ANNUAL REPORT
10.4.73 to 10.4.74
EXPLORATION LICENCE NO. 872
REDBANK, NORTHERN TERRITORY

OPEN FILE
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PLANS TO ACCOMPANY

Reconnaissance Geological Plan E.L. 872 1:20,000
✓ Geochemical Plan E.L. 872 1:20,000
✓ Soil Sample Profiles E.L. 872
1. SUMMARY

The following Annual Report is an outline of all work carried out from 10 April, 1973 to 10 April, 1974 on Exploration Licence No. 872, Redbank, Northern Territory.

A reconnaissance survey was completed on E.L. 872. Because the area is rugged and access difficult, only the eastern two-thirds of the licence was mapped. The geology is described. Detailed stream sampling was also carried out in the eastern portion of the lease. Rock chip and soil samples were collected. The soil samples were from sections through the Wollogorang Formation. The geochemistry demonstrates that two stratigraphic levels in the Wollogorang Formation are anomalous for copper.

2. INTRODUCTION

The area covered by E.L. 872 was taken up by Amdex Mining Limited because rocks of the Gold Creek Volcanics outcrop here. Because copper occurs in this formation at Redbank, the Gold Creek Volcanics were considered to be potentially prospective. E.L. 872 is situated in the northeast corner of the Northern Territory. It is bounded by meridians 137° 30'E and 137° 44'E, parallel 17° 15' 30"S passes through the centre of the area. The E.L. adjoins E.L. 689 which is also held by the Amdex Group.
The area covered by E.L. 872 can be divided into two morphological regions. In the S.E. a flat alluvial flood plain has been formed by Settlement Creek. The remainder of the area is a deeply incised plateau formed by a complex of cuestas with steep strike slopes facing S.E.

Access to the area is limited. There are no roads, but the Settlement Creek flood plain in the S.E. is readily accessible by vehicle. It is possible to drive up Twelve Mile Creek for some distance. Access to the western half of the northern boundary may be possible by driving south from the Redbank Calvert Hills road. The large remaining portion of the E.L. is only accessible on foot or by helicopter.

Because of poor access only the Eastern part of the area was visited. Particular attention was paid to the stratigraphy of the Wollogorang Formation.

3. GEOLOGY

(a) Stratigraphy  (See attached Reconnaissance Geological Plan E.L. 872).

The rocks in the area are of Proterozoic Age. The following sequence has been recognized.
CAINozoIC

CRETACEOUS

MAsterton FORMATION

PunGaliaNA MEMBER

HOBBLECHAIN RHYOLITE

GOLD CREEK VOLCANICS

PROTEROZOIC

WOLLOGORANG FORMATION

SETTLEMENT CREEK VOLCANICS

Cza

K

Ptn1

Ptn2

Ptu

Pth

Ptg

Pto4

Pto3

Pto2

Pto1

Pte

Aluvium

S.S., conglomerate

White, cross-bedded, quartz, s.s.

Well-bedded, clean, white s.s.

Purple to red-brown, flaggy, s.s.-siltstone.

Quartz and lithic s.s., minor grit bands, rare volcanic and rhyolite fragments.

Trachyte, volcanic agglomerate, trachy-andesite, s.s., siltstone, tuff

Andesite (probably feeder of Ptg)

Cross bedded quartz s.s., minor grit bands, thin siltstone interbeds.

Siltstone, dolomitic siltstone, dolomite, s.s., stromatolites; interbedded dolomite, siltstone, trachyte - tuff.

Algal mat, 'nodular' dolomite, spherical stromatolites.

Interbedded siltstone, dolomitic siltstone and dolomite.

Trachyte, basalt, trachy-andesite, andesite, volcanic agglomerate, tuff, tuffaceous siltstone.
The Settlement Creek Volcanics are a differentiated sequence consisting mainly of fine grained and vesicular trachyte, trachyandesite, andesite and basalt. Volcanic agglomerate is locally developed. Tuff and tuffaceous siltstone occur as interbeds near the top of the sequence. Although the bottom of the sequence is not exposed it is 102 to 122m thick.

The Wollogorang Formation which is approximately 122m thick has been divided into four. This division is based on 2 units. The first is a marker bed consisting of algal mats, 'nodular' dolomite and distinctive spherical stromatolites. The second is the prominently outcropping sandstone which forms the top of the formation.

Unit 1 of the Wollogorang Formation consists of interbedded siltstone, dolomitic siltstone and dolomite which conformably overlies the Settlement Creek Volcanics. Nodular dolomite has been seen in this unit. Tuff interbeds near the base indicate that sedimentation of the Wollogorang began during the final phase of Settlement Creek volcanism.

Unit 2 is a marker bed made up of algal mats overlain by distinctive spherical stromatolites up to 1m in diameter. A grey dolomite containing ovoid nodules (8cm) of coarsely crystalline dolomite is normally associated with this unit.
Unit 3 consists of interbedded siltstone, dolomitic siltstone and dolomite. A thin stromatolite unit is sometimes seen. Near the top of the unit a sequence of thinly interbedded dolomite, siltstone, trachyte and tuff occurs. This interbedded sequence is locally brecciated.

Unit 4 of the Wollogorang Formation is formed by thick beds of cross-bedded, coarse, quartz sandstone with locally developed grit bands. Up to 3 distinct sandstone beds exist with thin siltstone interbeds.

An intrusive andesite has been observed within the Wollogorang Formation. It is a broad dyke like body which may be part of the feeder system of the Gold Creek Volcanics.

The Gold Creek Volcanics are much thinner here than to the N.E. sometimes reaching a thickness of 60m but are usually 30 to 45m thick. Base of the volcanics is usually trachy-andesite with fine grained and vesicular trachyte flows overlying this. Trachyte-mud-breccias are developed in the upper half of the unit. A sandstone bed near the top of the unit (the equivalent of Ptg4 in the Redbank Area) is well developed in the N.W. part of the lease thinning to the south.

The Hobblechain Rhyolite is extant in the area as a sandstone up to 10m thick. The coarse quartz to lithic sandstone is cross-bedded and exhibits ripple marks and mud cracks containing grit bands and rare volcanic and rhyolite pebbles.
The Pungalina Member is approximately 10m thick. It consists of purple to red brown, flaggy, iron-rich, partly micaceous sandstone to siltstone. Ripple marks and mud cracks are evident.

Two units locally occur within the Masterton Formation. The lower is a well-bedded, clean, white, quartz sandstone, while the upper is cross-bedded quartz sandstone. The upper unit contains more matrix than the lower and is less resistant. In most areas the Masterton Formation is an undifferentiated quartz sandstone with occasional pebble beds.

Extensive flat lying Cretaceous deposits form a plateau which blankets much of the Proterozoic. Crumbly ferruginous quartz sandstone, s.s. - conglomerate and conglomerate make up the Cretaceous rocks. They unconformably overlie the Masterton Formation and appear in part to have been derived from it.

(b) Structure

The Proterozoic sequence exhibits a gentle regional dip to the N.W. The rocks are folded on a small scale into open symmetrical synclines and anticlines with dips usually less than 30°. Axes of the folds are randomly oriented. The most prominent structural feature in the area is an anticline at the head of the Camp Creek. Marked faulting has occurred at the nose of this structure. Few faults have been observed in the area and those that have been interpreted generally show small displacement.
4. **PHOTO GEOLOGICAL WORK**

An aerial colour photography survey was carried out over the E.L. at a scale of 1:20,000. The structural features of interest which were delineated were checked geologically and geochemically as part of the exploration programme in this area.

5. **GEOCHEMISTRY**

A stream sediment sampling survey has been completed in the eastern part of the E.L. (see attached Geochemical Plan). Because of the limited time available and problems of access not every stream was sampled. In the areas where samples were collected detailed sampling has been completed at an interval no greater than 650m and have been assayed for copper.

Stream sediment sample assay values greater than 100 ppm are considered anomalous. There are two localities of interest marked A and B on the Geochemical Plan. At both localities anomalous values occur in streams that drain unit 4 and the upper part of unit 3 in the Wollogorang Formation.

Six soil sample profiles were completed, the samples being collected at 16m intervals along well exposed scarp slope sections. The results of this programme are outlined on the accompanying diagram - Soil Sample Profiles E.L. 872. It is evident from profiles 4, 5, and 6 that unit 2 in the Wollogorang Formation is slightly anomalous for Cu. This observation concurs with a rock chip sample (CC 79) of dolomite and marble from unit 2.
which assayed 2500 ppm Cu. Malachite filling fractures in light-grey calcareous shale well observed nearby at the base of soil Profile 2. Profiles 4, 5 and 6 show that there is another anomalous stratigraphic level near the contact of Wollogorang Formation units 3 and 4. The rock types here are a grey limestone with locally developed algal mats and ferruginous siltstone-shale. This trend is also apparent in Profiles, 1 2 and 3 but the values are not significant.

The geochemistry completed to date demonstrates that there are two stratigraphic levels in the Wollogorang Formation that assay above background for Cu. We do not understand as yet the nature, extent or genesis of this mineralization.

6. CONCLUSIONS

Tenure of E.L. 872 was renewed on 10 March, 1974 for a further period of 12 months from 10 April, 1974.

The exploration programme to be followed during the next year's tenure is to consist of extending those photogeological studies and geochemical surveys already made.

Geochemical sampling will need to be extended. Detailed stream sediment sampling preceded by a carefully executed geochemical orientation programme will indicate where concentrations of copper exist. Samples will also be assayed for lead and zinc. Anomalies so located will be followed up by geological mapping and further sampling. The company aims to
gain a better understanding of the syngenetic ore potential of the area, and the relationship if any, between copper occurrences in the Wollogorang Formation and Gold Creek Volcanics.

Triako's main objectives are aimed at extending and exploring two differing mineralisation possibilities:

a) testing for Manto replacement ore situations in the top unit of the Wollogorang Formation surrounding known breccia pipes and along fracture zones interconnecting same.

b) testing out the probability of copper mineralisation contained as disseminations within specific volcanic flow units.

Any targets uncovered will then be further explored in a logical progressive method - i.e. geological mapping, geochemical grid sampling, geophysical surveying, followed up by drilling.

7. EXPENDITURE

The following expenditure was incurred on E.L. 872, Redbank, Northern Territory during the year 10 April, 1973 to 10 April, 1974 :-
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<th>Category</th>
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<td>Geophysics</td>
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<tr>
<td>Administrative Costs</td>
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</table>

**Total:** $58,483.34
STRATIGRAPHY

WOLLONGOONG FORMATION

Cross bedsded Quartz s.e., cross bedsded siltstone interbeded.
Siltstone, dolomitic siltstone, dolomite, s.e., stromatolite, interbedded dolomite, siltstone, tracele-tuff.
Algal mat, nodular dolomite, spherical stromatolites.
Interbedded siltstone, dolomitic siltstone, dolomite.

SETTLEMENT CHEEK VOLCANICS

Trachyite, basalt, tephraandesite, andesite, volcanic agglomerate, tuft, tuffaceous siltstone.

NOTE:
The diagram depicts the assay values of soil samples taken at 100 feet intervals along contour profile. The stratigraphic columns are not to scale. The results show the relative position of each sample with respect to the recognized stratigraphic units in the area.

AMDEX MINING LIMITED
REDBANK
SOIL SAMPLE PROFILES EL 872
SURVEY: M. Spudich, A. Fleming
DATE: Jan. 1970