QUARTERLY

Prosperity

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The Prosperity deposit is located in the most efficient and productive open pit mining region in the world.

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class mining operation," said Paul Semple, Vice-President of Kilborn Engineering Pacific Ltd., a subsidiary of SNC-Lavalin that has been commissioned to undertake a \$7 million final feasibility study of the Prosperity Project. "The equipment proposed for Prosperity is some of the most advanced, proven mining technology in the world today."

Taseko is confident that 1999 will be the year that Prosperity is confirmed as an economically viable and environmentally sound project. Kilborn's detailed feasibility study is scheduled for release early in the year, followed by the conclusion of a harmonized federal-provincial environmental review of the Prosperity Project.

In search of Prosperity BC's mining sector reaches a crossroad

ritish Columbia's reputation as a province that supports mining has been in free-fall for much of the 1990s. By 1998, exploration spending to identify and develop new mines in BC had fallen to a 30-year low of just \$40 million.

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This dramatic decline has not gone unnoticed by the governments of BC or Canada. As the 1990s draw to a close, government is re-thinking its policies and seeking new partnerships with the BC min-

ing sector. The upshot has been new mining-friendly legislation, streamlined regulations, enhanced security of mineral tenure, power-rate incentives for major project development and a cooperative effort between industry and government to create 22,000 new mining jobs within a decade.

BC

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The reforms look good in principle, but the mining community and the financial marketplace are still looking for a clear sign that things have changed in BC.

The Promise of Prosperity

The litmus test for BC's renewed commitment to mining may well be the Prosperity Gold-Copper Project. Not only is Prosperity the most advanced new development project in British Columbia, it is the most significant open-pit mine proposal that the province has seen in two decades.

"Prosperity is the right project in the right place at the right time," said Taseko Mines Limited President and CEO Robert A. Dickinson. "It presents an ideal opportunity for industry and government to show the world that you can develop world-class open-pit mines in British Columbia in a timely way and with a healthy return for investors."

A Golden **Opportunity...**

Taseko has spent more than eight years and \$65 million developing the Prosperity Project, an immense gold-copper porphyry deposit located 125 kilometers southwest of Williams Lake. More than 472,000 feet of drilling in 326 holes have proven a 633

> million tonne orebody, containing 9.49 million ounces of gold and 3.53 billion pounds



Taseko's modern team of mining professionals expects Prosperity to become a world-class model of responsible mineral resource development.

'Prosperity' benefits all of BC

When in production, the Prosperity Project will deliver substantial social and economic benefits to the people of British Columbia and Canada. These include about 550 direct and 1,280 indirect jobs, approximately \$1 billion in capital investment and more than two decades of economic development. More importantly, Prosperity will send a resound-



"What we're talking about is the largest mineable gold resource in the country," Dickinson said. "The Prosperity deposit is destined to become the most significant gold producer in British Columbia history." Taseko's proposed milling complex will also set a new standard for BC. Prosperity will use some of the largest and most advanced mining and milling equipment in the world to facilitate throughput of 110,000 tonnes of ore per day on two production lines. Annual metal production will range over 460,000 ounces of gold and 190 million pounds of copper.

"It's a very significant deposit, and we expect it to develop into a world

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ing message that BC is once again open for mining business.

"I think we're quickly approaching a crossroad," Dickinson said. "The success of the Prosperity Project will have a profound impact on the future of mining in BC."

The Prosperity Advantage

Why is Taseko so confident that Prosperity can operate profitably in British Columbia at a time when existing mines, such as Endako, Gibraltar and others, struggle to survive?

"Prosperity enjoys a number of benefits that clearly separate us from other projects," said Bruce W. Jenkins, Taseko's Director of Project Development. "For example, the Prosperity deposit is located in the most efficient and productive open pit mining region in the world."

Jenkins points to the excellent infrastructure that surrounds the Prosperity Project, including highways, railways, hydroelectric power and the ready supply of skilled mine workers. Prosperity will not require significant infrastructure improvements, he noted, beyond a few minor road upgrades and a \$15 million transmission line.

On power rates too, Prosperity is poised to benefit from a key BC advantage. Taseko recently signed an agreement with the provincial government to negotiate a preferred power rate for the Prosperity Project. "When 16 percent of your operating costs are directly attributable to power," Jenkins said, "tapping some of the most competitively priced industrial power in North America is a significant advantage."

But perhaps the biggest competitive advantage that Prosperity enjoys is the size and continuity of the deposit itself, as well as the tremendous economies of scale and long life that its development permits. The Prosperity deposit contains more

PROSPERITY PROJECT Projected Socio-Economic Benefits

	Jobs			
Construction	320 direct			
	860 indirect for 24 months			
Operations	550 direct			
	1280 indirect for 21 years			
Ca	apital Investment			
To date	\$65 million			
Construction	\$600 million			
Operations	\$300million			
Tax Payments to Government				
\$100 million annually				
Years of Economic Activity				
	23 years			

PROSPERITY PROJECT Reserves & Production Statistics



gold than any other mine in BC history, and ranks fourth all-time for contained copper. With a throughput of 110,000 tonnes per day, and annual production ranging over 460,000 ounces of gold and 190 million pounds of copper, Prosperity will be one of the most efficient mining operations in the world.

"Prosperity would operate at a profit at today's metal prices, and the economics will only improve as metal prices recover," said Ross Banner, Taseko's Engineering Manager. "The fact that two metals are present in significant quantities means that the value per tonne of ore at Prosperity will exceed the value per tonne of ore at Highland Valley."

Sustainable profit margins

Despite the absence of gold production at nearby Highland Valley, Banner said the giant open-pit copper mine provides a useful benchmark against which to compare the Prosperity Project. Highland Valley Copper is recognized as one of the most efficient mines in the world, due to a skilled labour force, excellent highway, railway and energy infrastructure and the productivities of scale realized from its high throughput rate. These efficiencies will also accrue to Prosperity, with additional efficiency benefits arising from the opportunity to utilize the very latest in proven mining and processing technology, and flexible metal price hedging strategies for the diversified production of two metals.

"With the high copper by-product credit, we expect the cost per ounce of gold produced at Prosperity to be in the lowest quartile of the cost curve for world gold mine production," Banner said. "This competitive operating position will ensure sustainable profit margins, even during cyclical downturns in gold and copper prices."

The Prosperity Partnership

Taseko is expected to be assisted in its efforts to develop the Prosperity Project by the recent positive reforms brought about by the provincial and federal governments. These include the BC government's *Mining Rights Amendment Act (Bill 12)*, which promises to entrench the right to mine in BC and enhance security of mineral tenure. The provincial government also created an exploration tax credit in 1998, and extended its Mineral Tax allowance for new mine developments. Ore Reserves at start-up of principal BC open pit mines

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The Cariboo-Chilcotin Land Use Plan – While the provincial government's land use planning initiatives have not provided security of land access in many areas of BC, the land use plan for the region in which the Prosperity Project is located has been finalised. The plan provides Taseko with absolute certainty that its project is located in an area explicitly identified for mineral development and extraction.

Cooperation from all sectors

The Prosperity Project has also been aided by the people and First Nations of the Cariboo-Chilcotin region. In addition, Taseko's extensive stakeholder consultation efforts, including a series of public workshops and open houses held in the Prosperity Project Community Office in Williams Lake, have returned overwhelming local support.

The North American mining establishment has also been a key backer of the Prosperity Project. Taseko has assembled some of the country's finest mining consultants to serve on the Prosperity Project team, including Ian Hayward International Ltd., Independent Mining Consultants Inc., Knight Piesold Ltd., Lakefield Research, Melis Engineering Ltd., and Triton Environmental Consultants Ltd. In 1998, Taseko called upon the recognized experts at Kilborn Engineering Pacific Ltd. and its parent company SNC-Lavalin to audit and verify all of the work that Taseko and its consultants have done over the past eight years as part of a \$7 million bankable feasibility study.

"Some of the best mining people in Canada believe in the Prosperity Project, to the point where companies like SNC-Lavalin have expressed an interest in participating in the development." Dickinson said. "It's an important vote of confidence for us, because we intend to fully finance the project prior to construction." At the end of the day, realizing the promise of Prosperity will take the combined will of Taseko Mines Limited, its contractors and suppliers, the governments of British Columbia and Canada, and the people of the Cariboo-Chilcotin. It's the kind of partnership that must exist for mining to succeed in the modern era.

	Orebody	
	633 million tonnes	
	Grades	
Gold	0.466 grams per tonne	
Copper	0.253%	
	Contained Metals	
Gold	9.49 million ounces	
Copper	3.53 billion pounds	
	Milling Rate	
	110,000 tonnes per day	
	Annual Production	
Gold	460,000 ounces	
Copper	190 million pounds	
	Years of Production	
	21 years	
t		
Constantinue		

Other positive steps include:
The BC government's Power for Jobs initiative, which utilizes surplus hydroelectric power to encourage major project investment in BC. Taseko recently signed a Cooperative Resource Development Protocol with the provincial government to negotiate a preferred power rate agreement for Prosperity by March 31, 1999.

The Canada-British Columbia Agreement on Environmental Assessment Cooperation, which is intended to eliminate unnecessary delays in permitting by establishing a single review process that involves both federal and provincial agencies. Prosperity is the first mine development proposal in BC history to be comprehensively reviewed under the 1997 harmonization agreement.

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The 1998 Mining Year In Review



Gary Livingstone

President, MABC

INETEEN HUNDRED AND EIGHTY-EIGHT was a very difficult year for BC's mining industry. While we remain a vital economic engine of the province, we have been plagued by a combination of circumstances that have had a traumatic effect on our industry. Slipping commodity prices and the Asian financial crisis

helped push production volumes down. Add to that the general lack of investor confidence in BC and you have a recipe for a very tough business environment for mining.

No closures, one opening



The good news is there were no mine closures in 1998. Unfortunately though, only one new mine was opened. With several projects at various stages in the mine development review process, every effort must be made in the coming year to see those pro-

The Mining Rights Amendment Act

jects advanced towards the construction stage.

We began the year with high hopes for Bill 12 - The Mining Rights Amendment Act. The legislative package included a welcome exploration tax credit as well as a new Mineral Exploration Code. It was also designed to ensure access to land and to provide fair market compensation to those mineral tenure holders affected by the creation of parks, two essential ingredients to survival and future growth. Once introduced however, the bill suffered a couple of setbacks. First, government watered down the land access components, in deference to the environmental lobby. And second, discussions between government and industry stalled over the concept of fair market value. After more than nine months of discussion, we are finally near to agreement and a positive announcement in this regard may yet be made in the early days of 1999.

Mineral exploration expenditures

Mineral exploration expenditures in the province this year will hit record low levels – estimated to bottom out at just \$40 million. It takes approximately \$75 million in exploration spending to find one mine and we need annual exploration spending to be in the \$200 million range to sustain our industry.

We have been plagued by a combination of circumstances that have had a traumatic effect on our industry.

Why is exploration spending so low? Two reasons: first, the general lack of investor confidence in BC makes attracting capital extra difficult. But perhaps the biggest barrier to mineral exploration investment is the current provincial land use planning process. Amongst the leading resource industries, particularly mining and forestry, there is agreement that the current land use planning and decision-making processes are not working well; some suggest not working at all. It started with the goal of turning 12 percent of the province into parkland, but now that the 12 percent have been reached; the objective seems to extend beyond.

Land Resource Management Plans The Land Resource Management Plans (LRMP's) are now zoning lands across the province, in many cases zoning mineral exploration and development into extinction. It is a serious situation that Government must address in the months ahead. The full impact the land use planning process is having on the province must be considered. Economic and social impact analysis should be an integral part of all land use planning decisions in the province.

Crown Land Crown land comprises 94 percent of BC. The rules governing access to that land have a huge impact on mining and several other of the province's most important industries – forestry, oil and gas, and agri-food. We account for roughly 30 percent of provincial GDP; we form the backbone

A tough business environment for mining in BC

of most regional economies outside of south-western BC and we must have access to the land in order to survive.

Looking ahead to challenging times

In looking ahead to next year, the provincial government must prepare for the closure of the Snip mine and the possible closure of Endako, Gibraltar, and the loss of tax revenue that goes with those closures. The coal industry, already facing tough times as a result of a 5 percent drop in coal prices, are invoking temporary shut down procedures to stem financial losses. A recently announced further 18 percent decline effective April 1, 1999 means that things are likely to get worse, much worse, before they get better. The coal industry in the Elk Valley alone accounts for annual revenue in excess of \$1 billion. When revenue of that size is threatened, it becomes a problem that can affect everyone in the province.

Despite the government's continued claim that job creation is their top priority, our industry, which generates the highest paying jobs in the province – an average of \$74,600 per year – remains stymied by policies that inhibit growth and discourage investment. This, more than anything else, is what pushed us to become leading advocates of the BC Business Summit.

BC Business Summit

The Summit was an unprecedented coming together of business interests large and small from across the province, a remarkable show of support from a group that can rightfully claim representation for the interests of 1.4 million employees in the province. The government would be well served not to dismiss the Summit recommendations as being a "business only agenda." We are all in trouble in BC, not just mining. Business and industry drive investment, which in turn drives job creation, economic growth and stability. For education, health care and other social program priorities to thrive, the economy must first thrive. *Gary Livingstone, MABC*

Kilborn



Paul G. Semple P.ENG., Vice

ILBORN Engineering Manager Peter Cosgrove looks over a blueprint of the Prosperity Project's proposed mill facili-

ties and whistles softly. "It's big equipment," he says."Up there with the biggest and most advanced produced in the world; certainly bigger

Big equipment, modern technology characterize Prosperity mill

will generate more revenue, it will generate it sooner and it'll enjoy significant operating efficiencies."

At 110,000 TPD, Prosperity will be the second largest milling facility in BC, second only to Highland Valley Copper (125,000 TPD) and well ahead of thirdplace Kemess (40,000 TPD). Recent advancements in mining technology mean that Taseko will achieve its 110,000 TPD throughput utilizing two grinding lines; Highland Valley Copper runs five lines to achieve its 125,000 TPD.

PROSPERITY PROJECT

Mine Equipment Specification Highlights

Mining equipment proposed for the Prosperity Project includes:

four electric shovels with 42.8 m³ (56 cy) buckets;

five electric blast hole drills capable of drilling 349 mm (13¹/4") holes;

15 - 320 tonne (350 ton) haul trucks with trolley assist;

President & General Manager Kilborn Engineerthan anything in use in British Columbia today."

Kilborn Engineer- Prior to commissioning *ing Pacific Ltd.* a detailed engineering feasibility study for the Prosperity Project last year, Taseko Mines Limited had contemplated a 90,000 tonnes per day (TPD) throughput for its gold-copper concentrator. Kilborn has since designed a 90,000 TPD mill that, due to the size of some of the components, will handle more than 110,000 TPD. The proposed Prosperity mill will use some of the most advanced proven mining technology in the world to achieve significant cost efficiencies without any loss of mill recovery.

"Any mine that maximizes throughput will improve its economics, particularly giant gold and copper and metal mines," explained Sean Waller, Kilborn Manager of Strategic Development."For about the same capital costs, a mine like Prosperity 5,

"The equipment that we're proposing for Prosperity just wasn't available when Highland Valley was built in the early 1980s, or even when Kemess was designed three years ago," Cosgrove confirmed. "Prosperity will use the latest generation of mining equipment in use around the world."

AVERAGE DAILY THROUGHPUT

Active BC Open Pit Mines

tonr	nes per day
Valley (Teck/Rio Algom/Cominco)	.125,000
Prosperity (Taseko)	.110,000
Kemess (Royal Oak)	. 40,000
Gibraltar (Boliden)	. 35,000
Mt. Polley (Imperial)	. 20,000
Huckleberry (Imperial)	. 16,500

.

two front-end loaders with 25.2 m³ (33cy) buckets.

Mill Specification Highlights

Kilborn SNC-Lavalin is designing two parallel grinding lines, each to be composed of:

one 38' x 20' SAG mill, driven by a wrap-around 24,000 horsepower synchronous motor;

two 26' x 38' ball mills, each powered by two 9,000 horsepower motors with pinion drive;

one 22' x 38' regrind mill, powered by a 9,000 horsepower motor with pinion drive.

The flotation plant has also been designed with the latest technology, including: 40 - 160 m³ flotation tanks

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Ian Hayward International Ltd.

ODERN ENGINEERING METHODS met with pre-Incan culture during the recent installation of Argentina's first privately commissioned transmission line. BC company Ian

Hayward International (IHI) Ltd. of Surrey had numerous challenges to overcome as it worked for the Argentinean mining company Minera Alumbrera in the design of 203 kilometres of 220 kilovolt transmission line, and two new substations for Argentina's newest and largest copper and gold mine in the Andes.

The project required installation of 530 towers in areas ranging from sugar cane fields to sub-

tropical jungle to desert. In less than two years the line went from feasibility study to its completion in January.

"The Challenge was how to do this project in such a short time period with so many different kinds of difficulties. We had people from all over the world with many different languages. We had to work together as a team to get this work completed quickly," said IHI resident engineer Ibro Hadzismajlovic.

Company's work in New

Guinea led to South American project IHI is a full firm of consulting engineers specializing in the fast-track installation of high voltage transmission lines in rugged, remote areas. "The company's work in South America and the South Pacific is gaining a reputation for getting tough jobs done in a timely and cost-efficient manner," said CEO JOE Chesham.

The successful completion of another difficult project in Papua New Guinea resulted in the recommendation of IHI for this latest job. The New Guinea project required the installation of 73 kms of 132 kV line at altitudes of up to 3,300 meters and the installation of four substations.

The resource-rich country of Argentina has the most well-educated population in South America, with a literacy rate of 94 percent amongst its 33 million people. Despite these assets the country has had a volatile history both economically and politically. In recent years the democratically-elected government of Carlos Menem has been aiming to improve economic performance and reduce the role of the state.

Terrain ranged from desert to mountainous jungle

Hadzismajlovic said the mine in northwestern Argentina, (about 1,000 kilometres northwest of Buenos Aires) is the largest project undertaken there in 40 years. It is also the first privately commissioned transmission line, so getting necessary government approval and permits was a learning experience for both IHI and local public servants.

In order to get power from El Bracho substation in Tucamán province to the mine site a Bajo de la Alumbrera in the Andes' Catamarca province, IHI had to locate towers in mountainous jungle, desert, and rocky terrain. The



extreme variation in terrain meant installing three types of foundation. concrete pile, classic "pad and chimney," and rock foundations were all used, depending on the dictates of the site.

Design of the line also had to take into consideration the high degree of seismic activity in the area and concerns about the impact of the line visually, environmentally and archeologically.

In areas where it was impossible to build access roads, lines were installed using helicopters – a difficult task when having to contend with altitudes of up to 3500 meters. Helicopterós Marinos S.A. of Argentina did most of the helicopter work using Llamas and Super Pumas. IHI has had considerable experience with helicopter methods of construction but, despite its expertise, an uncontrollable delay at the start of the project together with the onset of less favourable weather, left helicopters grounded and resulted in workers being left in the jungle sometimes days longer than anticipated.

IHI worked with archaeologist to protect sensitive sites

Putting high voltage transmission lines through an area rich in pre-Incan Taff culture meant IHI had to work with government-organized groups of archeologists. They would make excavations at planned tower sites to ensure that nothing of archeological significance was going to be destroyed. At times, finds in the area required readjustment of the line, but generally IHI was able to avoid sensitive areas by referring to aerial photographs used during site selection.

Consulting Electrical Engineers: proven performance around the world



the visual impact throughout the popular scenic holiday resort of Tafí de Valle. IHI obscured the line by locating it according to the contour of the land wherever possible.

Special Composite insulators required to prevent flashover

Where the transmission line traverses the Tucumaán sugar cane fields, a special type of insulator was needed to cope with the heavy concentrations of ash that can accumulate during seasonal burn off of the crops.

"In this area we used composite insulators instead of the more common porcelain type. We wanted to reduce the possibility of flash over," said IHI's senior electrical engineer Allan Guy.

"It is important that the mine have a continuous supply of power. In order to ensure this we have used two transformers. If one fails, the other can back it up and maintenance can be carried out on either one without interrupting supply to the mine," Guy said.



"IHI assisted greatly in the implementation of the environmental practices both at the early governmental approvals level and during construction," said Vice President and Project Manager Brian Bolden. Another consideration in the design of the line was The majority of the transmission line supplies were provided by Trydor Industries of Vancouver.

The Minera Alumbrera project is just one of the many South American jobs that Ian Hayward International Ltd. has been part of, and Chesham says, "We are currently preparing proposals for two new projects, one in Argentina, and the other in Chile."

For more information

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PHOTOS: top, middle left, middle right Linemen at work atop one of the 31 metre towers; and a right, a closeup view of the line being attached to a tower insulator. Working at rarefied altitudes of up to 3,500 metres in Argentina's Andes is a challenging task for both man and machine; bottom The MAA 132/220kV step-up substation at El Bracho.

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