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Appendix X

ORE DEPOSITION AT VANGORDA MINES LIMITED

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Introduction:

The property of Vangorda Mines Limited is located just north of the Pelly River, about 120 miles north-northeast of Whitehorse, Yukon Territories. The property contains one known major deposit of lead-zinc mineralization. The purpose of this paper is to describe the geological setting in the hope that it may be of some value in the search for further deposits.

General Geology:

The oldest rocks are a series of limestone, argillite and greenstone schists which are exposed mainly along the southeast quarter of the property. They are largely surrounded by basic intrusives and only in a few cases are they found in contact with the overlying sediments of a younger series. This relationship was not observed by the writer and the facts are taken from the mapping of a former employee, V.K. Papezik, whose geological mapping is the basis for this study.

The main sedimentary series on the property includes a considerable thickness of sericitic and graphitic schists which occupy a central portion of the property and are those host rocks for the ore deposits. These schists are considered the metamorphosed equivalents of a sedimentary deposition in a basin of undetermined size, but which now are exposed between a granitic contact on the north and a less definite boundary of basic rocks and older sediments to the south. Stratigraphically above these schists are biotite gneiss and staurolite schist which seem to belong to the same siliceous or arkosic sedimentary series as the sericite and graphite schists. The main exposures of biotite gneiss occur at the northwest corner of the property and extend into adjacent ground. The staurolite schists occur on the north-east corner of the property and extend for some distance to the northeast.

Overlying the sedimentary series is a small area of andesitic lavas on the south central part of the property. This merely covers a small part of the younger sediments.

Intrusive rocks include the basic intrusives along the south side of the property and the granitic intrusives that make up Mye Mountain to the north. The granitic rocks are more extensive and are of batholithic proportions, while the basic rocks are smaller on surface exposure at least and may be considered stocks and thick sills.

Smaller bodies of quartz-feldspar porphyry occur within the sediments and along the contacts with the basic intrusives.

Quartz veins occur on the property and some may be of metamorphic origin. None are of interest from an economic point of view.

Structure:

The sediments are now altered to schists with flat-lying schistosity. Details are lacking on the accompanying geological map, but the writer's observations indicate a general northeast strike with dips up to 25 degrees to the northwest. In the central portion of the basin this dip is much flatter. The steeper dips were noted in the northeast part of the property nearer the granite contact.

Some faults have been mapped, but they are not abundant. The projection of the fault shown in the main ore body is projected on the accompanying Ore Control Map, and is called the Northwest Structure. It is by no means certain that the condition in the main ore body does in fact persist over this length, but the projection seems to be a southern limit for linear features that occur on the magnetic maps, and which are labelled the northeast Structures on the Ore Control Map. These may be mineralized faults or fault zones. Evidence for this conception can be found in the profile through drill holes 161, 162, etc., drilled on the Champ anomaly. The number and locations of these minor structures, as shown on the map, may be in error due to lack of the necessary magnetic maps.

Ore Deposits:

The ore deposits are replacements of the sericite and graphitic schists by sphalerite, galena, chalcopyrite, pyrite, pyrrhotite. The sericitic types seem to be the more amenable types and replacement may be within this rock, or at the contact with the graphitic types. It seems that replacement of the graphitic type has also taken place in some horizons in the main ore zone.

Ore Control:

The most readily apparent control on the ore deposition is the rock type. The main ore body and the small zones found on the Champ and Firth claims are all contained within the sericite-graphite schists.

The second apparent control is the so-called northwest structure along which or near which the known ore deposits occur. The structure should be given some width and not considered a sharp line.

The concept of the northeast structure is admittedly tenuous. They do seem to be real features and must be explained. If they can be shown to be mineralized fault zones, they may be made to fit some structural theory. They are included here as possible ore controls, although the exact nature of the lineations is not clear. They do not seem to cross the northwest structure and are tentatively classed as cross-faults leading from the granitic rocks of Mount Mye, which can be postulated as the source of the mineralizing solutions.

The granite contact is considered as having some significance in the formation of the ore deposits. The sinuous nature of the contact

suggests differential stress on the schists and this may have been timed to provide channel ways for the migrating solutions from the cooling and differentiation of the granitic magma. Although this is a theoretical concept, it should be given some weight.

Application of Ore Control Theory:

While only one major ore deposit has been found on the property and the likelihood of others in the immediate vicinity seems to be ruled out by the recent gravity survey, it is still possible that other deposits can be found in the general area somewhat removed from the confines of the present property. It is felt that any search could profit to some extent by considering the known geological situation of the main zone and applying this over a larger field.

The first step would be to trace the favourable schists from the granite contact along the north to the east as far as possible. Most of this ground is now open and could be acquired for the staking. A stadia traverse plotted on 1,000 scale would make a good working map. The higher parts of this ground is underlain with biotite and staurolite schists which apparently cover the favourable sericitic and graphic types. If only open pit mining methods are considered feasible, it well may be that expenditures on finding underground deposits would rule out the value of exploration here. However, the lower slopes of the mountain do reveal sericite schists and is the locale of mineral deposits elsewhere. They could be investigated by geochemical or magnetic means.

With the granite contact plotted on a map, it would be possible to look for a repetition of the northwest structure. This can be seen to originate on a nose of the granitic mass. Others might be found in similar positions. There is a suspicion of a second one on the geological map and it may not be too much of an assumption to project it northwest where it can, by a slight curvature, be made to start at another salient of the granitic contact. A repetition of this may well be possible further east.

The next step would be to locate further examples of the northeast structures. Since these are merely linear trends on a magnetic map that was slowly and labouriously compiled by ground magnetometer, it might involve more time and money than the idea warrants, but it would, at the same time, serve to locate major deposits which have an appreciable magnetic content.

Respectfully submitted

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