

SOUTHWEST REGION

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SUMMARY AND TRENDS

Following the mining and exploration industries' strong performances in 2007 across the province, 2008 began with generally high expectations in the southwest for both commodity prices and exploration activity. Overall, 2008 spending on exploration remained strong in the southwest, relative to previous years. Rapidly changing conditions from late summer through the fall began to affect producers and explorers in the same way as virtually everywhere else. Companies with cash in their treasuries became increasingly selective and cautious, those without became reluctant or unable to undertake financing. In any year a number of proposed projects do not materialize or are cut short for various reasons. Anecdotally, financial reasons were cited more frequently in news releases and conversation in 2008 whereas in the previous year, equipment and personnel shortages, permitting or technical difficulties were frequently cited. Flow through tax incentives continued to be an important stimulus. Despite the economic uncertainty in the latter part of the year, several large projects did continue into November and December.

With zinc prices leading base metals later in 2008, an unfortunate result was the announcement in October that production at Breakwater Resources **Myra Falls Operations** would be suspended later in the year.

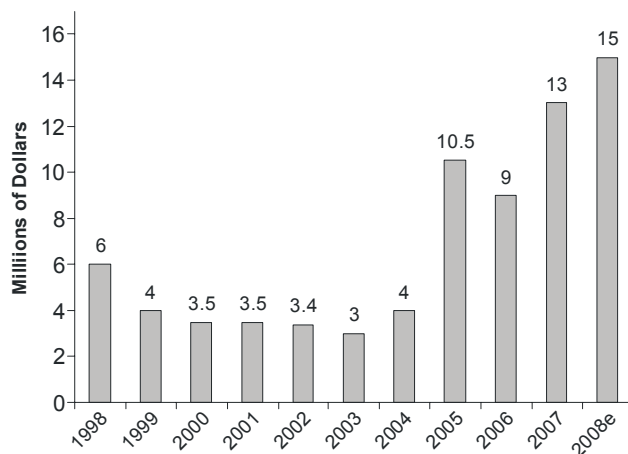


Figure 5.1. Annual Exploration spending in millions of dollars, Southwest Region.

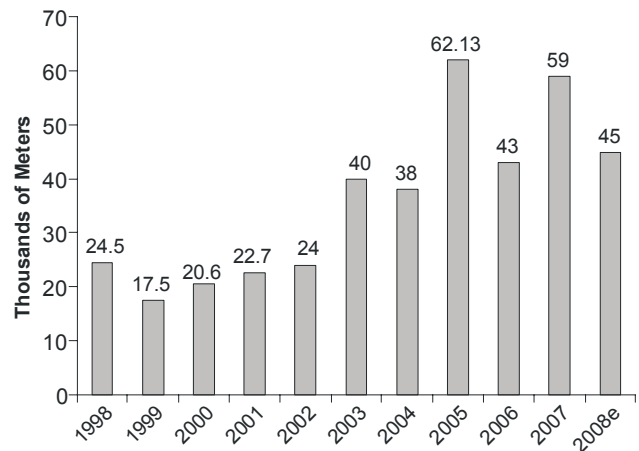


Figure 5.2. Annual exploration drilling in thousands of metres, Southwest Region.

Myra Falls has made significant gains in efficiency over the year and remains in operation at the time of writing.

Production at **Quinsam** thermal coal mine is on track to end at a similar level to the previous year. Employment at the mine is up over last year. With positive exploration results over the past several years, and continuing significant development work, an expansion of this operation remains likely.

Mine development spending is estimated at \$9 million for 2008, mainly at Myra Falls and Quinsam coal.

Production at the major quarries remained at high levels in 2008. Softening demand in the latter part of the year began to affect some producers. Contrary to this trend, Electra Gold Ltd anticipates approximately doubling its sales of chalky geyserite from **Apple Bay** in 2009 if an expected contract is finalized. Prices for aggregate and industrial minerals are negotiated either by shipment or contract basis; they may vary but are not necessarily subject to the same price fluctuations seen for metals.



Figure 5.3 Mines, quarries and major exploration projects of South West British Columbia 2008

Figure 5.3. Mines, quarries and major exploration projects, Southwest Region, 2008.

Similar to the rest of the province, the top exploration projects in the Southwest Region in terms of spending this year include the porphyry prospects **Hushamu**, **Catface**, **Okeover**, **Crack** and **Honeybun**. Iron skarns on Vancouver Island received a new level of interest in 2008. Two magnetite projects on the west coast of Vancouver Island were among the largest exploration efforts in the region this year: the **Pearson** project near Port Renfrew and the **Brynnor** near Ucluelet. **Myra Falls** completed a significant exploration program in 2008. One gold project, **Mineral Creek**, completed a major drill program, continued processing a bulk sample and discovered a new high grade vein. There were significant infill drilling

programs on resources surrounding the **Quinsam** coal mine. The **Raven** coal project was the subject of a new joint venture with international partners and a consolidation of the land position, which should allow further exploration work to proceed. Exploration programs for aggregates and industrial minerals also occurred in the region in 2008.

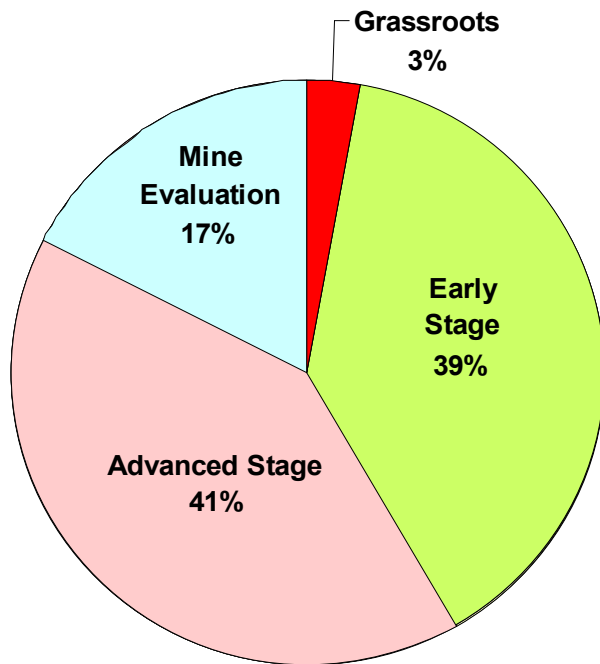


Figure 5.4. Estimated exploration spending by category, Southwest Region, 2008.

OPERATING MINES AND QUARRIES

Metals

News at **Myra Falls** over the course of 2008 included a revision of the production plan, a significant round of layoffs and a new labour contract with its hourly employees. The year was a difficult one for zinc producers, and Breakwater Resources Ltd, operator of Myra Falls, faced the same challenges as others. The mine instituted measures aimed at improving its financial performance; however, zinc prices continued to decline over the course of the year. As the price fell below 50 cents per pound in late October, Breakwater announced a planned suspension of operations at Myra Falls, along with its new Langlois mine in Quebec. These mines joined a number of other zinc operations worldwide which have reduced or temporarily stopped production in response to deteriorating market conditions in the second half of 2008. Breakwater Resources Ltd monitored the markets and its operations carefully and was able to keep the Myra Falls mine open throughout the year.

At December 31, 2007, Myra Falls had 5 835 000 tonnes of proven and probable reserves at 5.3% Zn, 0.05% Pb, 1.0% Cu, 45 g/t Ag and 1.3 g/t Au. Base metal prices used to determine economic viability for this estimate were significantly higher than prices at the time the decision was made to suspend production. At the time of the estimate, this would have suggested a mine life of 8 years based on an 800 000 tonne-per-year mine plan. Measured and indicated resources (including the reserves) were over 6.3 million tonnes at somewhat higher grades. A further 3.8 million tonnes are estimated in the inferred category. Toward the end of 2007 and into 2008 exploration efforts began showing encouraging results.

Development work at the Lynx and Price orebodies to allow exploration work and potentially mine development was suspended in favour of higher grade targets nearer existing infrastructure. A large portion of the 2008 capital expenditures at Myra Falls went toward construction of a new tailings disposal area.

Coal

In the nine month period ended September 30, Hillsborough Resources Limited's **Quinsam** thermal coal mine produced 335 098 tonnes of clean coal from 555 658 tonnes raw coal. Forecast production for 2008 was approximately 500 000 tonnes of clean coal. As in the previous year, delays related to training of personnel, faulted ground and equipment breakdowns impeded a planned increase in production at the underground room and pillar operation. Total in-situ reserves (proven and probable) are estimated at 23.1 million tonnes as of December 31, 2007. The majority of the mine's shipments travel from the site by truck to Campbell River and then by barge from the Middlepoint loading facility to customers in the Lower Mainland and Pacific Northwest. Local Vancouver Island customers are served by truck and international shipments can be taken to nearby deep water port facilities, such as that of Texada Quarrying Ltd on Texada Island.



Figure 5.5. Flotation tanks at Breakwater Resource's Myra Falls Operations.

Coal inventories at Quinsam in 2008 were higher than 2007, in part to fulfill an international shipment in the final quarter of the year, part of a larger off-take agreement with Vitol SA. Quinsam has locked in 2009 and 2010 international contract prices, offering some protection from recent price decreases for coal. Additionally the mine supplies five cement manufacturers in the Lower Mainland and Pacific Northwest.

Development at Quinsam proceeded with an underground access route, new equipment and an upgrade to the coal processing plant. Drilling at Quinsam North continued to define the resource there, and to provide geotechnical data for a mine development plan. The measured and indicated resource at Quinsam North is currently 21 million tonnes with 13 million tonnes being considered for a mining plan by the company. At the Quinsam 7 South area, there was infill drilling, including core drilling, to verify coal quality and facilitate developing an underground mine plan. The resource there is estimated at more than 3.8 million in-situ tonnes.

INDUSTRIAL MINERALS AND AGGREGATES

Limestone

Texada Island hosts three major limestone quarries producing aggregate, cement grade, agricultural and chemical grade limestone and dolostone products. The largest quarry is that of Texada Quarrying Ltd, a subsidiary of the large building materials company Lafarge North America Inc. Aggregates and Roadbuilding Magazine has identified this operation near **Gillies Bay** as Canada's largest quarry for several years, including 2007, when more than 7 million tonnes were shipped.



Figure 5.6. A truck from Quinsam releases its load of coal at Hillsborough Resources' Middlepoint barge loading facility.

As a rough estimate, Texada Quarrying's operation near **Gillies Bay** will ship 6 million tonnes in 2008, with 4.5 million tonnes of limestone to five plants in the Lower Mainland and some Seattle area cement plants. They also sold 0.5 million tonnes of chemical grade carbonate products to other plants and approximately 1 million tonnes of aggregate, including igneous dike material. The latter is shipped principally to the Lower Mainland market, including the Deltaport expansion project. Approximately 100 000 tonnes of asphalt aggregate went to Hawaii in 2008 as in 2007. Two years ago the quarry upgraded its ship loading facility, which is capable of accommodating Panamax class freighters.

Imperial Limestone Company Ltd forecasts 2008 production of 280 000 tonnes at its Quarry near **Van Anda** on Texada Island. This represents an increase over 2007. The product is shipped to parent company J.A. Jack & Sons Inc of Seattle, where it is processed and sold for chemical uses, agricultural lime, glassmaking, plaster and other industrial uses.

The **Blubber Bay Quarry** is owned by Ash Grove Cement Company. Recently the majority of the product has gone to the Lower Mainland market for use as aggregate. To the end of October the quarry had produced approximately 600 000 tonnes and shipped approximately 473 600 tonnes with a workforce of 16. Roughly 32 700 tonnes of dolostone is shipped to Ashgrove's Rivergate cement plant in Portland Oregon. As a rough estimate, Blubber Bay expects to produce another 10 000 tonnes by the end of the year before a temporary shutdown.

Imasco Minerals Inc operates a quarry at **Benson Lake**, northern Vancouver Island, producing a white crushed marble product. Production for 2008 is reported at 38 400 tonnes with shipments of approximately 40 800 tonnes. The high brightness material is barged from Port Alice to Imasco's Surrey facility and marketed as finely ground CaCO₃ (typically 95% purity) for fillers and extenders with a variety of industrial uses.

Aggregate

A brief survey of the largest producers in the Southwest Region demonstrated the continuing health of the industry into 2008. There were signs of a local drop-off in demand in late 2008 as local new housing starts decreased; however, local infrastructure development continues. Capability for water transport is the common feature of most of the largest operations. The Gillies Bay quarry, large operations at Sechelt and Port McNeill have facilities for loading Panamax class bulk freighters. Aggregate producers are often not prepared to release production forecasts, and pricing information.

Operated by Construction Aggregates Ltd, a subsidiary of Lehigh Cement Company, **Sechelt Pit** processed 5.7 and sold 5.1 million tonnes in 2007 and had anticipated an increase for 2008 to in part replace production at the now-closed **Producer's Pit** in Metchosin. An equipment failure early in the year slowed production from approximately February to June. Later in the year production was intentionally held back as inventories began to build up. A rough projection for 2008 is 5 million tonnes extracted and 4.5 million tonnes sold. Sechelt's principal market remains the Lower Mainland, with an estimated 20-25% of the product going to California and lesser amounts to Victoria and the Gulf Islands.

Polaris Minerals Corporation's **Orca** quarry near Port McNeill had a strong quarter in the three months ending September 30 with sales of 694 000 tons (630 000 tonnes). The company anticipates a yearly total of 2.1-2.5 million tons (1.9-2.3 million tonnes) shipped by the end of 2008. This is up from 1.15 million tons (1.04 million tonnes) in 2007. While aggregate prices generally have been under pressure following the decline of the US housing market, Polaris reports that prices received in its contracts are holding firm, even increasing slightly. Shipping fuel surcharges were affecting margins significantly. Under the terms of its contracts, it can recover these fuel costs in the year following the year in which they were incurred, *i.e.* 2009 sales prices will incorporate this recovery. At present, the 2009 contracts suggest 2009 volumes similar to those of 2008. Orca currently ships to markets in the San Francisco Bay area, Hawaii, and Vancouver. Like Sechelt, Orca products are of high quality and compete well on that basis. Infrastructure spending, particularly in California in the coming years will be important to Sechelt and Orca's export opportunities

The **Cox Station** quarry of Mainland Sand and Gravel Ltd produces crushed aggregate from quartz diorite on the north side of Sumas Mountain. Production in 2007 was approximately 2.5 million tonnes, following some equipment upgrades. Management estimates the quarry will ship approximately 2.7 million tonnes in 2008. Virtually all goes to local markets and most is shipped by barge on the Fraser River. At the time of writing, demand had remained steady.

Lafarge North America operates a large natural sand and gravel quarry at the mouth of Skookumchuk Narrows at **Earle Creek**. In operation since 1971, it is now capable of producing a maximum of 2.5 million tonnes per year. Recently it has produced 1.35 to 1.5 million tonnes per year. All material is shipped by barge to the Greater Vancouver market where 75% goes to value added applications such as ready mix, asphalt and block fabrication. On the **Pitt River** in Pitt Meadows, Lafarge's crushed aggregate plant produces 1.3 to 1.5 million tonnes per year. Approximately 50% of the product is shipped by barge and 50% by truck. It is used for asphalt and base construction. The new Golden Ears bridge from Langley

to Maple Ridge is expected to rely on aggregate from this and possibly other quarries.

The combined 2008 production of three sand and gravel quarries on **Pipeline Road** in Coquitlam is expected to exceed 2 million tonnes in 2008. These operations belong to Jack Cewe Ltd, Allard Contractors Ltd and Coquitlam Sand & Gravel. Valley Gravel Sales Ltd in Aldergrove has recently been another of the southwest region's more than 1 million tonne per year producers. Smaller pits in the region number in the hundreds.

Silica and Alumina

Sumas Shale Ltd continued with production at its **Sumas Mountain** quarry at virtually the same levels as previous years, with the large majority (98%) of its product consisting of shale, used in the Lower Mainland's cement industry. The remaining 2-3% is used in the brick industry. Companies under the Clayburn Industrial Group umbrella also manufacture and market products made from Sumas Mountain fireclay, used in refractory brick products.

Electra Gold Ltd's **PEM 100** quarry at **Apple Bay** has been supplying Ash Grove Cement Company in Seattle with chalky geyselite since 2003. Projected total shipments from the quarry this year are approximately 100 000 tonnes. Electra has also begun filling orders for Lafarge North America and is negotiating a longer term contract that would see production at the quarry approximately double in 2009. The chalky geyselite is an intensely silicified and clay altered rhyolite useful to cement makers as a source of silica and alumina. Early in the year, Electra completed a new access road to facilitate exploration and development of another geyselite resource on Holberg Inlet.

Lehigh Northwest Cement Limited's **Monteith Bay** quarry also produces a high silica geyselite used in the manufacture of cement. This quarry remained on care and maintenance in 2008.

Other Rock and Mineral Products

Great Pacific Pumice Inc's **Mount Meager** operation was placed on care and maintenance following an accident in 2007. Current management reports shipments on a small scale in 2008 and plans a return to full production in the coming year. The quarry is inaccessible during the winter and spring months, typically opening in May or June. Garibaldi Aggregates Ltd has also been producing pumice under bulk sample permits in the Mount Meager area as it progresses toward obtaining a mining lease. Pumice has a number of industrial and engineering applications, but most finds use as lightweight fill.



Figure 5.7. Golden Ears Bridge construction, Lower Mainland, as of early December 2008. In addition to fill, infrastructure projects such as this typically require high quality aggregate and other construction materials that can meet specific engineering standards.

There are a number of quarries in the region producing decorative rock for landscaping, flagstones, facing and dimension stone. Marble is quarried at several locations on Vancouver Island by Matrix Marble & Stone, based near Duncan, who also make a variety of value-added products. K2 Stone Inc has a **slate quarry** near Port Renfrew. At their facility at Duke Point near Nanaimo, the stone is split and cut to create building and landscaping products. Recently there have been other slate producers near Port Renfrew producing intermittently. The Squamish-Whistler corridor has several active quarries and intermittently active quarries. Huckleberry Stone Supply Ltd has been producing landscaping stone and facing for a number of years at its **Spumoni** quarry and other nearby locations. Corridor Masonry is another supplier of Quaternary Garibaldi volcanic rock. Granite is also quarried periodically in the Sea to Sky region. In recent years, historic quarries at **Hardy Island** (Hardy Island Granite Quarries Ltd) and **Haddington Island** (Haddington Island Stoneworks Ltd) have been shipping several thousand and several hundred tonnes respectively. Much of the product is processed at Bedrock Granite Sales Ltd in Coquitlam.

Sources of glacial marine clay for cosmetic purposes are best known near Bella Coola although other potential sources have been investigated. Glacial Marine Clays Inc (formerly Carrie Cove Cosmetics Inc), Precision laboratories Ltd and Ironwood Clay Company are among the companies that own the local quarries and market this material.

MINE DEVELOPMENT PROJECTS

(PROJECTS IN THE ENVIRONMENTAL ASSESSMENT PROCESS)

The **Cogburn** magnesium project entered the Environmental Assessment Office (EAO) pre-application with a project description report in 2005, following a 2003 feasibility study for Leader Mining International Inc. In 2007 the proponent communicated its decision to suspend its environmental assessment work pending more favourable economics. Among other factors, the project

would be sensitive to magnesium metal and energy prices. The deposit is a body of olivine-rich peridotite (dunite) with uniformly high magnesium content, located close to power and transportation infrastructure.

The **Hillsbar** aggregate project entered the EAO pre-application phase in 2003 with a project description submitted on behalf of Qualark Resources Inc, a corporation formed to represent Yale First Nation and other private interests. A new exploration-stage project at Hillsbar is operated by Yale First Nation and Lehigh Northwest Cement Company. The Yale First Nation has an investigative permit for sand and gravel.

Pan Pacific Aggregates Ltd started the environmental assessment pre-application process with its **Sechelt Carbonate** project in 2005. Pan Pacific continued to advance the project until 2007 with significant exploration programs totalling several millions of dollars. The principal targets are chemical and cement grade limestone and dolostone deposits. The company cited delays in submitting a large producer permit for the northern Sechelt Peninsula and in 2008 Pan Pacific's focus shifted to a new acquisition, the **Pumptown Quarry** in the Fraser Valley. Near-term plans as of the end of September 2008 were to develop their Fraser Valley aggregates business and utilize an existing small producer permit on the Sechelt Peninsula. Negotiations with Columbia National Investments Ltd to acquire an aggregate operation at Pine Flats (next to Construction Aggregates Sechelt Pit) were not concluded by year end. Pan Pacific retains a large tenure holding on the Sechelt Peninsula.

Eagle Rock, a permitted crushed rock quarry on Alberni Inlet, has remained undeveloped as Polaris Minerals Corporation focuses its efforts on the Orca quarry and securing sales contracts and access to port facilities in its primary target market. AMEC, a company under contract to Polaris, has resumed a feasibility study of Eagle Rock for Polaris and the company has renewed its BC Environmental Assessment certificate, which would have expired in September 2008. The prospective product at Eagle Rock would be mined from a uniform, unfoliated, medium grained slightly porphyritic granodiorite phase of the early Jurassic Corrigan Pluton.

TABLE 5.1. PRODUCING MINES AND QUARRIES, SOUTHWEST REGION, 2008.

Mine	Operator	Commodities	Mine Workforce	Forecast Production 2008	Reserves as of Dec 31, 2007
Metals					
Myra Falls Operations	NVI Mining Ltd (Breakwater Resources Ltd)	Zn-Cu-Au-Ag	287	34 200/29 000 t Zn 4900/4700 t Cu 485/361 kg Au 21 700/12 900 kg Ag (Metal in concentrate, contained/payable)	5 835 000 t 5.4% Zn 0.5% Pb 1.0% Cu 1.3 g/t Au 45 g/t Ag
Coal					
Quinsam	Quinsam Coal Corp (Hillsborough Resources Ltd)	Thermal coal	150	500 000 t clean coal	23.090 million t (proven and probable in situ reserves)
Industrial Minerals					
Apple Bay (PEM 100)	Electra Gold Ltd	Chalky geyselite	8	100 000 t	~5 million t
Benson Lake	Imasco Minerals Inc	White marble	5	38 400 t	100+ years
Blubber Bay	Ash Grove Cement Corp	Limestone aggregate, dolomitic limestone	16	610 000 t	100+ years
Gillies Bay	Texada Quarrying Ltd Lafarge North America Inc)	Limestone, aggregate	104	6 million t	100+ years
Van Anda	Imperial Limestone Company Ltd (JA Jack & Sons Inc)	Limestone	11	280 000 t	~50 years
Monteith Bay	Lehigh Northwest Cement Limited	Geyselite	Care and maintenance 2008		
Mount Meager	Great Pacific Pumice Ltd	Pumice	Care and maintenance 2008 (minor shipments)		100+ years
Sumas Mountain	Sumas Shale Ltd Clayburn Industrial Group and cement manufacturer (partners)	Shale and clay	10-20	510 000 t	~70 years

EXPLORATION HIGHLIGHTS

Northern Vancouver Island

IMA Exploration Inc optioned the **Hushamu** property in 2008 and was carrying out their initial phase of drilling late in the year in the **NW Expo** area, the site of 2005 and 2007 intersections of porphyry style molybdenum and gold mineralization. The majority of 2008 work occurred on the NW Expo. The company also began infill drilling on the Hushamu deposit itself. The company hopes to upgrade the inferred resource and collect data on molybdenum grades, not currently included in the resource estimate.

There are several known mineral occurrences within the area covered by the Hushamu property in what is commonly referred to as the Island Copper trend. Known porphyry copper-molybdenum-gold prospects are associated with Early to mid-Jurassic Island Plutonic Suite (diorite, quartz diorite, quartz monzonite and granodiorite) and Lower to Mid Jurassic volcanics of the Bonanza Group north of the WNW trending Holberg Fault and south of the WNW trending contact with Vancouver Group rocks. A string of lead-zinc (\pm silver) skarn occurrences follows this northern contact, several of which have been the subject of work in recent years.

Sand and gravel producer Polaris Minerals Corporation conducted exploration on its Northern Vancouver Island properties in 2008, which include the **Bear Creek**, **West Cluxewe** and **Cougar** properties.

Electra Gold Ltd acquired the right to obtain coal licences covering the **Suquash** coal field near Port Hardy. There was an initial exploration program in 2008.



Figure 5.8. A drill rig at the foot of Hushamu Mountain, on IMA Exploration's Island Copper project.

Following more intensive activity in 2006 and 2007, the **Merry Widow** property of Grande Portage Resources Ltd was relatively quiet in 2008. They have initiated a program of monthly baseline environmental sampling in the drainage area surrounding the Merry Widow Pit.

Western Gateway Minerals Inc conducted a 1000 m drill program on the **Copper Tree** property near Menzies Bay early in 2008. Copper mineralization has been described as redbed copper and vanadium, occurring largely as chalcocite and native copper in interflow sediments and/or tuffs near the top of the Karmutsen Formation. Copper is also found in amygdules within the flows themselves, but these occurrences have so far proved lower grade. Deposits in the Menzies Bay area have seen small scale historic production, despite the elusive, flat-lying and apparently spotty nature of mineralization.

Near Tahsis, Homegold Resources carried out a small drill program at its **Glengarry/Rob Roy** property. These showings are recorded in MINFILE (092E 001, 092E 015) as iron skarns, but there is also potential for gold mineralization.

Mid Island

Exploration efforts at **Myra Falls** changed focus over the course of the year. Drilling the Marshall Zone from the surface proved difficult, but has produced at least two impressive intersections. Hole MR15-0014 intersected 6.6 m (true width) of 12.8% Zn, 0.8% Cu, 109 g/t Ag, 2.7 g/t Au and 1.1% Pb. Hole MR15-0015 confirmed that the zone extends west into an untested area, with a 7.5 m intersection of 6.47% Zn, 0.46% Cu, 0.36% Pb, 1.1 g/t Au, 83.6 g/t Ag. Given that targets are more than 800 m below surface, the company has decided that future drill testing of the Marshall Zone will require a new drift. The inferred resource at the Marshall is 2.0 million tonnes at 8.8% zinc. As the need to cut exploration expenses became apparent, exploration drilling in the latter part of the year moved closer to existing mine infrastructure. Underground drilling focused on the peripheries of the Bornite and Gnu lenses, west of the Gopher lens and on an east extension of the HW Main zone. This relatively inexpensive closer-range exploration has been successful in locating extensions of the Bornite and Gnu mineralization and also a possible western down-drop of Gopher mineralization and host stratigraphy.

As noted above, Hillsborough Resources Ltd carried out definition drilling at **Quinsam North** and **7-South**. The combined programs consisted of approximately 3500 m of rotary and core drilling to define and upgrade the resources and for geotechnical and environmental testing. The company hopes to obtain necessary permits, proceed with feasibility studies and develop mine plans for underground and a potential open cast operation. They expect to significantly expand and extend coal mining operations at Quinsam in future.

A further indicator of the potential of coal to once again enhance the Vancouver Island local economy. The **Raven** coal project of Compliance Energy Corporation was quiet on the ground in 2008. Compliance and its partners, Itochu Corporation and LG International Corp, reached an agreement to purchase from West Fraser Mills Ltd certain freehold coal, mineral and gas rights, consolidating the joint venture's Comox Basin holdings. The Korean partner also agreed to provide the funding necessary to reach a production decision on the Raven coal project. The Raven deposit's measured and indicated resources stand at 39 million tonnes with a further 59 million tonnes in the inferred category. The coal is classified as High Volatile A Bituminous. A preliminary economic assessment considered production of both thermal and metallurgical coal.

A joint venture between Bitterroot Resources and Mineral Creek Ventures Inc proceeded with a significant drill program and processing of a bulk sample at the **Mineral Creek** project. As of August, more than six hundred grams of gold had been produced from 4.8 tonnes of ore mined from the Lower Linda vein. Based on these results, the partners have purchased new crushing equipment and are ordering a mill which is expected to allow much higher throughput. The project has a permit to process a bulk sample of up to 5000 tonnes. In August 2008, a new quartz vein, the Ember vein, was discovered approximately 120 m south of the Lower Linda. True width at the discovery outcrop is approximately 0.5 m. Chip samples returned results of 29.9, 41.6 and 69.7 g/t Au. Early drill results are impressive, with 253.6 g/t Au over an estimated true width of 1.5 m (Hole BTT-L54 from 64.3 to 68.8 m).

The **Catface** copper deposit saw a major exploration project for the first time in nearly 20 years in 2008. Selkirk Metals Corp drilled approximately 2400 m in eight NQ holes during a two month helicopter-supported program. The mineralized zones at Catface are called the Cliff, Irishman Creek and Hecate Bay zones. Most of the work and all of the drilling in 2008 and historically has focused on the Cliff zone. Drilling was intended to confirm historical copper results. Assays available at time of writing have done so, and in addition indicated significant and consistent silver values. Further work would be required to upgrade historical resource estimates to NI 43-101 standards. The Cliff zone has a 1990 drill indicated resource estimate by SRK Consulting of 170 million tonnes at 0.43% Cu using a 0.30% cutoff (or 390 million tonnes at 0.31% Cu using a 0.15% cutoff).

Mineralization at Catface is largely fracture controlled and hosted by several lithologies, including Westcoast Crystalline Complex diorite, a probable Island Intrusive Suite member and Karmutsen (possibly Sicker) volcanic rocks. Mineralization appears genetically related to mid-Eocene porphyritic quartz diorite to granodiorite stock or cupola, part of the Tofino Intrusive Suite.

East of Ucluelet near Kennedy Lake, Logan Resources published an initial resource estimate and



Figure 5.9. A helicopter-portable drill rig on the Cliff zone at Catface Copper.



Figure 5.10. Drilling underground at Myra Falls. Exploration focused on targets close to existing mine infrastructure in the latter half of 2008.

preliminary economic assessment for the **Brynnor** iron deposit. It is located on the company's Redford property, most recently explored for its gold potential. The NI 43-101 compliant estimate of 7 070 000 tonnes of a measured and indicated resource grading 51.3% Fe is based on historical data. A further 18 620 000 tonnes are in the inferred category. Brynnor is a magnetite skarn at the site of a Noranda mining operation in the 1960s. Following discovery in 1960, magnetite was concentrated and shipped from nearby loading facilities in Toquart Inlet to customers in Japan from 1962-1968. The contract was for 635 000 tonnes per year for a period of seven years. High iron ore prices in 2007 and the early part of 2008 prompted a re-evaluation of the economics of an operation on a similar scale.

In addition to the resource estimate, Logan carried out reconnaissance prospecting and soil sampling on the Redford property and conducted a significant drill program at the end of 2008 with the objective of upgrading and extending resources.

Magnetite at Brynnor occurs within a sequence of limestone and tuff of the Upper Triassic Quatsino Formation. Diorite and granodiorite of the Island Plutonic Suite are in intrusive contact with the limestone and tuff, which are also intruded by Tertiary diorite to syenite dikes.

South Island

Pacific Iron Ore Corporation is a new public company also focusing on magnetite iron ore exploration on southwest Vancouver Island. Pacific Iron Ore has substantial land holdings along the west coast of Vancouver Island. The principal targets at the **Pearson** project are iron skarns located north of the San Juan Fault in an area underlain by largely by diorites of the Westcoast Crystalline Complex and quartz diorite to granodiorite of the Island Intrusive Suite. Magnetite skarns are associated with gabbro-diorite intrusives and carbonates thought to belong to the Vancouver Group. There are historical resource estimates calculated for individual deposits on the property, however significant new drilling (53 core holes) was completed in 2008 and an extensive airborne geophysical survey begun.

Nitinat Minerals Corporation conducted an airborne geophysical survey over the **Jasper** property in February. Grassroots exploration work in recent years has identified a number of sulphide occurrences in addition to the four documented MINFILE occurrences on the property (092C 037, 80, 81, 88). In addition, the airborne survey identified 22 EM anomalies which did not coincide with known sulphide occurrences. The property is reported to have been drilled in the 1970s and 80s (packsack drilling) but no record of this work has been made public. Government regional mapping shows the area is underlain mainly by Lower Jurassic Bonanza Group volcanic rocks and Island Plutonic Suite granodioritic rocks. Possible Tertiary felsite dikes are also reported.

Mill Bay Ventures Inc assembled lands covering the **Valentine Mountain** gold prospect (MINFILE 092B 108) and the BPEX or Braiteach zone (MINFILE 092B 075) along with other vein occurrences not recorded in MINFILE. The company initiated work with a reconnaissance program of prospecting, geological mapping and sampling. The Valentine Mountain gold project is underlain by greenschist to amphibolite grade metamorphic rocks of the Pacific Rim Terrane, mainly Leech River Complex metavolcanics and metasediments. These are intruded by Tertiary quartz diorite of the Mount Washington Plutonic Suite and Late Cretaceous Jordan River metagranodiorite. A major thrust fault, the sinistral-



Figure 5.11. Garry Payie atop a creek exposure of massive magnetite at Pacific Iron Ore’s Pearson project.



Figure 5.12. Plant fossil below a coal seam near the Quinsam mine. The finger belongs to consultant Gwyneth Cathyl-Bickford.

oblique Leech River Fault, lies immediately to the south and divides the Pacific Rim and Crescent Terranes. Native gold is found in quartz veins which postdate milky white metamorphic veins.

Active placer camps remain along the Leech and Jordan rivers after more than 150 years of production.

Inside Coast

Work began late in 2008 at J&S Kulta Mining Inc’s **Bute Inlet** property with preparation of drill pads. The target is a possible copper gold skarn. The property hosts a known black sand placer magnetite occurrence. Exploration is expected to resume in the spring.

Sunshine Coast

Prophecy Resource Corporation acquired an option to earn an interest in Eastfield Resources Ltd's **Okeover** property in 2006. This copper-molybdenum prospect, located 20 km north of Powell River on Okeover Inlet, has been explored intermittently since the 1965 discovery of mineralization in creek beds. A 2006 resource estimate has an inferred 86.8 million tonnes at 0.31% Cu and 0.014% MoS₂ at a 0.2% Cu cutoff.

Prophecy's 2008 program consisted of six diamond-drill holes totalling 1449 m. Five holes were step-outs to the south and west of the North Lake zone. The remaining hole was drilled three km to the south.

Diamond drilling programs in 2007 and 2008 were successful in extending North Lake zone mineralization. A 300 m step out to the east encountered mineralization in 2007 and Hole OK-08-03, a 90 m step out to the south in 2008, encountered 45.5 m grading 0.33% Cu and 0.003% Mo. The results suggest the existing inferred resource could be expanded considerably.

The Okeover, or OK property is a calc-alkalic porphyry copper-molybdenum occurrence which is somewhat unusual in that it is situated within the Coast Plutonic Complex (Jurassic-Cretaceous diorite to granodiorite). Like several other porphyry occurrences in the CPC (see Crack Mo and Honeybun, below) mineralization is associated with younger (typically Tertiary) intrusions. In the case of Okeover, these younger intrusives are identified as the OK intrusive complex (quartz diorite, possible granodiorite), and remain undated, though presumed to be Tertiary in age. At least eight showings are distributed in a roughly NNW orientation over approximately five to six kilometres. Of these, the North Lake zone is the only one for which there is a resource estimate.

Sea-to-Sky Region

Wolverine Minerals Corp carried out a program of mapping and diamond drilling on its **Gold King** property (MINFILE 092JNE054) northwest of Pemberton. The property hosts a number of skarn and polymetallic vein prospects and occurrences, mainly in rocks mapped as Cadwallader Group volcanics and lesser sedimentary rocks. Six holes totalling just over 1000 m tested IP chargeability anomalies. All drillholes intersected skarn-related pyrrhotite zones, within which there were some intervals with elevated gold values. Other smaller grassroots stage gold exploration projects occurred in the area north of Pemberton. Also in the sea to sky region, mainly along the Squamish-Whistler corridor, there were several small new projects to quarry aggregate, granite and Quaternary volcanics.

Harrison Lake – Northern Cascades

Wallbridge Mining optioned a large property north of Harrison Lake covering a 2007 discovery by bulldozer operator and prospector Gary Poirier of porphyry style alteration and mineralization. The company reports a number of highly anomalous copper gold and molybdenum values in early grab samples. Encouraged by initial results, the program in summer-fall 2008 consisted of approximately 1400 line km of airborne magnetometer and VLF-EM surveying with prospecting, mapping, and silt, soil and rock sampling on the **Roger's Creek** property.

Regional mapping shows the area underlain largely by Miocene miarolitic granodiorite and syenodiorite with Miocene volcanics and minor sediments. Roger's Creek roughly coincides with an area of anomalous copper in rock samples, a steep magnetic gradient (low to the southeast, high to the northwest) and, on some regional maps, a contact between the Miocene intrusive and Late Cretaceous quartz diorite.

The Roger's Creek area has seen limited grass roots exploration in the past by Placer Development Limited and Noranda Exploration Company Limited in the 1980s. Work was not in precisely the same area as the new targets. Geochemical anomalies were recognized, but follow up never progressed beyond preliminary work. MINFILE occurrences are known to the east (092JSE021) and to the southwest near the Lillooet River (092GNE010, 13, 19, 26, 31, 40). Most of these are placer gold showings.

Westminster Resources Ltd drilled the **Honeybun** molybdenum porphyry prospect in 2008. Results of the approximately 1200 m helicopter-supported diamond drilling program were not yet available at the time of writing. Honeybun is one of a number of molybdenum occurrences in the northern Cascades, several of which saw activity in 2008.

Ten kilometres to the south, Pacific Cascades Minerals Inc conducted IP and diamond drilling on the **Crack** molybdenum project in 2008 with 6.8 line km extending the previous survey to the west. They completed three core holes, totalling 1325 m. No significant intersections were reported following the 2008 program. Future work would return to the area of more promising intersections encountered in 2007.

The **Gem**, located a further 12 km to the southeast has a small historic resource. In 1968, Utah Construction and Mining Company estimated reserves at just under 16 million tonnes grading 0.125% MoS₂ at a 0.10% cutoff. This appears to be the only published molybdenum resource among the showings in the area.

TABLE 5.2 SIGNIFICANT EXPLORATION PROJECTS, SOUTHWEST REGION, 2008.

Property	Operator	MINFILE (NTS ref.)	Commodity	Deposit Type	Work Program	Metres Drilled
Bear Creek	Polaris Minerals Corporation	092L 055	Aggregate	sedimentary	PD, GP	n/a
Brynnor	Logan Resources Ltd	092F 001	Fe (magnetite)	Fe skarn	GC, DD	6200
Catface	Selkirk Metals Corp	092F 120	Cu, Ag	porphyry Cu	DD	2400
Crack	Pacific Cascades Minerals Inc	092HNW072	Mo	porphyry Mo	DD, IP	1325
Honeybun	Westminster Resources	092HNW065	Mo	porphyry Mo	DD	1200
Hushamu/NW Expo	IMA Exploration Inc	092L 240	Cu, Mo, Au	porphyry Cu-Mo-Au	DD	5200
Mineral Creek	Bitterroot Resources Ltd	092F 079	Au	veins	DD, UG-BU, PP	6450
Myra Falls	NVI Mining Ltd (Breakwater Resources Ltd)	092F 330	Zn, Cu, Pb, Au, Ag	VMS	DD, UG	n/a
Okeover	Prophecy Resource Corp	092K 008	Cu, Mo	porphyry Cu-Mo	DD	1449
Pearson	Pacific Iron Ore Corporation	092C 091, 092C 022	Fe (magnetite)	Fe skarn	DD, AB	~7872
Quinsam North and 7 South	Hillsborough Resources Limited	092F 319	coal	sedimentary	PD, DD	3508

Note: Myra Falls and Polaris Minerals had not made details of their programs public at the time of writing.

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 totalling 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 (Xm) = X metres of underground development; UG-BU = underground bulk sample; UT = UTEM; VLF; WT = washability test (coal)

Pacific Coast Nickel Corp drilled its **Big Nic** property east of Harrison Lake in 2008 with seven core holes totalling 500 m. There were several short intersections assaying more than 0.1 % Ni, however, it does not appear that mineralization corresponding to the impressive massive sulphide float on the property was intersected.

Academy Ventures Inc optioned the **Doctors Point** property, a 1975 discovery of gold in quartz-pyrite-arsenopyrite veins in Gambier Group rocks (Brokenback Hill Formation) on the west side of Harrison Lake. There is a historic resource of 113 600 tonnes grading 2.16 g/t Au and 6.2 g/t Ag. Academy carried out an approximately

1000 m drilling program consisting of 11 holes on three targets.

Also west of Harrison Lake, DJ drilling drilled the **LD** polymetallic vein showing, underlain by Lower and Middle Jurassic Harrison Lake Formation andesites, rhyolite and pyroclastics.

Nomad Ventures Inc optioned the **Krof** (MINFILE 092HNW070) massive sulphide prospect on the east side of Harrison Lake and extended a 2006 airborne survey in 2008 to cover newly staked ground. The airborne survey has identified a northerly trending series of EM anomalies. In addition, 2008 soil sampling identified a



Figure 5.13. Slings with a long line at the Crack molybdenum project. Despite an extensive road network, the rugged terrain (and road deactivation) necessitated helicopter support for several projects on the east side of Harrison Lake.

nickel anomaly in the eastern part of the property. Known mineralization at Krof consists of stratabound massive and banded copper and zinc rich sulphides in mafic metavolcanics and lesser metasediments of the Cogburn Group.

Whiskey Peak Resources Ltd flew an airborne geophysical survey over its **Harrison Lake** property in the Mount Breakenridge area in 2008. The EM and magnetometer survey covered approximately 1150 line km and indicated a sizeable EM anomaly. The target is ultramafic hosted copper-nickel mineralization

Across the Fraser River from the town of Yale, the Yale First Nation and Lehigh Northwest Materials initiated their activities at **Hillsbar** with an archaeological survey. The target is a sand and gravel resource. Hillsbar is also known for its placer gold in the river gravels. It was the site of a gold rush in 1858, preceding discoveries up-river and the Cariboo Gold Rush.

OUTLOOK FOR 2009

Producers and explorers in the southwest are facing the same economic conditions as the industry in general. At the time of writing, availability of venture capital and other forms of financing upon which the industry depends remain limited. Base metals and thermal coal prices are well off recent highs. Although specifics of aggregate and industrial minerals contracts are generally not made public, several aggregate and industrial minerals producers indicate that they expect flat or somewhat lower demand for their products in 2009. However, not all expect to follow the prevailing trend – a few aggregate producers project higher sales in 2009, based on their individual contracts.

New housing construction, a major consumer of aggregate, cement, building stone, landscaping stone and other industrial mineral products, remains slow in the United States and housing starts have begun to decline in the Lower Mainland. Continuing and possible new public works projects in the local market and along the US west coast will offset this to some extent.

The operators of Myra Falls are watching markets carefully. The mine has made progress toward profitability even in the face of current low zinc prices. Considerable exploration potential appears to remain at this camp, suggested by the ambitious drill programs in 2007 and early 2008.

Several significant exploration programs in the region could see continuation or follow-up in 2009 based on their results. However, those companies with substantial treasuries may choose to conserve cash or seek to acquire new projects at attractive prices. For those companies, the current situation may represent a purchasing opportunity not seen for more than six years.

At the time of writing gold prices are holding up relatively well and Bitterroot Resources and Mineral Creek Ventures have indicated their intention to move forward with the Mineral Creek project, purchasing new equipment to process their bulk sample, now in progress. Preliminary grades and a new discovery (with impressive drill intersections) on the property provide ample incentive to continue this project, particularly with the bulk sample generating revenue.

Selkirk Metals was successful at Catface in 2008. Further work is warranted, based on this year's results.

IMA Exploration has a large treasury and at the moment is focused on their Northern Vancouver Island project. Depending upon results of the current program (unreleased at time of writing), they may choose to continue in 2009.

Compliance Energy Corporation expects to formalize a joint venture agreement with ITOCHU Corp and LG International Corp. With the agreement in place, the company plans a large exploration program on their Raven coal project in 2009.

Prophecy Resources was successful at Okeover in 2007 and 2008 with step-out drilling. They may be in a position to produce a new resource estimate

The new work at Brynnor and Pearson magnetite iron projects on the west coast of Vancouver Island may also leave operators in a position to expand or update their resource estimates. Direct shipping magnetite ore from these deposits located near tidewater could become an attractive proposition assuming prices for iron improve.

Several private companies have plans to go public on the basis of "properties of merit" located in the southwest. While some may proceed as planned, a number of these are expected to await more favourable market conditions than those anticipated in 2009.

There are a number of active prospectors in the Southwest Region, particularly on Vancouver Island. Grassroots exploration is relatively well represented in this region, though it is most often done with limited resources and not all finds are formally reported, much is intentionally kept confidential. This type of work is likely to continue regardless of economic conditions and some of it will ultimately lead to new projects.

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Thanks to all those who generously provided access to their properties and access to information over the course of 2008. This article provides only a brief look at the considerable contribution that the mineral industry makes to the regional economy in any given year and can only vaguely suggest its future potential. It is hoped that this article plays some small role in keeping those in government and the public informed of the industry's continuing and future importance to the region's economy.



Figure 5.14. Dan Berkshire beside one of his recently discovered roadside exposures of coal on Vancouver Island.