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MEMORANDUM

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DATE: October 3, 1984

À TO: A. J. Davidson

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DE FROM: H. L. Gibson

SUJET SUBJECT: BUTTLE LAKE MINE TOUR

Oulined below are a few points concerning the volcanic stratigraphy of Westmin's Buttle Lake Deposit that are not stressed in written descripsions.

1) The Mine sequence, as defined by R. Walker, encompasses all volcanic rocks of the Myra formation that lie below the "sharp banded Tuff unit " in the Mine area; in total some 450m. of stratigraphy. The mine sequence is composed of flows/domes and volcanicalstic rocks of which members classified as rhyolitic account for <10% of the mine sequence. In some rhyolitic volcaniclastic members rhyolite fragments constitute < 10-15% of the breccia and might be more correctly classified as andesitic or as "mixed breccias". Thus, the amount of true rhyolitic rocks within the mine sequence is volumetrically small, with epidotized andesitic volcaniclastic/ flow rocks and "mixed" breccias predominating - primarily a mafic volcanic sequence.

2) The Myra-Lynx "horizon", within the upper part of the mine sequence, is characterized by numerous small lenses of massive sulphide that occur over a strike length of 6.0 km. The massive sulphide lenses are elongate, lensoidal to tabular in cross-section and are underlain primarily by "rhyolitic" volcaniclastic breccias containing fine quartz phenocrysts. Only one of the massive sulphide lenses, the Myra Mine, is underlain by a pyritic stringer zone and sericitized (not chloritized) sheared volcanic rocks. The remaining lenses that constitute this upper horizon are thought to be proximal but are not underlain by stringer mineralization or altered footwall rocks. Recent mapping (B. Jeffreys, per. com., 1984) indicates that the ore in some of the lenses is definately clastic (with "exotic" volcanic fragments) and is more likely to represent transported sulphides.

3) The large H-W orebody (15.2×10^6 tons) is a classically zoned proximal VMS deposit consisting primarily of a single massive sulphide lens underlain by a pyritic stringer zone in sericitized, silicified andesitic volcanic rocks. The H-W deposit lies 125 m. below the Lynx-Myra horizon and following compilation and re-logging of previous drill holes was discovered after 7600 m. of drilling. The H-W "horizon" differs from the higher Lynx-Myra "horizon" in that:

a) the H-W orebody is located in the lowest portion of the mine sequence where flow/domal rocks of andesitic and rhyolitic composition comprise a higher proportion of the stratigraphy than volcaniclastic rocks.

b) although reported to be hosted by the H-W rhyolite the H-W deposit lies stratigraphically below this rhyolite and is underlain by a thick (300 m minimum) succession of andesitic flows. The deposit is directly overlain by rhyolitic volcaniclastic and mixed clast breccia followed by andesitic flows similar to those underlying the orebody.

The Buttle Lake deposits are localized in a proximal volcanic environment. The volcaniclastic rocks are typically coarse (i.e. tuff-breccias, lapilli-block tuffs, lapilli tuffs, after Fisher, 1966) but there is a tendency for the breccias to fine, become better sorted and bedded towards the top of the mine sequence. The Lynz-Myra horizon although primarily breccias includes dacitic and rhyolitic domes and andesite flows. The lower part of the mine sequence contains more flow and domal andesitic and rhyolitic rocks than breccias.

The breccias are reported to be, in large part, debris-flow deposits however ash-flows both of felsic and mafic composition are recognized. Volcaniclastic units in the upper mine sequence and specifically in the Myra-Lynx "horizon" are lenticular in form, characterized by a longer strike length (E-W) than dip. The attitude and form of the volcaniclastic units may be a product of their deposition as debris flows rather than an elongation as a results of tectonic stretching during folding. Massive sulphide lenses of the Myra-Lynx zone are elongate parallel to the volcanicalstic units which may reflect their deposition as clastic transported debris trapped in irregularities or channels within underlying voclaniclastic rocks.

Unfortunately the Westmin tour lasted only 1 day, however discussions with R. Walker, G. MacVeigh and B. Jeffreys were most illuminating and rewarding. They have invited me back for a possible 3 day tour, one day to examine underground exposures (both Myra-Lynx & H-W deposits), a second day examining drill core and a third day on surface exposures. I would like to accept their generous offer either this fall or next spring. The volcaniclastic rocks themselves and setting of the Myra-Lynx deposits are remarkably similar to Britannia and a more detailed examination/tour of Westmins' deposits is warranted.

Harold Gibson

HG/ik