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~~BRITANNIA~~  
BRITANNIA

# MINING



711 — **The History of Mining in British Columbia**

**By G.W. TAYLOR**

(1978)

the creek high above the town gave way about 9 p.m. on a Sunday night. A five-foot wall of water rushed through the residential section, taking many houses with it into Howe Sound. "The place," said an eyewitness, "looks like a prairie town which has been struck by a cyclone."

Only in 1924, after the double blow of the general slump of 1919 and the 1921 flood, did continuous operation resume at the mine. The peak came in 1928 with a record production of 1,661,225 tons. Then came the Depression; the price of copper dropped to an all-time low of 5 and 7/8ths cents per lb. Salaries and wages were cut and the staff put on a part-time basis. Further staff cuts were made from a high of 1100 men in 1928 to 548 in 1932.

As Hitler's war approached, the B.C. mining picture began to improve. Instead of operating on 10 per cent of capacity, the mine worked up to 20 per cent, then to 30 and 50 and on to its normal tonnage.

ANYOX

B.C. MINISTRY OF



In the lean years after 1945, when the head office in New York would not even authorize the purchase of a can of paint to redecorate company houses, the mine carried on. The Korean war and the upsurge in demand for metals gave Britannia a short break, but the ore was becoming exhausted. The Howe Sound Company pulled out and in January 1963, Anaconda Copper stepped in to the tune of (it is said) \$4 million. A little earlier, the isolation of the community had been broken by the building of both railway and highway. Today it is just an hour's drive from downtown Vancouver. In 1974 the mine closed its tunnels and tramways for the last time.

Concentrator of the Britannia copper mine at Britannia Beach, Howe Sound, 1922.

Further up the coast was Anyox, a name that was synonymous with copper for 20 years. It is located on Granby Bay 110 miles from Prince Rupert, on the west shore of Observatory Inlet and 35 miles from its mouth. A range of steep timber-clad mountains separates

see the Minister of Mines in Victo. to seek assistance in developing some of his claims. When this was refused, the good doctor's interest in the property vanished. Oliver Furry, a trapper living on the west side of Howe Sound, then took up the task. He drew in Joseph Boscowitz, a Victoria businessman, who enlisted Howard S. Walters from Montana and organized the Britannia Copper Syndicate Ltd. to develop the property. A little work was done but more funds were needed. The Syndicate was re-organized, bringing in Edgar Dewdney, a pioneer of the province and at one time its Lieutenant-Governor. The banking firm of Moore & Sichley of New York agreed to raise the money in its local market. By this time (1904) some 150 acres had been cleared and a store and several homes were built at the Beach. Meanwhile, a holding company had been created, for some reason under the laws of the State of Maine: the Howe Sound Co.

The ore went into the furnaces of a Vancouver Island smelter at Crofton which Britannia had bought. This smelter had been built by Henry Croft, brother-in-law of coal baron James Dunsmuir, under contract with the Lenora Mining Co. to treat the ore from its mine on Mount Sicker.

The mine and townsite at Britannia and the smelter at Crofton all came under the Howe Sound Co., which also owned copper mines in Mexico. The boom years for copper before World War I put the mine on a firm foundation. The latest equipment had been installed: a mile-long aerial tramway; five miles of industrial railway with gasoline as the motive power (an innovation in those days); a 200-ton concentrator. The ore reserves would last for many years. Then came August 4, 1914. Metal markets disintegrated immediately and a wire came from the New York office: "Close the mine." Local management tended to turn a blind eye to head-office requests but production was cut by 50 per cent.

Like all mining enterprises, Britannia had its share of natural disasters. In the early hours of March 22, 1915, the mountainside fell on the camp at the 1050-foot level. Newsmen from Vancouver arriving that afternoon found, in the words of Bruce McKelvie of the *Province*:

The mine office, store, rock crusher, tram terminus, a big bunkhouse, and half a dozen homes had been blotted out by millions tons of rock, mud and snow, which in some places were piled 50 feet deep over what had been the level of the camp.

It was comparable in horror and tragedy to the slide at Frank, Alberta, in 1903. Between 50 and 60 people died and 22 more were injured. It cost the company \$210,000 in property damage alone. In damage to property and lives there is not much difference between a landslide and a flood — or so the people of Britannia Beach found out in October 1921. It had been raining in torrents for several days and a natural driftwood dam holding the water in

Employment in the Boundary smelters at their peak ran into thousands. They helped to create towns like Grand Forks, Phoenix and Greenwood, where ten years before the region had been a wilderness. The smelters were one of the main markets for Crow's Nest coal, providing many jobs in the coal mines of the Kootenays and treating huge tonnages of copper ore. At one time Boundary copper was produced at the lowest price in the world. Operating costs for the Granby organization came down from \$4.77 per ton in 1901 to \$2.39 in 1913. Many factors contributed to this result, including economies of operating on a large scale, even though the grade was lower than any that had been worked before. In the twenty years from 1897 to 1917, copper production in B.C. rose from a mere \$250,000 to \$114,000,000.

But by the end of the war in 1918, the world's demand for copper had evaporated. The victorious allies had stockpiled a two-year supply. Copper prices dropped and the mines began to close. The year 1919 was the most unsatisfactory that the copper industry had experienced; obviously the decrease in home consumption and absence of foreign orders called for drastic action.

A permanent shutdown was announced at the **Granby** mines in Phoenix in the middle of 1919. Departures from Phoenix became a daily occurrence. All the hotels were boarded up. C.P.R. service dwindled to two mixed trains per week. The Great Northern began to dismantle its tracks. The banks closed down their branches. Houses were available for five dollars. Prime real-estate properties of ten years ago reverted to the government because nobody wanted to pay taxes on them, and by 1920 Phoenix was a ghost town.

A similar blight hit all the other Boundary towns. The smelters at Boundary Falls and Greenwood closed early. Machinery from Grand Forks and the compressor station at Knob Hill were shipped to the new Granby operation at Anyox, and skilled smelter personnel moved to that northern town. The copper industry in the Boundary country shut down for a long sleep. Not until Granby came back to Phoenix in 1956 with open-pit mining did the Boundary experience any new mining activity.

The scene now shifts to the coastal regions — to the little community of Britannia, 35 miles north of Vancouver on what is now the scenic motor road up Howe Sound to the ski resorts of Garibaldi. In the prosperous days of the **Britannia** copper mine there was no road, no railway, only the daily call of the Union steamship. Vancouver was a day's journey away.

Prospecting had been going on in the islands and mainland north and west of Burrard Inlet since the country had been opened up to miners in the gold-rush days. Dr. A.A. Forbes, medical officer to the Indians of the coast region, was the first to interest himself in the copper ore on Britannia Mountain. It is said that in 1893 he went to

B.C. GOVERNMENT



*In recognition of those who, copper mine and smelter, served World War I. Phoenix Memorial, 1914-18.*



*Re-activating Phoenix in 1956. Repairing workers' houses.*

GRANBY MINING COMPANY

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## HISTORICAL METALLURGY NOTES

### Britannia Mines (1888-1988) — Mill now a National Historic Site

by Marilyn Mullan, Executive Director, B.C. Museum of Mining, and  
 Dianne Newell, Department of History, The University of British Columbia



The Britannia Beach Historical Society, the governing body of the British Columbia Museum of Mining, is proud to announce that

the Historic Sites and Monuments Board of Canada has found the ore concentrating complex at Britannia Mines to be of national historic and architectural significance. This is the first time that a mining heritage resource of this magnitude has been so designated in Canada.

The announcement is timely because 1988 marks the centennial of the discovery of copper ore at Britannia in 1888. To celebrate this anniversary, the Museum will host a Discovery Day special event for the general public on May 14, the Saturday following the CIM Annual General Meeting in Edmonton.

Recognition as a National Historic Site means that the Society can now focus on developing a Mining Museum of national status. Although no immediate funding accompanies this commemoration, increased public awareness will assist the Society in its fund raising campaigns. Also, the incentive is there to enter into negotiations with the Federal Government, the Provincial Government and the private sector on a cost-sharing agree-



*Britannia Mines' concentrating mill complex.*

ment for Museum and Historic Site development.

Britannia's significance as a major world copper producer has been well documented. During its 70-year history, Britannia employed over 60 000 people and produced over 60 million tons of

copper ore. From 1925 to 1930, it was known as the largest copper producer in the British Empire.

The Mill is a magnificent structure, a marvel of industrial engineering and technology. It is a superb example of the ingenuity of the Canadian engineering

and mining industry. The Mill is the last remaining gravity-fed concentrator in North America that is accessible to the general public. Britannia is only 52 km from Vancouver on the well-travelled "Sea to Sky" designated tourist route.

The Britannia Concentrating Mill Complex provides a rare opportunity to study and illustrate early 20th century mining and milling practices. The remains of the two early mills, the tunnel network and the existing Mill provide rich material evidence for scholars, industrial archaeologists and the general public.

The Britannia Mines were discovered by Dr. A.A. Forbes in 1888 but the prospect was slow to attract local attention. George Robinson, an American mining engineer from Butte, Montana, visited the property in 1899. He was able to convince New York City financiers of the immense potential of the property. Access was by tidewater, a mere 52 km from the burgeoning city of Vancouver. A four-mile horse trail had been hacked through the dense mountain forest from Britannia Landing up to the Jane Basin prospects. One million tons of high-grade copper ore was estimated. There was ample timber, water, and a favourable climate. The Britannia syndicate was formed of which Robinson secured controlling interest in 1903. The next year a new company, the Howe Sound Co., was formed and it gained controlling interest in the Syndicate. Then in 1905, the Britannia Smelting Co. Ltd. was formed to purchase the Crofton Smelter on Vancouver Island. Now operations could begin in earnest. (Incidentally, the Smelting Co. and the Britannia Syndicate merged in 1908 to form the Britannia Mining and Smelting Co. Ltd., the operating arm for Howe Sound Co. The success of the Britannia mining operation was due largely to the stable long-term ownership by Howe Sound.)

Meanwhile, under Robinson's direction early development work began. Mine service buildings and employees' housing were constructed at the Jane Basin. New adits were driven. A true community grew up around the mine. A four-mile gravity Riblet aerial tram was constructed in two sections to transport the ore down the mountain to Britannia Landing, or the "Beach". Here two mills were built, one for crushing and one for concentrating. Transportation facilities were constructed and a community grew up to service both the mill and mine.

The first ore was shipped to the Crofton smelter in 1904, and in the next year full production was achieved. The early years were beset with difficulties, however. Robinson died suddenly in 1906, copper prices fell, and there were problems separating the minerals in the ore using the experimental new Elmore bulk oil flotation process. During this trying period, we gain rare insight into life and

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work at Britannia through an eye witness account by young Harriet Backus, the wife of the company assayer. In her book *Tomboy Bride*, we experience her delight as she first inspected her six-room "palace" with electricity and running water. She not only entertains but also provides useful and keenly-preserved

details about the well-equipped company store, the segregated housing for the Chinese, Japanese, and white crews, and the crusher house and mill.

In 1912, the production at Britannia was given a boost by the arrival of a demanding and skillful mining engineer from Ontario, James Dunbar Moodie.

The company of operators had given him the authority and the capital (about \$5,000,000) to revamp every aspect of the operation. During the next 10 years, he successfully expanded operations and thereby brought Britannia Mines into the first rank of world copper producers. Although Mill No. 1 had been modified and its production capacity increased to 850 tons per day, increased ore production from the mine and improvements in the mineral separation process stimulated plans for a new mill and a change in the smelting arrangements. Mill No. 2 was started in 1913 and completed in 1916. Built on the side hill overlooking Howe Sound, it consisted of six stories and was capable of processing 2000 tons of ore per day. The mill crew numbered 83, of whom 25 were Japanese. The improved milling practices and the lack of custom ore made it more economical to ship the concentrates by water to the ASARCO smelter at Tacoma, Washington. The transportation system was also revamped. A tunnel was driven from the mine through the mountain at the 2200-foot level to connect with a narrow gauge electric railway with switch backs on the mountainside. The railway connected with an incline and a skipway which transported ore to the mill.

The outbreak of World War 1, in 1914, increased demand for copper and the price rose sharply; this, in turn, funded further development. Then disaster struck. On March 21, 1915, an avalanche of mud, rock, and snow crashed through Jane Camp, just as the men were coming off the midnight shift. Fifty to sixty men, women and children were killed outright and another 22 people were injured. The owners ordered construction of a new and safer town at the 2200-foot level, which came to be known as "The Townsite" or "Mt. Sheer".

Moodie's drive and vision directed the broad and farseeing program that made Britannia one of the world leaders. He, and George Robinson before him, had received strong support and financial assistance from the Howe Sound Co. But with the end of the war, copper prices became uncertain and Howe Sound issued orders to tighten up operations. Moodie was recalled to home office, after which he resigned, in 1920.

Further setbacks ensued. During a brief period of shutdown, in 1921, Mill No. 2 burned to the ground. Just seven months later, on October 29, a flood unleashed itself on the unsuspecting Beach community. Thirty-seven persons died and 15 were seriously injured. Once again, a new mill had to be constructed and a new town had to be built.

The person to direct operations for the next 25 years through a period of both peak and decline of production was Carleton Perkins Browning, a 1913 graduate of Columbia University. Under his direction, Mill No. 3, the mill that

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stands today, was constructed in 1922. The million-dollar structure was designed on lines similar to the No. 2 Mill, with refinements and improvements. It was constructed of steel on concrete foundations and comprised eight roof levels. Equipped with the latest machinery, including 26 ball mills and apparatus for differential froth flotation, it was ready for the great industry that was to be carried on within its walls. It rapidly became a prominent feature on the coast landscape — a thing of beauty.

By 1929, the Britannia Mines were attracting attention as the largest copper producer in the British Commonwealth. Britannia was isolated and linked to the outside world by steamer alone, but with Browning and his wife Mary at the helm, community life flourished. The social and recreational activities were directed by the community clubs in both townships. Everybody belonged. Everybody participated. Everybody was employed.

The onset of the Great Depression, in 1930, signalled another downturn in fortunes. But despite the depression, operations continued without interruption. Browning was awarded The Canadian Institute of Mining and Metallurgy's Randolph Bruce Gold Medal in 1931 for his technical skill, organizational ability, and remarkable leadership.

Zinc production was started at the East Bluff, and in 1933, the first shipment of zinc concentrates (containing gold) was shipped to the smelter.

Meanwhile, within the walls of Mill No. 3, the mill superintendent, A.C. Munro, carried on a constant search for better and more efficient methods and machinery. In 1935, two units of the elevation-type classifier, designed by Munro, were installed. Six years later, the primary crushing process was improved by the installation of a Buchanan Jaw Crusher. In 1938 and 1939, a total of 122 000 tons of pyrite was shipped to Japan.

Copper prices rose during World War II. As the war progressed, the mine continued to produce minerals for the war effort, but the work force fell off drastically to about 400 because of men enlisting in the armed forces and the lure of better jobs in wartime industries. The Britannia Mines became unionized and suffered through its first strike in 1946.

After some boom years in the early 50s, when the Korean War created a demand for zinc from No. 6 "Fairview" Mine, copper prices sank to an all time low. The outside world came to Britannia when the rail line was completed from Squamish to North Vancouver in 1956. Two years later, the Squamish highway was completed. Community life could not compete with outside attractions. Mt. Sheer emptied and eventually all the buildings there were destroyed. For reasons of economy, all operations for the mine was moved to the Beach. The once proud

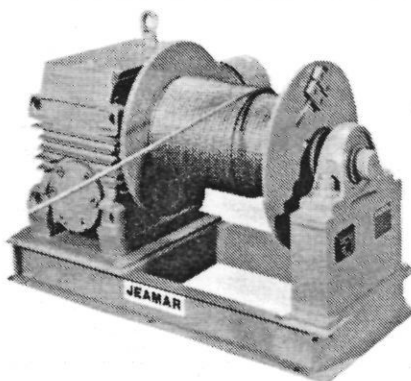
Britannia Mining and Smelting Co. was down to seven employees and, in 1959, went into liquidation, its assets being taken over by the Howe Sound Co.

This was not the end for Britannia Mines, however. In 1963, the Montana-based Anaconda Mining Co. purchased the property from Howe Sound Co., intending to use Britannia as a base for its exploration programs in western Canada. Anaconda launched an aggressive search for new ore at Britannia. A labour dispute intervened just as the drills were intersecting mineralization in a new ore zone. This new orebody proved to be the carrot that brought the company and the union to the bargaining table.

The mill was not left behind in the renewed activity. The fine grinding circuit was remodelled. By increasing the horse power and adding rubber liners, the capacity of each ball mill was increased and the number of mills decreased from 15 to 6. The coarse ore bins were rehabilitated to accommodate the coarse ore now being crushed underground. In addition, the silica contained in the coarse sands of the tailings was recovered and sold to cement companies in the area. A new precipitation plant to remove copper from the mine water was installed at the "Townsite" to replace the very successful smaller ones that had operated there and at several other places on the surface and

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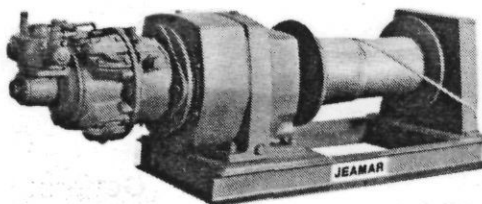
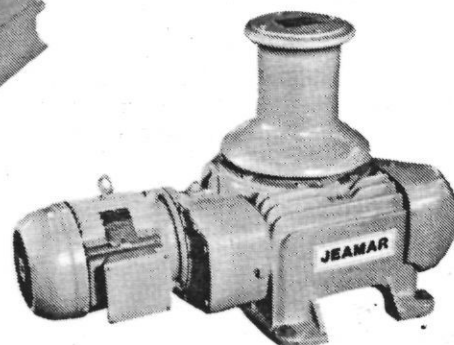


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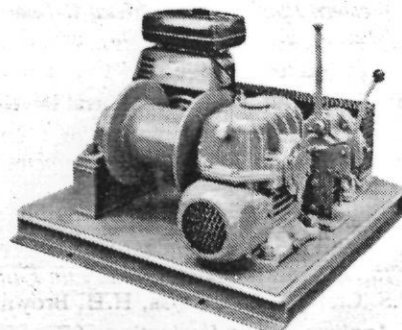


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underground since 1924.

Although 300 employees continued to produce an average of 60 000 tons of concentrate annually, the new ore reserves were limited, and rapidly rising costs and increased taxation combined to defeat efforts to keep the mine operating. The rumours of shutdown became a reality and on November 1, 1974, the whistle blew a three-second requiem blast for the 55 men who went underground on the last shift. During the 70-year life of the mining operation, approximately 60 000 employees with their families called

Britannia their home. Their story is representative of the key role of hardrock mining in the Western Cordillera. Determined to preserve their story, Britannia people commissioned a history of the mining operation and planned a mining museum. In the spring of 1975, the British Columbia Museum of Mining opened its doors to the public. Since that time, a great deal of energy has been spent on developing the museum and the old mining property. In the words of Olive Baxter, a Britannia "old timer", . . . "as long as the Museum remains

of the old mines will always be with us'.

**Postscript:** The Museum is anxious to contact, as many as possible, the men and women alive today who lived or worked at Britannia. Please contact B.C. Museum of Mining, P.O. Box 155, Britannia Beach, BC. V0N 1J0.

**Invitation:** Plan to attend the Museum's special event which will relive "a day in the life of a mining community" on Saturday, May 14, following the Annual General Meeting of CIM in Edmonton, Alberta.

## PROJECTS '88

held in conjunction with  
18th Annual Hydrometallurgical Meeting  
in association with the Annual General Meeting of CIM  
Edmonton, Alberta, Canada, May 9 to 11, 1988

### Introduction

The 18th Annual Hydrometallurgical Meeting will comprise four sessions having the theme of project development and looking at all project phases including research, engineering, construction, startup, and early operation. Hydrometallurgy will be stressed, but other metallurgical operations will also be included.

The sessions will be held in association with the Annual General Meeting of CIM, at the Edmonton Convention Centre from May 9 to 11, 1988. Registration for the Annual General Meeting will include registration for the Annual Hydrometallurgical Meeting.

### Content

**Monday, May 9, p.m.**

#### Session 1: Gold and Platinum Projects

*Development of an Arsenical Gold Project—Consolidated Professor.*

G.R. Cunningham-Dunlop, M. Allen and K.R. Rawling  
*A. Case for C-I-L, The Eden Roc Project, Ivory Coast, West Africa.*

N. Brewster, C. Lendrum and R. Salter

*The Arseno Process—An Update.*

M.J.V. Beattie and R. Raudsepp

*The Sao Bento Bento Project—Process Development.*

R.M. Berezowsky, A.K. Haines and D.R. Weir.

*The Western Platinum Base Metal Refinery.*

J.C. Mostert, K. Hay, M.D. Day, and D.G. Kerfoot

**Tuesday, May 10, a.m.**

#### Session 2: Federal-Provincial Mineral Development Agreements

*Mineral Research and Technology Under the Federal-Provincial Mineral Development Agreements.*

R.J.C. MacDonald and S. Savard

*Evaluation of the Great Central Mines Hydrometallurgical Copper Process for Application to Hudson Bay Mining and Smelting Copper Concentrates at Flin Flon, Manitoba.*

M.J.S. Craigen, B.D. Krysa, H.H. Brown, and B. Barlin.

*The Application and Evaluation of Zinc Pressure Leaching at the Hudson Bay Mining and Smelting Co.*

B. Barlin, D. Wittleton and B.D. Krysa

*The RPC Sulphation Roast Leaching Process Pilot Plant Project, Technical Evaluation and Commercial Plant Scale Up.*

M.E. Chalkley, R. Gilders, K. Jibiki, J. Synott, H.R. Grant, and R.S. Boorman

**Tuesday, May 10, p.m.**

#### Session 3: Projects General

*The Leaching of Zinc Oxide Fume With Soda Ash to Control Halides at Cominco.*

H. Salomon-de-Friedberg

*Pilot-Testing Vat-Heap Leaching Technology of Uraniferous Cobble Ore at Key Lake.*

Nick Holl and Bernhard Rosner

*St. George Mining Corporation's Apex Project.*

Thomas M. Olsen, Dennis E. Voelker and Rocky A. Smith

*Removal and Recovery of Thallium from Impure Lead.*

E.F.G. Milner and E.G. Parker

**Wednesday, May 11, a.m.**

#### Session 4: The Rabbit Lake Project Story: Eldor Mines

*Introduction:* M.R. Babcock

*Geology:* D. Ward

*Mining and Development:* G.W. Clark

*Milling and Metallurgy:* M.R. Babcock

*Industrial Relations:* D.S. Anderchek

*Environmental:* R.L.J. Phillips

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**M.D. Day**, Sherritt Gordon Limited

Session 3: **A. Ismay**, Minproc Technology Limited  
**B.N. Doyle**, Sherritt Gordon Limited

Session 4: **R. Salter**, Lakefield Research  
**I.M. Masters**, Sherritt Gordon Limited



SUMMARY OF FAME REPORT RECEIVED

GRANT REFERENCE NO.: 10962-E66

NAME OF COMPANY: Minnova Inc.

NAME OF PROJECT: Britannia Option

AMOUNT OF GRANT APPROVED: \$ 40,000.00

TOTAL EXPENDITURES: \$ 68,401.80

ELIGIBLE GRANT: \$ 22,800.60

FUNDS LIBERATED: \$ 17,199.40

DATE REPORT RECEIVED: February 18, 1988

AUTHOR OF REPORT: C. Burge

TITLE OF REPORT: Summary of Exploration  
Activities Britannia Option P.M. 313 Furry Creek Area

COMMENTS ON REPORT: Geological report with 1:2000  
scale map of property. Details volcanic stratigraphy  
similar to that at the Britannia deposit to the west.

COMMENTS ON PROJECT: Successful in delineating 2  
new mineralized targets by geological methods. Property is  
about 15 kilometres east of Britannia Beach. Original  
program included a drilling component but this was cancelled  
due to lack of equipment.

COMPANY'S COMMENTS ON FAME: "Mapping and sampling outlined  
2 exciting new mineralized zones never before documented.  
500 meters east of the Watershed prospect, extensive  
chalcopyrite/pyrite/sphalerite stringer systems below copper  
and zinc-rich dacitic ash beds were discovered in numerous  
old pits and adits. A second possibly lower mineralized  
cherty ash unit was discovered situated stratigraphically  
above a silica-flooded andesite, a unit remarkably similar  
to that which hosts the No. 8 ore body in the prolific  
Britiannia mine. This area has not been drill tested."