

104A/4W
104A-59

L. L. and H. Mine - Stewart, B.C.

The L. L. and H. mine was examined in September 1942, only with the idea of determining whether the mine showed any possibilities of zinc production in the near future. It is the opinion of the writer that there is very faint hope of this except possibly as a by-product of gold mining. One of the veins has a considerable zinc content, but as this vein, exposed over a length of 80 feet, varies in width from zero to 15 inches, the tonnage of zinc ore exposed is small. Elsewhere in the workings no appreciable amount of zinc was observed.

The map accompanying this report is drawn from an assay plan by H. Langille, engineer for Premier Mine. It incorporates as well as the Premier assays, those for the writer, by Dr. J. T. Mandy and Mr. J. O. Le Francois manager of the property.

Location and Accessibility

The mine is situated at an elevation of 3000 feet in 'Harkley gulch', on the east side of Bitter Creek valley, directly above the tongue of Bromley glacier. The workings are reached by foot or horseback on a trail leaving the Bear River road at Bitter Creek bridge, 9 miles north of Stewart. For the first 4 miles, this trail passes through the narrow valley of Lower Bitter Creek, then for the following $1\frac{1}{2}$ miles it continues up the broader moraine

covered valley floor of upper Bitter Creek as far as the tongue of Bromley glacier. For the last 2 to 3 miles, the trail zig-zags up the eastern slope of the valley from an elevation of 1100 feet to the workings, an air-line distance of just over 1 mile. The showings are exposed on the steep hillside on the north side of Harkley gulch and continue easterly almost to the foot of the glacier covering the western slope of Mt. Otter, the highest peak of the area (9000 feet).

Holdings

The L. L. and H. mine, named after its original owners: Lade, Leyden and Harkley, is now held by a syndicate consisting of:

M. L. Derome	-	holding a 41%	interest
J. O. LeFrancois	-	" "	10% "
P.O. Box 1240 Place d'Armes, Montreal, Que.			
Misses Derome	-	" "	12% "
Smith, Carolan and Harkley		" "	25% "
W. H. Tolin			12% "

The property consists of 10 claims, the Bon Accord and the Bon Accord Nos. 1 to 9 inclusive, held by location and said to be in good standing.

Geology

The main workings are situated in the argillites of the Bitter Creek formation and in intrusives of augite

porphyrite and related types cutting the argillites. About 25 to 30 feet below the portal of the middle tunnel what appears to be bedding in the argillites, strikes north 70 degrees west and dips 50 degrees northeastward into the hillside, which at this point strikes north 60 degrees west and slopes steeply to the southwestward. Elsewhere the argillite is so badly crushed that no bedding is recognizable. Cutting the argillite in various directions are lenticular masses of a pale green fine grained igneous rock, in places showing small pyroxene phenocrysts, mapped by Hanson (Memoir 159) as an augite porphyrite. These masses of porphyrite vary in thickness from a few feet to 100 feet or more and occur in great quantity at and above the middle tunnel, but are relatively scarce below this level.

Cutting across both argillite and porphyrite are two well defined shears (see map), both striking north 20 to 30 degrees west and dipping from 55 to 80 degrees northeast, and both marked by from 1 foot to 2 feet of a soft white gouge. The character of the deformation in the footwall of these shears in the porphyrite and argillite are markedly different. In the former, fracturing or brecciation, attributed to the shearing movements extends for long distances, often 40 feet or more, to the southwest of the gouge. The shear zones moreover dip at flatter angles than in the argillites. In the argillites there is little or no brecciation which can be attributed to the shears;

instead below the gouge is a few inches of highly sheared argillite. The mineralization in the porphyrite as shown in the middle adit (see below) and in the argillite as shown in the lower adit is correspondingly different. In the former, mineralization extends throughout the full width of the brecciated zone; in the latter it is confined to a quartz-sulphide vein from a few inches to 3 or 4 feet in width, directly below the main gouge.

The mineralized zones have been exposed underground by three crosscuts (see map). The uppermost adit, 85 feet in length, exposes the northeastern shear only. The middle adit, 100 feet lower than the first, exposes both shears. The southwestern one appears at the portal, and the second about 210 feet northeast of the portal. The lower adit, over 200 feet below the middle one, has been driven northeasterly for 400 feet to intersect the first shear and an additional 200 feet to intersect the second. Drifts, 75 and 50 feet long have been driven on the first and second shears respectively from this crosscut.

In the middle adit, where the shear cuts porphyrite, mineralization is widespread. Low values in gold and silver have been obtained over widths of 40 feet and more; mainly on the lower side of the second shear, but extending for a short distance into its hanging-wall. The mineralization includes quartz, pyrite, sphalerite and some galena. Values

in zinc of 1 percent over a width of 4 feet have been reported by Mandy . In the lower adit, the mineralization is much less encouraging. There, both shears cut argillites, and mineralization is confined to two relatively narrow veins, the first from zero to 15 inches in width, the second from 2 to 4 feet each lying against the foot-walls of the two shears. In the first vein in this adit, zinc values are reported to be quite high, up to Zn. 25 to 30 percent, but the quantity exposed is very limited, probably only 50 square feet in the back of the first drift and was, therefore, not sampled. In the second vein, channel samples at the intersection with the crosscut and 50 feet to the northwest at the end of the drift, gave values of Zn 0.1 percent and Zn 0.1 percent respectively, over widths of 38 inches and 22 inches. Arsenopyrite is present in small amounts in the latter vein.

The shears have been traced across the northern slope of Harkley gulch for a reported distance of 1200 feet but they were not examined by the writer except in the immediate vicinity of the workings.

Two interesting and unusual problems have entered into mining at this property. In the lower crosscut, unexpectedly large quantities of water were encountered after passing into the second, northeastern, shear, and it was found necessary to drive a second short crosscut into the shear to assist in its drainage. This water, pouring out of the

adit, has succeeded in cutting a deep canyon in the crushed argillites immediately below it, till the portal almost hangs in space, to use a local description, 'like a mouth without a lower jaw'.

A second problem is a marked deficiency in oxygen in the lower workings. At the inner end of the drifts and crosscuts there is insufficient oxygen to maintain a carbide lamp or to light a match; any undue effort, even that of taking a channel sample, is accompanied by distress in breathing, dizziness and a slight headache, symptoms which are, however, relieved immediately the surface is reached. Evidently oxygen from the air dissolved in the subsurface water is exhausted by chemical reactions with the ore minerals etc., and the remaining inert gases on coming out of solution in the tunnels dilute or displace the fresh air. The problem could readily be solved by forced ventilation.