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ADMINISTRATIVE RECORD

ZONOLITE COMPANY

LIBBY, MONTANA

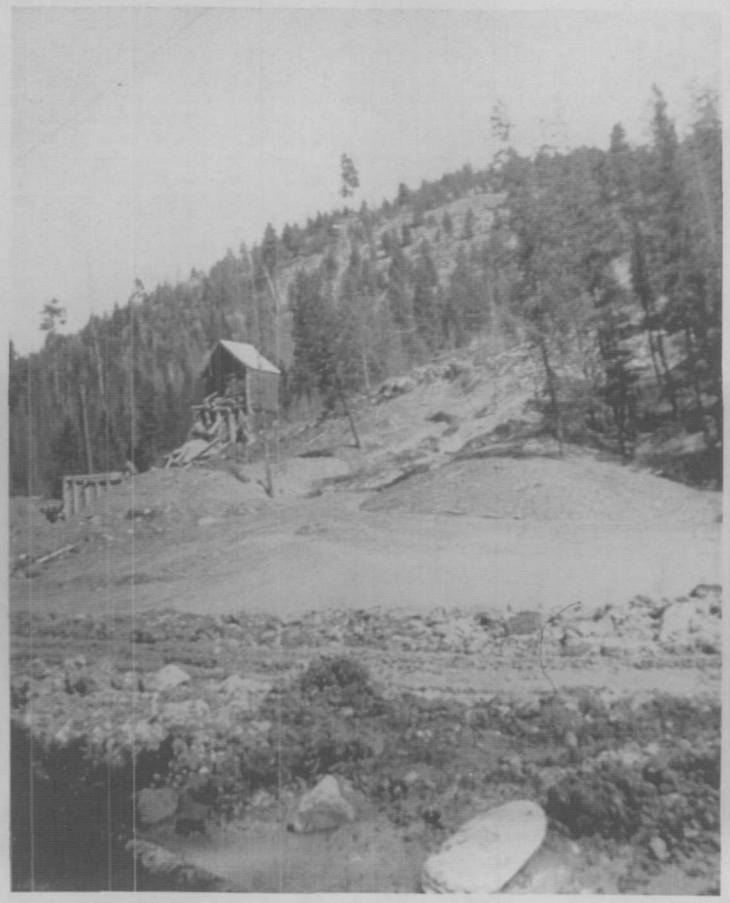
1934 - 1961

HISTORICAL HIGHLIGHTS

Prior to 1934, mining was by pick and hand shovel. The UNIVERSAL INSULATION COMPANY was mining underground, THE ZONOLITE COMPANY mined by open pit. Both companies were high-grading and there were no ore beneficiating facilities. This picture shows the open pit operation of the ZONOLITE COMPANY.

The first power shovel was a 3/4 yard Northwest purchased by THE UNIVERSAL INSULATION COMPANY. Mining on their property was changed to open pit from an underground operation on receiving this shovel, and small 1-1/2 to 2-yard dump trucks were used in the pit area and for the concentrate haul from the mill to Libby. Following picture shows the 3/4-yard shovel being "walked" across the Kootenai River as the bridge at Libby would not bear its weight.

In 1934, THE UNIVERSAL INSULATION COMPANY built a mill on Rainy Creek at the foot of Vermiculite Mountain. This was the first ore beneficiating facility installed for concentrating vermiculite. Prior to this time, THE ZONOLITE COMPANY had built drying and screening facilities in Libby. Both operations were small scale with production capacity of approximately 15 tons per day. This picture shows the mill building on Rainy Creek at the lower end of the tram. This building was later converted into concentrate ore bins.



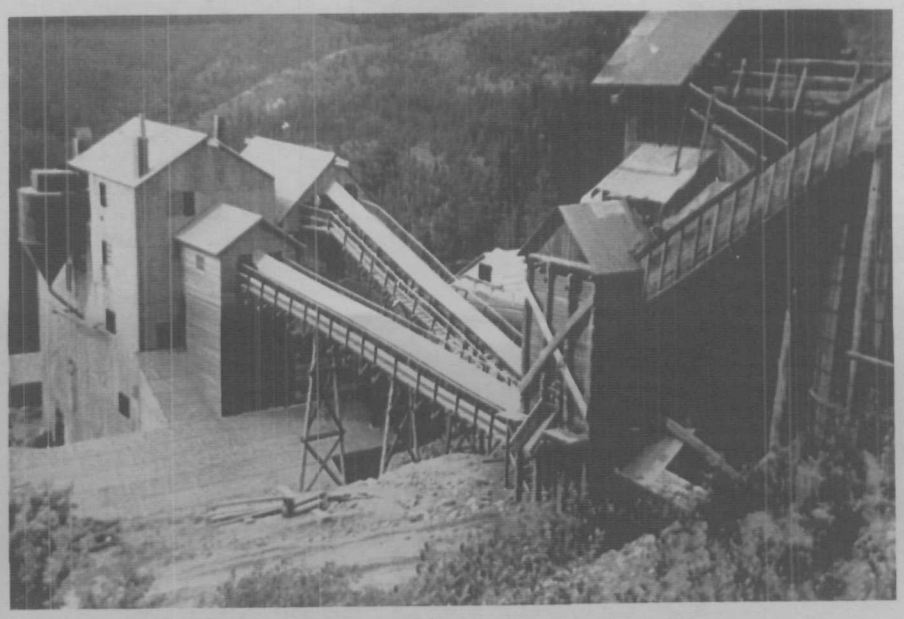
Dump trucks of 1-1/2 to 2-yard capacity were used in the pit and for the concentrate haul. This picture shows one of the trucks loaded with concentrate in bags. Most concentrates, however, were hauled in bulk, but this shipment was bagged for export and was part of the first export shipment from Libby.

In 1936, THE UNIVERSAL INSULATION COMPANY built a second mill at the site of the present mill which was also the upper terminal of the tram. The lower or original mill was abandoned as a mill and converted into concentrate bins. The following picture shows this second mill which was the beginning of the facilities now in existence at that location.

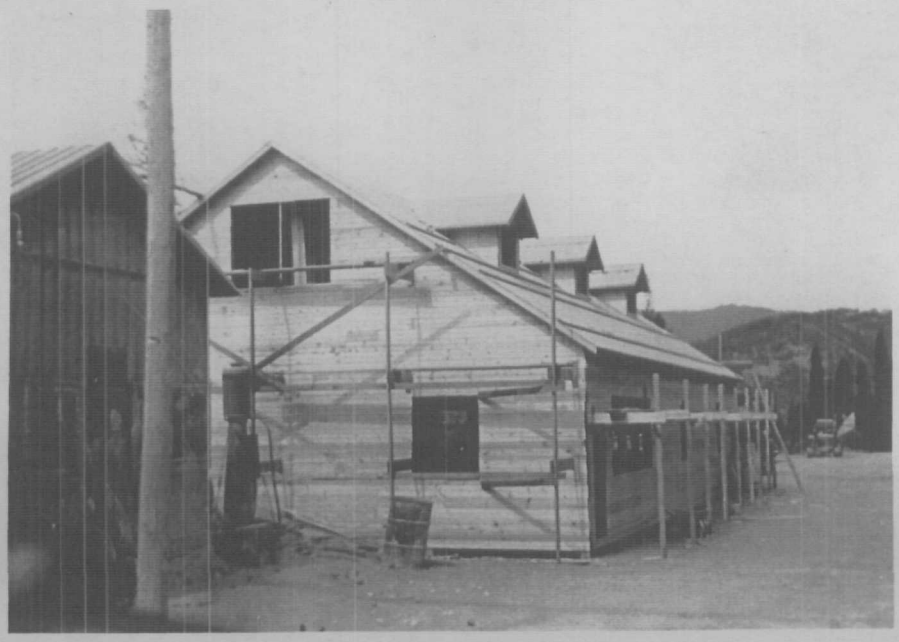
In 1937, an addition to the mill was made. Prior to this time, No. 1 concentrate only had been produced. This addition provided for some production of No. 2 and No. 3 concentrate. This picture shows this first addition to the mill during construction.

In 1938, additional mining capacity was required and a 1-1/4-yard Model 5 Northwest shovel was purchased to replace the smaller 3/4-yard machine. This picture shows this 1-1/4-yard machine.

In 1939, THE UNIVERSAL INSULATION COMPANY and THE ZONOLITE COMPANY merged. THE ZONOLITE COMPANY had no milling facilities and now the entire mountain was available for processing through THE UNIVERSAL INSULATION COMPANY mill. The new company was THE UNIVERSAL ZONOLITE INSULATION COMPANY. This name was changed in 1948 to ZONOLITE COMPANY. This picture shows the mill in existence at the time of the merger in 1939.

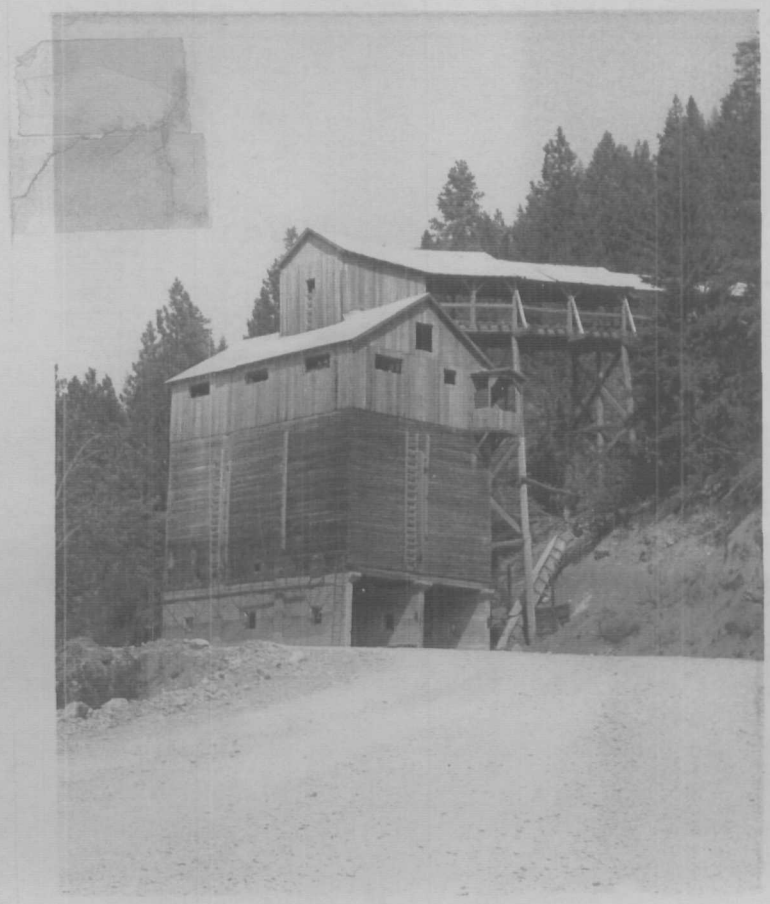


With the increase of mining equipment, etc. facilities for maintenance and repair were required. A big advance for this service was the building of a garage. This picture shows the first garage during construction.



In 1943, the mill tailings pile slide down the mountain and demolished the lower concentrate bins (original mill building.) This picture shows the slide slowly but surely engulfing the building.

Because the lower concentrate bins were demolished by the tailings slide, it was necessary that they be replaced immediately. This picture shows the new bins located at a point approximately 300 yards above the old bin location. The new bins were so constructed that larger haul units could be used for the haul into Libby.



During the war years, the business increased, but little expansion of the physical plant was possible. Following the war several mill additions were made, making it possible to mill lower grade feeds. One of the most significant changes was the installation of a conveyor belt from the mine to the mill in 1947, eliminating a truck haul of ore to the mill from the mine. The completed belt can be seen on the following picture.

With the building of the mine-mill conveyor belt, it was necessary to build a new mine ore terminal or transfer point. Here the mill feed ore is dumped, and all plus 1-3/4-inch diameter rock is scalped off. The balance is conveyed to the mill for feed. This transfer point was built in 1950.

After many additions and changes, the mill looked like this in 1950.

As business increased, milling activity through necessity increased. As mill additions made possible milling and processing of larger tonnages, so it became necessary to mine more tonnage at the mine. In addition to increased production demands, mine movement increases were made necessary by the fact that the high grade ore was being depleted. As a first step in increasing mining activity, in 1946 3 Linn half-tracks were purchased. The following year a 2-yard Lima shovel was bought, together with another Linn, with an additional Linn being acquired in each of the following two years. This picture is of a Linn half-track.

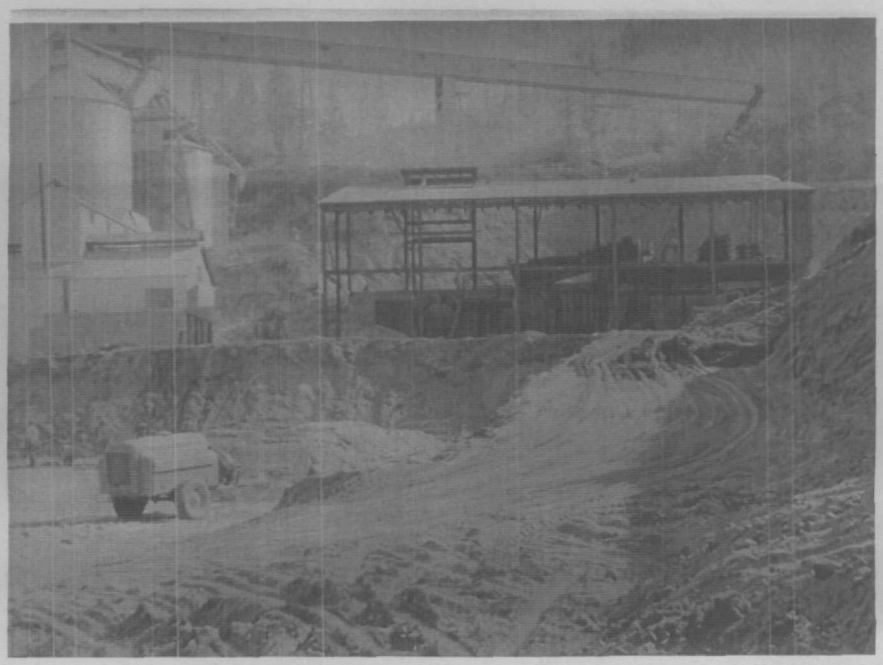
In 1949 it again became necessary to increase the amount of movement at the mine and four Euclid 15-ton rear dump trucks and a Northwest 80-D, 2-1/2-yard shovel were purchased. In 1950, four more Euclids and another Northwest 80-D were bought. With the purchase of the first 80-D shovel, the 2-yard Lima shovel was sold.

Following is a picture of one of the new Euclid trucks being loaded with the 80-D shovel.

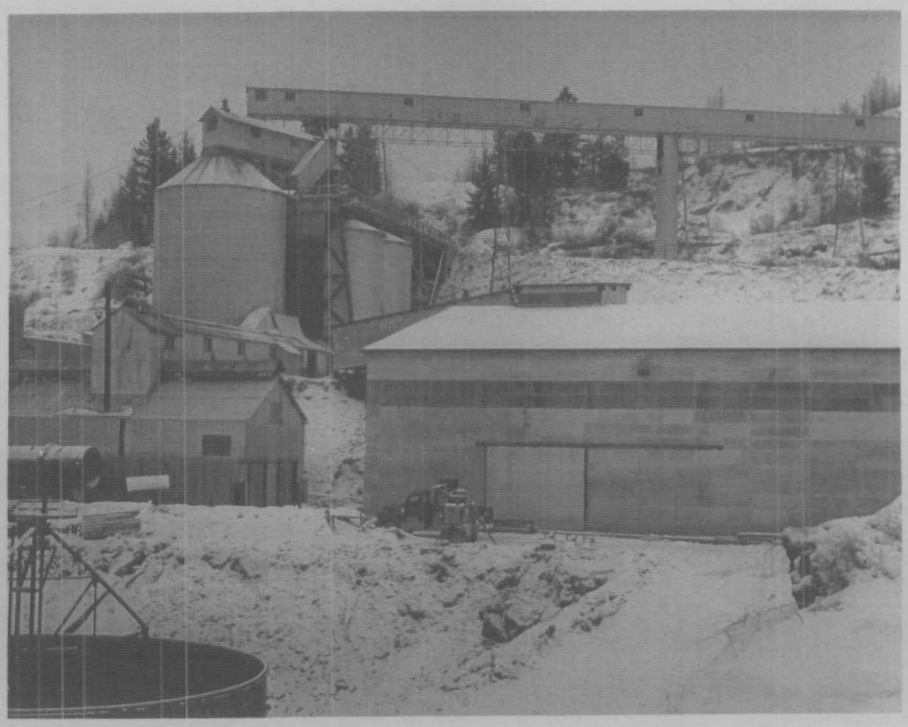
As production increased, the concentrate haul into Libby with small capacity trucks became uneconomical. In 1949, a conveyor bridge was built across the Kootenai River at the mouth of Rainy Creek. Loading hoppers and rail siding were also installed and rail cars could then be loaded at a 100-ton per hour rate. The concentrate haul was reduced from eight miles to three miles. In 1950, because of cyclical nature of business, it became clear that additional storage facilities were required so that production could be stabilized. Storage bins were built adjoining the river belt installation so that stored ore could also be loaded by this belt. This picture shows loading hoppers (center), belt across the river and rail siding (right center). The storage bins are at left center.

As the haul to Libby could be eliminated, it was no longer necessary to haul on the state highway. This made it possible to sellthe smaller trucks (12-ton capacity) and haul all production with one larger unit. A Kenworth, capable of hauling 25 tons to the load was purchased in 1950.

In spite of the increased movement at the mine, as time went on it became apparent that the percentage of high grade ore in the mine was steadily decreasing, and a change in the milling process was necessary. In order to utilize a greater percentage of the ore in the mine, the milling process was changed. In 1954 an addition to the mill was built in order to utilize a wet milling process. To obtain the water for the mill, a damwas built on Rainy Creek at the foot of the hill, a pump and pipe line laid to pump the water to the mill and an addition built on the mill. By gravity process the coarse ore was concentrated by Hancock Jigs and the fine (-10) ore was concentrated by Humphrey spirals. This picture shows the wet mill building during the early stage of construction.



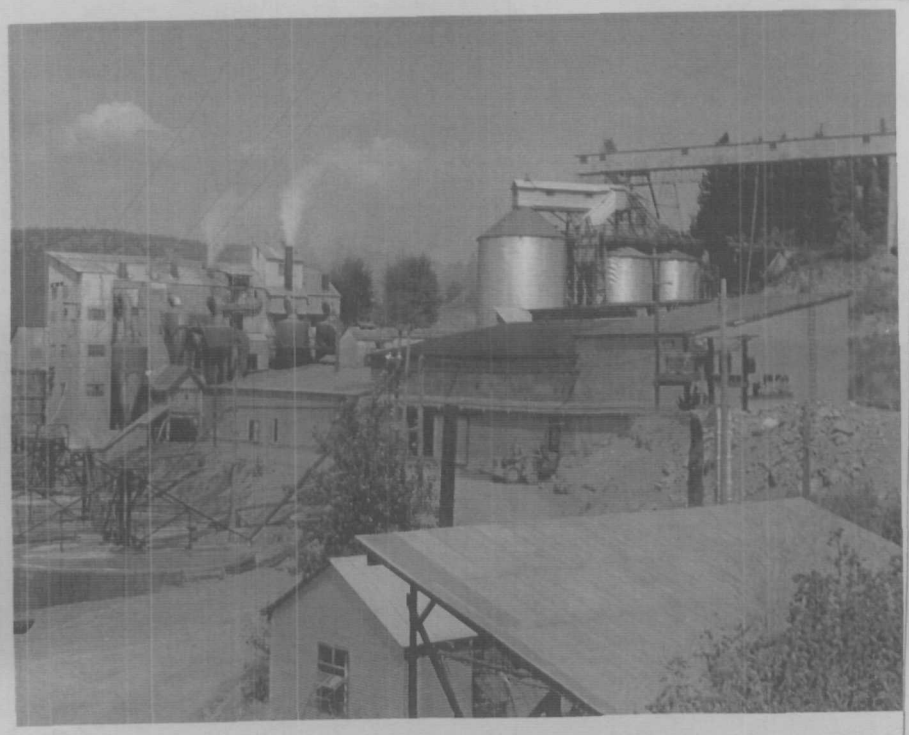
The wet gravity milling process made it possible to change the mill feed requirements from 50% vermiculite to approximately 35% vermiculite. Additional drying capacity was required because of the wet process. The following picture shows the wet mill building after completion. The dryer and dryer building had not been completed when the picture was taken.

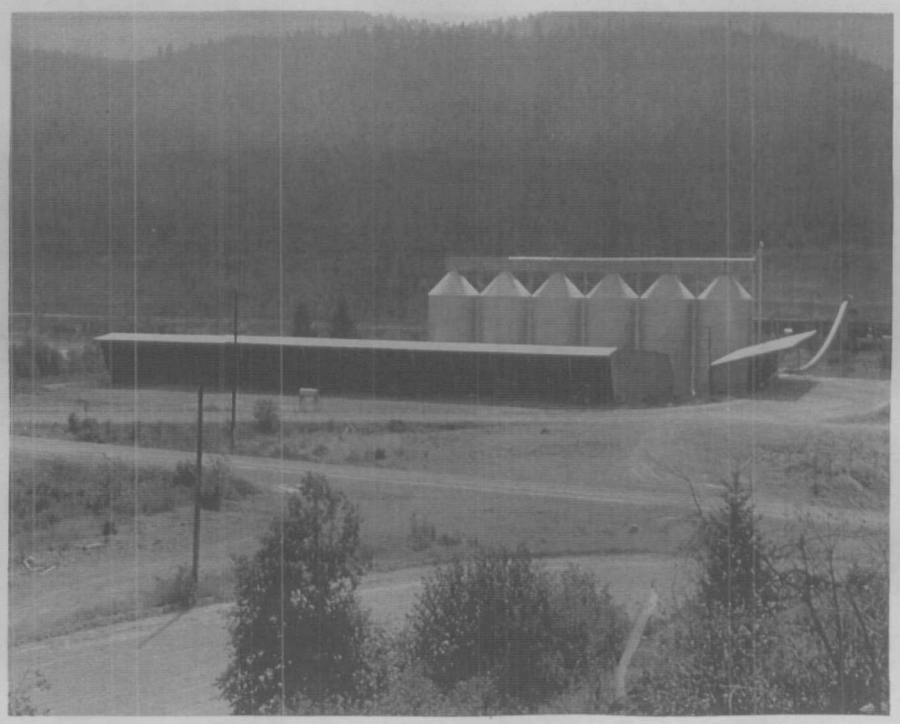


Again the additional milling capacity for lower grade ores required increased mine movement and it became necessary to do more drilling and blasting in the mine. For many years drilling had been done with a wagon drill and truck-mounted compressor. In 1953 a Joy Drillmobile was purchased. This is a self-contained unit using a long 24-foot carriage and increased drilling capacity approximately three times. The picture shows the Drillmobile in position at a rock face.

As milling capacity continued to increase, more mine movement continued to be needed. In 1957, a Bucyrus-Erie 3-yard shovel was purchased. This unit replaced a Northwest 80-D 2-1/2-yard unit which was placed on standby service. The 71-B can produce 15% more than an 80-D without an increase in trucks or labor. This picture shows the 71-B digging ore.

In order to improve recovery and quality of concentrate in 1959 the milling process was changed to a flotation process. This necessitated another addition to the mill building. Initially the flotation was done in the aggregate sizes on spirals. In 1960 a further change was made and 14 Wilfley tables were installed. Six of these tables were installed in the mill building which was in existence and another mill addition was put on to make room for 8 tables. This picture shows this completed mill building.



In 1960, the twleve FD Euclids which hauled 17 tons of material each at the mine were replaced with nine TD model Euclids which haul 26 tons of material. This picture shows one of the TD model trucks.

During the last few years there has been an increasing demand for No. 4 size concentrate. It has been by far our fastest growing size by percentage. For years demand for No. 4 was between one and two percent of our business. Last year it approached eight percent and it is still growing. As demand for this size was also seasonal and our storage facilities for it very limited, additional storage became necessary. At the site of the storage bins at the mouth of th Rainy Creek, silos were built for No. 4 storage. These have been built two at a time and the last two have just been completed so we now have six of them in use. This picture shows the storage facilities as they are at present. The total storage capacity in these bins is as follows: For No. 1, 5000 tons; No. 2, 3000 tons; No. 3, 10,000 tons; No. 4, 7500 tons; for a total of 25,500 tons.