



BRITISH
COLUMBIA

Ministry of Energy and Mines
Resource Development Division

INDUSTRIAL MINERALS IN BRITISH COLUMBIA

2003

By G.J. Simandl, B. Grant, D. Terry, M. Cathro, B. Lane, P. Wojdak, J. Houle and T. Schroeter



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INTRODUCTION AND INVESTMENT CLIMATE

Industrial minerals are an increasingly significant component of international trade. British Columbia is strategically located to take advantage of such trade, by its location on the west coast of North America (Figure 1). It has a well-developed transportation and industrial infrastructure, particularly in the southern, populated third of the province. It has several deep-water ports, a well maintained all-weather highway system that permits efficient, long-distance trucking. Rail lines link British Columbia's industrial centers to terminal points across Canada and USA.

The province has attractive energy costs, a well-trained and experienced workforce and untapped mineral resources. British Columbia's industrial mineral production for 2002 is estimated at \$56 million, and mineral exploration expenditures are an estimated \$2.6 million, which is about 8% of the province's exploration investment in 2002. Production is expected to increase this year, even though exploration expenditures declined. Structural material production is estimated at \$493 million.

British Columbia has excellent geological potential for over 40 industrial mineral commodities and there are already over 2400 industrial mineral occurrences described and georeferenced in MINFILE, an interactive mineral occurrence database available free on the Internet at:

www.em.gov.bc.ca/Mining/Geolsurv/Minfile/

There are a number of government initiatives available to industrial minerals developers, including the *British Columbia Mining Exploration Tax Credit Program*, the Federal Government flow-through share program and a Private-Public Partnership program (P3) for geoscience surveys.

SUMMARY OF INDUSTRIAL MINERAL ACTIVITY

The most economically significant industrial minerals produced are: magnesite, white calcium carbonate, limestone, silica, dimension stone, gypsum, sulphur, construction aggregate and crushed rock. Commodities produced in lesser quantities include jade (nephrite), magnetite, dolomite, barite, volcanic cinder, pumice, flagstone, clay, tuffa, fuller's earth and zeolites. There are more than 40 mines or



Figure 1. Strategic geographic location of British Columbia in western North America with access to Pacific Rim countries.

quarries and at least 20 major sites where upgrading of industrial minerals into value-added products takes place, not counting the aggregate operations listed by the British Columbia Aggregate Producers Association. Selected mining operations are shown on Figure 2, and processing plants are included on Figure 3. Most of these operations are concentrated close to existing infrastructure and markets.

TRENDS

Over the last three years, the most significant industrial minerals trend in British Columbia has been the increasing export of crushed stone and natural aggregate to urban centres along the west coast of the United States. This market, however, is becoming very competitive as industry identifies new potential for development.

Another important trend, which was not apparent during the 1990s, is the increase in value-added processing of raw industrial minerals. In 2001, we witnessed the development of a basalt quarry and related roofing-granule plant in

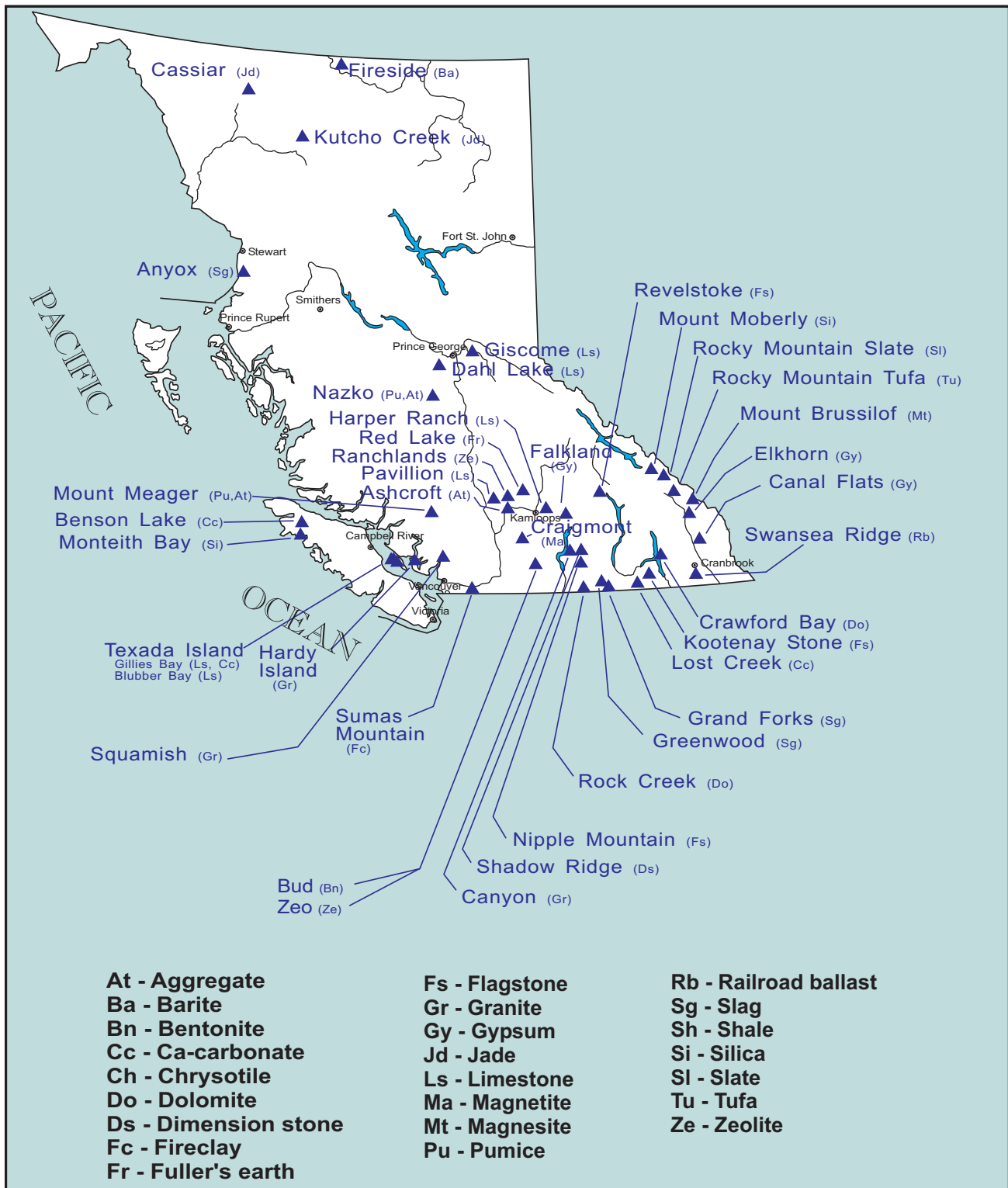


Figure 2. Selected industrial mineral mines in British Columbia.

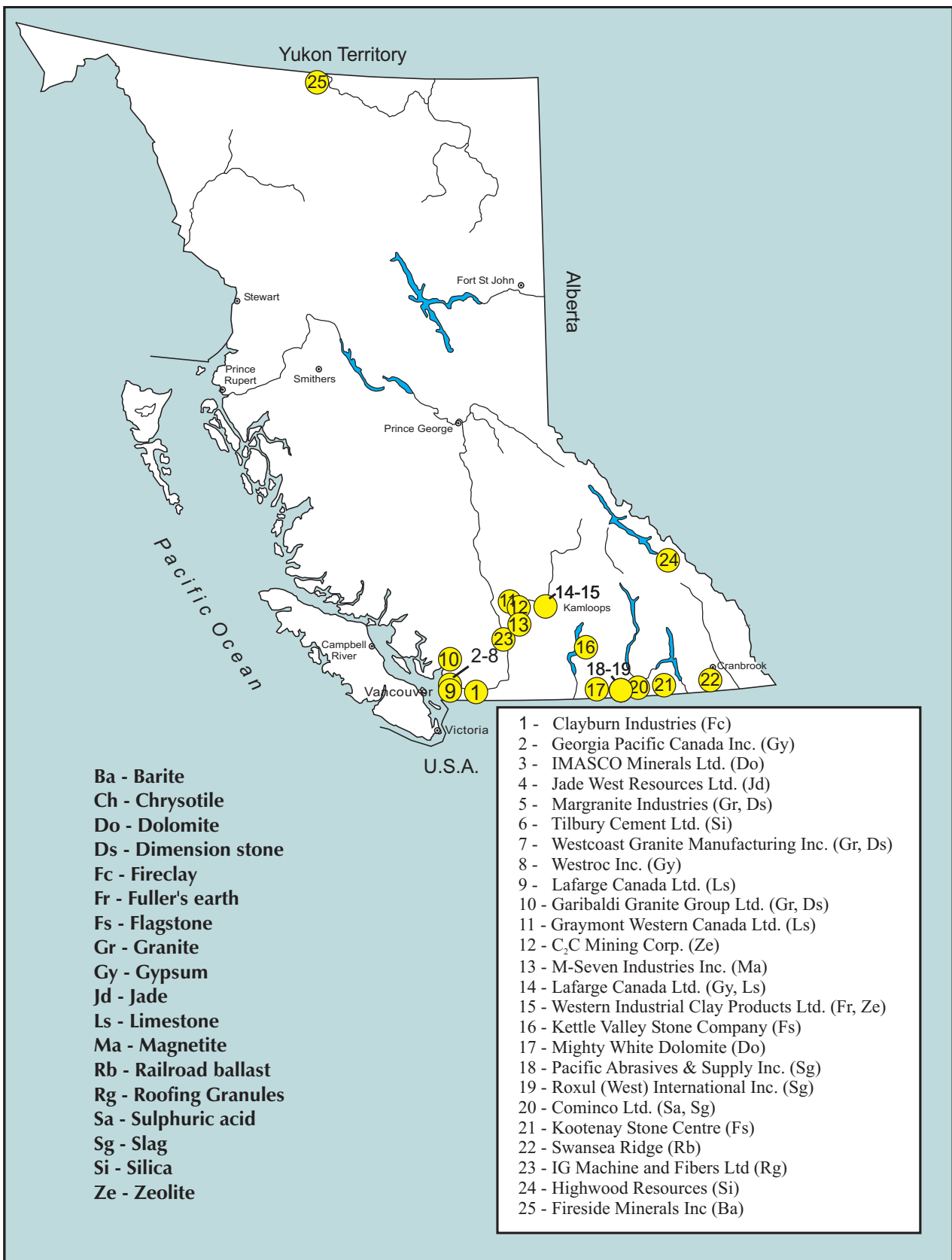


Figure 3. Selected industrial mineral processing plants in British Columbia.



Figure 4. Elkhorn gypsum quarries near Windermere; Westroc Inc.

the Ashcroft area of BC. The plant reached 50% of its designed capacity, of 500 000 tonnes, in mid July 2002. The continuous investment by Roxul (West) International Inc. in its mineral wool plant near Grand Forks also supports this trend. In November 2002, Clayburn started trial runs to produce lightweight aggregate based on the material from its Sumas Mountain shale quarry. There is extensive opportunity for additional local value-adding activity.

On a smaller scale, an increase in the number of flagstone operations, and a significant interest in tufa and other landscaping materials has been noted. Such projects do not require major capital investments and are ideally suited for family-type businesses.

It is expected that over the next few years, new opportunities will arise in the field of 'green' minerals along the west coast and the Pacific Rim in general. Green minerals are those that can be used in environmental clean-up, agriculture, waste disposal or otherwise improve the environment. Agricultural markets for zeolites appear to be improving this year and they may further benefit from the lifted moratorium on new, salmon-farm developments in the province. BC has number of well-documented bentonite deposits and several warrant rigorous laboratory testing. Depending on test results, some of these deposits could



Figure 5. Baymag Mines Company Ltd. mines magnesite at Mount Brussilof.



Figure 6. Silica processing plant, Golden area, Highwood Resources Ltd.

supply material for linings and barriers in waste disposal applications, and potentially for drill-mud applications.

The BC offshore energy potential presents a significant new area of interest in the province for development. Assuming development drilling takes place, and that BC bentonite meets specifications, this could develop into an important industrial minerals market sector.

Starting in 2002, there was an increase in the search for pozzolans near major population centers (materials sought for their cementitious properties). Deposits of specialty, natural and light-weight aggregates, such as pumice, may also be on the upswing. An increase in the use of natural pozzolans and lightweight aggregates is expected, at least in part, as consequence of the ratification of the Kyoto protocol. The use of natural pozzolans and fly ash, reduces energy consumption and greenhouse gas emissions. Niche markets will continue to provide opportunities for smaller scale operators.

COMMODITY REVIEW

Gypsum

Westroc Inc estimates production of 475 000 tonnes of gypsum from its Elkhorn quarries near Windermere (Figure 4) in 2002. During the last four years, the company drilled 98 holes, which indicated a resource of 16.7 million tonnes of gypsum on its Koot property, northeast of Canal Flats. In 2002 they completed a successful drilling program on Elkhorn West gypsum deposit, located immediately west of its Elkhorn quarry site. It consisted of 40 drillholes totalling 1600 metres. These new reserves at Elkhorn West will postpone the need for development of the Koot deposit.

In 2002, Georgia Pacific Canada Inc produced an estimated 175 000 tonnes of gypsum from its Four J mine near Canal Flats. The company ships about 100 000 tonnes of gypsum annually from the Four J quarry to its wallboard plant near Edmonton, Alberta. Both Westroc and Georgia Pacific also operate wallboard plants in the Vancouver area.

Lafarge Canada Inc mined a small quantity of gypsum from its Falkland pit (approx. 6000 tonnes) for its



Figure 7. Gillies Bay Loading Facility, Vancouver Island; Texada Quarrying Ltd.



Figure 8. Dolomite processing plant near Rock Creek; Mighty White Dolomite Ltd.

Kamloops cement plant, supplemented by gypsum supplied by Westroc.

Magnesite

Baymag Mines Company Ltd produces magnesite at Mount Brussilof (Figure 5) at a rate of about 200 000 tonnes annually. The company has two plants in Exshaw, Alberta. The first site is a converted limekiln producing sintered magnesite; the second (Figure 3), houses a 50 000-tonne capacity, multiple hearth furnace, vertical-kiln, dedicated to specialty calcined MgO and also an electrofusing installation. Calcined magnesite is the main product, however, a portion is further processed to high-quality fused magnesite for export. The company has also started to sell crushed, white magnesite for landscaping applications. It conducted a very modest drilling program in 2002

Silica

In 2002, Highwood Resources Ltd estimates it shipped approximately 80 000 tonnes of silica (Figure 6) from its Moberly mine, mainly to Lavington BC. In the past, it has also shipped lump silica to Springfield, Oregon, and other destinations, however, since the collapse of the US silicon and ferrosilicon production these shipments have stopped.

The Horse Creek silica mine, which is owned by Metaltech of Seattle and operated by Nugget Contracting Ltd., remained idle in 2002 as a result of the 1998 shutdown of the Wenatchee metallurgical grade silicon and ferrosilicon plant.

Homegold Resources Ltd provided a bulk samples of geyserite (silica material & minor clay) from its Apple Bay deposit to the Ashgrove Cement Company's cement plant near Seattle. During the 2002, Lehigh Northwest Cement Limited (formerly Tilbury Cement Ltd) mined 30 500 tonnes of geyserite from its quarry at Monteith Bay on western Vancouver Island to supply its cement plant in Delta. Lafarge Canada Inc mined about 5000 tonnes of silica-alumina material from the Buse Lake deposit, as feedstock for its Kamloops cement plant. Electra Gold Ltd and Homegold are planning diamond drill and metallurgi-

cal testing in late 2002 at their Apple Bay project near Port Hardy.

Limestone

The largest limestone production centre in the province is Texada Island (Figure 7), where two quarries, Gillies Bay (Texada Quarrying Ltd.) and Blubber Bay (Ashgrove Cement Corporation), ship 5 to 6 million tonnes annually to customers in British Columbia, Washington, Oregon and California, for cement, chemical and more recently agricultural use. In 2002, 5.1 and 3.8 million tonnes of rock was quarried from Gillies Bay and Blubber Bay respectively, but not all was shipped. Texada Quarrying Ltd, recently invested \$10 million in an aggregate crushing plant and shipped crushed rock as far as Los Angeles and San Diego, California. Ash Grove upgraded their crushing plant in 2002 and is expected to ship over 2 million tonnes of rock, while Texada Quarrying is expected to ship about 4.1 million tonnes. Both operations currently have excess capacity and are aggressively marketing in Vancouver and the USA.

In addition to pulp mills, which normally produce their own lime, three cement plants and two lime plants in British Columbia process limestone. Graymont Western Canada Inc's Pavilion Lake limestone quarry and lime plant, near Cache Creek, has a capacity of about 190 000 tonnes of lime annually. The Kamloops cement plant of Lafarge Canada Inc is forecast to mine about 187 000 tonnes of limestone, and to produce about 122 000 tonnes of cement, from the Harper Ranch quarry. Lafarge's plant located in Richmond and Lehigh Northwest Cement Ltd's plants in Delta are state-of-the-art operations. Lafarge's plant has the capacity to produce one million tonnes of cement. Pacific Lime Products Ltd at Giscome, near Prince George, sells small quantities of limestone to pulp mills in the region.

Northrock Industries Ltd provided a limited amount of limestone from its Dahl Lake quarry for riprap and landscaping. I.G. Machine and Fibers Ltd and Homegold completed a 5000-tonne, bulk sample in 2002 from its South Slesse quarry near Chilliwack. Graymont Western Canada Inc may submit its proposed 250 000-tonnes per year chemical limestone Var quarry, on Rupert Inlet near Port Hardy,

to the Environmental Assessment Process. The company had a modest exploration program on their Nimkish Lake limestone property, late in 2002.

White Calcium Carbonate

White, high-calcium carbonate is produced from deposits on Texada Island (Vananda and Gillies Bay), at Benson Lake on Vancouver Island, and if needed, at Lost Creek near Salmo. It has a variety of uses including paper, paint and plastic filler. A number of prospects are being investigated as potential sources for paper and plastic fillers.

Dolomite

Dolomite is quarried by IMASCO Minerals Ltd at its Crawford Bay mine on Kootenay Lake and by Mighty White Dolomite Ltd near Rock Creek (Figure 8). Dolomite is used for: soil conditioning, white ornamental aggregate, stucco and roofing, fine aggregate, and in synthetic marble products.

Crushed Stone and Aggregate

Grassroots exploration for traditional construction materials is expanding along the British Columbia coastline. It is expected that shipments of crushed stone from Texada Island and other coastal sources will make significant inroads into the Vancouver, Seattle, San Diego, San Francisco and Los Angeles markets. Texada Island limestone producers have already started to exploit this market opportunity. Texada Island producers are well established, and crushed rock is the natural by-product of their limestone operations. Natural aggregate is the focus of similar market demands. Tilbury Cement Ltd shipped aggregate from its facility at Sechelt to the San Francisco Bay area in 2001. Although Polaris Minerals Corporation abandoned its efforts to develop aggregate and crushed rock operations in Bella Coola, it is in the permitting process for a combined crushed rock/natural aggregate operation at Port Alberni. Other companies, including Southern Pacific Development Corp's project near Renfrew, Vancouver Island, propose similar ventures.

Railroad ballast stockpiles, produced last year from Canadian Pacific Railway's Giscome basalt quarry and from British Columbia Railway's Ahbau basalt quarry, diminished. No new production took place at either of these two quarries. Canadian National Railways however, also operated at least six other railroad ballast operations in British Columbia McAbee (near Ashcroft), Boulder (near Clearwater), Taverne (near Tete-Jaune), Pacific (East of Terrace) and Kwinitza (Mile 40 on Skeena). Canadian Pacific Railway mined, crushed and shipped railroad ballast at its Swansea Ridge gabbro quarry south of Cranbrook.

No information is available about Wallachin quarry of Canadian Pacific. Teko pit, southwest of Taylor near Fort St John, was a major aggregate crushing operation in 2001 and reactivation occurred in late 2002. This pit supplies material mainly for the oil and gas sector in northeastern BC (road metal, etc).



Figure 9. Ashcroft roofing-granule plant; IG Machine and Fibers Ltd. (subsidiary of IKO Industries Ltd.)

Roofing Granules

In October 2001, IG Machine and Fibers Ltd, a subsidiary of IKO Industries Ltd, opened its Ashcroft basalt quarry and roofing-granule plant (Figure 9). The plant currently produces at about 50% of its rated capacity of 300 000 tonnes of granules per year in six distinct colours. Basalt is quarried, crushed, sized and coloured on site, prior to shipping to IKO Industries shingle plants in Sumas, Washington, Calgary, Winnipeg and Chicago.

Industrial Clay and Shale/Sandstone

Clayburn Industries Ltd of Abbotsford processes fire-clay from Sumas Mountain into a variety of refractory bricks and castable products, which are exported worldwide. Sumas Clay Products Ltd also produces small quantities of flue-line pipe and ornamental and facing bricks from near Abbotsford.

Clayburn, Lafarge Canada Inc. and Tilbury Cement Ltd. produced around 500 000 tonnes of shale and sandstone from their Sumas shale quarry in 2001. Clayburn is developing new light-weight aggregate with good isolation properties based on this material.

Medical Clays

Ironwood Clay Company Inc is the largest producer of cosmetic/medical clay in BC. They mine seasonally from the De Cosmos Lagoon on Hunter Island.

Similar material from at least one other BC locality, Carrie Cove Clay of Comox Valley, also reached market. It is currently sold by Carrie Cove Cosmetics for medicinal and cosmetic applications. It is also expected Glacial Marine Clay Inc. will be producing a clay for specialized hydroponics applications. Mr. Robert Davie has an undeveloped clay deposit on the King Island. The market for cosmetic/medical clay is limited, however, the processed product may retail about \$100/kg. The market for specialized hydroponics clays is less stringent and larger, however, the material still retails at prices around \$20/kg.



Figure 10. Integrated granite Processing Plant; Margranite Industries in Surrey.

Diatomite, Zeolite and Bentonite

Western Industrial Clay Products Ltd. produces domestic and industrial absorbents, principally from its Red Lake fuller's earth deposit near Kamloops. In the Princeton area, the company also controls the Bee and Brom zeolite properties and is mining bentonite from the Bud property. In 2001 the company began to market "leonardite" (low-grade oxidized coal) as an organic soil conditioner. The company secured a contract to sell humic acid (a leonardite derivative) to a major retail chain. The leonardite occurs between the diatomite horizons at Red Lake. There are bentonite deposits in British Columbia, however, Willy Kovacevic made the most promising, recent discovery in the Clinton area.

Highwood Resources Ltd. reports increasing annual sales of zeolite from the Ranchlands Z-1 quarry near Cache Creek. It has drawn from existing stockpiles and there was no mining in 2001, however company will extract more raw materials before the end of 2002. C2C Zeolite Mining Corporation recently sold its Z-2 zeolite quarry near Cache Creek and its Ashcroft processing and packaging plant to Industrial Mineral Processors of Calgary, Alberta. C2C Zeolite and Zeo Tech Enviro Corp and have created an alliance for processing, product and technology development, and marketing production from respective zeolite deposits in the Cache Creek and Princeton areas. Zeo-Tech prepared an application for a 75 000 tonne per year quarry on the Zeo property at Princeton. The site was stripped and drilled in 2002.

Canmark International Resources Inc tried to develop a lower mainland market for zeolite from its Sunday Creek deposit near Princeton, but the mine remains inactive.

Dimension Stone

Westcoast Granite Manufacturing Inc. in Delta, Margranite Industries in Surrey (Figure 10), Matrix Marble Corporation in Duncan and Garibaldi Granite Group Inc in Squamish, operate stone-processing plants. Margranite processes imported granite, and nine granite varieties, from



Figure 11. Pum property on Mount Meager, north of Pemberton; Great Pacific Pumice Ltd.

at least three quarries located in the East Anderson River, Beaverdell and Skagit Valley areas. Garibaldi Granite owns a processing plant in Squamish and is mining and processing three granite varieties from nearby quarries. The company also produces a variety of basalt landscape products. Huckleberry Stone Supply Ltd. of Burnaby and Mountain High Properties Ltd of Pemberton produced basalt from small quarries in the Whistler area. Mountain High recently installed a hydra-splitter at its Pemberton factory. In 2001, Matrix Marble Ltd concentrated on processing materials at its plant near Duncan, but it also extracted blue and white marble from its Tahsis quarry in Tlupana Bay.

Hardy Island Granite Quarries Ltd extracted about 3500 tonnes of stone this year and the product was sold through Bedrock Granite Sales in Coquitlam, BC. In 2001, Quadra Stone Ltd produced a small tonnage of Cascade Coral blocks from a new granite quarry near Beaverdell, no information is available for 2002. Near Kelowna, the Kettle Valley Stone Company produced flagstone, ashlar, thin veneer and landscape rock products from several quarries.

Revelstoke Flagstone Quarries, Kootenay Stone Centre, and other small operators in the West Kootenays quarried flagstone. Small flagstone quarries were also opened in the North Thompson and Golden areas. In 2001, Dome Creek Structural Slate Company quarried a limited tonnage of attractive green slate from its Dome Creek deposit on Highway 16, east of Prince George, however there was no activity in 2002. Rocky Mountain Slate opened a new slate quarry east of Golden. The blue-gray and beige materials from this location are used as flagstone. Rocky Mountain Tufa produced around 2500 tonnes of tufa, mainly for landscaping applications.

Jade

Jade West Resources Ltd and its affiliated company, Polar Gemstones Ltd, are the main nephrite producers. In 2001 they produced about 200 tonnes of nephrite from the Kutcho Creek and Serpentine Lake areas, northwestern BC. There was no activity in 2002, however the company expects to be active in mid-2003. Jade West also operates a jade processing facility in south Surrey. The company is currently looking for partners to set up a facility to produce

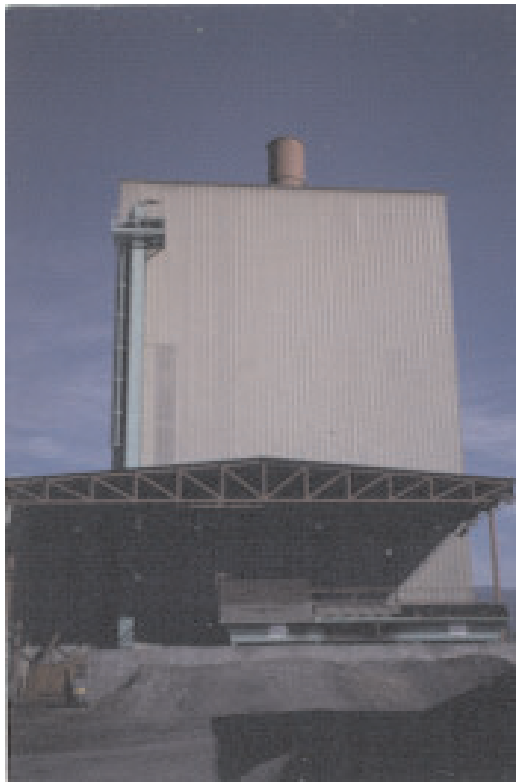


Figure 12. Rock wool plant, Roxul (West) International Inc.

nephrite tiles. Jedway Enterprises Limited extracted small quantities of nephrite from Kutcho, Cassiar and Polar.

Pumice, Tephra and Lava Rock

Canada Pumice Corporation produced about 30 000 cubic metres of tephra from its Nazko quarry, west of Quesnel. The material is used for landscaping, sporting facilities, growing and filtration media, and lightweight aggregate applications. Shipments have gone by rail as far as Toronto, and the company is negotiating contracts to ship lightweight aggregate to the western USA. Great Pacific Pumice Ltd. (Figure 11) is shipping a variety of pumice-based products from its Pum property on Mount Meager, north of Pemberton. Production in 2001 was estimated at 12 000 cubic metres. Garibaldi Aggregates Ltd. started to produce pumice from the same area as Great Pacific Pumice Ltd. Mr. George Wollanski staked a property in the Falkland area, which may produce three, colored varieties of vesicular basalt, potentially marketed as a lava rock for landscaping.

Mineral Wool

New investments into plant improvements are expected at an insulation/mineral wool manufacturing plant in Grand Forks (Figure 12) operated by Roxul (West) International Inc. Since 1999 it invested \$25 million, while in 2002 it spent about \$4 million to improve competitiveness, and on environmental initiatives. The main source of rock for the plant was the Winner diorite quarry in the Green-

wood mining camp, 4 km south of the former Phoenix mine. In 2002, approximately 50 000 tonnes of diorite were mined and crushed there. The material from Winner Quarry is supplemented by talus material from Cannon Creek. During the last few years, slag was recovered from Roxul's operation in Greenwood, however, this year the company reverted to Pacific Abrasives & Supply Inc., its original, local supplier in Grand Forks.

Slag

Pacific Abrasives & Supply Inc. is producing and processing slag from Grand Forks dumps, mainly for sand-blasting at major shipyards and for roofing granules. Slag was also shipped from Anyox by Tru-Grit as abrasive for cement industry applications, mainly in the Vancouver area, including roofing granules and some abrasive applications. Teck Cominco Ltd. is also a major slag producer at its Trail smelter. It markets its products mainly for cement production and abrasive applications. The company is converting one of the old furnaces into a second fuming furnace. The use of two furnaces doubles the fuming time and results in substantially lower base metal levels in the slag, improving the quality of the product. For the last few years, the slag was also recovered in the Greenwood area, mainly as one of the raw materials for the production of mineral wool by Roxul (West) International Inc. in Grand Forks, however, in 2002 Roxul received slag from Grand Forks.

Magnetite

M-Seven Industries Inc. produces between 60 000 and 70 000 tonnes of magnetite annually for industrial applications, by processing the Craigmont tailings. The company is supplying most coalmines in western Canada with heavy media material for their wash plants. Homegold Resources Ltd. optioned its Iron Mike magnetite occurrence, approximately 6 kilometres south of Sayward to a major coal company. Drilling and bulk sampling, on this property, was carried out in Nov 2002. Benson Magnetics Ltd is investigating the feasibility of installing a 25 000 tonne per year plant near Benson Lake, on northern Vancouver Island.

Graphite

In 2002, Crystal Graphite Corp, released new resource calculations for its Black Crystal graphite deposit in the Slocan Valley. The weathered zone has 648 000 tonnes containing 1.82% "fixed carbon" in measured and indicated resources, and 516 000 tonnes of inferred resources containing 1.69% "fixed carbon". The underlying unweathered zone has indicated resources of 4 763 000 tonnes containing 1.21% "fixed" carbon, and 4 591 000 tonnes of inferred resources containing 1.24% "fixed carbon". The company received a mining permit to process flake graphite to a maximum feed rate of 250 000 tonnes per year and some metallurgical work was performed.

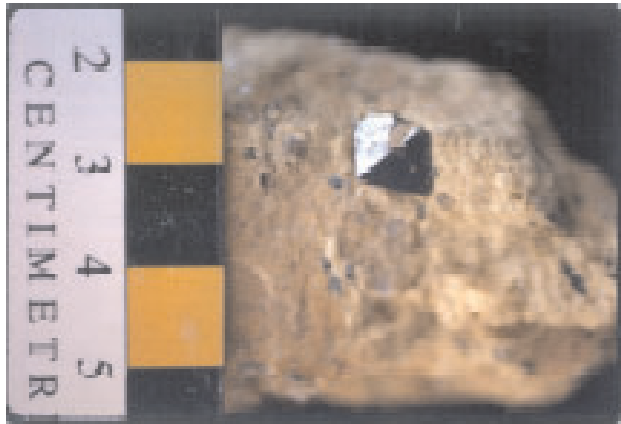


Figure 12. Pyrochlore from the Verity deposit Blue River Area.

Sulphur

West Coast Energy Inc, Petro-Canada Inc, TransCanada Midstream and Amoco Canada Petroleum Company Limited produce Sulphur, a byproduct of natural gas, at a number of processing plants in the northeast of the province. Liquefied SO₂ and sulphuric acid are also produced at Cominco's smelter in Trail. A rough estimate for 2002 production is slightly below 900 000 tonnes.

High Tech Minerals

Commerce Resources Corporation drilled its Fir carbonatite deposit near Blue River in 2002. Newly released resource estimates for Fir deposit are 5.6 million of indicated and 6.7 Mt of inferred, both grading 203.1 g/tonne of tantalum pentoxide and 1047 g/t of niobium pentoxide. Company's 2001 resource estimate for the nearby Verity deposit was 3.06 million tonnes containing 196g/t tantalum pentoxide, 646 g/t niobium pentoxide, and 3.2% phosphate. The Fir ferrocolumbite and pyrochlore-bearing carbonatite (Figure 13) appears flat lying, and has been outlined over an area 425 by 325 metres. It also announced completion of two preliminary cost assessments on processing and beneficiation of these tantalum and niobium of enriched carbonatites .

Cross Lake Minerals Ltd continues to hold its Myoff Creek, niobium, tantalum and rare earths property.

Gemstones

Okanagan Opal Inc continues to cut, test and market precious opal from the Klinker locality near Vernon. Follow-up prospecting and excavating was conducted on the Northern Lights precious opal occurrence in the Whitesail Range, south of Houston in 2001. This year there was no new mining; however, a small quantity of opal was retrieved from the material mined in 2001.

Mr Schaefer of Burns Lake discovered precious opal bearing boulders, or subcrop, in 1999, on the Firestorm

property west of the Burns Lake. In 2001, Cantec Ventures Inc excavated trenches to bedrock, and washed a 20-cubic-metre bulk sample to recover opal and opalized basalt. Most of the trenches were rehabilitated in 2002. The Schaefer family continues to extract precious opal by hand.

A new precious opal discovery was made and reported by the Warren family in 2002. Samples submitted to the Ministry of Energy and Mines were confirmed to be precious opal.

Barite

Tiger Ridge Resources Ltd continued underground development and bulk sampling of two adits on its barite project at Jubilee Mountain, west of Spillimacheen. In addition, surface exploration drilling northwest of the adits, continued in 2002. The investigation of barite potential for the adjacent past producer, Silver Giant Mine was also carried out. In 2001, the company installed a jig concentrator at the minesite to preconcentrate the barite and reduce the cost of transportation to the mill.

In 2001, Fireside Minerals Inc mined 15 000 tonnes of barite from the Bear vein at the Fireside mine, 125 km east of Watson Lake, and used jigs to recover 10 000 tonnes of barite for the northwest BC and Alberta oil and gas drilling industry. In 2002 Fireside shipped only 1500 tonnes.

Wollastonite/Garnet

During February 2002, Clearview Minerals Ltd and Tri-Sil Minerals Ltd completed a 6-hole, 1000 metre diamond-drilling program on the Mineral Hill wollastonite/garnet skarn project, near Sechelt. One hole intersected 91.2 m of 50% wollastonite and 35% garnet.

Perlite

BBF Resources Inc plans to truck 400 tonnes of perlite from Frenier Deposit, Southwest of Williams Lake to Ashcroft. According to the company, perlite will be used to produce commercial-size samples of the product for horticultural applications and mining may start as early as 2003.

For information on industrial minerals in British Columbia contact:

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 Tel: 250-952-0413 Fax: 250-952-0381
 E-mail: george.simandl@gems2.gov.bc.ca

CONTACT LIST

Industrial Mineral Mines and Selected Processing Plants in British Columbia, Canada

Owner / Operator	Mine/Processing site	Comodity
ASH GROVE CEMENT COMPANY PO Box 126 Blubber Bay, BC, V0M 1E0 Tel: 604-486-7715 Fax: 604-486-7701 Internet: www.ashgrove.com	BLUBBER BAY	Limestone
BAYMAG MINES CO. LIMITED PO Box 399, Radium Hot Springs, BC, V0A 1M0 Tel: 250-347-9511 Fax: 250-347-9711 Internet: www.baymag.com	MOUNT BRUSILOF	Magnesite
CANADA PUMICE CORPORATION 2009 Abbotsford Way Abbotsford, BC V2S 6Y5 Tel: 604-852-1888 Fax: 604-852-2775	NAZKO	Pumice, Aggregate
Clayburn Industries Ltd. 33765 Pine Street Abbotsford, BC, V2S 5C1 Tel: 604-859-5288 Fax: 604-859-0424 Internet: www.clayburngroup.com	SUMAS FIRECLAY	Fireclay
CRAIGMONT MINES JOINT VENTURE 320 - 1639 2ND Avenue West Vancouver, BC, V5M 1C4 Tel: 604-738-3434 Fax: 604-738-4034	CRAIGMONT MINES PO Box 3000 Merritt, BC V1K 1B8 Tel: (250) 378-2212 Fax: (250) 378-5794	Magnetite
DOME CREEK STRUCTURAL SLATE c/o 4767 Sumas Mountain Road Abbotsford, BC, V2G 2L2 Tel: 780-457-3573	DOME CREEK	Slate
FIRESIDE MINERALS LTD. 202 - 4406 50th Avenue Red Deer, AB, T4N 3Z6 Tel: 403-343-7764 Fax: 403-340-4688	FIRESIDE	Barite
GARIBALDI AGGREGATES 1582 Booth Avenue Coquitlam, BC, V3X 1B9 Tel: 604-540-1384 Internet: www.garibaldiaggregates.com	MOUNT MEAGER	Pumice, Light weight aggregate
GARIBALDI GRANITE GROUP INC. 38949 Queens Way Squamish, BC, V0N 3G0 Tel: 604-892-0191 Fax: 604-892-0170	SQUAMISH	Granite
GEORGIA-PACIFIC CANADA INC. PO Box 116, Canal Flats, BC, V0B 1B0 Tel: 250-349-7517	CANAL FLATS	Gypsum
GRAYMONT WESTERN CANADA INC. 190 - 3025 12TH Street N.E. Calgary, AB, T2E 7J2 Tel: 403-250-9100 Fax: 403-291-1303 Internet: www.continentallime.com	PAVILION PO Box 187 Cache Creek, BC, V0K 1H0 Tel: (250) 457-6291 Fax: (250) 457-5364	Limestone
GREAT PACIFIC PUMICE INC. 790 Millbank, Vancouver, BC, V5Z 3Z3 Tel: 604-250-2750 Fax: 604-879-6411	MOUNT MEAGER	Pumice, Light weight aggregate

Owner / Operator**Mine/Processing site****Comodity**

HARDY ISLAND GRANITE QUARRIES LTD. RR 2, 4743 Ketch Road Pender Island, BC, V0N 2M2 Tel: 250-629-3778 Fax: 250-629-3779 Internet: www.hardygranite.com	HARDY ISLAND	Granite
HIGHWOOD RESOURCES LIMITED PO Box 570 Golden, BC, V0A 1H0 Tel: 250-344-7171 Fax: 250-344-7343 Internet: www.highwood-resources.com	MOBERLY RANCHLANDS	Silica Zeolite
HOMEGOLD RESOURCES LTD. Unit 5 - 2330 Tyner Street Port Coquitlam, BC, V3C 2Z1 Tel: 604-944-6102 Fax: 604-944-6102 Internet: www.homegoldresources.com	APPLE BAY	Silica
I.G. MACHINE & FIBERS LTD. (IKO INDUSTRIES LTD) plant PO Box 1000, Ashcroft, BC, V0K 1A0 Tel: 250-453-9015 Fax: 250-381-2254 Internet: www.ikogroup.com/prods-minerals.html	ASHCROFT	Basalt quarry, roofing granules
IMPERIAL LIMESTONE CO. LTD. PO Box 190 Vananda, BC, V0N 3K0 Tel: 604-486-7623 Fax: 604-486-7509	IMPERIAL	Limestone
INDUSTRIAL MINERAL PROCESSORS 2921, 15th Street NE Calgary, AB, T2E 7L8 Tel: 403-569-0403	ASCROFT PLANT	Zeolite
INTERNATIONAL MARBLE AND STONE CO. LTD. 19287 98A Avenue Surrey, BC, V4N 4C8 Tel: 604-888-3848 Fax: 604-888-5671 Internet: www.imascomineral.com	CRAWFORD BAY LOST CREEK BENSON LAKE SIDAR	Dolomite Limestone Limestone crushed granite & quartzite
IRONWOOD CLAY COMPANY INC. 450-3771 Jacombs Richmond, BC, V6V 2L9 Tel: 604-279-9498 Fax: 604-279-9496	De COSMOS LAGOON	Medical Clay
JEDWAY ENTERPRISES LTD. 2115 - 1297h Street, Surrey, BC Tel: 604-538-4542 Fax: 604-538-7798	CASSIAR and other areas	Jade
J.E. Falkoski RR 1, Bridesville, BC, V0H 1B0 Tel: 250-446-2528	GREENWOOD	Slag
JADE WEST 638 - 176th Street South Surrey, B.C. V3S 9S6 Tel: 604-538-4525 Fax: 604-538-5490	KUTCHO CREEK SERPENTINE LAKE	Jade Jade
RAINBOWS AND SUNSHINE HOLDINGS LTD. PO Box 866, Grand Forks, BC, V0H 1H0 Tel: 250-442-2917 Fax: 250-442-2917	WINNER	Granodiorite (for Mineral wool)
KETTLE VALLEY STONE COMPANY 204 Cambro Road Kelowna, BC, V1X 7T3 Tel: 250-491-0405 Fax: 250-491-4959 Internet: www.ldpetch.com	CANYON NIPPLE MOUNTAIN GEMINI	Granite/gneiss Flagstone Basalt-dimension stone

Owner / Operator	Mine/Processing site	Comodity
KOOTENAY STONE CENTRE PO Box 486 Salmo, BC, V0G 1Z0 Tel: 250-357-9515 Fax: 250-357-9515 Internet: www.naturalstonesite.com	KOOTENAY STONE	Flagstone
LAFARGE CANADA INC. 7611 No. 9 Road Richmond, BC, V6W 1H4 Tel: 604-244-4300 Fax: 604-244-4301 Internet: www.lafargenorthamerica.com	SUMAS	Shale
LAFARGE CANADA INC. RR 2, Site 12, Comp 1 Kamloops, BC, V2C 2J3 Tel: 250-573-3211 Fax: 250-573-4010 Internet: www.lafargenorthamerica.com	HARPER RANCH FALKLAND BUSE LAKE	Limestone Gypsum Silica
LEHIGH NORTHWEST CEMENT LTD PO Box 950, 7777 Ross Rd Delta, BC, V4K 3S6 Tel: 604-946-0411 Fax: 604-946-2229	DELTA MONTEITH BAY	Lime plant Silica (geyserite)
MATRIX MARBLE CORPORATION 2890 Allenby Road PO BOX 795, Duncan, BC, V9L 3Y1 Tel: 250-746-7257 Fax: 250-746-5684 Internet: www.matrixmarble.com	DUNCAN HISNET (near TAHSIS)	Marble processing
MIGHTY WHITE DOLOMITE LTD PO Box 10, Rock Creek, BC, V0H 1Y0 Tel: 250-446-2450 Fax: 250-446-2707	ROCK CREEK	Dolomite
NORTHROCK INDUSTRIES LTD. 3905 - 18th Avenue Prince George, BC, V2N 1B2 Tel: 250-561-2770 Fax: 250-564-5616	DAHL LAKE	Limestone
OKANAGAN OPAL INC. Box 298, Vernon, BC. V1T 6M2 Tel: 250-542-1103 Fax: 250-542-7115 Internet: www.opalscanada.com	KLINKER	Precious opal
PACIFIC ABRASIVES & SUPPLY, INC. 1448 St. Paul Avenue Tacoma, WA 98421 Tel: 415-831-9800 or 1-800-228-4786 Fax: 253-383-2267	GRAND FORKS	Slag
PACIFIC LIME PRODUCTS LTD. 2951 North Street Prince George, BC, V2N 5P9 Tel: 250-964-7775 Fax: 250-964-7015	GISCOME	Limestone
QUADRA STONE COMPANY LTD. 1275 75th Avenue West Vancouver, BC, V6P 3G4 Tel: 604-266-5341 Fax: 604-266-5441 Internet: www.quadrastone.com	BEAVERDELL	Granite
QUARRY PACIFIC INDUSTRIES LTD.(Margranite) 2820 Ingleton Avenue Burnaby, BC, V5C 6G7 Tel: 604-435-4431 Fax: 604-435-4266 Internet: www.ceramstone.com	EAST ANDERSON RIVER SKAGIT VALLEY	Granite Granite

Owner / Operator	Mine/Processing site	Comodity
REVELSTOKE FLAGSTONE QUARRIES General Delivery 1208 Pine Road, Revelstoke, BC, V0E 2S0 Tel: 250-837-3294	REVELSTOKE	Flagstone
ROCKY MOUNTAIN SLATE 1900 Anderson Road Golden, BC, V0A 1H0 Tel: 250-344-7060 Fax: 250-344 7050 Internet: www.rockymountainslate.com	GOLDEN	Slate/Flagstone
ROCKY MOUNTAIN TUFA PO Box 66 Brisco, BC, VOA 1B0 Tel: 250-344-7060 Fax: 250-344-7056 Internet: www.tufa.bc.ca	BRISCO	Tufa
ROXUL (WEST) INTERNATIONAL INC PO Box 2890 Grand Forks, BC, VOH 1H0 Tel: 250-442-5253 Fax: 250-442-5278 Internet: www.roxul.com	GRAND FORKS plant	Mineral wool
TECK Cominco Limited Trail Operations PO Box 1000, Trail, BC V1R 4L8 Tel: 250-364-4222 Fax: 250-364-4109 Internet: www.teckcominco.com	TRAIL	Slag
TEXADA QUARRYING LTD PO Box 160 Vananda, BC, V0N 3K0 Tel: 604-486-7627 Fax: 604-486-7280	GILLIES BAY	Limestone
TRU-GRIT ABRASIVES, INC. 1448 St. Paul Avenue Tacoma, WA 98421 Tel: 415-831-9800 or 1-800-228-4786 Fax: 253-383-2267 Internet: www.trugrit.com	ANYOX	Slag
WESTERN INDUSTRIAL CLAY PRODUCTS LTD. 714 Sarcee Street East Kamloops, BC, V2H 1E7 Tel: 1-800-667-0336 Fax: 250-372-3777 Internet: www.wicp.com	RED LAKE BUD	Fuller's earth Bentonite
WESTCOAST GRANITE MANUFACTURING INC. 7399 River Road Delta, BC, V4G 1B2 Tel: 604-365-2909 Fax: 604-946-8168	DELTA	Granite Processing
WESTROC INC. PO Box 217, Invermere, BC, V0A 1K0 Tel: 250-342-9410 Fax: 250-342-6311 Internet: www.westroc.com	ELKHORN	Gypsum
ZEOTECH ENVIRO CORP. 1066 West Hastings Street Suite 2300 & Z2 Quarry Vancouver, BC, Canada V6E 3X2 Tel: 604-684-3301 Fax: 604-684-3394 Internet: www.zeo-can.com	ASHCROFT PLANT	Zeolite