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PLANET MINING COMPANY

GEOLOGY OF THE HINTERLAND

of

E.L. 5/66

MACQUARIE HARBOUR, TASMANIA

by

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of

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Map showing Drainage and Mineralization
Central west Tasmania.

INTRODUCTION.

Planet Mining Company Pty. Ltd., Exploration Lease E.L.5/66 covers the confines of Macquarie Harbour to high water mark, an area of 135 square miles.

Macquarie Harbour is situated on the west coast of Tasmania, lying between $145^{\circ} 14' E$ and $145^{\circ} 33' E$ longitude and between $42^{\circ} 08' S$ and $42^{\circ} 28' S$ latitude. It is a landlocked harbour with, at its north western end, a narrow outlet ($\frac{1}{2}$ mile wide) to the Southern Ocean. It is roughly rectangular in shape, being 20 miles long in a N.W. to S.E. direction and 5 miles wide.

It occupies part of the Tertiary Macquarie Harbour Graben.

ACCESS AND COMMUNICATIONS.

Access to Macquarie Harbour is by boat, rail, road or plane to Strahan, which is in the north western corner of the harbour. Access to the rest of the bay is by shallow draught boat and possibly by land vehicles along a small section of the north western shore. Strahan is linked to Queenstown by road and rail and is the shipping port for the Mt. Lyell mines. Vessels of at least 6,000 tons use the port.

Strahan is the only township on Macquarie Harbour and is an important fishing port. It is connected to the state-wide Hydro Electricity Commission power network through Queenstown.

Queenstown, with several small satellite towns is the main centre of population in the hinterland area, having a population of about 5,000 people. The majority of these people are employed in mining and associated industries.

Adamsfield is the only other settlement area in the drainage basin, and is situated in the far east, almost on the drainage divide. It is now almost abandoned.

3. CLIMATE

The hinterland of Macquarie Harbour is largely unsettled, and, except in the north west, there are no weather stations. Rainfall is known to be high and is generally well over 60", except along the coastal strip, and in places (Queenstown) is up to 120" on the ranges and up to 90" in the valleys. Summer temperatures are mild, but in winter the area is very bleak with low temperatures and westerly gales common.

The coastal strip is milder in both summer and winter, due to the moderating effects of both low elevation and the sea.

4. TOPOGRAPHY.

The hinterland area shows marked relief. It is generally rugged, with elevations ranging up to 4739 feet above sea level at Frenchmans Gap.

The area is characterised by approximately parallel resistant ridges, generally of quartzite or conglomerate separated by river valleys which are generally 1000 feet above sea level. The ridges have a rough north-south orientation, but in the south they have an arcuate shape convex to the south west.

The region of the Macquarie Harbour Graben is not as rugged as the rest of the area due to the unconsolidated nature of the rocks.

Pleistocene glaciation has partly modified sections of the hinterland resulting in a typical glacial topography. Several river courses were diverted and several lakes were formed as a result of the glaciation. Lakes were formed both as a result of morainal damming (Lake Pedder) and by the glacier carving a depression in the rocks (Lake Dora). The glaciers were generally on the eastern sides of the ridges though there are several cirques present (Frenchmans Gap, Mb. Owen) on the western side.

5. DRAINAGE.

The hinterland of Macquarie Harbour is drained by two main river systems, the Gordon-Franklin River system and the King River system. These systems and other smaller rivers make up a drainage basin of 2500 square miles. The basin is roughly rectangular and has a north-west - south-east elongation.

The Gordon-Franklin River system is the most extensive of the two systems and drains practically all the basin south of a line drawn north east from the mouth of the Gordon River. The main river of the system is the Gordon, which empties into Macquarie Harbour at its south east end. Rivers in the system generally are subsequent, running north south between parallel ridges. They flow into the Gordon River which has cut narrow gorges through the ridges in an east-west direction. Rivers include the Gordon, Franklin, Serpentine, Denison and Jane Rivers. As the area is one of high year round rainfall these rivers are permanent and carry considerable volumes of water.

The King River system drains the basin north and north west of the Gordon-Franklin River system. The rivers here again show a north south orientation though there are a greater proportion of east west streams. The King River empties into Macquarie Harbour a few miles south east of Strahan.

Other minor drainage is to the west of the above systems and includes the short streams (e.g. Bird River) draining the southern portion and western slopes of the West Coast Range and the Sorell River draining an area south of Macquarie Harbour.

6. GEOLOGY.

A. General.

Rocks outcropping in the hinterland area range in age from Recent to Pre-Cambrian and consist of sedimentary, metamorphic and igneous rocks. Sedimentary rocks include rocks of Recent and Tertiary ((Cainozoic), Triassic, Permian, Devonian and Silurian, Ordovician, Cambrian and Pre-Cambrian ages. Metamorphic rocks of Pre-Cambrian age are extensive in outcrop, whilst igneous rocks outcropping include Jurassic dolerite, Cambrian, ultra basics and granite.

The area has been subject to several orogenies, (the most important being the Tabberabberan), and to later epeirogenic movements.

B. Structure and Geological History

Western Tasmania has experienced several periods of tectonic activity throughout geologic time. They range from Pre-Cambrian to Cainozoic.

The first period of tectonic activity was the Frenchman Orogeny in Pre-Cambrian time which resulted in the formation of the massive Tyennan Geanticline in central Tasmania. The development of this orogeny signified the end of "older" Pre-Cambrian sedimentation.

"Younger" Pre-Cambrian rocks were then deposited. The close of the Pre-Cambrian was marked by the Penguin Orogeny. This was characterised by at least two stages of deformation and by the intrusion of dolerite dykes.

Sedimentation continued with the Success Creek Beds (Jane River Dolomite in the hinterland area) in late Pre-Cambrian or early Cambrian time. This was followed by the deposition of Cambrian sediments with considerable admixtures of pyroclastic material and spilitic lavas. Ultra basic rocks were also intruded into the base of the Cambrian in Cambrian time.

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The end of the Cambrian is marked by the Jukesian (Tyennan) Orogeny which produced gentle folding of the Cambrian and older sediments in trends roughly parallel to the margin of the Tyennan Geanticline. Major faulting along similar trends was a major factor on the development of basins which were later filled by Ordovician sediments. Also during this orogeny, emplacement was effected of potash granite along the west Coast Range and also of a small intrusion in the hinterland area at Mt. Darwin.

Sedimentation continued during Ordovician times in the basins formed in the Tyennan Orogeny. The close of the Ordovician was marked by an uplift possibly related to the Benambran Orogeny of Eastern Australia.

This uplift was followed by sedimentation during Silurian and Lower Devonian time. Lower Devonian sedimentation was terminated by the most dominant orogenic phase in Tasmania the Tabberabberan Orogeny.

The first stage of the Tabberabberan Orogeny was marked by a structural pattern similar to that of the Jukesian Orogeny with folding parallel to the stable Tyennan Geanticline margin, faulting along pre-existing faults and eventual refolding of the Geanticline itself. The effect of this folding on the topography is evident in the series of parallel ridges in the Silurian-Devonian to Pre-Cambrian rocks.

The later stage is characterised by folds trending west north west to north north west superimposed on the older patterns of folding and faulting. These folds occasionally swing to an east west trend, and were accompanied by east west faulting, the most marked faulting being the Linda Fault Zone in which the Mt. Lyell Mines are situated.

Sedimentation did not recommence till Permian time. Following the Tabberabberan Orogeny there was possibly another orogeny, the Kanimblan Orogeny (?). It was during the period of Tabberabberan - Kanimblan (?) tectonic activity that large masses of granite were emplaced, but none of these are known to outcrop in the hinterland area.

This Devonian Tectonic activity marked the end of major folding and faulting in Tasmania, with later sediments exhibiting mainly sub-horizontal attitudes.

The commencement of Permian sedimentation was marked by an ice age and the deposition of tillites. Subsequent Permian and Triassic strata consisted of both marine and non-marine sediments.

Extensive sheets and sills of dolerite were intruded in Middle Jurassic time and were accompanied by tensional faulting.

The Tertiary was marked by horst and graben faulting with the formation of the Macquarie Harbour Graben. Terrestrial sedimentation in the graben and surrounding areas followed. It was at this time that some alluvial mineral deposits were formed.

The Quaternary saw an uplift followed by Pleistocene glaciation, deposition of glacial till, a morainal material deposition of river gravels and the formation of coastal sand dunes. The Quaternary has been marked by several fluctuations of sea level, the most marked being at the close of the Pleistocene glaciation and possibly by minor uplifting or downwarping

C Sedimentary Rocks

1. Precambrian

Present day Pre-Cambrian sedimentary rocks are not widespread in the hinterland area. They are restricted to the south western shores of Macquarie Harbour and to several small inliers in the "older" Pre-Cambrian, the largest inlier being along the Jane River.

The sediments to the south west of Macquarie Harbour have not been studied in much detail and are mainly slate and quartzite with possible basic sills and dykes. They are metamorphosed but generally not to the degree that the "older" Pre-Cambrian are.

The Jane River dolomite inliers were deposited after the Penguin Orogeny and may be of Cambrian age. They rest unconformably on the "older" Pre-Cambrian, are correlated with the Smithtown dolomites in the north of Tasmania, and belong to the Success Creek Beds. They represent a transgression onto the Tyennan Geanticline which was a land mass during most of the "Younger" Pre-Cambrian sedimentation.

2. Cambrian.

Cambrian sediments in the hinterland area occur in several areas. The main outcrop is along the West Coast Range and its southerly extension between the Gordon and Sorell Rivers. Other outcrops occur in the vicinity of Adamsfield in the east, near Strahan, and to the south west of Macquarie Harbour.

The sediments rest unconformably on the Pre-Cambrian but outside of the hinterland area they are known to lie conformably on the Success Creek Beds.

Three main lithological assemblages have been recognised in the Cambrian of Tasmania, but there are several interpretations of their relation to each other. They are the Crimson Creek Argillite, the Mt. Read Volcanics and the Dundas Group.

(a) Crimson Creek Argillite

Very little is known of the nature of this sequence or its stratigraphic position.

(b) Mt. Read Volcanics.

This sequence consists of normal sediments, pyroclastic material and igneous rocks. They were deposited along the margins of the Tyennan Geanticline in the Mt. Read Volcanic Arc. The formation consists of large bodies of keratophynes, quartz porphyries and quartz feldspar porophies, associated with massive or schistose pyroclastic rocks, spillites and occasional cross bedded tuffs. They range generally from acidic near the geanticline margins to basic further to the west, though acidic and basic are often intercalated.

The age of the Mt. Read Volcanics is not clear and may be early Middle Cambrian.

(c) Dundas Group

This is the most widespread of the three sequences. It consists mainly of sandstone, shale, greywacke, conglomerate, slate and chert and it reflects eugeosynclinal cyclic sedimentation under unstable tectonic conditions. The sediments were deposited in the Dundas Trough which developed along the west of the Mt. Read Volcanic Arc.

(d) The Cambrian Sediments in the vicinity of Adamsfield have been identified as Cambrian on palaeontological and lithological-structural grounds. In the Adam River Valley to the west of Adamsfield the rocks are slate, siltstone, chert and greywacke breccia while on the Sawback Range to the east of Adamsfield the rocks are conglomerate, sandstone and siltstone composed of serpentinite detritus. These sediments overlie the serpentinite and contain osmiridium and chromium.

3. Ordovician

The Ordovician rocks of Tasmania are known as the June Group and consist of the following formations:

Fenestella Shale
Gordon Limestone
Florentine Valley Mudstone
Caroline Creek Sandstone
Owen Conglomerate
Jukes Conglomerate

Ordovician sediments were deposited after the Jukesian Orogeny lie unconformably on the Cambrian. Outcrop in the hinterland area is in the same general area as the Cambrian outcrop.

(a) Jukes Conglomerate (Lower Ordovician)

This formation is dominantly composed of conglomerate and breccia consisting of fragments of lava and other Cambrian rocks. It is limited in extent, varies rapidly in thickness, and rests unconformably on the Cambrian.

(b) Owen Conglomerate (Lower Ordovician)

This formation rests conformably on the Jukes Conglomerate and often transgresses it, and unconformably on pre-Ordovician rocks. It consists of two units. The lower unit, unit A, is composed mainly of siliceous conglomerate with sandstone and siltstone, while the upper unit, Unit B, is composed of red and pink sandstone with coloured conglomerate. The formation varies greatly in thickness over short distances. It has a maximum outcrop thickness of over 2,000', and is prominent in the present topography with the conglomerates often forming the most resistant peaks in the ridges.

(c) Caroline Creek Sandstone (Lower Ordovician)

This formation conformably overlies the Owen Conglomerate, or rests unconformably on older rocks. Near Queenstown it rests on Cambrian rocks. It consists mainly of coloured siliceous sandstones with "tubicolar" sandstone and pebbly grit, and is up to 1550 feet thick.

(d) Florentine Valley Mudstone (Lower to Middle Ordovician)

This formation has only been recognised at a few localities and is a transition from the underlying Caroline Creek Sandstone to the overlying Gordon Limestone. It consists of up to 300 feet of fossiliferous siltstone and calcareous sandstone.

(e) Gordon Limestone (Middle to Upper Ordovician)

This formation is widespread and consists of up to 5000' of fossiliferous limestone in part sandy and in part dolomitized. Numerous analyses of the limestone have been carried out and part of the formation is suitable for blast furnace flux.

(f) "Fenestella" Shale (Upper Ordovician)

This formation has only been recognised in the hinterland area to the east of Queenstown. In this area it overlies the Gordon Limestone and underlies Silurian-Devonian Crotty Quartzite. It consists of siltstone and is very thin, ranging from a few feet to a few tens of feet in thickness.

4. Silurian and Devonian

The Silurian and Devonian rocks in the hinterland area are known as the Eldon Group and they overly the Junee Group, generally conformably, with the contact varying from gradational to sharp and in some cases the contact is reported to be unconformable. The Eldon Group was deposited in a miogeosyncline with up to 12,000' of sediments present near Queenstown.

The Eldon Group is composed of six formations:

- Bell Shale
- Florence Quartzite
- Austral Creek Siltstone
- Keel Quartzite
- Amber Slate
- Crotty Quartzite

These formations outcrop in similar areas to the Cambrian and Ordovician sediments.

(a) Crotty Quartzite (Lower Silurian)

This formation is the basal formation of the Eldon Group and rests on the Juneau Group. It consists of rapidly deposited quartzite with some pebble bands and siltstone and is fossiliferous. It is up to 1600' thick and contains some detrital chromite which is probably derived from the Cambrian ultra basic rocks.

(b) Amber Slate (Lower to Middle Silurian)

This formation overlies the Crotty Quartzite and consists of fossiliferous fine grained sediments, which are about 800 feet thick in the type area.

(c) Keel Quartzite (Middle to Upper Silurian)

This formation consists of poorly fossiliferous ripple marked sandstones. In the type area it is 200 feet thick.

(d) Austral Creek Siltstone (Upper? Silurian)

This formation consists of quartzite and siltstone, fossiliferous in the upper section. To the north of the hinterland area it is 700 feet thick.

(e) Florence Quartzite (Lower Devonian)

This formation which is 1600' thick is composed of highly fossiliferous arenaceous sediments.

(f) Bell Shale (Lower Devonian)

The Bell Shale marks the topmost formation of the Silurian Devonian sequence in the hinterland area. It is fossiliferous and is composed of bands of silicified sandstone interbedded with shale.

5. Permian

Permian sedimentation in the hinterland area was probably extensive but later erosion has since stripped most of it, leaving only an isolated remnant, such as that capped by Jurassic dolerite at Mt. Sedgwick near Queenstown. Continuous outcrops occasionally capped by Triassic rocks occur further to the east towards Lake St. Clair. A small outcrop also occurs near Strahan.

At Mt. Sedgwick about 200' of tillites are present which were deposited during the period of glaciation at the beginning of the Permian.

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The formations comprising the Permian in the hinterland area towards Lake St. Clair are:

- Cygnets Coal Measures
- Ferntree Group
- "Woodbridge" Group
- Mersey Group
- Wallace River Group
- Basal Conglomerate

(a) Basal Conglomerate

This formation rests unconformably on the earlier rocks and consists of tillite and conglomerate with a thickness up to 200 feet.

(b) Wallace River Group

This group is composed of siltstone and conglomerate and north of the hinterland it reaches a thickness in excess of 300 feet.

(c) Mersey Group

The Mersey Group outcrops in the far eastern to north eastern of the hinterland area. It is composed of well sorted siliceous sandstone with occasional coal or oil shale. It is variable in thickness (up to 170 feet) and is non-marine with several marine intercalations.

(d) Woodbridge Group

This group is restricted to the same areas as the Mersey Group and consists of siltstone, calcareous siltstone, sandstone and minor limestone. It is up to 100 feet thick and in part is very fossiliferous

(e) Ferntree Group

This group consists of alternating fissile and non-fissile siltstone with sandstone and conglomerate. It contains some marine fossils and is up to 650 feet thick.

(f) Cygnets Coal Measures

This is the uppermost formation of the Permian and consists of sandstone with carbonaceous and siliceous sandstone and occasional thin coal seams. It contains plant fossils and has a thickness of up to 300 feet.

6. Triassic

Sediments of Triassic age outcrop only in the north east of the hinterland area, near Lake St.Clair and Lake King William. The Triassic rocks are concordant with the underlying Permian rocks, but the contact is gradational. The sediments consist of quartz sandstone, lithic sandstone and shale with minor conglomerate. The thickness several miles to the north east of the hinterland is in excess of 2000'.

7. Cainozoic

(a) Pliocene

Tertiary sediments outcrop in the hinterland around Macquarie Harbour and along the Sorell River in a graben known as the Macquarie Harbour Graben. There is a known thickness of over 700 feet of the non-marine Macquarie Harbour Beds. The sediments are unconsolidated and consist of sand and conglomerate with bands of clay and lignite. Post depositional movements along the faulted margins of the Graben has resulted in the beds being displaced several hundred of feet vertically.

(b) Pleistocene

Glaciation in Pleistocene time covered much of the north and north east of the hinterland and small areas in the east and south east. The most extensive glaciation was to the north and east of Frenchmans Cap and in the King River area.

Pleistocene deposits from the glaciers are common in the glaciated valleys (e.g. the King River). The river is at present cutting through these deposits. Lake Pedder was caused by glacial deposits damming the Serpentine River. Streams such as the Serpentine River were displaced in a number of places by glacial deposits.

A large Pleistocene glacial deposit occurs in the east from Lake St.Clair to the headwaters of the Gordon River.

Glacial varved deposits are known in the hinterland area in the Linda Valley

(c) Quaternary

Quaternary alluvial deposits exist along river courses and in part consist of redistributed Pleistocene deposits. These alluvial deposits are known to contain gold in areas such as the King River.

Coastal sand dunes were formed during the Quaternary along the coast north of Macquarie Harbour.

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(d) Metamorphic Rocks

Metamorphic rocks in the hinterland area range in age from Pre-Cambrian to Devonian. However the Cambrian to Devonian rocks occur in only isolated cases along fault zones or in zones of strong metamorphism. An example is the schist of Cambrian age at Mt. Lyell.

Pre-Cambrian metamorphic rocks are more widespread and can be divided into "older" and "younger" Pre-Cambrian. The "younger" Pre-Cambrian rocks are generally weakly metamorphosed and have been described in the sedimentary rock section of this report. The "older" Pre-Cambrian rocks are strongly to moderately deformed with a low to moderate grade of regional metamorphism. They generally possess more than one lineation, and bedding in the metasediments is often obliterated.

The "older" Pre-Cambrian have been studied in detail in only a few areas. The rocks consist generally of schists, quartzites, phyllites and amphibolites. Accessory minerals in the rocks include rutile, garnet, sphene, zircon, tourmaline and ilmenite.

There is very little contact metamorphism associated with the intrusion of the Cambrian granite at Mt. Darwin.

(e) Igneous Rocks

The hinterland area has been subjected to several periods of igneous intrusion and extrusion.

1. Pre Cambrian

The "older" Pre-Cambrian contains amphibolites which were probably originally basaltic rocks. The "younger" Pre-Cambrian contains some dolerite intrusions in an area to the north of the Macquarie Harbour drainage basin. It is not known to what extent, if any, they are present in the drainage basin itself, although there is the possibility of some basic sills and dykes to the south west of Macquarie Harbour.

2. Cambrian

Several periods of igneous activity occurred during Cambrian times. Pyroclastic rocks and lavas in the Mt. Reid Volcanics show the existence of volcanic activity.

Before middle Upper Cambrian times ultrabasic rocks were intruded as concordant sheets along or close to the Pre-Cambrian - Upper Cambrian contact, and as sills and dykes in Pre-Cambrian and Cambrian rocks. Rock types present, in the intrusions include dunite, bronzite

and serpentinite. These rocks outcrop in the hinterland in four localities (see map). These localities are Asbestos Point on the south west shore of Macquarie Harbour, along the Serpentine River just up stream from its junction with the Gordon River, on the east of Adamsfield, on the drainage divide, and about 8 miles north west of Adamsfield and just north of the Gordon River. There are two other outcrop areas just outside of the Macquarie Harbour drainage basin, both lying south west of Macquarie Harbour.

These ultra basic rocks contain minerals which may form alluvial deposits. Osmiridium has been found in river gravels related to most of the outcrops, with the deposits at Adamsfield being at one time the largest producer in the world. Osmiridium has been found at Asbestos Point though the main mineral occurrence here is of chrysotile asbestos. Besides osmiridium, the ultrabasics are known, in Tasmania generally, to contain gold, platinum, diamonds and nickel, though only gold has been found in the hinterland area. Chromite, ilmenite, magnetite, chlorite and picotite are also minor constituents of the ultra basics and are found in streams adjacent to ultra basic outcrops.

Later in the Cambrian a granite was intruded along the axis of the West Coast Range at Mt. Darwin. This lenticular body is roughly concordant and has had little metamorphic effects on the enclosing sediments.

3. Jurassic.

Widespread Jurassic dolerite sills, sheets and dykes occur in Tasmania and in the hinterland area referred to in this report they occur generally in the east with an isolated remnant at Mt. Sedgwick. At Mt. Sedgwick dolerite caps Permian tillites and forms the peak of the mountain. Further to the east towards Lake St. Clair and east of the headwaters of the Denison River are widespread dolerite outcrops. The dolerite rests on Permian, Silurian-Devonian, Ordovician, and "older" Pre-Cambrian rocks.

(f) Mineralisation

1. Primary Mineral Deposits.

Primary mineral deposits occur in the hinterland area in several localities, though there is very little information published on the southern portion of the area. Deposits occur in the Mt. Lyell district, at Adamsfield and at Asbestos Point. There are reports of gold mineralisation in the Jane River area but detailed information is not available.

(a) Mt. Lyell District

This district includes the West Coast Range from Lake Dora in the north to Mt. Darwin in the south and includes the Darwin-Jukes and Mt. Lyell Mining Fields. It is about 20 miles long in a north south direction and only a few miles wide.

The most important period of mineralisation was between the Tabberabberan and Kanimblan (?) Orogenies and Devonian time. The mineralisation fluid may have been related to a deep seated Devonian intrusion. Some relocation of minerals present in previous (Cambrian) sedimentary deposits may also have occurred.

The orebodies at Mt. Lyell are related to the Linda Fault zone and the Great Lyell Fault zone, and they lie within the Linda fault zone. Copper with associated silver and gold mineralisation is characteristic of the area.

Mt. Lyell was originally worked for gold from a hematite magnetite "mass" which contained gold and did not persist below the surface. The first copper deposit was later discovered nearby. The ore bodies consist of massive pyrite and chalcopyrite with associated silver and gold, or occur as mineralised zones in the Lyell schists. Occasional silver rich shoots were found in the massive ore bodies. Production to the end of 1963 was over 550,000 tons of copper, 16,000,000 ounces of silver, and nearly 600,000 ounces of gold.

The copper ore bodies at Lake Dora and between Mt. Jukes and Mt. Darwin are similar to the Mt. Lyell ore bodies, but their grade and size have not allowed them to be exploited.

Mineralisation of a different kind also occurs in the Mt. Darwin - Mt. Jukes area and is possibly related to the Cambrian granite at Mt. Darwin. It consists of massive magnetite-haematite pods with minor copper, silver and gold, and of barytes veins with small amounts of included pyrite and chalcopyrite. Quartz veins with free gold also occur as well as epidote veins.

(b) Adamsfield

To the west of Adamsfield is a lenticular dyke-like intrusion of serpentine which contains two or three narrow bands with osmiridium and chromite. Production was small, only 200 to 400 ounces of osmiridium being produced. Some writers refer to this as a Cambrian detrital deposit.

(c) Asbestos Point

At Asbestos Point, on the south west shore of Macquarie Harbour is an outcrop of Cambrian ultra basic rocks of limited extent. The rock is almost wholly serpentine and, in places is seamed with chrysotile asbestos. The serpentine belt is about 2 chains wide and contains bands of unserpentinized rock, such as bronzite, and small rounded masses of partly serpentinized rock.

Several feasibility studies have been carried out on the deposit but no production has resulted.

2. Alluvial Mineral Deposits.

Alluvial and detrital deposits in the hinterland area are related to the areas mentioned above, and the deposits consist of gold and osmiridium.

(a) Mt. Lyell District.

Alluvial gold was first found in this district, the search for which resulted in the finding of the Mt. Lyell ore bodies. Gold is found along most of the rivers and creeks draining this district, and has been found at the mouths of some of the streams where they enter Macquarie Harbour. The King River and its tributaries are reported to have been very auriferous, while alluvial gold was mined on the Flannigans Flat in the Jukes - Darwin area.

(b) Adamsfield.

Detrital and alluvial osmiridium deposits were worked in this area, both to the east and to the north west. The deposits were situated close to the ultra basic rocks from which they were derived as the very high specific gravity of osmiridium results in it sinking rapidly to the bedrock in the streams and then being concentrated in fractures in the bedrock.

The deposits worked were of different ages, being either Quaternary alluvial deposits or possibly Cambrian detrital deposits.

Production from this area has constituted half of Tasmania's total production of 31,000 ounces of osmiridium.

(c) Asbestos Point

There are reports of detrital osmiridium associated with the Cambrian, ultra basic rocks but it is not known if there was any significant production.

J. Chromie

7 SUMMARY

Macquarie Harbour is a landlocked harbour with a narrow mouth, and is the outlet of a drainage system covering 2,500 square miles. Its hinterland is in an area of high rainfalls with north-south flowing rivers, the major river systems being the Gordon-Franklin and the King.

Primary mineral deposits were emplaced in Cambrian and Devonian time and in places they have been partly redistributed in the form of alluvial and detrital deposits. The Pleistocene glaciation period had a modifying effect of the topography in certain areas and would have redistributed any alluvial deposits in these areas.

Macquarie Harbour forms a natural deposition area for alluvial minerals. Any minerals passing through the Harbour mouth would tend to be redistributed north along the coastline due to the prevailing current direction.

Minerals that could accumulate in Macquarie Harbour are gold from the Mt. Lyell district and osmiridium from the Asbestos Point Cambrian ultra basic rocks. Other minerals which could accumulate, but probably in smaller quantities, are chromite, magnetite, picotite and ilmenite from the decomposition of the Cambrian ultra basic rocks, magnetite from the Mt. Darwin Cambrian granite, and rutile, zircon, ilmenite, tourmaline, garnet and sphene from the "older" Pre-Cambrian metamorphic rocks. Another source of the above minerals could be from the reworking of the unconsolidated Tertiary sediments covering much of the area adjacent to Macquarie Harbour.

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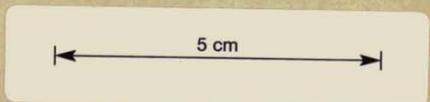
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LEGEND

- Cambrian Ultra Basics 
- Cambrian Granite 
- Mineral Deposits
- Gold 
- Copper 
- Silver 
- Osmiridium 
- Alluvial and Detrital Deposits All 

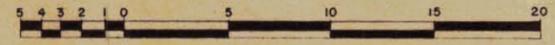


LOCALITY DIAGRAM



CENTRAL WESTERN TASMANIA
DRAINAGE & MINERALISATION MAP

Scale 1:500,000



To accompany report on
 GEOLOGY OF THE HINTERLAND OF E.L. 5/66 MACQUARIE HARBOUR, TASMANIA.

for
 PLANET MINING COMPANY PTY. LTD.

by
 G. C. Campe
 of

CUNDILL, MEYERS AND ASSOCIATES