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Mr. P. A. McGonigle,
President,
Consolidated Sheena Mines Ltd. (N.P.L.)
203 - 1033 West Fender Street,
Vancouver 1, B. C.

Dear Mr. McGonigle:

SUMMARY REPORT 69-1

GEOLOGICAL-GEOCHEMICAL-GEOPHYSICAL EXPLORATION

TOMMY LAKE-BOOT LAKE AREA, NICOLA M. D.

PRELIMINARY:

This report briefly reviews the more significant aspects of the regional geological setting and local geological features within various parts of the over-all exploration area; however, the principal emphasis is on results accruing from detailed geochemical and geophysical exploration performed within selected areas during 1968.

The considerable amount of new exploration data resulting from the 1968 work has permitted re-assessments of the apparent mineral potential within specific claim blocks and adjoining areas. As a result of these most of the original 'Echo' claims have been dropped; within the Toe section several claims have been dropped and others added; in the Mal-Chal section the preliminary block has been expanded via new staking to the south and west.

The report text is supplemented by three maps; Fig. 69-1, Dwg. 1-M, and Dwg. 1-T - these providing details of regional geology, geophysical-geochemical surveys, and current interpretations and correlations.

The various claim groups are conveniently located with respect to Merritt, B.C.; however, for general exploration efficiency, field personnel accomplished the larger part of the 1968 exploration from field camps located at Hobs and Paradise Lakes, respectively.

PROPERTY:

The westerly exploration area consists of three adjoining claim blocks, comprising 41 Mal-Chal claims and fractions, 19 Echo claims and fractions, and 8 HN-WEN claims.

The easterly exploration area comprises the 'Toe' claim block - containing 79 claims and fractions, and the separate 'Boot' block of 10 standard claims; currently, the Toe block is being extended to the southwest to cover inferred extensions of I.P., and geochemically-anomalous zones. Following application of the 1968 exploration as assessment, the principal claim groups will be in good standing for an additional two, or more years.

GENERAL GEOLOGY:

Both claim blocks are situated within the north-westerly, or outer part of the Pennask re-entrant - this comprising a 6 mile by 18 mile easterly-trending embayment of Nicola group rocks within the regional Princeton-Pennask granodioritic batholiths. The Brenda property, situated some 12 miles east of the Toe claim group, lies at the easterly limit of this district geological feature; in local detail, the Brenda Cu-Mo deposit occurs within a mass of extensively fractured granodiorite near its contact with Nicola group rocks. On a regional scale, the deposit appears to be related to one of the several "N 60° E" lineaments which form a characteristic geologic feature of the total re-entrant. At least one such major lineament traverses the Toe claim block. The Mal-Chal group, lying closely outward of the westerly nose, or bulge of the Pennask batholith, is situated near the intersection of a N.E.-trending lineament with a system of northerly, to northwesterly-striking (formational) fractures within the local andesites, quartzites, and argillites.

Over the general Mal-Chal group bedrock outcrops amount to some 5 - 10 percent of the surface area; for the Toe group this is estimated to range between 10 - 20 percent. Significant areas of volcanic and intrusive rock have been thermally, metasomatically, and hydrothermally altered. Within the volcanics, Cu-Fe mineralization is frequently associated with propylitic, to skarn-silicate alteration; within fractured and altered intrusive rocks the mineralization is usually associated with secondary quartz, kaolin, sericite and, locally, calcite and chlorite.

*1 loc. horn-
felsic altm
in v.d.c.*

Because of the minor proportion of outcrop within the general prospect area, exploration to date has essentially followed a sequence involving reconnaissance-to-detailed geochemical surveys and magnetometer surveys over full grids - followed by I.P. surveys and detailed, or fill-in geochemical surveys of smaller, selected, potentially-mineralized areas.

1967 - 68 EXPLORATION

I - MAL-CHAL GROUP

GEOLOGICAL FEATURES:

From evidence provided by a few, widely separated bedrock exposures it is possible to infer an east-west trend of the main volcanic-intrusive contact across the north end of the claim block. However, earlier mapping by the Geological Survey indicates that the intrusive-locally occurring as a corner, or bulge - touches only the N.E. corner of the group. In addition, the survey has interpreted sporadic exposures outward and W.S.W. of the main body of the intrusive as an approximately linear succession of small stocks or plugs.

All currently available evidence suggests that the northeasterly Mal-Chal and adjoining Echo claims are underlain, principally, by a sequence comprising volcanics and minor sediments; the southwesterly part of the block contains argillites and quartzites, with subordinate proportions of Nicola volcanic rocks. Fairly large amounts of finely-disseminated pyrite have been noted within certain limy-argillaceous sedimentary sections.

GEOCHEMICAL SURVEY:

All soil samples were taken from the 'B' horizon - where locally present. However, as this zone is frequently absent within large areas of sandy overburden a large proportion of the samples comprise 'A', or 'C'-zone material. All samples were laboratory tested for parts-per-million total copper; a minor, but systematic proportion were tested for parts-per-billion Hg - to detect halos relating to hydrothermal activity.

The surveys delineated extensive, but relatively weak Cu anomalies on Mal 1, and on Mal 7 - 9 claims. The former has E-W and N-S dimensions of 1,100' by 2,000' and, spatially, is closely affiliated with an earlier (1962) - delimited zone of chalcopryite-magnetite mineralization. The latter (S.W.) anomaly measures 800' (avg.) by 2,500', and is somewhat tenuously related to a recently discovered occurrence of sparsely-disseminated chalcopryite within a section of skarny-altered sediments and volcanics.

MAGNETOMETER SURVEY:

This was carried out over a major portion of the grid, by means of a Sharpe MF-1 flux-gate magnetometer during the winter of 1967-68. Magnetically-unstable field conditions

caused considerable difficulty. The following interpretations resulted: General background was about 650 gammas. A large plus-1,000 gamma anomaly centers on Mal 1-2 claims, with local peaks of 2,500 gammas. The anomaly also approximately centers on the zone of magnetite-copper mineralization - indicating probable extensions of the local magnetite-skarn zone.

INDUCED POLARIZATION SURVEY:

This was performed by Barringer Research Ltd., employing 7.5 KVA pulse-type equipment, and pole-dipole electrode configurations. The greater part of the claim group was covered via E-W grid lines at 400' N-S spacing; a general electrode spacing ('a') of 200' was employed, with an electrode separation of 400' (n = 2). Multi-space detailing was carried out over the main showings. A total of 23.22 miles of grid-line was surveyed.

The more significant I.P. anomaly has its westerly edge some 1,000 feet due east of the ON, OW Fe-Cu zone; moreover, it has a composite areal extent of 1,000' (N-S) by 1,500' (E-W). Anomalous chargeabilities range from 8 Ms (periphery) to 10 Ms, and higher (central); local background is taken at 4 Ms - decreasing outward. *GEN. BACKGROUND \approx 2 MS.*

A smaller, but geologically-significant I.P. anomaly occurs closely south and west of the drilled and trenched segments of the Fe-Cu zone; this trends northwesterly, and has a 300' width and 800' length. In addition it overlaps the principal geochemical anomaly on the Mal-Chal claims.

* In view of their local geological-mineral affiliations, both anomalies comprise first-order drilling targets.

The third I.P. anomaly, although of greater strength and size than the above two, is presently thought to merely reflect a relatively strong occurrence of disseminated (reconstituted) pyrite and graphitic material in the altered section of Nicola sediments and volcanics which underlies the south end of the claim block.

*INDICENOS
PYRITE
OR
MANGANITE*

II - TOE GROUP

GEOLOGICAL FEATURES:

A variably altered assemblage of Nicola andesitic volcanics, with minor sedimentary strata, underlies 90 percent of the claim block. The Pennask granodioritic body lies to the north of the block. A local bulge of the intrusive underlies the northwesterly claims. From this area the contact

trends (dip ?) northeasterly to about one-half mile north of Boot Lake, through the 'Boot' group, thence easterly and northeasterly beyond the Company's property.

The Nicola rocks are mildly to strongly altered; locally, they have acquired crystalline textures (meta-volcanics and meta-sediments) - frequently to a degree where they resemble dark, fine-grained diorites. Some exposures of the foregoing contain appreciable amounts of disseminated (metamorphic ?) pyrite and, very locally, magnetite; more locally, chalcopyrite occurs as sparsely disseminated grains, or within micro-fractures and/or quartz seams. Rock exposures are rare, but one noteworthy occurrence of copper mineralization was seen at 48W, 26N - as a sparse dissemination, with pyrite, in recrystallized, to skarny tuffs.

Some evidence pointing to the possible occurrence of outlying 'granitic' bodies which may underlie the volcanics at relatively shallow depths is provided by an exposure of quartz monzonite-syenite on line 40W, 36-38S. These rocks are cut by quartz-aplite veins, and contain some coarsely crystalline pyrite. The local fracturing, intrusives, and alteration lie within the general zone of the inferred E.N.E.-trending 'Wart' regional (fracture) lineament.

GEOCHEMICAL SURVEY:

This was performed over the entire Toe grid, prior to the addition of 8 new claims to the west. In general, samples of B-zone soil were taken; within anomalous (Cu) areas these were supplemented by C-zone (profile) samples. All samples were lab.-analyzed for total copper content; intermittent C-zone samples were tested for Hg.

Six prominent, and four minor anomalies (60 + p.p.m. Cu) were delineated by the Company's survey. The more important of these were checked and evaluated by Bondar-Clegg, Geochemical Consultants - this company's evaluation being based on the conspicuous presence or absence of organic (Cu "sponge") material in samples providing the anomaly. In view of the unpredictable effect of organics at various parts of the grid, the writer's current evaluation of separate anomalies hinges largely on their position with respect to I.P.-anomalous zones and local geological environments. On this basis the multiple soil anomaly centering on the 23N line between 22W and 64W is most important. Its separate easterly and westerly parts are both enclosed by the extensive 6-12 Ms I.P. anomaly; in addition, the previously noted Fe-Cu dissemination in recrystallized tuff and skarn lies towards the interior of this zone.

FIELD EXAM. → STRONG SILICIFICATION & PYRITIZATION.

Next in importance is the 1,000' by 1,800' soil anomaly centering on 6S, 64W. This lies closely west of a major

I.P. anomaly; in addition, outcrops of conspicuously bleached-pyritic tuffs occur at only 200' - 300' west of the soil anomaly. The co-occurrence of veining and dispersed epidote-quartz-pyrite suggests a center of hydrothermal-mineral activity.

Third in importance is a 700' by 1,800' soil anomaly, with E-W elongation, centering at 10N, 0E. This overlaps a moderately strong, but extensive I.P. anomaly; outcrops of significantly altered volcanics, with some disseminated pyrite also occur within the general locality. Two separate, smaller soil anomalies, of 500' by 1200' extent, lie closely south and up-slope of the I.P. anomaly. With the above, a general 2,000' by 2,000' compositely-anomalous area forms a significant exploration target.

Finally, the 600' by 1,600' soil anomaly, centering on 34W, 30S and overlapping the areally extensive zone of I.P. anomalies lying within the southwest portion of the Toe grid may, or may not be significant. No actual evidence of mineralization, other than some patchy formational pyrite, has been seen in this locality. However, the quartz monzonite-syenite body noted at 36-38S, 40W may constitute a source of copper mineralization. In any case, the general area is of sufficient importance to warrant follow-up exploration by trenching and/or drilling.

MAGNETOMETER SURVEY:

This was done in conjunction with the Mal-Chal survey.

There is little variation in magnetic intensity over the whole Toe grid. However, a magnetic depression is indicated for the general area of geo-chemical-I.P. anomalies, with a level of about 500 gammas. A zone of slightly higher magnetic intensity (1,500 gammas) corresponds with the inferred intrusive-volcanic contact - possibly indicating a halo of metasomatic magnetite.

The most significant feature accruing from the survey is the E.N.E.-trending magnetic grain - which corresponds well with I.P., lithological and major structural trends.

INDUCED POLARIZATION SURVEY:

The most essential features of this have been noted in the preceding section, "Geochemical Survey". The principal survey was performed by Barringer Research Limited in conjunction with that on the Mal-Chal claim group; it was run on grid lines at 800' E-W intervals, with similar procedures and electrode spacings as employed on the Mal-Chal project. The Barringer crews surveyed 16.23 line miles, including detailing.

(The preliminary or "east-half" survey by Geo-X Ltd., using low power, portable equipment, produced only a random, uncoordinated pattern of localized anomalies which, however, provided an adequate check on the sporadically occurring minor geo-chemical anomalies characterizing this half of the claim block.)

The Barringer interpretations are summarized: The most extensive area of 'resistivity-lows' lies along the northern edge of the grid - probably reflecting the presence of the Pennask granodiorite under a possible increasing cover. Areas of higher resistivity tend to be concentrated towards the south boundary of the grid.

The best I.P. response was obtained in the general intrusive-volcanic contact zone (unfortunately time and weather conditions did not allow a more northerly extension of the survey into the main body of the intrusive - cf. Brenda Mo-Cu setting - or of a reconnaissance of the Boot group which effectively straddles the contact). The general I.P. anomaly along this section of the contact has an E.N.E. length of over 4,000 feet, and width of about 1,000 feet.

The large, southerly (20-45E) composite anomaly adjoins and laps a resistivity high. As noted previously, the I.P. anomaly probably reflects a general, bedding-controlled concentration of formational pyrite; however its spatial relationships with regard to one, or more bodies of potentially mineralized quartz monzonite-syenite furnishes considerable geological and economic significance. The 600' by 1,000' chargeability high centering on 10S, 50W, together with a northerly-situated satellite zone, are considered significant in that they are spatially related to a large geochemical anomaly lying up-slope of them, and also by reason of the possibility that they are related to an inferred underlying intrusive 'dome', or sheet. The anomaly, centering on line 22S, 72W, and opening westward, is considered important by reason of the existence of strong contrasts within the local pattern of chargeabilities. In this connection R. Caven postulates a southerly-lying body of granitic rocks; however, no substantial evidence of this has been observed. For similar reasons, the large (800' by 1,400') and strong (8 - 14 Ms) anomaly is considered significant - and worthy of extended, detailed geochemical investigation.

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