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COMMONWEALTH OF AUSTRALIA.

DEPARTMENT OF NATIONAL DEVELOPMENT.

BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS.

RECORDS.

1959/27

GEOLOGICAL REPORT MT. VICTOR PROSPECT, E.P.L. 37 KAINANTU, T.N.G.

by

D. B. Dow

GEOLOGICAL REPORT

MT. VICTOR PROSPECT E.P.L. 37.

KAINANTU, T.N.G.

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INTRODUCTION

LOCATION & ACCESS :

The prospect is located about 10 miles south-east of Kainantu, Territory of New Guinea. Access from Kainantu is by motor road to BESE Village then by about 1½ miles of walking track to the prospect. (See plate I). It is situated on the top of a steep-sided, northeast trending ridge at an altitude of about 6,000 feet but an access road should not be difficult to construct and could roughly follow the present walking track.

Kainantu is connected by a motor road to Lae but as the Leron River and the Umi River are not bridged it is not possible to ensure a regular freight service by road. However, heavy machinery for a treatment plant could be transported by road during the dry season. Until such times as the rivers are bridged, air transport will continue to be the main means of supply for Kainantu at the cost of 4d. per pound charter rates from Lae. The airstrip will handle aircraft up to DC 3 size with loading limits of :

In -- 6,800 lbs.

Out -- 3,500 to 4,000 lbs.

CLIMATE:

The climate is warm by day and cold at nights. Rainfall is between 90 and 100 inches per annum most of it falling between November and March.

WATER :

As the prospect is situated on the top of a ridge near the crest of the main range, permanent water is some distance away. A supply sufficient to run a battery seems assured by the Tutubaia Creek which is about 500 feet to the north-east of the orebody and about 400 feet below the crest of the prospect ridge.

TIMBER :

The lease is covered by dense rain forest and there is an ample supply of timber suitable for mining purposes within a short distance of the prospect.

HISTORY AND TENURE:

The prospect was discovered by Mr. N. Stagg in March, 1957. It is covered by E.P.L. 37 Kainantu District and is at present under option to Australian Gold Development N.L.

DEVELOPMENT :

The lode has been developed by two crosscuts and subsidiary drives, one from the south side at the ridge at a reduced level of 5976 feet, the other from the north side at a reduced level of 5926 feet. In addition, extensive pitting and open cut operations have been developed to delineate the outcrop of the lode.

G E O L O G Y.

GENERAL GEOLOGY (See Plate 2).

The geology of E.P.L. 37 consists of a large mass of granodiorite to the east intruded by a body of hornblende andesite porphyry to the west.

The granodiorite is coarse-grained and hypidiomorphic and in places varies in composition to quartz diorite. It consists of about 55% oligoclase, 20% microcline-perthite, 10% hornblende and biotite and their alteration products, 7% to 10% quartz, 5% epidote and 2% ilimenite and apatite. Scattered granules of pyrite are present. Similar igneous rocks intruding sediments of Palaeozoic Age to the west of Kainantu are part of the Wilhelm Batholith of probable pre-Permian Age and it is considered possible that the granodiorite is the same age.

The hornblende andesite porphyry is part of a large intrusive body which is about 5 miles in diameter. The phenocrysts are euhedral andesine feldspar and hornblende with some pyroxene. The groundmass is fine-grained and consists of granular feldspar crystals with small amounts of quartz, hornblende and epidote and accessory apatite and zircon. Pyrites is common as irregular grains of phenocryst size. Near the lode, and as irregular patches to the west, the porphyry has been hydrothermally altered. The plagioclase feldspar has been altered mainly to albite but also to sericite and calcite; the hornblende to green chlorite, calcite and epidote, with some talc; the pyroxene to an intergrowth of chlorite and calcite sometimes with leucoxene.

The contact with the granodiorite is remarkably straight and is probably faulted. However, small dykes of porphyry have been found intruding the granodiorite in the prospect area.

Ore of possible economic grade is confined to the porphyry -- granodiorite contact and is found at Mt. Victor and Mt. Clarke Prospects. These two prospects were probably joined to form a single body but have since been separated by the downcutting of Tutubaia Creek. Small manganiferous stringers and masses of limonite, both carrying gold, are common in the porphyry but are not of economic importance except as a shed for alluvial gold found in Tutubaia Creek.

To the north of the area covered by plate 2, outliers of conglomerate limestone and marl are found resting unconformably on the granodiorite. They are probably of Tertiary Age.

ORE GEOLOGY :

DEVELOPMENT.

MAIN SOUTH CROSSCUT :

The Main South Crosscut (R.L. 5976 feet) was

started in granodiorite footwall near the south-western extremity of the outcropping orebody and was driven for 97 feet in lode on a bearing of 295°. At 97 feet the hangingwall was encountered dipping at about 10° to the north-west and a shaft was sunk for 30 feet in lode till water, which probably indicates the proximity of the footwall, was struck. Drives of 57 feet and 27 feet were put in to the south-west and north-east respectively. The south-west drive struck the hanging wall, which strikes north and dips gently to the west, at 57 feet. At this point a shaft was sunk for 15 feet in ore before water was again met with.

NO. 3 CROSSCUT :

No. 3 Crosscut (R.L. 5926 feet) was started in hydrothermally altered porphyry, on the northern flank of the ridge, on a bearing of 150°. At 62 feet the hangingwall was encountered dipping to the north-west at 65°. The crosscut was continued for a further 110 feet in lode. A drive to the south-west at 74 feet from the portal encountered the porphyry hangingwall along which was a large mass of pyrites up to 3 feet wide. Another drive to the south-west from 126 feet is being continued in ore and by the end of October 1958 had penetrated 40 feet of lode. A north-east drive was started in October 1958 at 172 feet.

LOWER NO. 3 CROSSCUT :

Lower No. 3 Crosscut was started in porphyry 54 feet below No. 3 Crosscut on a bearing of 137°. By the end of October 1958 it had penetrated 110 feet of porphyry.

NO. 1 CROSSCUT:

No. 1 Crosscut was started in porphyry at 5880 ft. altitude and by October 1958 had penetrated 43 feet of porphyry on a bearing of 162°.

G E O L O G Y.

The outcrop of the lode is lens-shaped, approximately 800 feet long by 180 feet wide at the widest part; it follows roughly the trend of the ridge i.e. to the north-east. The lode dips to the north-west at about 15°.

The hangingwall is composed of porphyry which has been hydrothermally altered to white clay near the lode: it dips at about 10 degrees to the north-west for about 200 feet down dip. At 240 feet down dip the hangingwall was intersected by the No. 3 Crosscut where it dips at about 65° to the north-west. The hangingwall is well defined and fairly regular, though small tongues of porphyry intrude the ore in No. 3 Crosscut. Scattered crystals of pyrite occur throughout the prophyry and in Lower No. 3 Crosscut crystals of sphalerite up to 3 inches across are present in the porphyry. In No. 1 Crosscut irregular veins of pyrites and sphalerite up to 3 inches wide were found.

The footwall is granodiorite and dips at about the same angle as the hangingwall.

The lode consists of banded, sugary and usually friable quartz, ranging in colour from white to brown to green. Patches of finely crystalline, free running specular haematite and large masses of hard limonite are present in the lode. The limonite masses result from the oxidation of massive bodies of pyrite, one such body having been preserved in the hangingwall in No. 3 Crosscut by the impervious nature of the porphyry. Insufficient development work has been

done to enable an estimate of the thickness of the lode. Two shafts from the Main South Crosscut penetrated 15 feet and 30 feet of lode respectively before striking water. It is thought that the water shows the proximity of the impervious granodiorite footwall.

The porphyry contains auriferous, manganiferous and iron stained stringers of quartz and masses of limonite which also carry gold within the prospect area. Some pitting and driving has been done on some of these bodies but they are small and discontinuous and the grade of gold mineralisation is generally low. However, they show that the gold is intimately related to the porphyry and was probably introduced by the porphyry at a late stage of the intrusion.

GRADE OF THE ORE.

Gold values throughout the lode are very patchy and samples taken from the dumps and the underground workings vary from 2 dwts to 65 dwts per ton. Systematic sampling has been done only in No. 3 Crosscut from 130 feet onwards hence no estimate of the overall grade can be made. However, dump samples collected by the writer gave the following results :

Dump Sample	Assay Au. per ton
Main South Crosscut	6 dwts. 20 grs.
No. 3 Crosscut	5 dwts.13 grs. to 11 dwts. 14 grs.
Portion Open Cut	12 dwts.

It is expected that the average tenor of the ore will be 7 to 8 dwts. gold per ton.

The prospect is an attractive open cut proposition. The overburden on most of the lode is less than 20 feet and has a maximum of about 40 feet. It is composed of soft hydrothermally altered porphyry which could be easily stripped by a bulldozer and disposed of to the south in the steep-sided tributary of Tutubaia Creek.

Treatment of the ore should present no difficulty. All the gold is apparently free, and fine crushing with amalgamation over plates should give a satisfactory recovery. The treatment plant would be best situated at the eastern end of the prospect ridge near Tutubaia Creek where a permanent water supply seems assured.

EXTENSION OF THE LODE :

The lode thins to the south-west from 30 feet at the end of the Main South Crosscut to 15 feet at the end of the south-west drive. In a tributary 290 feet south-west of the Main South Crosscut the porphyry is in contact with granodiorite without intervening lode. Thus there is little chance of further lode in this direction.

Outcrop of ore cuts out to the north-east down the fall into Tutubaia Creek. This may be due to cutting out of lode laterally or, more likely, by pinching cut at depth. This is supported by the fact that no lode material is exposed at the porphyry-granodiorite contact at creek level but it is again exposed on the contact at Clarke's Ridge. Further evidence is given by a granodiorite-porphyry contact with no intervening lode,

which is exposed in a drive about 240 feet to the east of Lower No. 3 Crosscut. Lower No. 3 Crosscut is designed to prove whether or not the ore persists at depth.

RECOMMENDATIONS :

At the present stage of development no estimate of the ore reserves can be made. In particular there is insufficient data on the thickness of the lode, hence future work should be concentrated on exploration as recommended below :

1. A rise and a shaft should be started in No. 3 Crosscut about 180 feet from the portal.

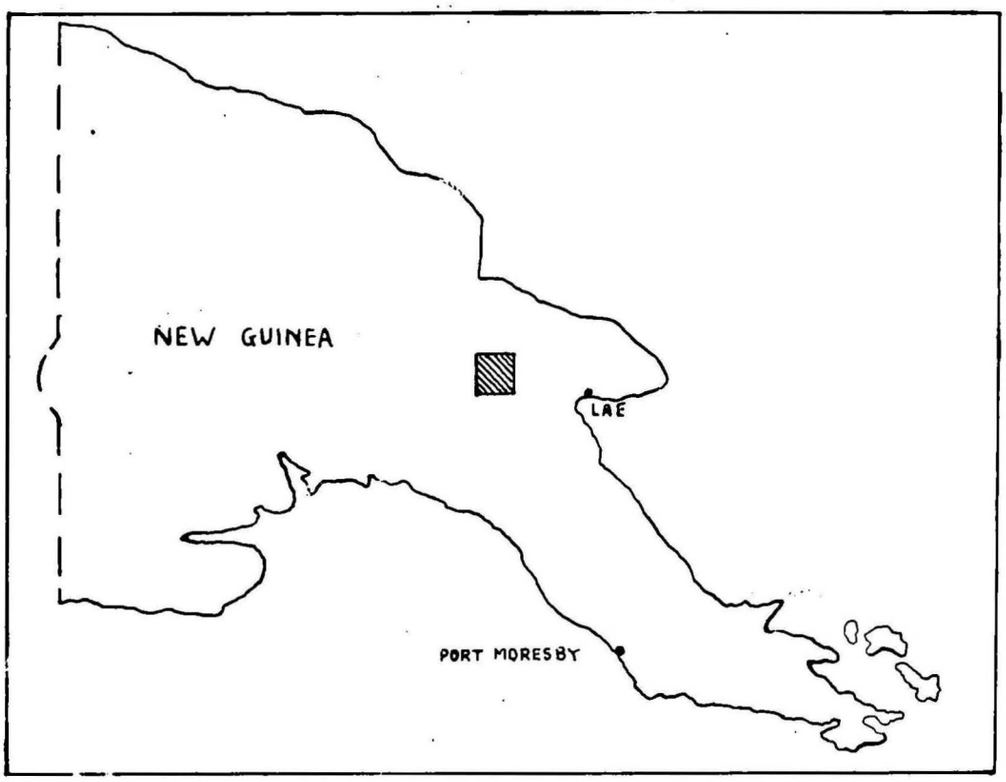
2. The south-west drive in No. 3 Crosscut from 126 feet should be continued, preferably on a slightly more northerly bearing (say 250°) to test the westerly extension of the lode.

3. To the north-west there is only a thin mantle of overburden and a program of shafts sunk to the footwall is the best way to delineate the lode.

Diamond drilling has been suggested to prove the lode but the nature of the orebody is such that little or no core would be recovered and high water losses would prevent the recovery of sludge samples. Percussion drilling would be satisfactory but the Administration drill will not be available for at least nine months.

November, 1958,
WAU.

LOCALITY MAP
MT. VICTOR PROSPECT



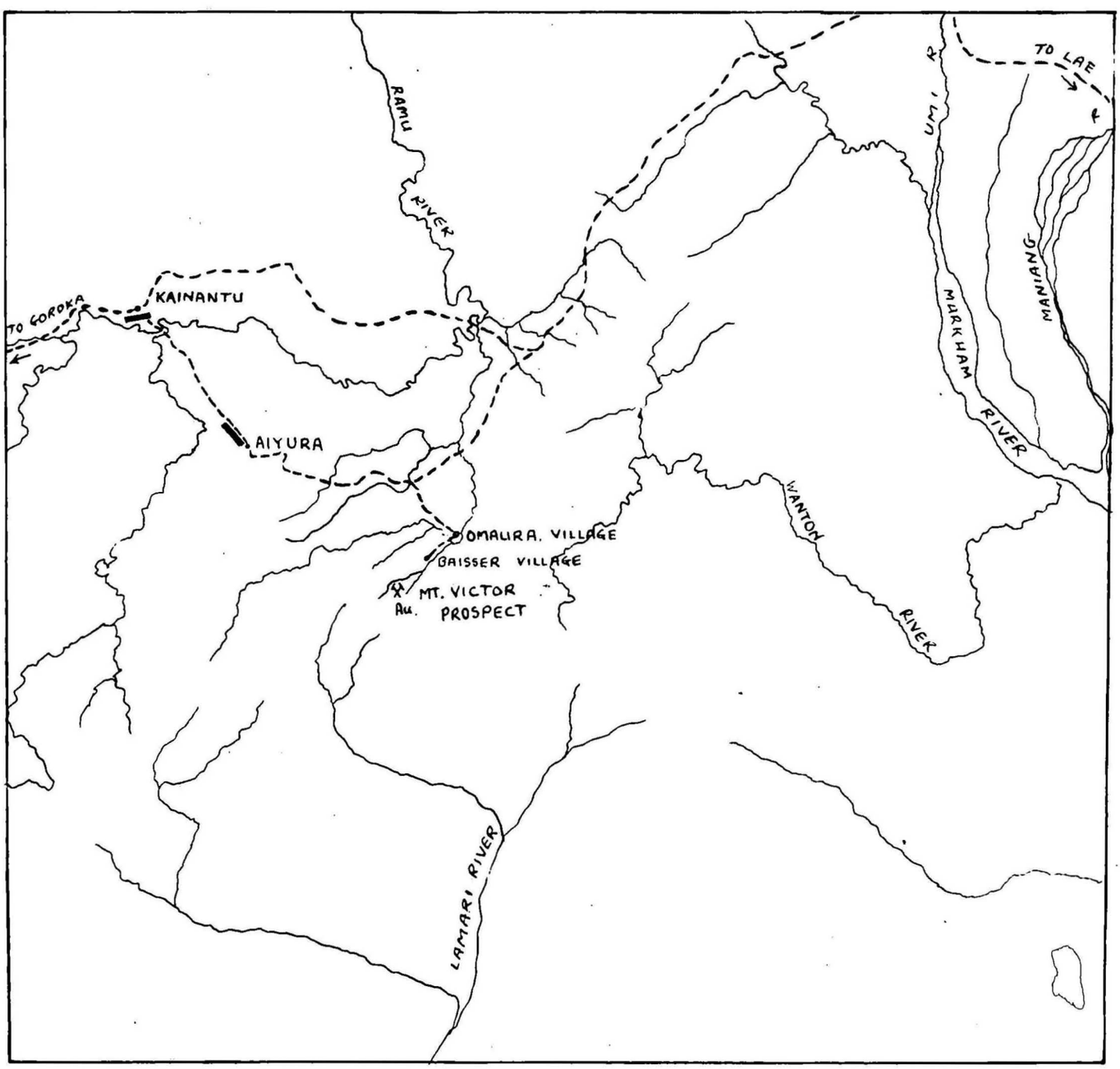
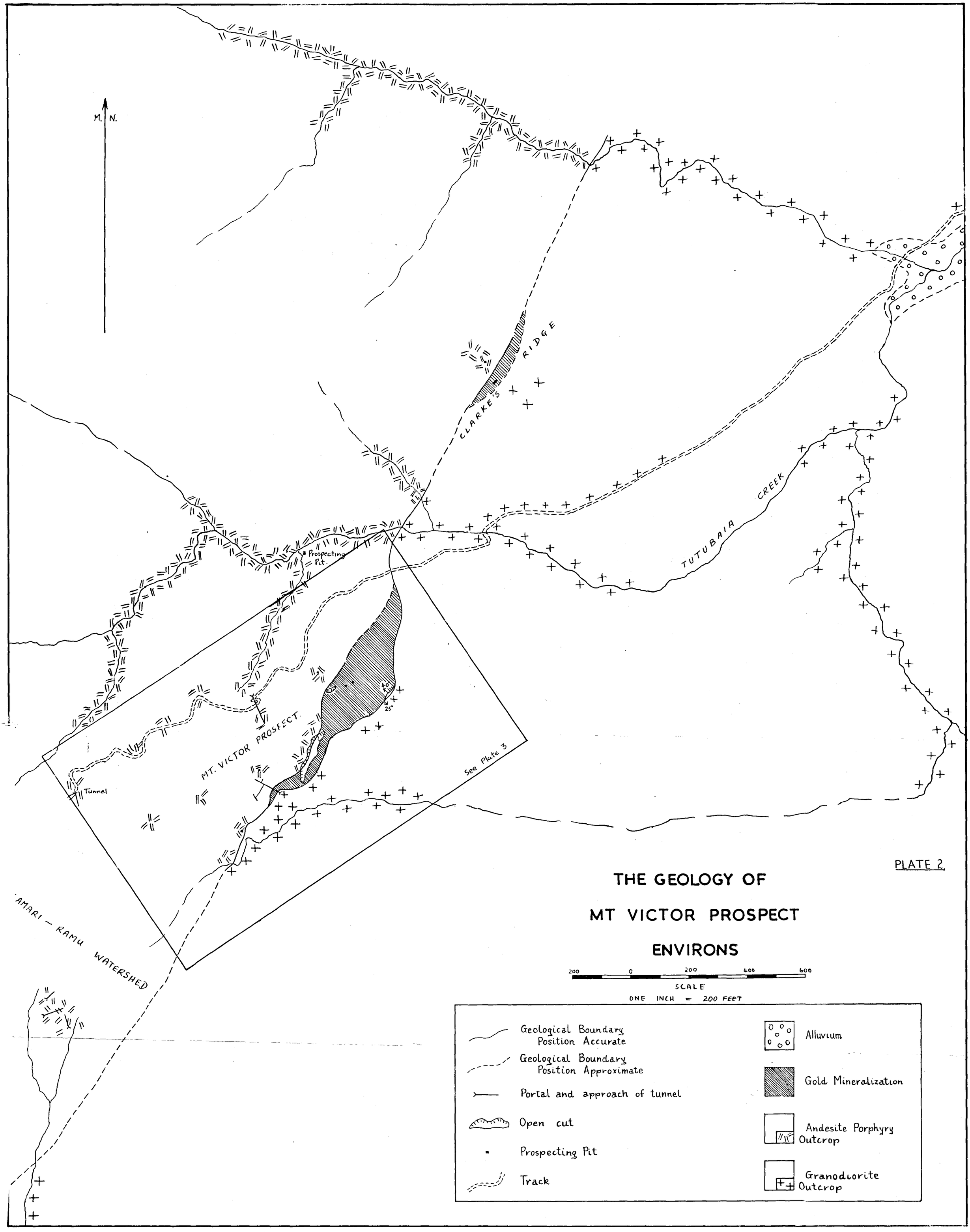


PLATE 2.

THE GEOLOGY OF MT VICTOR PROSPECT ENVIRONS



SCALE

200 0 200 400 600

ONE INCH = 200 FEET

- Geological Boundary Position Accurate
- Geological Boundary Position Approximate
- Portal and approach of tunnel
- Open cut
- Prospecting Pit
- Track
- Alluvium
- Gold Mineralization
- Andesite Porphyry Outcrop
- Granodiorite Outcrop

GEOLOGICAL PLAN

MT VICTOR PROSPECT

E.P.L. 37 KAINANTU T.N.G.

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SCALE

ONE INCH = 40 FEET

40 20 0 40 80 120

LEGEND

- Contour (5980)
- Form Line
- Walking Track
- Portal and Approach of Tunnel
- Head of Shaft
- Pit
- Orebody / Outcrop
- Andesite Porphyry / Outcrop
- Granodiorite / Outcrop
- Geological Boundary (Position Accurate)
- Geological Boundary (Position Approx.)

N

B

A

LINE OF SECTION

LOWER No. 3 CROSSCUT 5872

No. 1 CROSSCUT 5883

No. 3 CROSSCUT

MAIN TRAMWAY CUT

OPEN CUT

Pit

Mt

IRONSTONE AND PORPHYRY RUBBLE

IRONSTONE RUBBLE

Native Ochre Mines

SECTION A-B

HEIGHT IN FEET

6020
6000
5980
5960
5940
5920
5900
5880
5860

Projection Main South Xcut

Winze

Projection of Air Shaft

ORE

Projection of No. 3 Crosscut

Possible extension of ore

Projection of Lower No. 3 Crosscut

A

B