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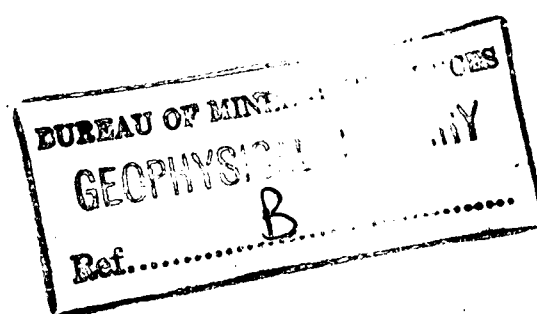
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COMMONWEALTH OF AUSTRALIA.

DEPARTMENT OF NATIONAL DEVELOPMENT.
BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS.

RECORDS.

1962/121



THE LOLUAI COPPER PROSPECT, WOODLARK ISLAND
TERRITORY OF PAPUA AND NEW GUINEA

by

P.W. Pritchard



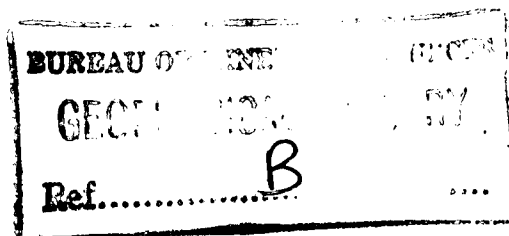
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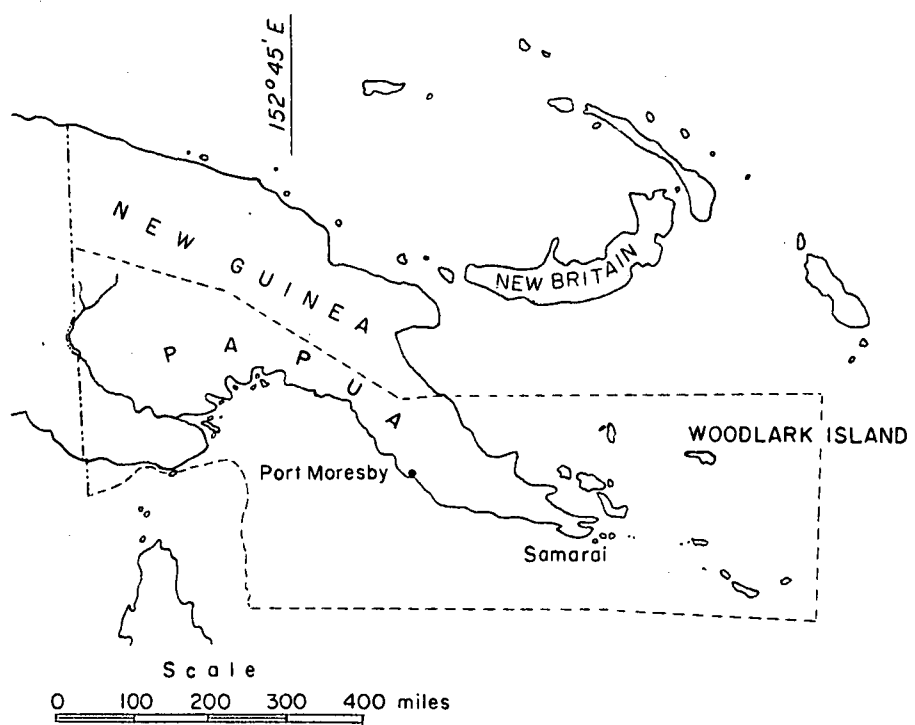
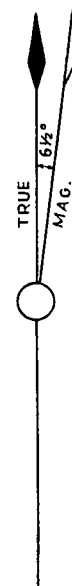
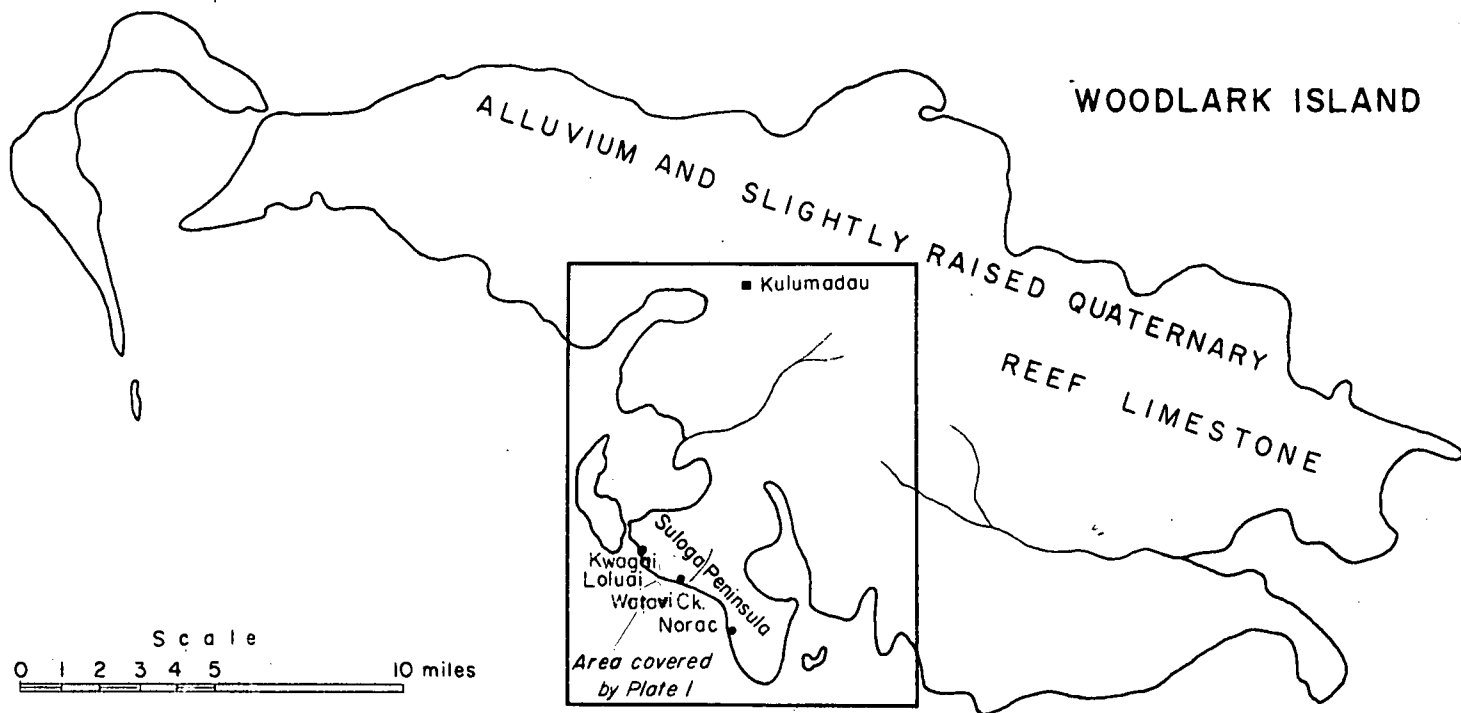
- 1: Note on a magnetometer survey of
 the Loluai Area.

PLATES

- 1: Geological Map. Scale 1 inch to 100'.
2: Vertical force magnetic variometer
 survey. Scale 1 inch to 100'.
3: Mine workings on the Loluai Copper
 Prospect. Scale 1 inch to 40'.

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LOCALITY MAPS - WOODLARK ISLAND PAPUA



THE LOLUAI COPPER PROSPECT WOODLARK ISLAND

TERRITORY OF PAPUA AND NEW GUINEA.

SUMMARY

In 1960 a Bureau of Mineral Resources regional party discovered a large copper anomaly near Loluai Creek, Woodlark Island by geochemical prospecting. This copper anomaly is associated with an outcrop of skarn in a sequence of indurated siltstone and greywacke, which is part of the Loluai Volcanics. These sediments are folded into a north-west plunging syncline faulted on its eastern limb. They are unconformably overlain by basalt and andesite and intruded by gabbro and granodiorite. Later, Ward (1960) examined the Loluai Creek area for Thiess Brothers Limited. After this investigation Thiess Brothers and Mr. R.C. Neate who holds a mining lease over the copper area, asked the Administration of the Territory of Papua and New Guinea for 1500 feet of diamond drilling to test the prospect.

No primary copper mineralisation was seen in the area. Secondary copper minerals (malachite and azurite) are visible in the fault and joint planes in the shear zone exposed in the old Loluai workings.

The diamond drilling programme requested by Thiess Brothers Limited should explore for mineralization below the highs in the geochemical anomaly, and it should test the fault on the eastern limb of the syncline for an orebody.

INTRODUCTION.

The presence of copper, gold, and iron in the Loluai area has been known since the early days of mining on Woodlark Island (Stanley, 1912; 1917). Since then exploration by open cuts, shafts, and adits have failed to prove a copper-gold ore body at Loluai. At present a mining lease of the area is held by Mr. R.C. Neate, who in 1955, interested Broken Hill Proprietary Limited in the iron ore at Loluai. This was examined by Canavan and Collins (1956), and by Thompson (1960), but after an aeromagnetic survey (Woyzbun, 1955) Broken Hill Proprietary showed no further interest.

In 1960 Fricker and Trail (1961) of the Bureau of Mineral Resources made a geochemical survey of the Loluai area and discovered a large copper anomaly west of Loluai Creek and a smaller one to the east. Mr. Neate interested Thiess Brothers Limited in the prospect as a possible open-cut copper deposit, and Ward (1960) made a geological survey for the company. As a result of Ward's report Thiess Brothers Limited asked the Territory of Papua and New Guinea Administration to test the deposit by fifteen hundred feet of diamond drilling.

The prospect was examined between 29th April and 14th May, 1961 by I.A. Wood and P.W. Pritchard of the Department of Lands, Surveys and Mines, Port Moresby, and by A.B. Clark of New Consolidated Goldfields Limited, Sydney.

GEOLOGY

The regional geology of Woodlark Island was mapped by a Bureau of Mineral Resources party led by D. Trail in 1960 (Trail, 1961).

STRATIGRAPHY

Loluai Volcanics

Trail's party mapped the rocks exposed in the Loluai area as part of the Loluai Volcanics.

In the area between Watavai Creek and Kwagai thermally metamorphosed and metasomatized clastic and limy metasediments intruded by gabbro and granodiorite, appear to be overlain unconformably by basalts and andesites.

The clastic sediments are thin to thick beds of light-green to blue-grey, laminated, and thin-bedded indurated siltstone and fine-grained to medium-grained indurated greywacke. They contain minor chert beds and nodules and show small slumps, graded beds, and pull-apart structures.

The calcareous sediments have been altered to reddish-brown skarn most of which is fine-grained to medium-grained and impure. The small amount of pure skarn present is commonly coarse-grained to very coarse-grained, and in many places it contains boxworks after pyrite and possibly chalcopyrite.

The formation in most places deeply weathered to brown clay except for the outcrop along the coast and in the creeks. A well exposed section can be seen in Watavai Creek.

The age of the formation is Tertiary (Trail, 1961).

Unnamed Volcanics

Unmetamorphosed basalts and andesites crop out along the coast west of Loluai Creek. In places the basalt shows well developed columnar jointing. These volcanics appear to rest unconformably on the Loluai Volcanics.

INTRUSIVE ROCKS.

The Loluai Volcanics are intruded by gabbro and granodiorite. Sheared, coarse-grained gabbro crops out near the portal of Number One Adit (Plate 1) and gabbro intruded by basalt dykes and sills can be seen on the coast east of Kwagai. The gabbro contains a high percentage of magnetite.

Granodiorite is exposed in Loluai Creek and on the coast half a mile east of Kwagai, where a granodiorite dyke contains xenoliths of basalt.

STRUCTURE

In the area of the geochemical anomaly the Loluai Volcanics are probably folded into a north-west plunging syncline which is displaced by north-trending faults (Plate 1). The main fault is on the eastern limb of the syncline and is exposed in the old Loluai workings. The fault probably extends along Loluai Creek where shearing and quartz veining are visible in the eastern walls of costeans 4 and 5 (Plate 1). This fault forms the eastern edge of the skarn outcrop area.

MINERALIZATION

Iron, copper, and gold occur at Loluai.

The iron is predominantly hematite with some magnetite, limonite, and siderite. It is found both in the shear zone exposed by the old workings and in the skarn. Some samples of the iron ore assayed up to 65 percent iron (Ward, 1960).

The only visible copper mineralization in the Loluai area is acicular malachite and azurite on shear and joint planes in the fault zone exposed by the old workings. Most of the secondary mineralization occurs in the iron ore filling the shear zone. A small amount is visible in the sediments on the hanging wall of the shear zone. The grade of the copper body exposed in the old workings is estimated to be less than 2 percent, although a twenty-ton parcel of handpicked ore extracted by Mr. Neate and his son in 1958 averaged 9.1 percent copper (Ward 1960). This parcel also averaged $5\frac{1}{2}$ dwts. of gold.

No sulphide ore was seen in the Loluai area but there are poorly-formed boxworks.

DIAMOND DRILLING PROGRAMME

The diamond drilling programme should test the highs in the geochemical copper anomaly and the fault zone exposed in the old workings and along Loluai Creek for a sulphide ore body.

Six vertical 100-foot long holes (A to F, Plate 1) should be drilled to test for primary sulphides below the copper anomaly highs. An angled hole 200 feet long (G, Plate 1) should be drilled to test the shear zone 100 to 150 feet below the Loluai workings and below the zone of weathering. If sulphides are intersected in hole G a second inclined hole (H, Plate 1) 200 feet long should be drilled to test for a northerly extension of the mineralized shear zone.

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Appendix 1Note on a magnetometer survey of the Loluai area

Mr. I.A. Woods the Chief of the Division of Mines, Port Moresby carried out a magnetometer survey of the area in which the Loluai copper anomaly was found (see Plate 2). He used an E.R. Watts Vertical Force Variometer with a reading of 30 gammas per scale division, which gave a background reading of between 500 and 700 gammas. Because of the strength of the magnetic anomalies found in the area corrections for diurnal (gammas 0-45) and temperature variations (25° - 27°C each day the instrument was in use) were not made.

WOODLARK ISLAND
LOLUAI COPPER PROSPECT
GEOLOGICAL MAP

REFERENCE

Tb Basalt.

Tg Gabbro.

Tgr Granodiorite.

Tlv Lolui Volcanics. Indurated, laminated and thin-bedded mudstone, siltstone and greywacke.

Tsk Skarn. Brown, coarse to fine-grained skarn and impure skarn.

Iron ore. Magnetite, hematite, limonite, siderite. with copper carbonate in places.

Geological boundary - definite.

-- " " - approximate.

..... Outcrop boundary.

$\tau 40^\circ$ Attitude of bedding.

40° " " jointing.

~ ~ Shear zone.

—F Fault.

● $\frac{60}{200}$ Proposed diamond drill hole, showing depth and angle.

= Costean.

□ Pit.

□ Shaft.

\approx Adit portal.

P.A. Position approximate.

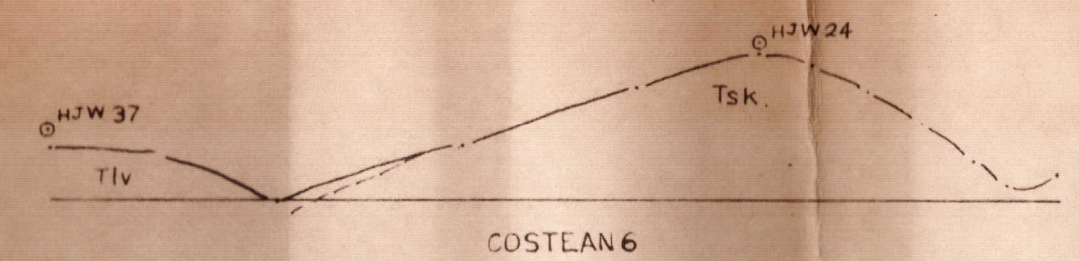
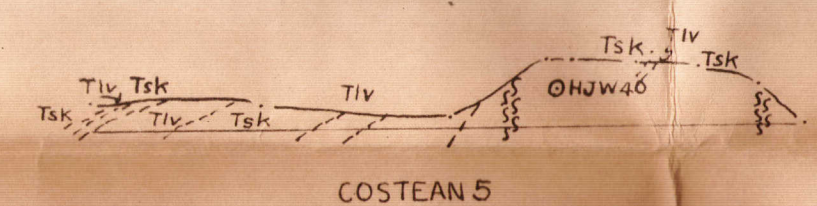
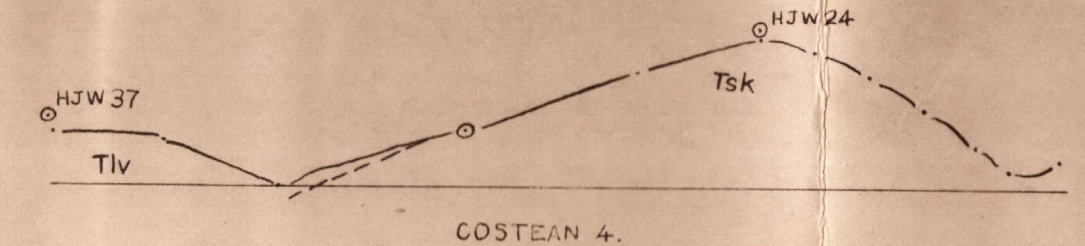
1.1.W.02 Peg surveyed by H.J. Ward.



Scale.

Abney level, tape and compass survey tied to pegs surveyed by H.J. Ward.

INTERPRETIVE CROSS SECTIONS

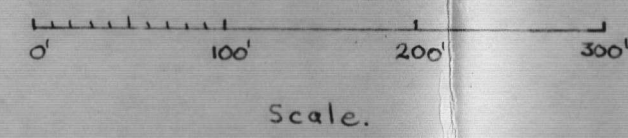
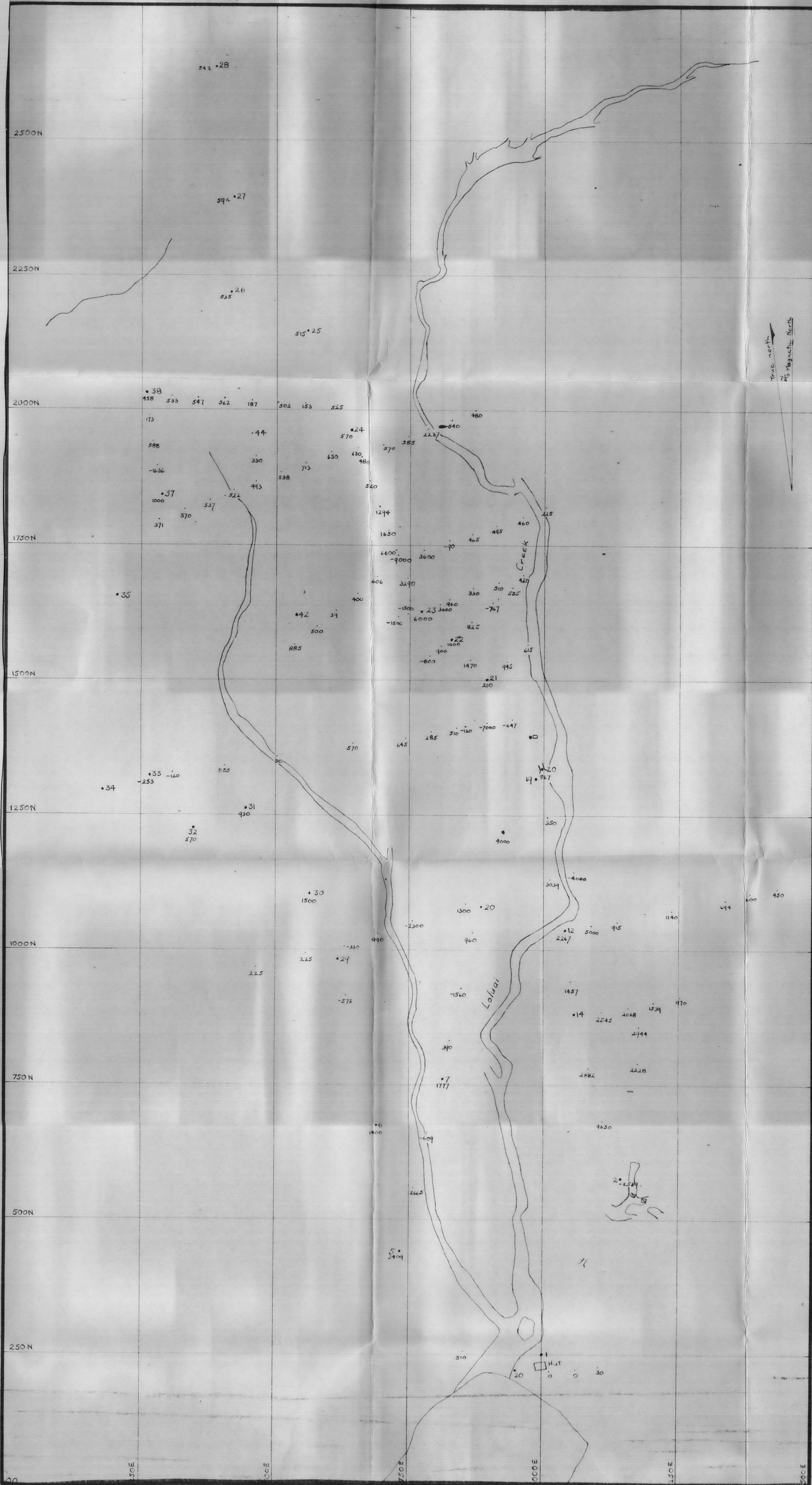


WOODLARK ISLAND
LOLUAI COPPER PROSPECT

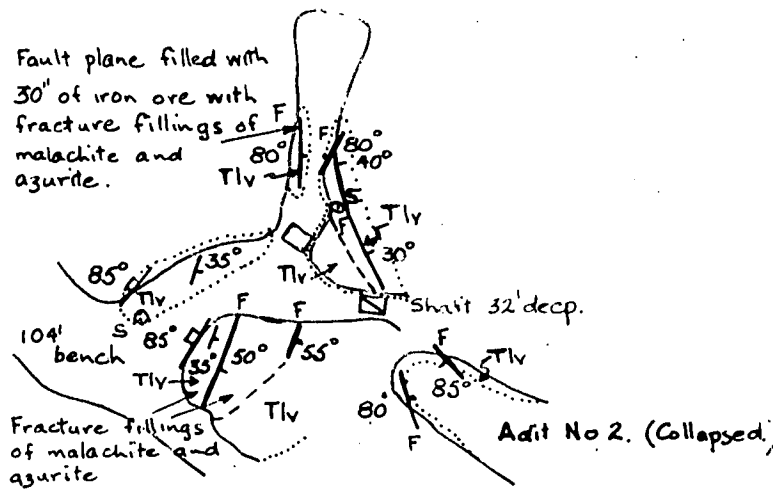
Vertical Force Magnetic Variometer Survey
After L.A. Wood, - May 1961.

REFERENCE

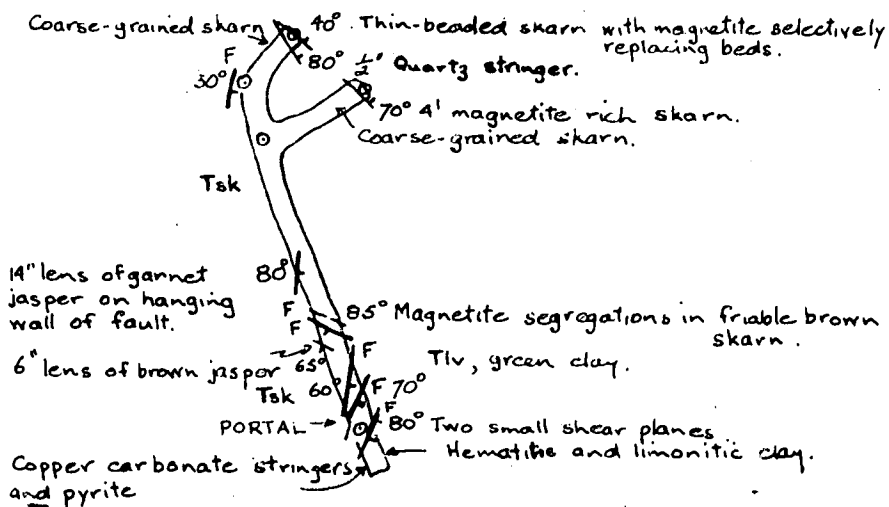
- * 37 Station 37 surveyed by H.J. Ward with vertical magnetic force in gammas.
439
459 Spot reading of vertical magnetic force in gammas.



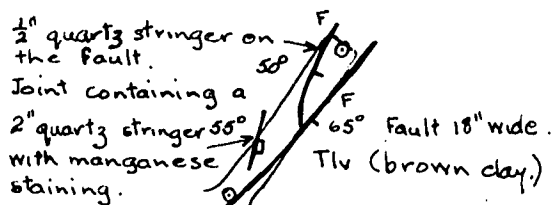
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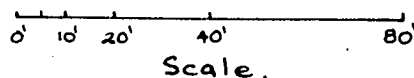
a) Surface workings near Number 2. Adit.



b) Number 3 Adit.



c) Number 4 Adit.



REFERENCE

- Iron ore
- Tlv Loluai Formation.
- Tsk Skarn.
- $\backslash 40^\circ$ Attitude of bedding.
- $\backslash 40^\circ$ " " jointing.
- $\backslash 40^\circ$ Fault, definite.
- Outcrop boundary.
- - - Geological boundary.
- / Physical boundary.
- Survey point.
- S Specimen locality.

WOODLARK ISLAND
MINE WORKINGS ON THE LOLUAI COPPER PROSPECT

To accompany Record No 1962/121