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Deer Horn
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DATE: ~~January 11, 1999~~ early 1998?
TO: Gordon Enemark
FROM: David Lefebure
RE: Analysis of Mineral Occurrences in Tweedsmuir Park Recreation Area
CC: Jill Pardoe

The following information is intended to compliment the memorandum dated June 20, 1997 provided by Jill Pardoe. A quick review of the mineral occurrences in the Tweedsmuir Recreation area reveals that they can be subdivided into five types:

- gold-silver veins (Au-Ag)
- polymetallic vein (silver-lead-zinc±gold) - I05
- copper skarn - K01
- tungsten skarn - K05
- porphyry (molybdenum) - L05

Please note that the above classifications are based in many cases on rudimentary descriptions of the occurrences. The only production (very minimal) from the area has been from two short adits on polymetallic veins at Nickel Plate and Roosevelt near Chickamin Mountain. These types of veins are common in British Columbia and range from several hundred to several million tonnes grading from 5 to 1500 g/t Ag, 0.5 to 20 % Pb and 0.5 to 8% Zn. Gold typically averages 4 g/t, but is not reported for many deposits.

Deer Horn - Developed Prospect

The best developed prospect in the recreation area, the Deer Horn or Lindquist, is not easily classified with the available information. It exhibits characteristics of gold-quartz veins (I01), epithermal gold-silver veins (H05), and possibly a new type of deposit called plutonic-related gold (Fort Knox-type). The presence of significant base metals and tungsten and possibly potassic alteration are consistent with formation at a intermediate depths common for gold-quartz veins. This would also explain why the host rocks are granodiorite and Skeena Group sediments, rather than volcanic rocks. On the other hand the abundance of silica and high silver to gold ratios are more characteristic of epithermal veins. The vein deposits are typically mined with underground workings.

Teck spent over \$800,000 drilling the Deer Horn in 1989/90 and identified a broad silicified zone with lower grades of gold and silver with bulk tonnage potential which might suggest an alternative scenario for the future development of a mine on this site. The presence of bismuth-bearing minerals (cosalite, tetradymite, tellurbismuth) and arsenopyrite in the main vein, proximity to a Cretaceous intrusion, and metasedimentary country rocks (quartzite, chistolite schist, argillite and greywacke) would support interpreting this zone as similar to plutonic-related gold.

Both gold-quartz and epithermal veins can range from tens of thousands to occasionally tens of millions of tonnes. The gold-quartz veins are generally larger deposits, however, have significantly lower silver grades. Most past producers in British Columbia of both these types of deposits have been underground operations.

Since the reported reserves for the Deer Horn are 86 100 tonnes grading 418 g/t Ag and 13.7 g/t Au in the Contact zone and 215 g/t Ag and 8.74 g/t Au in the Main Zone, it would appear the best deposit model to use to determine the probable reserves for a future mine is an epithermal gold-silver vein. The United States Geological Survey identify a median epithermal deposit as 770 000 tonnes grading 7.5 g/t Au and 110 g/t Ag. Lawyers (528 000 tonnes) and Blackdome (398 000 tonnes) are two British Columbia examples of underground mines of this type which produced in the 1980 and early 1990s. They could be used to model the potential economic impact of a mine at Deer Horn.

Other Potential Types of Mineralization

There is also excellent potential for porphyry copper deposits (L04) based on the number of known deposits found in the same belt of rocks outside the recreation area. It is interesting to note that there are claims in good standing north of Chickamin Mountain that were examined for their potential for a large tonnage deposit, such as a porphyry copper. Veins of the type found on Chickamin Mountain often occur peripheral to porphyry-style mineralization. More speculative is the potential for volcanogenic massive sulphide deposits (G04, G06, G07) in the Hazelton Formation or Gamsby Complex.

Conclusions

- As pointed out by Jill Pardoe in her memorandum, the recreation area has an extremely high mineral potential assessment.
- For at least the last 15 years the amount of exploration activity has been limited by the association of the area with the park, including many published maps which show the area within the park. The creation of the Recreation Area did spark some initial interest, however, many companies were not prepared to accept the higher level of risk associated with this type of designated area.
- Potential mine developments in the recreation area in the near future are most likely to be for a new porphyry deposit or development of the precious metal mineralization at Deer Horn, the only developed prospect in the recreation area.
- An evaluation of the potential economic impact of a mine development at Deer Horn could be assessed by comparison with Lawyers and Blackdome, two British Columbia examples of underground mines of this type which produced in the 1980 and early 1990s.
- There is a high probability that there are polymetallic vein (I05) deposits in the recreation area, however, they are currently less attractive targets, particularly in an unroaded setting. This could change with the discovery of a very gold-rich system or an increased demand for unusual commodities (i.e. gallium and germanium).