updated resource calculation for Willa that is based on drilling by the previous operators. The company utilized three cutoff grade scenarios and cut high gold assays to 34.286 g/t Au. Using a 3.5 g/t Au cutoff, measured, indicated and inferred resources total 996 623 tonnes grading 6.3 g/t Au, 0.79% Cu and 10.77 g/t Ag. At a 2.5 g/t Au cutoff, resources in all categories total 1 830 666 tonnes grading 4.77 g/t Au, 0.68% Cu and 9.21 g/t Ag. If a cutoff of 1.5 g/t Au is used, resources in all categories are 3 989 494 tonnes grading 3.23 g/t Au, 0.53% Cu and 7.16 g/t Ag. Aspects of the feasibility study include: evaluation of the Goldstream mill infrastructure and process layout; assessment of the surface infrastructure requirements related to a 500 metric tonne per day underground mining operation at the Willa property; review and update of underground mine plans for Willa; estimation of the cost of trucking Willa ore to the Goldstream mill; and submission of an application for mine development under the Environmental Assessment Act. Orphan Boy intends to commence drilling in early 2004 to increase resources at the Willa deposit, complete the Goldstream/Willa feasibility study, and achieve a startup mining plan for late 2004. The company announced acquisition of the adjacent **LH** gold property early in 2003.

An exciting development for the **Sullivan Camp** came in the spring when private company Mariner Ventures Corporation reached an agreement with Teck Cominco Limited to earn a 50% interest in the **Sullivan Deeps** target, which is north of the historic Sullivan mine, by expending \$4 million over four years on exploration. In the fall, this agreement was assigned to Stikine Gold Corporation, controlled by the same principals. The company has been raising funds to initiate exploration and has engaged in public meetings to describe the project.



Photo 5. Intrusive breccia-hosted mineralization, Willa Au-Cu-Ag deposit.

The Sullivan Deeps is an untested exploration target that is about 2450 metres deep and immediately north of the east-trending and north-dipping Kimberley Fault. The site is approximately 4 kilometres northwest of the **Sullivan** mine (082FNE052). The target is geologically and geophysically defined. Cominco drilled a number of deep holes north of Sullivan over the course of three decades of exploration for mineralization related to the northern extension of the Sullivan-Northstar mineralized corridor. The final hole, completed in 1996, cored distinctive formal Sullivan mine stratigraphic units north of the Kimberley Fault but passed through a flat fault 10 metres above where the first ore band was expected to occur. Below the fault the hole terminated in characteristic footwall rocks. A down hole UTEM survey of this hole identified a sheet-like conductor estimated to be 3 kilometres by 3 kilometres in size that lies east of the hole at the prospective Lower-Middle Aldridge (LMC) contact. The conductor has characteristics and footprint similar to that of the Sullivan deposit itself. In early 2004 Stikine Gold plans to start drilling of pilot hole from which a number of wedge holes will be drilled to test the target .

In 2003 Klondike Gold Corp. continued to explore its large holdings in the Purcell basin for Sullivan-type Pb-Zn-Ag deposits. Early in the year a four hole drill program was completed on the **Pit/Ash** property, located 9 kilometres south of the Sullivan mine on the south side of the St. Mary's River. The first three holes were drilled in the same general area. Hole P03-01 cored Lower Aldridge Formation rocks immediately beneath the overburden. Hole P03-2 was collared approximately 4 metres away from Texas Gulf Sulphur hole TGS71-1. The purpose was to confirm a report that the 1971 hole intersected 5.5 metres of laminated and layered semi-massive sulphides at the Sullivan horizon beneath 100 metres of overburden. Immediately below overburden, P03-02 cored approximately 4.5 metres true thickness of laminated to bedded argillaceous wacke with locally abundant sulphide, believed to represent an

incomplete Sullivan section. Within this section 1 metre sample intervals assayed up to 1.2% combined Pb-Zn, the best stratiform sulphide mineralization ever found outside of the immediate Sullivan mine area. P03-3 cored a steep fault, and P03-4, which was drilled approximately 600 metres to the west to a depth of 1073 metres, cored mainly silicified and chloritized Middle Aldridge sediments before passing through a fault and ending in less altered Lower Aldridge Formation rocks. The company is planning further drilling on the property in early 2004.

During the summer Klondike Gold deepened their 2002 drill hole on the **Fran** property, located northeast of Moyie Lake, from 560.2 to 729 metres. Below 610 metres depth, 40 metres of Sullivan-time stratigraphy was intercepted that carried minor disseminated sphalerite and pyrrhotite and contained two intervals with wispy laminations of sphalerite with minor pyrrhotite. Two intervals, 1.1 and 1.3 metres in length, both assayed approximately 0.25% Zn, some of the highest base metal grades recorded from Sullivan-time strata outside of the immediate Sullivan basin and its southward extension into the Pit/Ash claims area discussed previously. In the Aldridge Basin the thickness of the Sullivan Horizon generally varies from 1 to 10 metres but at the Sullivan mine it is approximately 100 metres thick. In the Davent sub-basin, previous drilling indicates that it is as much as 86 metres thick with anomalous base metal sulphide concentrations.

At the northern end of the Payday Basin, Klondike Gold drilled a single hole to approximately 1250 metres depth on the **Payday #1** property. The new hole is approximately 1 kilometre east of a previously drilled hole (SMC95-1), which intersected a Sullivan horizon thickened to 16.8 metres with visible sphalerite and pyrrhotite. The Sullivan time horizon was not apparent in the latest hole and may have been engulfed by a younger gabbro sill; the hole bottomed in Lower Aldridge Formation sediments. To the south, near the headwaters of Lewis Creek in the **Panda Basin** and 30 kilometres southwest of Cranbrook, hole L-80-1, started by Cominco in 1980, was lengthened from a depth of 857 to 1142 metres, and intersected a thickened Sullivan time horizon at the LMC. Klondike Gold also completed a stratigraphic hole targeting Sullivan-type mineralization on their **Spid** claims near the confluence of Spider and Kid creeks, 45 kilometres southwest of Cranbrook. At year end the company was extending a hole on the **Clair** property west of St. Mary's Lake to LMC depth.

Klondike gold advanced their **Thea 17** gold prospect, located along the western edge of the Payday Basin in the Kidd Creek drainage area, with a 13-hole 378 metre diamond drill program and further trenching (Photo 6). The silicified breccia/shear zone has now been traced over a strike length of 600 metres, and has

an inferred strike length of at least 850 metres. The prospect was discovered in the late 1990s and exposed in two short trenches in 1999. The shear zone, which strikes northerly and dips variably to the east, cuts Middle Aldridge Formation siltstones and Moyie gabbro sills. It varies in width from approximately 2 metres to more than 11 metres. The quartz-breccia zone is enveloped by limonite stained sericitic siltstone and consists of thin irregular quartz veins and annealed quartz breccias. Grades of chip samples of the zone range up to 14.5 g/t Au across 4 metres in the central portion of the zone; the zone is anomalous in gold over its entire length. Several fences of drill holes tested the central portion of the zone over a 200 metre strike extent. The best results came from the southernmost drill hole (ddh 13) in which the silicified breccia zone assayed 3.7 g/t Au over 3.25 metres, including a 0.65 metre interval of 11.5 g/t Au. The company is planning further drilling for 2004.



Photo 6. Klondike Gold geologists examining trench on Thea 17 gold property.

Sawmill Creek and Perry Creek are both prolific historic placer creeks. Seeking a bedrock source, Klondike Gold Corp. carried out a 273 metre 5 hole drill program on the **Prices Pit** (082FNE056) gold property in the area. In the late 1930s the Prices Pit produced 5194 grams Ag, 3173 grams gold, and 200 kilograms Pb from 381 tonnes of ore. The 2003 program tested a 130 metre section of a north-trending structure with felsic and mafic dykes and irregular lenses of quartz that locally contain high grade gold. Anomalous gold was detected in thin quartz veinlets within and in the footwall margin of a felsite dyke; one intersection of quartz vein material assayed 16.53 g/t Au over 0.49 metres. Further exploration in the area by Klondike Gold will focus on the iron-oxide Au-Cu potential of the area.

Sedex Mining Corp. carried out prospecting, soil sampling, a VLF survey, and a trenching program on high priority areas within its **MW** gold property, located

between Cranbrook and Kimberley. The property is underlain by rocks of the Purcell Supergroup. The claims are at low elevation, consequently a thin veneer of glacio-fluvial sands and gravels covers most of the property. In spite of this, a number of areas with anomalous gold mineralization have been identified through surface sampling of small bedrock exposures. Two areas are considered to be drill targets. One is central to a linear breccia zone that is more than 250 metres wide. Grab samples from a trench that crossed the silicified central zone of the breccia assayed up to 3.62 g/t Au. In a second area, 1300 metres to the north, grab samples from a swarm of quartz veins with associated carbonate alteration assayed up to 2.56 g/t Au.

Ruby Red Resources, a Calgary-based private company, carried out a geologic mapping and trenching program on its **Eddy** gold property in the Weaver Creek area southwest of Cranbrook. The company also conducted soil sampling and geologic mapping on the Loose Leg and Spirit Dream gold properties in the Hughes Range of the Rocky Mountains northeast of Fort Steele.

Late in 2002 Chapleau Resources Ltd. entered into an option agreement to acquire a 70% interest in the **Lookout** (Bar 19) (082GSW068) property, which includes the Lookout gold prospect. The property is 12 kilometres west of Cranbrook. Gold mineralization in the Lookout prospect is related to an altered Cretaceous syenitic dyke that lies along the east-trending Cranbrook fault system. When the prospect was discovered in the early 1990s, soil sampling and a series of trenches traced the mineralization over a strike length of 200 metres. Trench sampling yielded assays as high as 0.132 oz/ton (4.5 g/t) Au across 85 feet (25.9 m); a selected grab sample of quartz stockwork in syenite returned 0.592 oz/ton (20.3 g/t) Au, 3 oz/ton (102.9 g/t) Ag and 1.7% Pb. Chapleau completed 3358 metres of drilling in 17 holes on the property in 2003. Analysis by metallic screen fire assay suggests that a significant proportion of the gold mineralization is coarse, so the 'nugget effect' caused assay results to vary. Highlights of reported assays from the first eight holes include 7.23 g/t Au over 1 metre in hole B-03-03A, and 5.2 g/t Au over 1.06 metres in hole B-03-04A. The property was returned to the vendor before the end of 2003.

Also in 2002, Chapleau Resources Ltd. announced assembly of a major land position in the Cranbrook area through several option agreements and direct claim staking. The major option agreement was with Cranbrook-based Supergroup Holdings Ltd. to acquire a 90% interest in their **Zinger, Zeus, Hot Sausage, Love, Jackleg, IT, and TAC** gold properties. Numerous known gold occurrences occur within the land package, which was laid out to cover two major mineralized trends in the Cretaceous Bayonne magmatic belt. With the exception of the Jackleg, TAC, and IT properties,

which are located approximately 35 kilometres northeast of Cranbrook on the eastern side of the Rocky Mountain Trench, the land holdings cover a large area to the west of Cranbrook.

During 2003 Chapleau drilled 3317 metres in 20 holes in the Heart Lake and Gold Run Lakes areas, two separate areas of the Zinger property (Photo 7). In addition the company carried out prospecting and a large soil geochemical survey over the property. Linear mineralized structures on the property cut Middle Proterozoic quartzites and argillites, concordant gabbro sills, and dykes. En echelon mineralized zones of bedding-parallel quartz stockwork with Fe carbonate, sericite, and sulphides occur. Gold mineralization in bedrock has been found over approximately 10 kilometres on the Zinger property. The company identified visible gold in a number of showings, and in pan concentrates of soil and silt. Chapleau reports that several hundred surface rock grab samples contained anomalous gold with values ranging from several hundred parts per billion to several grams per tonne but some samples assayed 15-20 g/t Au. Anomalous gold mineralization over significant widths occurs in a number of holes in the western area of the Zinger property; highlights include: 17.5 metres assaying 0.484 g/t Au, including 1.5 metres assaying 1.41 g/t Au, in hole Z-03-16; and 2.0 metres assaying 1.29 g/t Au, including 0.5 metres assaying 2.24 g/t Au, in hole Z-03-15. This year's drilling tested a 2.8 kilometre extent of the northeast-trending anomalous belt. The company plans to drill-test further targets on the Zinger property in the spring of 2004.



Photo 7. Drilling in the Heart Lake area of the Zinger gold property.

On the Jackleg-Goldylot property, located east of Wasa, Chapleau Resources drilled 3 short holes for a total of 418 metres in two separate areas of the property. Gold showings related to numerous flat-lying quartz veins on the property are hosted by a sequence of alternating quartzites and gabbro sills. Historical gold assays from grab samples range up to 42 g/t Au whereas

those collected by Chapleau this year yielded grades up to 10 g/t Au. Based on analyses of 2000 soil samples collected on the property, a number of strong gold-copper-lead anomalies have been identified. Drill holes that were spotted to test the anomalies intercepted quartz veins and stockworks, but no significant gold values.

Jasper Mining Corporation carried out a surface drill program on their **Vowell Creek** property 30 kilometres southwest of Golden. The property includes the past-producing Ruth Vermont mine (082KNE009), which has a historical indicated mineral resource (drill indicated and probable) of 302 000 tons (273 970 tonnes) of vein and replacement type ore averaging 6.8 oz/t (233 g/t) Ag, 4.8% Pb, and 5.4% Zn (resource may not be compliant with National Instrument 43-101). The property is underlain by folded clastic and carbonate sediments of the Late Proterozoic Horsethief Creek Group, a subdivision of the Windermere Supergroup. The primary purpose of the 21 hole 3200 metre 2003 drill program was to test for extensions to the Ruth Vermont vein system, particularly on the north side of Vermont Creek. On the south side of Vermont Creek, drill holes intersected the Ruth vein system above the underground workings, but the zone was thinner than anticipated by the company. On the north side of the creek, no mineralization was intersected along the strike projection, suggesting it has either pinched out or been offset. During the work the company identified a second phase of gold mineralization. Gold occurs in arsenopyrite veins that are associated with a grit package immediately underlying the mine sequence. Evaluation of the 2003 drill results, in conjunction with information from previous work carried out on the project, is ongoing and will help to direct further exploration on the property.

In 2002 Goldrea Resources Ltd. entered into an agreement to earn a 55% interest in one or both of the **Crowsnest** (082GSE070) and **Howell** (082GSE037) gold properties from Eastfield Resources Ltd.. The properties are in the Flathead drainage basin, 30 to 50 kilometres southeast of Fernie. Both properties cover large gold anomalies related to Cretaceous alkaline rocks that intrude Paleozoic carbonate-dominant sedimentary sequences. In 1999, trench TK99-1 on the Crowsnest property exposed a mineralized zone associated with a syenite dyke that cuts limestone. The zone assayed 8.57 g/t Au over 16 metres. In the general area of trenching numerous altered float boulders of various rock types contain anomalous gold concentrations, some as high as 620 g/t Au. In 2002 Goldrea drilled 660 metres in 11 holes in the area around and south of TK99-1. The third hole of the program (DDH-02-03), which is 200 metres south of TK99-1, intersected 42.5 metres of 0.40 g/t Au, including a 12 metre interval with 1.05 g/t Au and a 3 metre interval grading 2.62 g/t Au. Mineralization is

hosted in strongly altered monzonite/syenite and limestone. In 2003 Goldrea carried out a prospecting and sampling program on the property during the summer, then returned in the fall to conduct a 5 hole 477 metre drill program. Four of the holes were completed in the area south of trench TK99-1 and one further to the east to test a geochemical anomaly. Anomalous precious metal values of 0.82 g/t Au and 0.4 g/t Ag over 0.76 metres were reported from hole CR03-1b, located 200 metres south of TK99-1, and 0.06 g/t Au and 248 g/t Ag over 3.05 metres from hole CR03-3, located 150 metres south of TK99-1. Hole CR03-4, 700 metres southeast of TK99-1, intersected 0.02 g/t Au and 240 g/t Ag across 3.35 metres.

Drilling by previous operators on the Howell property intersected 1.23 g/t Au over 58 metres (hole HRC-25) in pyritized and silicified limestone that is intruded by syenite. In 2002 Goldrea completed 3 holes that stepped out to the west about 200 metres from HRC-25. All intersected wide zones of low-grade gold mineralization in silicified and pyritized limestone that is intruded by syenitic dykes, sills, and diatreme breccias. Two hundred metres west of HRC-25, hole DDH-02-01 assayed 0.52 g/t Au over 149.4 metres, including 30 metres grading 0.83 g/t Au. DDH-02-03, 65 metres west of HRC-25, intersected 88.4 metres assaying 0.58 g/t Au, including an interval of 27 metres grading 1.01 g/t Au. In 2003 the company completed two further holes totaling 322 metres in the area west of HRC-25. Both holes cored crudely banded Devonian and Cambrian Fairholme/Elko carbonates with 0.5 to 3.0% disseminated and fracture-filling pyrite. The carbonates are cut by 0.1 to 25.0 metre wide porphyritic syenite and intrusive breccia dykes and sills of the Cretaceous Howell intrusions. Hole H03-01 intersected 87 metres that assayed 0.24 g/t Au and 2.9 g/t Ag, while H03-02 cored 106.4 metres that assayed 0.22 g/t Au and 4.5 g/t Ag.

Commerce Resources Corp. and Lalo Ventures Ltd. drilled one hole on their **Aubyrd 2** claim, which adjoins the Crowsnest property to the south. The hole was designed to test a geophysical anomaly at 200 metres depth, however, drilling was halted at 108 metres due to poor drilling conditions caused by swelling clays. Anomalous values of 32 ppb Au over 1.3 metres in pyritized and brecciated syenite were intersected at the bottom of the hole. The company intends to extend the hole to the target depth in 2004.

Industrial Minerals

Cream Minerals Ltd. located widespread beryl mineralization in pegmatite dykes hosted in both granitic and sedimentary rocks during prospecting and additional claim staking on their **Kootenay Gemstone** property near Salmo. The company reports that ice-blue beryl crystals are most common, followed by green

beryl, and some clear, white and yellow beryl. The property is now more than 50 square kilometres in size and covers 23 kilometres of strike length of the favorable contact area. The company feels the property has strong emerald potential, based on geology and soil and rock geochemistry data from certain areas. In 2004 the company will establish a grid over much of the claim block to facilitate detailed mapping, prospecting and soil sampling to pinpoint areas most prospective for gemstone occurrences.

Tiger Ridge Resources Ltd. continued underground development and surface exploration drilling on its **Jubilee Mountain** (082KNE079) barite project west of Spillimacheen in 2003. The property is underlain by massive dolomite and limestone of the Middle to Upper Cambrian Jubilee Formation. Barite and sulphide mineralization are hosted in veins and solution breccias in the Jubilee Formation. During 2003 the company completed 580 metres of surface drilling in 8 holes and collected a 1000 tonne surface bulk sample. They also completed limited underground development and collected a 1931 tonne bulk sample. As well, Tiger Ridge carried out a 22 hole 1155 metre drill program on the **Surelock** (082KNE081) barite property near Radium Hot Springs. At Surelock, barite cements structurally brecciated dolomites of the Helikian Mount Nelson Formation.

Zena Capital Corp. optioned the **Lapin Barite** project south of Bridesville and completed 217 metres of drilling in 12 holes. The widest intercept was 10 metres of barite but the average was 5 to 6 metres. Further drilling and bulk sampling are planned for 2004.

Grid Capital Corporation completed a 3 hole 124 metre drill program on the **Rossland Wollastonite** (082FSW341) property 9.5 kilometres north of Rossland. The showing is hosted by metasediments of the Pennsylvanian to Permian Mount Roberts Formation that are intruded from the west by syenite and quartz monzonite of the Middle Eocene Coryell Batholith.

Coal

Most coal drilling activity in the region took place within or adjacent to existing open pit mining operations. The Elk Valley Coal Partnership completed 23 182 metres of reverse circulation drilling in 198 holes. Of this, 6669 metres in 27 holes were classified as "deposit appraisal", and 16 483 metres in 171 holes were classified as "mine development" in-pit drilling.

At the **Fording River** mine (082JSE009, 10, 12) the company drilled 6100 metres in 78 in-pit holes, and 1599 metres in 6 exploration holes. At the **Greenhills** mine (082JSE007) in-pit drilling comprised 1383 metres in 12 holes. At the **Line Creek** mine (082GNE020, 021, 022) exploration drilling totaled 2000 metres in 12 holes whereas in-pit drilling consisted of 21 holes with a

cumulative length of 2400 metres. At the **Coal Mountain** mine (082GSE052) 4100 metres in 30 holes in-pit and 3100 metres in 9 holes were completed outside the mine area. At the **Elkview** mine (082GNE013), 2500 metres in 30 holes were drilled in producing pits.

In October Cline Mining Corporation announced that it had acquired the coal licenses that cover the **Sage Creek** metallurgical coal deposit in the Flathead Basin area south of Fernie. The Sage Creek deposit was previously held by the Sage Creek Mining Company, a subsidiary of Rio Algom. In the 1980s a large exploration program involving extensive drilling, mapping, trenching, and bulk sampling was carried out on the property. The company also completed a detailed feasibility study and Stage 1 Environmental Assessment Report at that time. In-place coal resources were reported to be 149.9 million tonnes of raw coal, hosted in 3 seams in the North Hill and South Hill deposits. The major shareholder of Cline Mining Corporation is Mitsui Matsushima Co. Ltd. of Japan, an experienced Japanese coal mining and marketing company. Cline plans to carry out a detailed review of past exploration, and to undertake new evaluation and verification studies to determine if the project can be moved toward production.

PRODUCING MINES AND QUARRIES

The locations of producing mines and quarries in the Kootenay Region for 2003 are shown on Figure 7 and listed in Table 2. Production data is included where it is available.

Metals

After more than a century of continuous production, the giant **Sullivan** Pb-Zn-Ag mine at Kimberley closed permanently in December 2001. Since differential flotation to separate lead and zinc concentrates was initiated in 1916, the mine produced more than 17 million tonnes of Zn and Pb metal and more than 285 million ounces of Ag. During 2003, decommissioning and reclamation work at the mine site continued. There are currently no operating metal mines in the Kootenay Region.

Industrial Minerals

All the major industrial mineral producers in the region maintained production during 2003 at roughly the same levels as in 2002. Westroc Inc. expects to produce approximately 475 000 tonnes of gypsum from its **Elkhorn** quarries (082JSW021) near Windermere in 2003. Discovery of the **Elkhorn West** gypsum resource west of the Elkhorn quarry may extend the projected life of that operation beyond the 2005 exhaustion of current

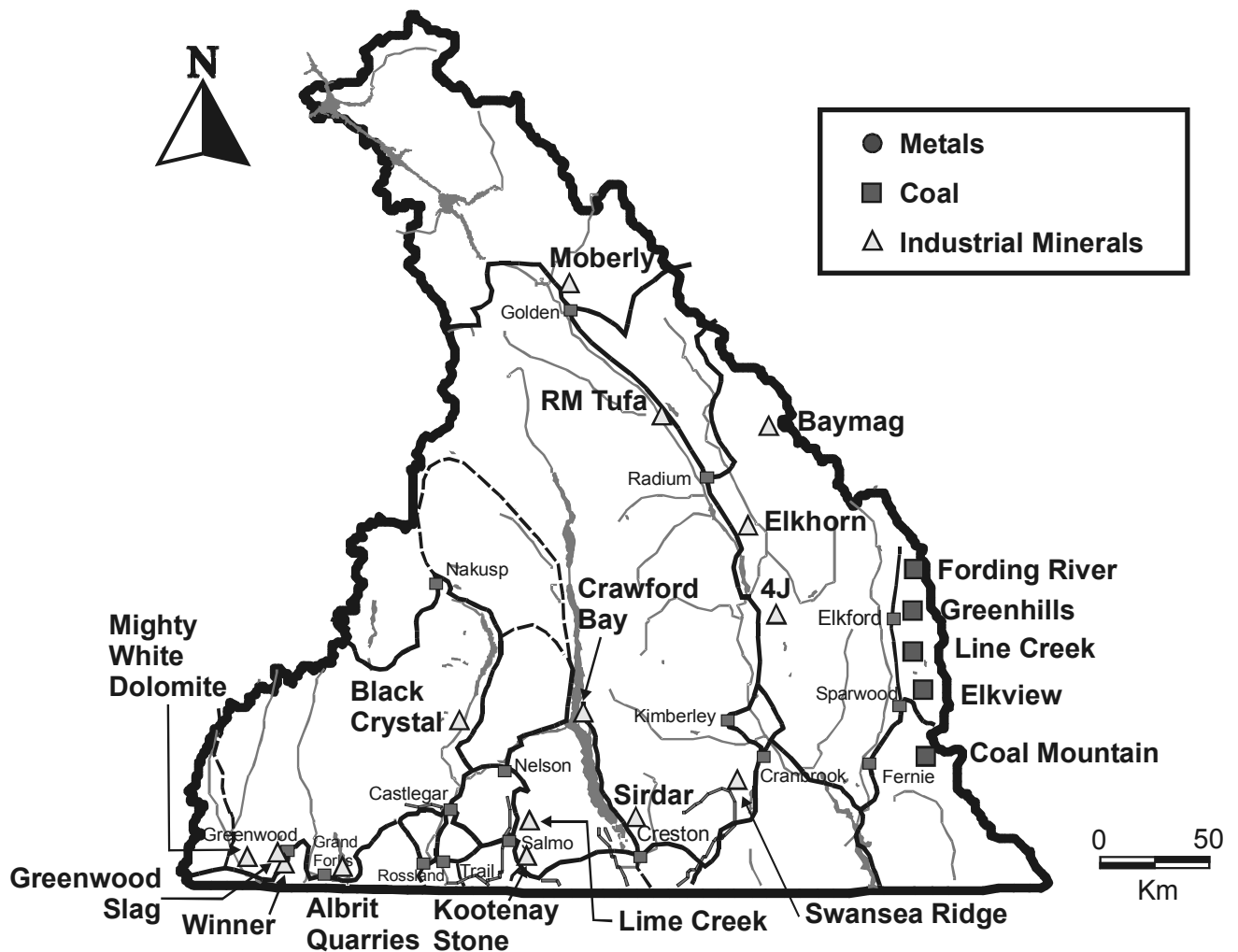


Figure 7. Producing mines and quarries, Kootenay Region, 2003.

reserves. Georgia Pacific Canada Inc. is expected to produce about 175 000 tonnes of gypsum from its **Four J** deposit (082JSW009) near Canal Flats. Typically it ships about 100 000 tonnes of gypsum per year from this quarry to its wallboard plant near Edmonton, Alberta. Both Westroc and Georgia Pacific operate wallboard plants in the Vancouver area.

Baymag Mines Company Ltd. produces high quality magnesite from the **Mount Brussilof** pit (082JNW001) at a rate of approximately 200 000 tonnes annually. The magnesite is transported by truck to Exshaw, Alberta where the company has two plant sites that produce sintered, calcined, and fused magnesia. The Silica Division of Highwood Resources Ltd. expects to ship about 80 000 tonnes of silica from its **Moberly** quarry (082N001), near Golden, mainly to Lavington, British Columbia. In the past it shipped to Springfield, Oregon, and other destinations; however, since the

collapse of silicon and ferrosilicon production in the United States, these shipments have stopped.

IMASCO Minerals Inc. processes a variety of specialized industrial mineral products at its plant at Sirdar, north of Creston. Raw materials include dolomite from the underground **Crawford Bay** mine (082FNE113) near Kootenay Lake, and calcium carbonate from the **Lime Creek** quarry (082FSW307) on Lost Creek, south of Salmo. Dolomite is used for soil conditioning, as a white ornamental aggregate, for stucco and roofing, as a fine aggregate, and to produce synthetic marble products. White calcium carbonate is used as a filler in paper, paint and plastics. The company also produces crushed granite and quartzite products from material mined at **Sirdar** (082FSE072) and near Crawford Bay. Dolomite is also quarried and processed by **Mighty White Dolomite Ltd.** (082ESE200) at **Rock Creek**.

TABLE 2. PRODUCING MINES AND QUARRIES, KOOTENAY REGION, 2003

Mine	Operator	Deposit Type	Forecast Production in 2003
Industrial Minerals			
Elkhorn	Westroc Inc.	Gypsum	500 000 tonnes
Moberly	Highwood Resources Ltd.	Silica sandstone	85 000 tonnes
Mount Brussilof	Baymag Mines Co. Ltd.	Magnesite	200 000 tonnes
4J	Georgia Pacific	Gypsum	175 000 tonnes
Black Crystal	Crystal Graphite Corporation	Graphite	
Crawford Bay	IMASCO Minerals Inc.	Dolomite	
Kootenay Stone	Kootenay Stone Centre	Flagstone	
Lime Creek	IMASCO Minerals Inc.	Limestone	
Rock Creek	Mighty White Dolomite Ltd.	Dolomite	
Rocky Mountain Slate	Rocky Mountain Slate	Flagstone	
Rocky Mountain Tufa	Alan Wolfenden	Tufa	
Sirdar	IMASCO Minerals Inc.	Crushed granite	
Swansea Ridge	CPR	Railroad Ballast	
Winner	Roxul (West) Inc.	Diorite	
Coal			
Coal Mountain	Elk Valley Coal Partnership	Metallurgical coal	2.1 million tonnes
Fording River	Elk Valley Coal Partnership	Metallurgical coal	9.0 million tonnes
Greenhills	Elk Valley Coal Partnership	Metallurgical coal	4.0 million tonnes
Line Creek	Elk Valley Coal Partnership	Metallurgical coal + minor thermal	1.8 million tonnes
Elkview	Elk Valley Coal Partnership	Metallurgical coal	5.6 million tonnes

No mining took place in 2003 at the **Winner** diorite quarry (082ESE265), near the past-producing **Phoenix** mine (082ESE020) in the Greenwood mining camp. Instead, plant feed for the insulation and mineral wool manufacturing plant of Roxul (West) Inc. in Grand Forks came from stockpiled material and also from the **North Fork** quarry (20 000 tonnes) north of Grand Forks. In 2004 the company plans to mine 50 000 tonnes from the Winner quarry. Canadian Pacific Railway mined, crushed and shipped railroad ballast from its **Swansea Ridge** gabbro quarry (082GSW065) south of Cranbrook.

Kootenay Stone Centre and other small operators quarry flagstone in the West Kootenays. In 2003, **Rocky Mountain Slate** did not reactivate the new slate quarry that it opened east of Golden in 2002. **Rocky Mountain Tufa** (082KNE059) produced about 2500 tonnes of tufa, mainly for landscaping applications.

Pacific Abrasives & Supply Inc. produces and processes slag from **Grand Forks Slag** (082ESE264) dumps mainly for sandblasting at major shipyards but also for roofing granules. For the last few years some slag has been excavated from the slag pile in **Greenwood** (082ESE266) as a raw material for

producing mineral wool by Roxul (West) International Inc. in Grand Forks. In 2003 MRI Americas purchased slag from Greenwood, trucked it to Mission, shipped it on barges to Texada Island then on ships on to Poland, where it will be used to produce lead crystal and abrasives. An initial 25 000 tonnes was extracted and significantly more demand is anticipated (Photo 8).



Photo 8. Greenwood Slag.

Coal

Early in 2003 a multiparty C\$ 1.8 billion agreement was reached to combine all the metallurgical coal assets of Fording, Luscar, and TeckCominco (all the Elk Valley mines), as well as the export terminals owned by Luscar and Westshore Terminals at Roberts Banks, to form the Elk Valley Coal Partnership. The partnership is initially 65% owned by the Fording Coal Trust, a TSX listed income trust, and 35% by Teck Cominco Limited, who will act as manager for the partnership. Teck Cominco can increase its ownership to 40% by achieving certain cost savings, and operational and marketing synergies.

Estimated coal production for the Elk Valley mines in 2003 was 22.5 million tonnes. Of this, the **Fording River** mine produced approximately 9.0 million tonnes of metallurgical coal, **Greenhills** 4.0 million tonnes, and **Coal Mountain** 2.1 million tonnes. Thus collective production from these former Fording operations increased to 15.1 million tonnes, up from 13 million tonnes in 2002. **Line Creek** expects to produce 1.8 million tonnes of coking coal and a minor amount of thermal coal, which is significantly less than the 2.6 million tonnes produced in 2002. **Elkview's** 2003 production is estimated to be approximately 5.6 million tonnes of metallurgical coal, similar to that in 2002.

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