I. Pirie

824327

PROJECT: SAMATOSUM PROPERTY

STRUCTURAL SECTION FROM

THE SAMATOSUM DEPOSIT TO THE REA LENSES

CONFIDENTIAL PROGRESS REPORT
FOR MINNOVA INC.

by

J. Keith Glover, Ph.D, M.Sc.

Geological Consultant

June 20, 1990

INTRODUCTION

The main purpose of last month's visit to Sam (May 21 to May 30) was to relog a selection of the 1989 holes from the 266 Zone. Six holes from section 104 + 00 W and five holes from section 105 + 50 W were chosen because they offer the most complete coverage from the Sam Mafics to the Rea Mafics. The four holes that were drilled from the road, between 110 +00 W and 112 + 00 W, were also relogged. In addition, several of the holes from this year's program that intersected the "argillite wedge" were relogged in an attempt to define the nature of this structure.

I feel confident that the broad picture that has emerged from this visit is internally consistent and provides a better understanding than we have had before with regard to both the stratigraphy and the structure, but, more important, gives us the necessary key to deciphering the genesis of both Sam and the 266 Zone, and their possible relationship to the Rea Lenses.

THE 266 ZONE

1. Stratigraphy and mineralization

The thickness of the Dol Seds varies from about 10 to 40 metres on the limbs of folds but can be as much as 80 metres within hinge zones. Relict textures within the Dol Seds indicate a volcaniclastic origin. Furthermore, identical lithologies are recognized at the stratigraphic top of the Rea Mafics (R.G. 283 and R.G. 288). In addition to its high ferroan dolomite content, this unit contains variable amounts of argillite within the matrix. Clasts of this unit are also found within unaltered argillite. Its base is commonly characterized by a gradational contact with sedimentary chert breccia, whereas it is generally overlain by well bedded chert. Rapid lateral changes occur in the

thickness of the unit, not all of which can be attributed to the structure. The Dol Seds appear to be laterally equivalent to volcaniclastic rocks of the Middle Mafics toward the northeast (see Section 105 + 50 W).

All the above features are compatible with volcaniclastic debris flows that invaded a quiescent sedimentary basin characterized by ribbon chert and argillite. The dolomite content is believed to be a primary component of this unconsolidated volcanic detritus prior to transport. However, this could still have been the product of carbonatization, but along the flanks of the basin, not in their present location.

There are several types of sedimentary chert that are commonly in gradational contact with one another:

a) Ribbon chert:- alternating, 1 to 3 cm thick interbeds, of argillite and light to dark grey chert;

b) Laminated chert:- light to dark grey laminated chert, locally with argillite partings;

c) Argillaceous chert:- dark grey to black massive argillaceous chert that is commonly graphitic.

The most laterally continuous chert horizon on the sections examined occurs stratigraphically above the Dol Seds, where it varies in thickness from 5 to 10 metres. Some of this chert (particularly [b]) may be exhalative in origin. This horizon also coincides with the mineralized zone. However, in detail, the position and number of mineralized intersections varies. Furthermore, as previously recognized, the mineralization is laterally discontinuous. The stratabound nature of the mineralization and its stratigraphic position, host by a sedimentary chert horizon, points to an exhalative origin.

Another chert horizon occurs locally below the Dol

Seds, but does not appear to be mineralized.

2. Structure

Sections 104 + 80 W and 105 + 50 W show that the 266 Zone occurs with the hinge zone of a relatively major southwesterly verging structure that comprises two anticlines separated by a syncline. In detail, small scale thrusting occurs along the limbs and hinges of these folds and the thickness of individual units varies considerably. Re-examination of other sections through the zone indicate that this geometry persists toward the northwest, but is complicated by cross faults.

A major fault probably occurs at or slightly above the contact of the Rea Mafics, but the sense of movement could not be determined. The position of this fault approximately coincides with the conductor above the Rea Mafics. If this is a normal fault, then it is possible that the Dol Seds and the Middle Mafics are laterally equivalent to the Rea Mafics. However, if it is a thrust, then these volcaniclastics rocks that are intercalated with the Sam Sediments are older than the Rea Mafics. The normal fault option has been used for the sake of simplicity in the structural section and reconstruction (Figures 1 and 2) presented here, but both options are equally possible.

THE ARGILLITE WEDGE AND ITS RELATIONSHIP TO SAM

1. The "argillite wedge" that separates the upper zone or barite horizon from the lower zone or Sam horizon represents the core of a southwesterly verging overturned syncline. In places, this syncline has an axial plane fault (thrust) that marks the boundary between opposing facing directions.

2. Lithologies within the "argillite wedge" include lithic wacke and siltstone turbidites.

3. To the northwest of Sam, both the upper and lower limbs of this fold involve mafic volcaniclastic rocks (the "Middle Mafics") that are in gradational contact with the intervening sedimentary sequence. However, on the lower limb the mafics thin toward the southeast and are represented in the footwall of Sam by the fuchsite zone. This thinning must be stratigraphic because no significant thickness of mafics (if any!) appear to be present in the hinge zone of the syncline immediately north of Sam.

4. The southeasterly termination of this syncline occurs at the Samatosum Deposit against the contact with the overlying Sam Mafics which must therefore be a thrust fault in the immediate hanging wall of the deposit. This thrust fault cuts up section through the mafics toward the northwest, structurally above the overturned limb of the syncline.

5. The Samatosum deposit occurs at or close to the hinge zone of this structure.

6. Yellow and grey sericite alteration are more or less stratabound along the limbs of the syncline but cross-cut the turbidite sequence in the hinge zone stratigraphically above Sam.

7. The RG 85/86 root zone to Sam cross-cuts the Sam sediments on the upright limb of this syncline.

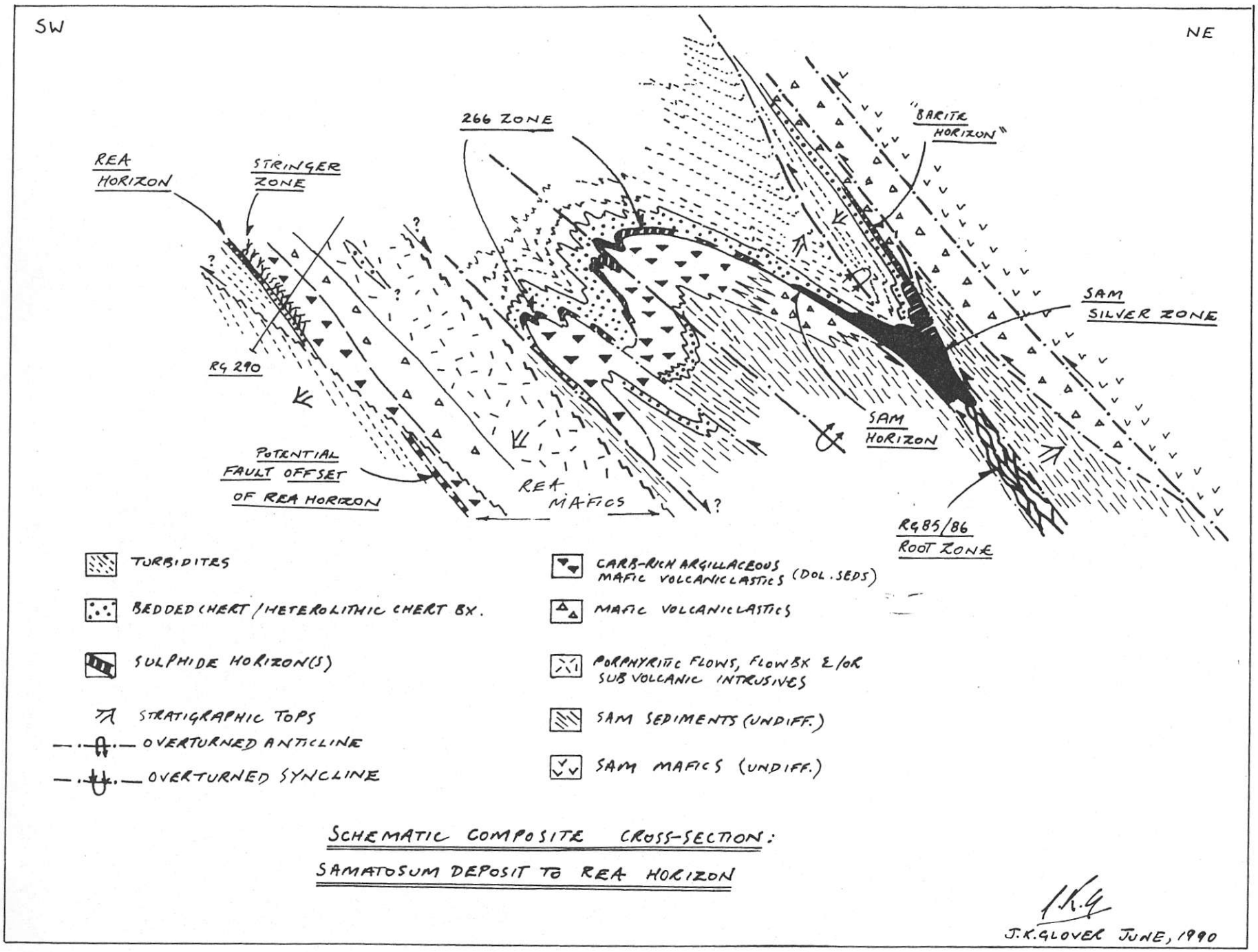
8. Although the mafic/sediment contact immediately above Sam is a thrust, the amount of displacement is not considered to be great, because the hanging wall mafics

are progressively altered toward the contact. However, a major thrust (or growth fault?) does appear to be necessary somewhere within the mafic sequence in order to explain the juxtaposition of the Middle Mafics against the considerably thicker package of Sam Mafics.

9 Therefore, Sam occurs at a T junction made by the Barite Horizon and the Sam Horizon on the overturned and upright limbs, respectively, of this syncline, and the R.G. 85/86 root zone to the deposit. The locus of this triple point down-plunge toward the northwest is believed to offer the best exploration opportunities. Moreover, exploration indices, such as the type, thickness and intensity of mineralization, quartz veining, and sericitization can possibly be calibrated as a function of distance from this T-Junction.

Respectfully submitted:

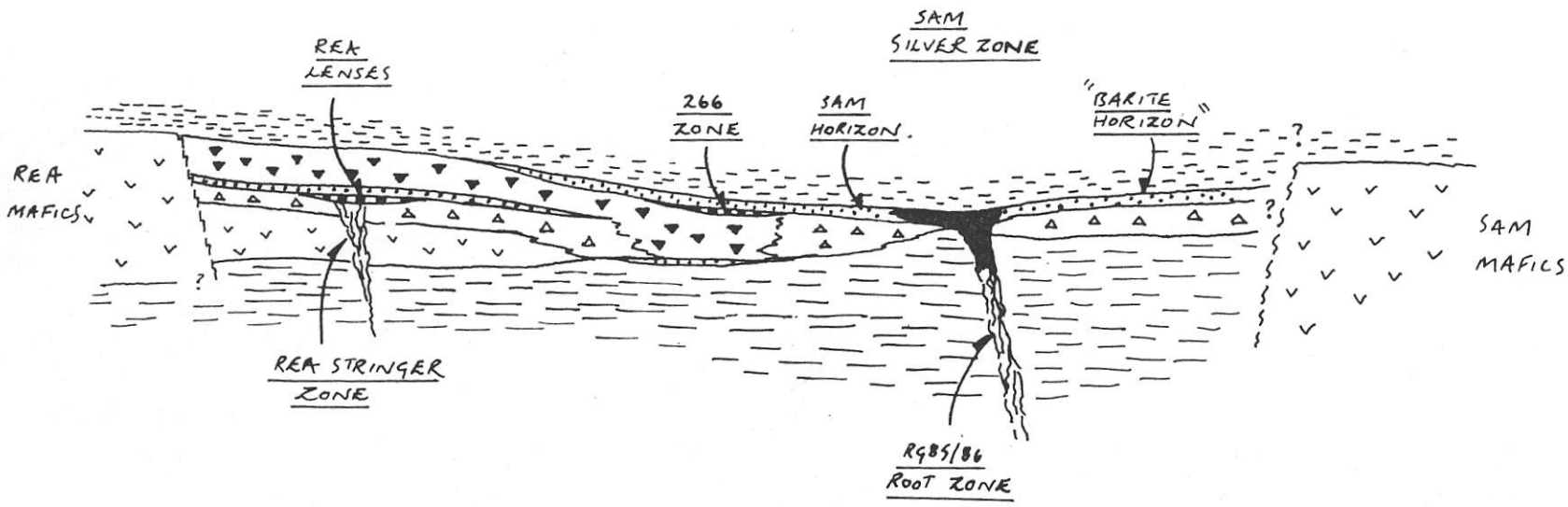
J. Keith Glover
Geological Consultant



SCHEMATIC COMPOSITE CROSS-SECTION:

SAMATOSUM DEPOSIT TO REA HORIZON

J.K. GLOVER JUNE, 1990



- TURBIDITES
- BEDDED CHERT / HETEROLITHIC CHERT BX.
- SULPHIDE HORIZONS
- HIGH SILVER EPIGENETIC MINERALIZATION – STRATABOUND IN PART.
- INTERMEDIATE VOLCANICLASTICS & CARB-RICH ARGILLACEOUS MAFIC VOLCANICLASTICS
- MAFIC VOLCANICLASTICS
- UNDIFFERENTIATED MAFIC VOLCANICS
- UNDIFFERENTIATED SAM SEDIMENTS

SCHEMATIC PREDEFORMATIONAL CROSS-SECTION:
SAMATOSUM DEPOSIT TO REA LENSES

J.K. GLOVER, JUNE 1990