MAR 19560003: ALBERTA

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Report for Period Ending October 5th, 1956 -

A N-S total projection completed this period has indicated the following:

The controlling fault dips 55° S, strikes N22W and has an average dip-strike N68E. This fault has apparently succeeded the first two faults mentioned previously. It is not certain whether movement along this fault stopped at the flat fault, dip 10°S, strike northerly, or was cut off. If it was cut off, then the flat fault is the last movement to take place. However, the greatest deformation tends to be vertical, or nearly so.

In certain holes there is evidence of extreme dragfolding. The ore horizon has been folded vertically, (average dip of bedding 80°), for at least 82.0'. At depths beyond this folding the horizon has again assumed the normal attitude of 10°-20° dip westerly. This indicates that major movement has been vertical, after the bedding has been tilted westerly. This vertical movement coincides with displacement along the Livingstone thrust, Todd and Mill Creek faults, and the general displacement in the Marasek area.

Core examination has also shown that there is an old erosional surface at the top of the ore horizon. This zone of brecciation suggests an old fault plane, along which the breccia has been cemented by calcite, and occasionally magnetite. Thus far there is no evidence that the magnetite is a deltaic deposit. It is also not a beach deposit as such. There is relatively little evidence to suggest that varved deposits are laid down on beaches. If this had been a beach then it would have been a minimum of 16 miles wide, several hundred miles long, and with a gradient of less than 1°. There has, thus far, never been noted any of the familiar characteristics of a beach, such as conglomerate. Some cross-bedding has been noted, particularly in the overlying sandstone, but this feature ceases some time before the ore horizon. Cross-bedding in the ore is rare, and might have been mistaken for healed fault structures. Microscopic examination has shown that both the magnetite and its matrix are relatively little water-worn. The magnetite is in haggly particles and crystals; the quartz is rarely in any other form than nearly complete crystals.

The intense folding thus far observed suggests a much greater ore potential than heretofore assumed. Very little evidence of this folding is apparent on the surface. If the vertical bedding persists for any distance the ore potential may be quite considerable. The average thickness of the ore appears to be 13.1'. The average length of the horizon (s) appears to be more than 500'; and the breadth is quite often 300', (between fault segments). The average depth of drag folding is more than 50'. The above seems to imply that there is retrievable ore both in a relatively flat plane, and in a vertical attitude. It is quite possible that when the fault segments are related, they will indicate continuous ore in the above-mentioned planes. The vertical horizon may be accepted as a bonus. Thus far there are four flat and two vertical horizons, each set being out by an E-W fault set.

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Some of the holes put down have not encountered ore. This is mainly because they have not gone far enough. Some of the holes have missed the ore because they were in an area of vertical bedding, and consequently, a target of 13' was hard to locate. The area, 1,200 x 2,000', immediately north of hole #28 (see map) is a complete blank, due to the fact that one hole did not go deep enough and the other was probably in an area of vertical bedding. Surface features are very definitely poor, if not misleading, guides. Only close drilling will prove the potential in this area. It is, however, reasonable to expect that the ore horizon (s) found thus far persist to the present limits of the explored area.

Although no assays have yet been received, examination of the ore indicates that grades better than 40% Fe may be expected. Some sections are massive magnetite, with very little other material. The cement appears to be calcite. In sections of intense faulting the magnetite has been transformed to hematite or marcasite. The marcasite appears as globs on the fault planes. There has been no other evidence of any sulfide. Some sections show a glauconitic matrix, which suggests an ultra-basic ancestral host rock. The ore is rather unique in its homogeneity of texture, and appears somewhat finer-grained than that at Iron Flats.

Proven tonnage stands at better than 6.5 million tons.

Smelter
Kanna Montana -