

PROPERTY FILE

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The Granby Mining Company Limited
PHOENIX COPPER DIVISION

A Brief History and Description of the "Phoenix" Operation

The Phoenix mine is situated some 6½ miles north of the United States border, 4 miles due east of the City of Greenwood and 8 miles west-north-west of Grand Forks.

The open pit now occupies an area once covered by the City of Phoenix which between the years 1900 and 1919 was a large thriving community, and the original Granby underground mine. The present open pit is mining through the old underground workings.

1891 - A group of prospectors from the Coeur d'Alene area of the United States discovered the ore body, brought supplies in from Marcus, Washington over a trail that joined the Dewdney Trail at Grand Forks, set up a camp and carried out detailed exploration work. They found the ore body to be large, but low-grade. As a result, interest in the property died. A little later it was discovered that the ore was self fluxing (thus cutting the costs of smelting) and interest once again rose.

1896 - A rubber footwear manufacturer from Granby, Quebec (from which the company was to take it's name) named S.H.C. Miner, gathered a group of mining promoters, including J.P. Groves and A.L. Little of Spokane, and formed a syndicate. Later a Company, the "Granby Consolidated Mining, Smelting and Power Company" was incorporated to work the ore body on a large scale. (In 1963 the name was changed to The Granby Mining Company Limited.)

1898 - The C.P.R. extended a branch line to Phoenix.

1900 - The City of Phoenix was incorporated. The Granby Smelter at Grand Forks was completed and began producing copper metal.

1904 - The Great Northern Railway was extended to Phoenix.

The ore body was developed by shafts reaching depths as great as 500 feet. Crosscuts were then driven from the shafts to the ore. As the ore was mined it left a series of large rooms, called stopes. To prevent these stopes from caving in, pillars of ore were left behind to support the roof.

The ore was drilled, blasted and then loaded into cars which were hauled on rails to the shaft. The ore was then hoisted up the shaft and sorted by hand prior to loading into railroad cars for shipment to the Grand Forks Smelter.

Copper was separated from rock at the smelter by mixing the ore with coke and heating it until it became molten. The copper settled to the bottom and the lighter molten slag was floated off. After cooling the metal was then shipped to a refinery in the east for further purification.

1919 - By 1919 some 13,000,000 tons of ore had been mined containing 1.5% copper. From this ore some 400 million pounds of copper, 400,000 ounces of gold and 7 million ounces of silver had been recovered.

At the end of the First World War the price of copper declined. This, and the lack of coke for the smelter, caused by a strike at the Crowsnest coal field, resulted in the closure of the mine. During the period of it's operation the Granby smelter was the largest in the British Empire and the second largest in the world. Phoenix, with it's schools, churches, banks, graded and

paved streets, and curling rink, supporting a population varying between 2,500 and 3,000 became a "ghost town". Phoenix had also held the distinction of being the highest incorporated city in Canada, at an altitude of 4,500 feet.

1920 - The few remaining citizens of Phoenix erected a modest granite memorial to the men who lost their lives in the Great War. Now, apart from a few decaying cabins on the outskirts of the area this granite memorial reminds us of the great sacrifice this community made. Granby maintains this memorial in a small park-like area close to a public road.

1930s- Ted McArthur of Greenwood, acquired the claims and mined small quantities of ore containing good gold values.

1952 - Attwood Copper Mines Limited carried out extensive exploration work on the property and finally sold it to Granby.

1956 - During the 50's large, efficient types of open pit mining equipment had been developed and in August 1956, Granby using this type of equipment to mine the remnants of low grade ore and the ore pillars in the old mine, started the construction of the plant.

1959 - In April 1959, production commenced at 900 tons per day.

1961 - In 1961 the mill was expanded, more heavy equipment was purchased and production was increased to 2,000 tons per day. Anything containing 0.5% was taken as ore; while the grade averaged 0.8% copper. Rock containing between 0.3% and 0.5% copper was stockpiled in the hope that one day it would be worthwhile milling. Today this grade is being maintained. One ton of ore contains 16 pounds of copper.

1969 - The capacity of the mill was once again increased. Now as much as 2,500 tons of ore were treated every day. The ore and waste are mined in horizontal slices on benches, 25 or 33 feet deep. A large electrically driven crawler-mounted machine drills 9"-diameter holes, 40 feet deep on a square pattern 20 feet by 14 feet apart. Each hole is loaded with ⁵⁰⁰250 lbs. of explosives, and as much as 250,000 tons of ore and waste rock are blasted at one time. These blasts break the solid rock sufficiently small to enable it to be loaded with large electric and diesel powered shovels into trucks capable of hauling 35 tons at one time. During 1969 for example 5 million tons of rock was moved, of which 900,000 tons was ore; the remainder had to be removed to expose the ore. Only 60 men and their large equipment were employed to do this.

The ore is hauled to the crushing plant which breaks the rocks to less than $\frac{1}{2}$ " in size. This is carried by conveyors to the mill where large rotating drums, 8 feet in diameter and 12 feet long, full of steel balls and water, grind the ore until it is as small as talcum powder. This released the copper from the waste rock. This fine rock, mixed with water is pumped to large flotation tanks through which air is bubbled and to which chemicals are added. The chemicals cause the fine copper particles (chalcopyrite) to attach themselves to air bubbles causing them to float to the top of the tank where the froth is removed. The unwanted waste (called tailings) is taken, suspended in water along a pipe line to the tailings pond where it is impounded behind a large dam. When the particles settle out of the water, the water is pumped back to the mill for reuse. About 1 million gallons of water are used every day for this.

The copper, now concentrated, is filtered to remove the water and partially dried in a furnace. It is then stored to await shipment to a smelter in Japan. Each day, of the 16,000 tons of rock moved out of the pit, only 60 to 80 tons of concentrate, containing 25% copper, remain. The remaining waste is either dumped in large waste dumps or sent to the tailings pond in the form of fine sands.

In 1969 reclamation experiments were started so that by the time the property at Phoenix closes down for the second time, plans for establishing a cover of vegetation can be formulated and executed.

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Since reopening operations at Phoenix in 1956, Granby has mined over 30,000,000 tons of waste and 7,000,000 tons of ore, having a gross metal content of 110,000,000 pounds of copper, 200,000 ozs. of gold and 1,700,000 ozs. of silver.