METALS INVESTMENT HOLDINGS N.L.

- Summary Report -

ELKEDRA RIVER P.A. NO.3228 N.T.
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ACCOMPANYING DIAGRAMS

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1. **INTRODUCTION**

Authority to Prospect No.3228 for 480 square miles of the north western region of the Elkedra Sheet N.T. has been granted on 28.5.71 for a period of 12 months to Aberlour Pty. Ltd. being a wholly owned subsidiary of Metals Investment Holdings N.L.

The location of the area known as "Elkedra River" is shown on Map A.

2. **GEOLOGY**

A detailed location and geology is shown on Map B.

The lower Proterozoic **Hatches Creek Group** crops out over a large part of the held area. This Group consists mainly of medium to coarse-grained, thin to medium bedded, cross-bedded, ripple-marked silicified quartz sandstone which forms prominent steeply dipping strike ridges. Between the ridges, shale, greywacke and acid, intermediate and basic lavas crop out but only the basic lavas are exposed in the held area. Geological mapping has been insufficient to delineate sedimentary units within the Group.

The Hatches Creek Group crops strongly on the Davenport Range to the north of the held area and extends southward onto the Frew River Sheet north-west onto the Bonney Well Sheet and westward on to the Barrow Creek Sheet.

On the Elkedra Sheet the Group has been strongly folded and faulted during the Lower Proterozoic but was not regionally metamorphosed. Local contact metamorphism is, however, evident on the western side of a granite intrusion near Supplejack Bone, south of the held area, where sediments of the Hatches Creek Group have been converted to metaquartzite and hornfels.

Quartz feldspar porphyry is common on the central and eastern regions of the lease area where they generally occupy the cores of anticlines. Most of the porphyry is sheared and weathered brown to orange with feldspar phenocrysts usually present.

Granite and dolerite intrusions also occur south of the held area near Supplejack Bore.

There is only one small area of outcrop of the **Middle Cambrian Sandover Beds**, occurring in the far south eastern corner. These beds commonly form the base of the Palaeozoic sequence around the margins of the Georgina Basin. The maximum
exposed thickness of the Sandover Beds is about 800 ft., consisting of three units which in descending order are:—
175 feet limestone
500 feet siltstone and shale
120 feet sandstone

The Upper Cambrian to Lower Ordovician Tomahawk Beds are not a dominant rock type in the lease area. They outcrop along the south western margins only in small isolated occurrences. They are, however, important in the Davenport Range, where several outcrops of cobble, pebble and boulder conglomerate occur along the south west flanks and in the valleys within the range. About half the A. to P. area is covered by Quaternary sand soil, alluvium and gravel, but the thickness usually is less than 10 feet.

3. MINERALIZATION

Within the held area only minor mineral occurrences have been noted. A narrow vein of chalcocite has been reported, presumably within Lower Proterozoic rocks to the west of Elkedra Station.

South of the held area a wolfram prospect has been tested by pitting. The wolfram occurs in a narrow quartz vein in granite.

To the west of the Elkedra Sheet limited copper and lead mineralization has been noted in the Hatches Creek Group on the north east of the Barrow Creek Sheet. The minor secondary copper occurs in quartz veins within the Hatches Creek Group while the galena deposits are associated with quartz veins which cut basic volcanic rocks.

Mineralization is much more extensive on the Bonney Well and Frew River Sheets to the north west and north respectively of the held area.

On the eastern Bonney Well Sheet wolfram has been mined for sometime at the Wauchope Field. The ore occurs in narrow quartz veins which cut the Hatches Creek Group. Also in this region near Mosquito Creek wolfram and scheelite occur in similar veins but in shear zones within Pre-Cambrian granite.

Secondly uranium minerals have also been mined near the Mosquito Creek Wolfram Fields where mineralization occurs in a fault zone within sheared acid volcanics of the Warramunga Group (which underlies the Hatches Creek Group). Follow up airborne scintillometer work by the B.M.R. in this region gave unencouraging results.
To the south-east of the Bonney Well Sheet copper has also been noted in a sample of amygdaloidal metaandesite believed to be of the Hatches Creek Group. Further to the south gold has been mined at the Great Davenport Prospect about 30 miles north west of the held area. The gold again occurs in narrow quartz veins cutting shales of the Hatches Creek Group.

On the Frew River Sheet a considerable amount of tungsten, accessory copper and bismuth have been mined from the Hatches Creek Wolfram Fields less than 10 miles north of the held area. The tungsten areas occur in steeply dipping quartz reefs, usually ranging from 6 to 18 inches in width which cut sedimentary and volcanic rocks of the Hatches Creek Group and a gabbro. The lodes are concentrated in groups of shear zones and the commonest ore is wolfram but scheelite has also been mined.

Traces of gold have also been noted near Hatches Creek and airborne radioactivity anomalies have been reported in this region although follow-up work by the B.M.R. was not encouraging.

4. REGIONAL B.M.R. GRAVITY AND AEROMAGNETIC SURVEYS: PRELIMINARY INTERPRETATION

No closed regional gravity anomalies occur within the lease area (Map C) and a gravity gradient with values decreasing to the north east is present. This suggests generally deeper basement to the east and north-east shallowing gradually to the west. The held area appears to be on the eastern side of a north west striking gravity plateau extending onto the adjoining map sheets.

The magnetic field over the N.E. corner of the Elkedra Sheet is extremely complex with considerable magnetic relief. (Map D.) Two distinct magnetic lineations are apparent from the contour map. On the central and western side of the held area a dominant N.W. - S.E. trend consists of narrow elongated and isolated roughly equidimensional anomalies; which are highly distorted. To the east and north-east of the area similar although predominantly negative anomalies, trend in a N.E. - S.W. direction. The latter trend appears to be subsidiary to the major N.W. - S.E. direction and where they intersect in the central region of the held area the magnetics are highly variable. Some faulting in these major directions is also suggested (Map D) but may be due to intense folding.

The outcropping basic lavas and porphyrys do not appear to cause prominent magnetic anomalies and in fact tend to be associated with magnetic lows. In the case of the basic lavas this is somewhat surprising and may suggest reversed magnetization of these bodies.
For the most part it appears that the magnetic features delineated are due to sources within the underlying crystalline basement which is probably Arunta Complex.

Quantitative interpretation was done on a number of anomalies using the characteristic curve method of Grant and West. Vertical prism models were assumed for the reasonably isolated anomalies shown on Map D. The results are listed below:-

<table>
<thead>
<tr>
<th>Anomaly</th>
<th>Depth (feet)</th>
<th>Magnetic Susceptibility (c.g.s. units)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A 1</td>
<td>3,000</td>
<td>.004</td>
</tr>
<tr>
<td>A 2</td>
<td>2,900</td>
<td>.002</td>
</tr>
<tr>
<td>A 3</td>
<td>2,300</td>
<td>.001</td>
</tr>
<tr>
<td>A 4</td>
<td>4,600 (?)</td>
<td>.014 (?)</td>
</tr>
<tr>
<td>A 5</td>
<td>5,500</td>
<td>.004</td>
</tr>
</tbody>
</table>

The sources of these anomalies are at considerable depths within the basement. It is probable, however, that within the held area basement is much shallower than this as Ammaroo No.1 and 2 about 10 miles south encountered Arunta Complex gneisses and granites at depths of 570 and 765 feet respectively. Within the lease area shallower depths than this could be expected.

5. CONCLUSIONS

As with the Canadian Shield areas extensive mineralization to the north, north west and west of the lease area is almost always in the proximity of acid and basic volcanics. In view of the fact that essentially the same suite of rocks occurs within the held area; the area must be regarded as sufficiently prospective to warrant further exploration.

6. RECOMMENDATIONS

a. As the targets for exploration include not only the intruding porphyry but the volcanics and sediments of the Hatches Creek Group initial exploration should commence with high altitude aerial colour photography and infra-red scanning.

b. This should be followed by a detailed low altitude geophysical survey using principally gamma-ray spectrometer, electromagnetics and magnetics.

c. Ground investigations in the form of geological mapping and geochemical sampling could then proceed in suitable areas delineated from the airborne surveys.