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True Blue

THE DICKENSON MINES LTD., SILVANA DIVISION MINING OPERATION, SANDON B.C.

Silver was discovered in the Sandon area of the Slocan country around 1890. The first claim dates from 1891. Sandon became a town of several thousand people, served by two railroads, by 1900. Silver production reached a peak in 1918, continuing since then at a reduced rate, with total production to date amounting to some 30 million ounces, accompanied by 250 million pounds of lead and 75 million pounds of zinc, having a total value of nearly half a billion dollars at current metal prices.

The property on which the Silvana operations are located has seen several changes in name both prior to and during production. At the time of the discovery of the first new ore zone the Silmonac Mines Syndicate was the exploration company, and it was their drilling from the far west extremity of the 4000 Level in 1968 that showed a new mine might be possible. Drilling from the surface the following year confirmed the discovery, and it was decided to collar a portal at the 4,625 feet elevation about two miles from Sandon and drive South half a mile to test the deposit. The success of this venture led to production in 1970, which has been continuous to this date.

Production to the end of 1981 has been close to 250,000 tons of ore containing 3.5 million ounces of silver and about 24 million pounds each of lead and zinc. The majority of this has been brought out through the 4625 Level portal and trucked 2.5 miles (4km.) to the Concentrator at the south end of Sandon. Just before the start of 1980, however, new development on the 4000 Level, which had been rehabilitated in 1978, resulted in a new internal ore-handling system of greater efficiency, and now 95% of the ore is trammed out on the 4000 Level. The trucking distance from there is a mile shorter than from the upper level.

In the future an even shorter truck haul may be achieved, when the 3850 Level ore handling system is completed.

The Concentrator currently is operated on a five-day week basis, handling 100 to 125 tons per day. Occasionally ore from other mines has been treated there also.

About 50 people make up the payroll, only about 20 of who work in the mine itself. The rest are in the Mill, on the Surface crew or on Staff. Exploration mining on the 4000 Level and most of the diamond drilling on both levels has been done by outside contractors.

The geological structure which is gradually being traced throughout the Silvana property and in which all the orebodies so far mined have occurred is apparently the Main Lode, which is thought to run through the mountains for five miles (8km.) between Silverton and Sandon. By far the largest quantities of silver, lead and zinc mined in the Slocan area have come from orebodies in the Main Lode, several lesser lodes contributing the balance. Much of this structure is unexplored at depth and a large, unexplored segment lies on Silvana property west of the current workings. On the basis of past production and the amount of unexplored ground it could be assumed that Silvana might produce for another ten years, assuming favourable economic conditions to prevail.

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BRIEF GEOLOGICAL DESCRIPTION

The geological setting of the Silvana Division mine of Dickenson Mines Ltd. - also known as the Silmonac Mine - is within the Slocan Series Triassic age sediments that overlie the Nelson Batholic intrusive in this area. The Slocan Series is a pile of mostly argillaceous sediments comprising argillites through argillaceous quartzites, accompanied by limy beds and argillaceous limestones. Marker beds are rare or poorly developed and the structural disposition of the sedimentary pile was not correctly determined until the late 1940s, by geologists who were forerunners of and in some cases still associated with the Silmonac mining properties that Dickenson now holds.

Unfortunately the tour-de-force of structural interpretation, that of mapping and proving the existence of the large, overturned and eastwardly recumbent folds, thus leading to excellent and considerable theorising as to the location of orebodies, has not produced the desired results, i.e. exploration tools capable of finding new mines. The work, in the writer's opinion, may well explain underlying relationships of the mineralisation to the structure but later events have intervened to obscure many of them.

In particular, examination of the lode faults (lode structures) that constitute one of the two principal types of orebody host in the area suggests that remobilisation and redistribution of the products of the main phases of mineralisation are in large part responsible for the present mineral distribution. The Silmonac Mine orebodies are hosted by the Main Lode, a south to southeasterly dipping structure interpreted over a 7 miles (11 km.) length between Silverton Creek on its west end to Sandon on its east. This structure is sinuous, showing great variation in both dip and expression. Throw and sense are somewhat obscure and also vary along its length. An interpretation from the currently worked segment suggests it is a shallowly- dipping (20 - 30 degrees) to the south, thrust type of fault with a horizontal throw of several hundred feet, probably approximately in a dip-slip sense. Other segments, principally east of current workings have much steeper dips, and with parameters quite unknown to the writer. In fact when discovered, the lode segment that hosts the Silmonac Mine was, because of its aspect, considered unlikely to be an extension of the Richmond-Eureka, Slocan Star, Silversmith, Hope Mines segments of the Main Lode. As the result of many cosiderations, including 12 years exploration and production, it is now fairly well justifiable to call the productive structure at this property part of the Main Lode. If the interpretation is correct there is a large piece of the Main Lode yet to explore to the west, possibly up to 5 sq. km. between the 4000 and 5000 feet elevations.

Lode rocks are breccias of two basic styles - flow and vein - of greatly variable degrees ot coarseness. Much if not all of the flow breccia arises from the later deformation and shearing of vein breccias and/or previously non-brecciated rocks, an event that was responsible for the greef quantity of carbonaceous "graphitic" material developed in the lodes and other structures. The "graphitisation" event appears responsible for the remobilisation and redistribution of the Ag/Pb/Zn mineralisation. Silicification of lode

rocks is a pre-graphitisation event, this alteration often also appearing in adjacent rocks, principally the hangingwall, from the writer's observation, and occurring with a more or less similar distribution to the mineralisation. Lode thickness varies from a few cm. to several metres and multiple-stranding or braiding is a common feature.

Mineralisation occurred in at least two stages. Initially a zinc/iron phase resulted in a sphalerite and pyrite in quartz veins assemblage. Very little lead and relatively low silver values also characterise this early phase. The main later mineralisation was of lead with lesser zinc and iron, characterised by galena, a second sphalerite introduction and siderite/quartz gangue. Later remobilisation has obscured these relationships somewhat. Minor copper as chalcopyrite and tetrahedrite (grey copper), arsenopyrite, stibnite and pyrrhotite also occur. Ruby silver (from the pyrargyrite - proustite series) is an intermittently observed fracture-coating mineral. Occasionally, though not yet reported from the Silvana Division mining, horn silver and native silver have been reported.

The ore mineralisation occurs as veins, lenses, pods, shreds, breccia infillings etc., almost every ore occurrence boundary showing shearing and/or slickensiding. En echelon lenses and pods with such tectonic boundaries also the presence of a frequently folded gneissic foliated texture in much of the galena mineralisation are principal reasons for postulating considerable redistribution of previously-existing, largely vein-type mineralisation.

Later fracturing has led to repeposition of some silver as ruby silver, and pyrrhotite flakes and small, flat crystals are also frequently developed on open fracture surfaces. The latest-occuring tectonic disruptions are normal, clay-gouge-filled faults that slice through or drag the lode and any contained ore. These structures are widely distributed, not in any discernible pattern and never of any great size either in throw or persistence.