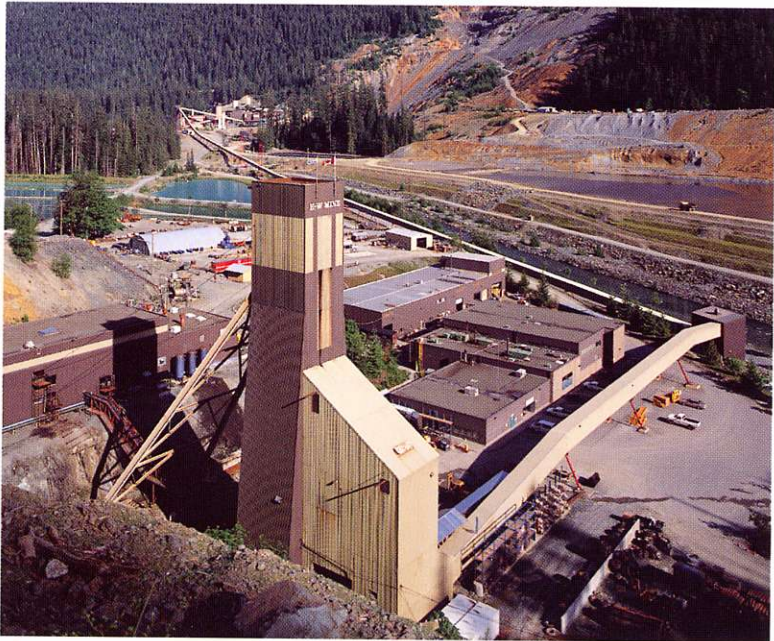


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Myra Falls Operations

Campbell River, British Columbia

Corporate Profile

Boliden Limited is engaged in the mining, processing and sale of metals and mineral products, principally zinc, copper and gold. The Company operates mining and milling operations in Sweden, Spain, Canada and Saudi Arabia, as well as smelting and refining operations in Sweden and Norway. In February 1998, the Company completed the acquisition of Westmin Resources Limited, which has zinc and copper mining and milling operations in Canada and Chile. Boliden is also engaged in the fabrication and sale of copper tubing and brass products with fabrication facilities in Belgium, the Netherlands, Sweden and the United Kingdom.

Welcome to Myra Falls Operations

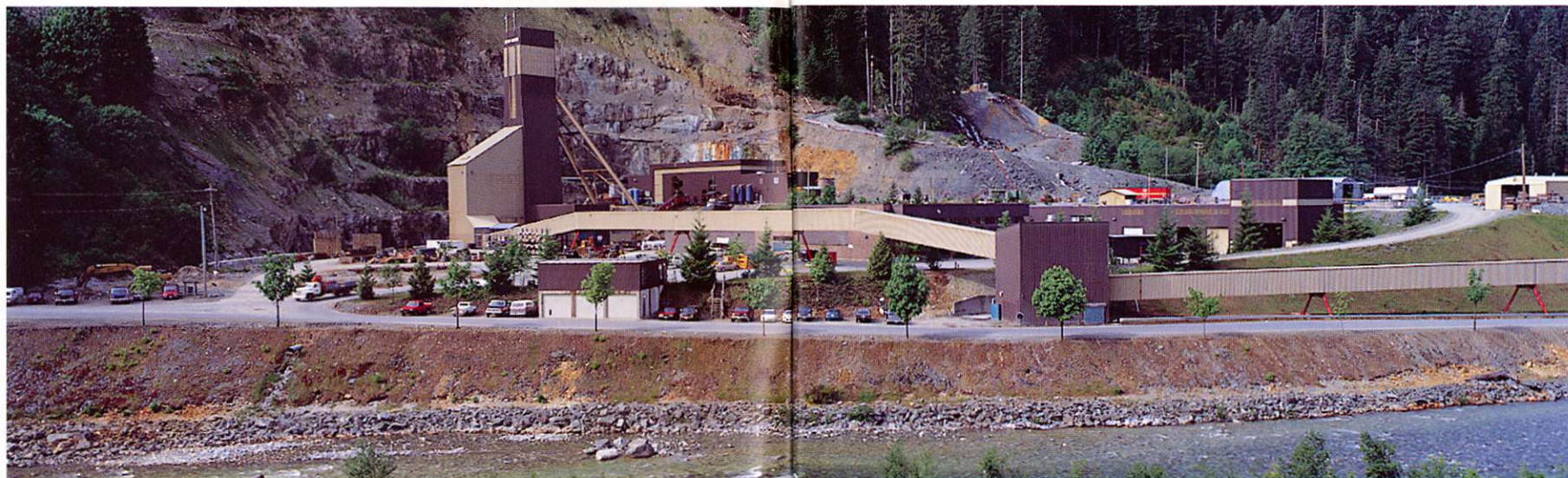
This modern mining facility is located in Strathcona Park, British Columbia's oldest provincial park, near the south end of Buttle Lake on Vancouver Island. A 90-kilometre highway from Campbell River provides access to the scenic minesite.

Most of the approximately 400 employees at Myra Falls have made

their homes in the region. They work as partners with the community and the environment, enjoying and cherishing the area's beauty. During your stay, Boliden asks that you also help to maintain these picturesque surroundings so future visitors may enjoy this natural wilderness park.

Myra Falls Operations produces copper and zinc concentrates with significant gold and silver values. After being trucked to Boliden's Discovery Terminal storage and loading facility in Campbell River, the concentrates are transferred to ships destined for smelters in Europe, North America and Asia. There, the concentrates are further processed to yield final metal products.

Copper is primarily used in the manufacture of wire, tubing and sheeting for use in houses and buildings, electrical and electronic products, telecommunication systems and power equipment. Zinc's resistance to atmospheric corrosion makes it an attractive coating for steel and is used in the automobile and construction industries. Zinc is also alloyed with copper to make brass and with other metals for use in diecasting precision parts. Zinc powder is an important ingredient in cosmetics, sun protection and tires.



Panoramic view of H-W headframe, administration offices, garages and conveyor system.

History - *the search for hidden treasures*

In 1918 James Cross and Associates of Victoria staked claims in the Myra Falls/Buttle Lake area covering the H-W, Lynx, Price and Myra Mines. Today, these claims make up a sizeable portion of Boliden's Myra Falls property holdings.



Hardrock miner.

Following the discovery of the Lynx Mine mineralization, evaluating the underground deposits was the next challenge. The Paramount Mining Co. of Toronto started the first development work in the area during the 1920s, but inconclusive findings, along with the remoteness of the area and depressed metal prices, resulted in little work being done in the Myra Valley until 1959, when the Reynolds Syndicate acquired the claims. This group then sold the claims to Western Mines Limited, in 1961.

In 1966, the Lynx Mine started as an open pit operation and by late 1967 was producing 860 tonnes of ore per day containing gold, silver, copper, lead and zinc. As mining of the Lynx open pit continued, diamond drilling established underground ore reserves. A shaft was sunk to a depth of 335 metres with horizontal levels at 46 metre intervals. Exploration results were favourable and the company decided to bring this underground operation into production. The Lynx open pit mine was completed in 1975, but the Lynx underground mine produced approximately 8,500 tonnes of ore per month until operations were suspended in 1993 for economic reasons.



Access to the minesite was by boats and barges on Buttle Lake until 1966.

Prior to 1966, the year Westmin Resources Limited built the 50-

kilometre highway along the east side of Buttle Lake, all workers, construction equipment, materials and supplies were transported to the site by boat or barge on Buttle Lake.

The Myra Mine orebodies were discovered in late 1969 and underground development quickly accessed these high-grade deposits. This mine operated from 1972 to 1986 and produced over one million tonnes of ore that was rich in gold, silver and zinc.



Ore truck, circa 1960s.

The Price Mine, another of the three original deposits discovered in the area, lies adjacent to the Myra Mine, but on the other side of Mt. Myra. This mine's development has been limited and it has not yet been brought into production.

In 1976, an aggressive exploration program was initiated to offset the inevitable decline in the Lynx and Myra ore reserves. In late 1979 this program was successful in locating the large, massive sulphide deposit now known as the H-W deposit. "H-W" stands for Harold Wright, the first President of Western Mines.



Administration building under construction, circa 1960s.

Following additional drilling, development and feasibility studies at the new H-W Mine, a 716-metre, six-compartment shaft was completed. This is serviced by a 49-metre-high headframe. In 1985, after completion of a 1.4 kilometre conveyor to the new mill, the mill itself and a number of support facilities, initial production averaged 2,700 tonnes per day. Mill production capacity was later increased to 3,650 tonnes per day in 1989. An intensive exploration and stope development program is currently underway to meet and sustain this production target and increase ore reserves.

Mining is a process of discovery and development. A team made up of geologists, geophysicists, diamond drillers, mine-planning engineers and other technical specialists, locates and maps mineral deposits containing valuable metals such as copper, zinc, gold and silver.

Although it is commonly thought that base and precious metals are found in solid veins of pure metal, they usually occur in chemical compounds known as sulphide minerals, distributed throughout the rock. Even in a massive sulphide deposit, ore may contain less than 50 per cent sulphides and less than 15 per cent pure metals.

For example, in high-grade orebodies such as some of those at Myra Falls, one tonne (2,204.6 pounds) of rock may contain approximately 2 grams of gold, 30 grams of silver, 50 pounds of copper and 100 pounds of zinc. In many lower grade mineral deposits, the metals that occur as sulphide minerals are more sparsely distributed, resembling raisins in a cake. Finding these orebodies is like finding a needle in a haystack, especially when geologists must rely on 50 millimetre (2 inch) diameter drill-hole core samples to provide the clues that tell them where ore may be located.



Diamond drilling core samples.

Each year millions of dollars are spent in search of reserves for future mining activity. While the sulphide deposits that make up the various orebodies at Myra Falls are being mined, further exploration is necessary to

maintain the ore reserve base and prolong the life of the Myra Falls Operations.

An understanding of how orebodies are formed is one of the main tools in the process of discovering new reserves. Specialists must analyze all available data and decide where exploration drilling should be done. The result of exploration drilling is a drill core that is logged and examined in its entirety and sampled at intervals to obtain assay tests of specified zones. These geological and assay results are then compiled by geologists and mine-planning engineers to determine if mining is warranted and if so, to establish a mine design.

Orebodies in the H-W, Lynx, Myra and Price Mines are located within a 450-metre thick sequence of volcanic rocks of Permian age known as the Sicker Group. This sequence of rocks is approximately 350 - 400 million years old and consists largely of volcanic flows deposited on the ancient sea floor. Orebodies within the Sicker Group are associated with favourable bands of volcanic rock known as rhyolites.



Computer modeling by project geologist.

Three rhyolites are recognized in Boliden's Myra Falls properties. Lynx, Myra and Price orebodies outcropping above the valley floor belong to one of two "upper" rhyolitic horizons. The "lower" rhyolitic horizon hosts the H-W orebody, about 300 metres below the valley floor. At the Lynx Mine, the numerous individual ore lenses typically occur at the top of the rhyolite. At the H-W Mine, ore is at or near the base of the lower rhyolite.

The orebodies extend in a northwest/southeast direction over a known length of 6,100 metres in the Lynx/Myra/Price and H-W rhyolitic horizons. The major ore minerals are zinc sulphide (sphalerite), copper/iron sulphide (chalcopyrite) and lead sulphide (galena). These ore minerals occur as either massive fine-grained lenses, or are finely dispersed in the surrounding host rock (rhyolite or sericite schist).

Mining - extracting nature's treasures

Personnel who work underground are given extensive training so they can handle the sophisticated equipment and unique environment more than 300 metres below the Earth's surface. The mines generally operate three shifts a day, five days a week, with the mill operating seven days a week.



Longhole drilling, H-W Mine.

Underground on each level, a network of drifts (tunnels) extends from the shaft to the actual mining areas referred to as stopes. Mining is a continuous process of drilling, blasting and removing broken ore. When ore is removed and the valuable minerals separated from it, about 60 per cent of the ground-up waste rock (tailings) is placed back into the mine as backfill.

The H-W orebody is a thick massive sulphide deposit that allows for a bulk mining system utilizing rubber-tired diesel equipment. Parts of the Lynx Mine have also been modified to allow use of this type of equipment.



Remote controlled scooptram, H-W Mine.

H-W ore is transferred from stopes to orepasses (vertical or sub-vertical tunnels through which broken ore moves by gravity) using load-haul-dump vehicles commonly known as scooptrams. Once in the orepasses, ore drops into waiting train cars on 24 level and is trammed to the coarse ore bin. Due to wide variations of stope ore grades, the ore is blended through specific tramming patterns to ensure a more consistent ore grade at the concentrator.



Miners, H-W Mine.

Once the ore reaches the primary-jaw crusher, underground, it is broken down into pieces less than 150 millimetres in thickness and loaded into an 11.5-tonne capacity skip. Then, two giant metal buckets called counter-balanced skips hoist the ore up the shaft to a 100-tonne storage bin in the headframe.

From the storage bin, the ore then travels on a 1.4-kilometre-long conveyor to a 3,600-tonne coarse ore bin at the concentrator.



Conveyors transporting ore to mill.

Underground *Maintenance*

More than 300 metres underground in the H-W Mine is a huge maintenance shop containing five work bays, a drill repair bay, electrical shops, a warehouse with computer facilities and a



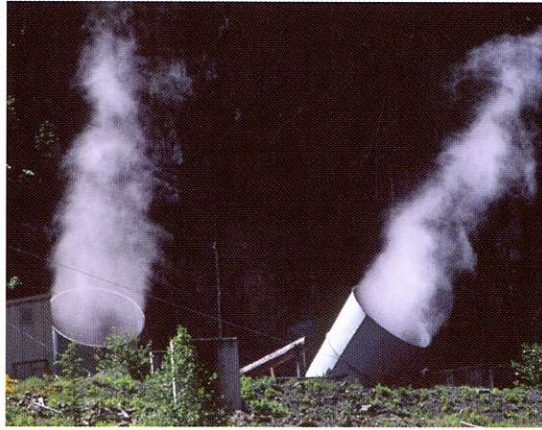
Maintenance shop 300 metres below the surface, H-W Mine.

lunchroom. Over one hundred pieces of equipment operate underground at H-W, including trucks, drill jumbos, a road grader, and mobile service vehicles for tradesmen.

Ventilation

A large amount of ventilating air is required to remove exhaust gases, blasting fumes and smoke when mining with diesel powered equipment underground. At Myra Falls, Boliden has ventilation fans installed that move more tonnes of fresh air through the mine than tonnes of ore removed.

H-W ventilation fans installed on the surface, even with buffers and mufflers, were found to produce an annoying whine, which could be heard by Strathcona Park hikers miles away. After considerable investigation and expense the Company purchased new energy efficient fans and installed them deep underground to successfully alleviate this noise problem.



Mine ventilation exhaust ducts.

Milling - liberating nature's treasures

The ore from the mines, already broken into pieces less than 150 millimetres thick, is taken to the mill/concentrator. (The mill is also known as the concentrator because it concentrates the ore minerals and separates them from waste rock.)



Grinding mills.

The milling process begins when ore reaches the secondary crusher. Here the rock is crushed and recycled back to the crusher until it is broken down into small pieces approximately six millimetres thick. After crushing, the ore passes through a rod and ball milling

process that grinds it into fine particles. These particles are mixed with water to form a slurry.



Mill operator, H-W mine.

This slurry, now ready for separation, is then passed through flotation cells where the chemically treated ore particles are separated from waste particles, floated to the surface with bubbles, and skimmed off as a bubbly froth. Copper mineral particles are recovered first, and then the slurry is recirculated and

zinc particles removed. Gold and silver are not separated at Myra Falls but are contained within the base metal concentrates and recovered when concentrates reach the smelters.

Samples are taken regularly to determine the grades (percentage) of copper and zinc contained in the concentrates, as well as the amount of other metals like gold and silver.

Copper and zinc concentrates are then pressure filtered to remove water before being transported by truck to Boliden's storage facility at Discovery Terminal in Campbell River. Every three to four weeks the concentrates are loaded onto barges or ships destined for smelters in Asia, Europe and North America.

Power Generation

Boliden operates two hydroelectric plants as mining and milling on the scale of the Myra Falls Operations requires considerable electrical power. The Thelwood Hydro plant fed from the Thelwood and Jim Mitchell Lakes, generates eight megawatts, while a second, smaller hydro plant, fed by Tennent Lake, provides the operation with an additional three megawatts. With supplementary power from diesel electric generators a total of 12 megawatts is used to run the mine, mill and support facilities.



Power station control room.

Environment - preservation for the future

Strathcona Provincial Park is British Columbia's oldest provincial park and the largest one on Vancouver Island, covering 231,000 hectares. Boliden's mineral claims cover about 3,000 hectares, but the area of surface installation and disturbance is only about 170 hectares, or about 0.074 per cent of the park area. Despite this small surface disturbance, Boliden takes its responsibility to minimize and mitigate its impacts on the park environment very seriously and continues to research ways to reduce its current impacts and improve its post-mining reclamation.

In the early 1980s when the owners of the mine requested approval to expand its operations, they had to meet specific guidelines set by the Government of British Columbia as well as address concerns of the local community. Two of these were requirements to cease deposition of tailings onto the bottom of Buttle Lake and to reduce the quantity of metals leaching out of waste rocks and finding their way into the lake. To do so, surface and ground water treatment systems were installed during July and August of 1982. A new onland tailings disposal system was devised using a "sub-aerial" technique to produce a seismically stable, dry-land mass. Since installation, this system has performed to expectations and can be fully reclaimed when mining is completed. As part of the facility, tailings drainage and ground water are now collected by a specially designed under-drainage system. These waters are pumped to the Myra ponds, an integrated water management system, for treatment.



Environmental Technician.



Tailings pond facility.

Detailed monitoring, undertaken not only by Boliden but also by federal and provincial agencies, has proven that the new, combined systems are effective. Currently, Buttle Lake water quality more than meets federal guidelines established in March 1987 for the protection of freshwater aquatic life, and is significantly better than the water quality in 1971, when monitoring commenced.

In 1983 and again more recently, independent studies have shown that previously deposited tailings have had no effect on Buttle Lake. They have not leached and are unlikely to do so because of the oxygen-deficient nature of the lake bottom. This indicates that the tailings do not contribute to metals in the lake and a natural, organic-rich layer of lake sediment is now covering them.

Reclamation, the rehabilitation of disturbed areas, is an integral part of today's mining processes. At Myra Falls much has been done to return areas of the minesite to their original appearance through the use of landscaping and vegetation designed to make the site blend in with the surrounding parkland.

Obsolete installations have been removed from the site to improve its overall appearance. These include the old mill, the road, bridges and pipeline once used for disposal of tailings to Buttle Lake. Sites used for surface diamond drilling are reclaimed to the point where no visible evidence of any drilling activity remains. A five-year project completed in 1993 involved roadside rehabilitation along the six kilometre access road to Jim Mitchell Lake. This road was constructed through some very rugged, mountainous terrain and extensive use of bioengineering techniques was necessary for slope stabilization prior to seeding and planting. Close to 30,000 indigenous trees and shrubs have been planted in addition to seeding with grasses and legumes. This road now forms the access route to a new trail to the Bedwell Lake area of the park, built partially with Company financing.



Whitetail deer grazing on the H-W berm.

The overall objective of Boliden's reclamation program is to return as much of the site as possible to its natural, pre-mining, productive state prior to reverting to Class "A" Park status after completion of mining. To this end the Company is engaged in ongoing research,

and supports research being done by others, to determine the most effective reclamation methods and to minimize any possible long-term effects from its waste rock dumps and tailings deposit. Much of this research is being conducted in cooperation with industry and government agencies and has been recognized at several international forums.

Socio-Economic Impact

The Myra Falls Operations has an economic impact spreading far beyond the minesite. A May 1997 study by economic consultants Will McKay and Co. Ltd. estimated that in 1996 Myra Falls Operations generated \$45.7 million in income and created 1,085 jobs within the Comox-Strathcona Regional District (CSRD).

The \$45.7 million in income was made up of \$27.5 million wages, pensions and dividends to our employees, retirees and local shareholders (direct income) and \$12.4 million by the income component of the local purchases of our suppliers and employees (induced income). Working this backward it means that every \$1.00 of direct income from the mine generates \$1.68 in total regional income.



Buttle Lake.

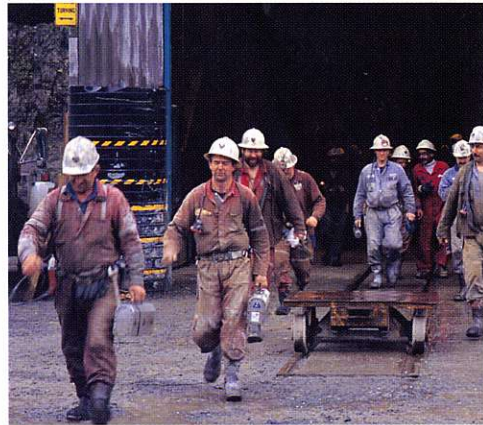
Applying provincial and national income multipliers of 2.5 and 3.0 respectively which are appropriate for the mining industry, means there is an additional \$18 million of income generated elsewhere in the province and an additional \$15.2 million nationally for a total of \$78.9 million of income generated in Canada.

The employment impact works somewhat the same way. At the end of March 1998 there were 434 employees at Myra Falls (direct

employment). Employment of our suppliers and contractors in the region is estimated at 165 (indirect employment) and the spending of our employees and suppliers/contractors results in an additional 492 jobs in the region (induced employment). This comes to a total of 1,085 jobs, which means each direct job generates 2.50 total jobs in the region.

Using applied employment multipliers of 3.0 and 3.3 for the province and the country to estimate employment outside the Regional District, it is estimated that the Myra Falls Operations generates an additional 130 jobs in B.C. and a further 143 in the rest of Canada - a total of 1,358 jobs.

The total employment generated by the mine accounts for roughly 3 per cent of all jobs in the CSRD. In Campbell River, which is the residence of approximately 80 per cent of Myra Falls employees and the source of most local purchases, the relative importance of the mine is more than double that for the CSRD. Over 7 per cent of total employment in Campbell River result from the Myra Falls Operations activities. Another local benefit is the annual lease payment to the Campbell River Indian Band which owns the land where the Discovery Terminal stands.



End of shift, H-W Mine.

Myra Falls Operations also makes a significant contribution through taxation, which generates and supports a significant portion of the income and employment outside the CSRD. The Company pays millions of dollars in direct, non-profit based taxes to three levels of government - mainly in the form of sales and property taxes. The mine's profits are also subject to income tax.



Aerial view, Myra Falls Operations.

In addition to company taxes, a substantially larger amount is paid by way of payroll deductions that include employee income taxes, Employment Insurance premiums and Canadian Pension Plan contributions to local, provincial and federal governments.

In fact, although the B.C. mining industry employs less than 12,000 workers, which is less than one-half of 1 per cent of our population,



Myra Falls.

we contributed \$3.0 billion to the Canadian economy in 1996. B.C. mining companies have used less than one-tenth of 1 per cent of the land area of B.C. since mining began about 150 years ago.

NOTES

Design and production: Malcolm Gordon Limited



Mount Myra, Strathcona Provincial Park, B.C.



Ship loading concentrate at Discovery Terminal.

Myra Falls Operations

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**Regular tours start at 1:00 p.m.
Monday to Friday from May to August**

Arrangements can be made through the Employee Relations Office for special group tours anytime throughout the year.

 **boliden**