RIO TINTO AUSTRALIAN EXPLORATION PTY. LIMITED

MELBOURNE, AUSTRALIA

PROJECT:— PRP/7/100

REPORT No.:— 13/1958

THE PRELIMINARY INVESTIGATION OF IRON DEPOSITS IN THE BURNIE-PENGUIN AREA

by

W. J. Atkinson

Iron Deposits of the Burnie-Penguin Area - preliminary investigation by W. J. Atkinson July 1958.

FILE REFERENCE:— 8D/20U

MAP REFERENCE:—

DATE:— 10/9/58

58-240

400001

000

THE PRELIMINARY INVESTIGATION OF IRON DEPOSITS IN THE BURNIE-PENGUIN AREA

by

W. J. Atkinson

CONTENTS

PLATES

Plan

T.458	Locality Map, Burnie-Penguin Area.	4 miles to 1 inch
T.459	Blythe River Iron Deposit	200 feet to 1 inch
T.460	Natone Iron Deposits	200 feet to 1 inch
T.461	Penguin Creek Iron Deposit	400 feet to 1 inch

001

PRELIMINARY INVESTIGATION OF IRON DEPOSITS IN THE BURNIE - PENGUIN DISTRICTS - N.W. TASMANIA

by

N.J. Atkinson

SUMMARY

Magnetic iron ores do not occur within the area studied. Five haematite prospects were investigated in the Burnie and Penguin districts; of these, the Natone, Blythe River and Penguin Creek deposits are replacement bodies in slates of Dundas, possibly Carbine age. The Dial Range and South Penguin deposits are formed by sporadic replacement of the Owen Conglomerate series.

All the deposits are relatively small. A rough calculation of possible ore reserves at the largest, the Blythe River, revealed hardly more than 10 million tons of usable ore. However, in the Burnie district Tertiary basalt covers more than three-quarters by area of the older slates in which the ore-bodies occur and it is stressed that in the Blythe-Natone area excellent prospects exist for the extension of the ore zone beneath the surrounding basalt sheet.

Although fairly extensive, the low overall grade of the Penguin Creek deposits would preclude their use today. In the early 1900's these deposits produced high grade ore on a small scale by the use of highly selective quarrying methods.

The Dial Range and S. Penguin prospects are small and the ore, although of high grade locally, contains many highly siliceous patches freely intermixed with the high grade material.

It is recommended that any future work on these deposits be concentrated in the Blythe River - Natone area with the object of:-

(a) Making a detailed assessment of the Blythe River material exposed at present.

(b) Attempting an assessment of the "possible" ore-bodies covered by the basaltic sheet, either by geophysical (if possible) or sub-surface geological methods.

INTRODUCTION

The preliminary examination of these deposits was made during the latter half of July and the first weeks of August 1958, whilst the writer was based at Burnie.

This investigation follows the same lines as those adopted during the recent examination of iron deposits in the Hampshire-Highclere area i.e. the grade, size and nature of the prospect is described with the object of determining whether further investigation is warranted.

The deposits so described are Blythe River, Natone, Penguin Creek, Dial Range and South Penguin. These deposits have been made the subject of numerous reports by members of the Tasmanian Geological Survey, and the Blythe River and Penguin Creek ore-bodies during the early part of the century formed the sites of Blythe River Iron Mines Ltd. and the Tasmanian Iron Mines Ltd. respectively.

THE BLYTHE RIVER IRON DEPOSITS

(a) Location and Access

The Blythe River has intersected the iron deposits at about six miles from its mouth at Blythe Heads. The ore-bodies are exposed on the steep sides of the valley and access to the northern and southern extensions of the deposit are from opposite sides of the river. The southern ore-bodies are reached by way of Natone, about nine miles from Burnie, a branch road about one mile north of the township leads east to within half a mile of the deposit. The northernmost of the ore-bodies is directly accessible to vehicles by metalled road from Cuprona leading to the northern quarries. A cleared baseline and timber tracks connect with the remainder of the deposits.

(b) Topography

The Blythe River, a youthful stream, has cut a channel through the surrounding gently undulating basalt plains, exposing the ore-bodies on its bed and on the steep walls of the valley. The northernmost ore-body is situated more than 600 feet above river level.

(c) General Geology

The ore-bodies occur within a series of buff and grey slates with minor interbedded quartzite bands. The country rocks strike approximately 40°E. of N. and in the vicinity of the ore-bodies appear to be in conformity with them, dipping at high angles to the east.

About ½ mile to the west, at the abandoned "Copper King" Mine the slates are highly graphitic with pyrite and copper mineralisation localized in shears. However, there is no visible sulphide mineralisation associated with the iron ore-bodies.

The country rock slates appear to be lithogically similar to Carbine (P4) sediments outcropping along the coastline to the north and containing minor haematite mineralisation. However, since typically Dundas pyroclastic types occur to the S.W. near the Natone iron prospect the true age of these rocks is somewhat in doubt at present.

Several hundred feet east of the main "line of lode" medium grained breccias and conglomerates of the Owen Conglomerate series overly the older slates. Minor iron mineralization in the

form of haematite joint fillings and veinlets are probably associated with the formation of the main deposits in the slates.

South of Natone and near Riana granite occurs as a large intrusive mass. Overlying the older rocks is the Tertiary basalt sheet. Where the basalt intersects the line of the iron ore-bodies the maximum calculated thickness is 200 feet.

(d) The Ore-Bodies

In the early 1900's this deposit formed the proposed site of Blythe River Iron Mines Ltd. Several adits, numerous costeans and two quarries have been cut in the ore-bodies but except for the quarries all previous work has been of a prospecting nature only. The estimated production from the deposits has been about 7,000 tons from the northern quarries.

Estimated ore reserves by previous investigators are as follows:-

1894	J.A. Montgomery	30 million tons gross.
1900	J.H. Darby	24,500,000 tons net.
1901	W.H. Twelvetrees	17-23 million tons net.
1919	Messrs. Boyd, Gibson and Young	9 million tons, the bulk of which is too siliceous for present day usage (i.e. 1919).

The following observations by the writer appear to substantiate the low estimate of Boyd, Gibson and Young.

The lode material consists essentially of fine grained, blue-grey haematite ore with varying amounts of siliceous gangue. Small amounts of soft specularite occur as veins and joint fillings within the richer patches of ore. The ore is non-magnetic and limonite occurs only locally as rare weathered cappings of outcrop.

The only visible impurity is very fine grained siliceous material consisting mainly of iron stained quartz, but due to the small grain size some cryptocrystalline silica may accompany it. This material, apparently associated with the formation of the ore-bodies as it is limited to the line lode, contaminates the lode in all degrees, varying from almost pure haematite to completely silicified patches.

The ore-bodies appear as lenses outcropping as crags and ridges above the scree covered slopes of the river valley, and forming two main parallel lines of lode, an eastern and a western. These crags represent the better grades of ore and do not appear to be connected in depth. The deposit strikes approximately 30°E. of N. and where observed dips at 75° to the S.E.

The lodes at their extremities, grade into siliceous and low grade material and it is to be noted that the "Old Central Tunnel" (Plan No. T.459) intersects only five feet of good grade ore, although driven near the end of a much wider outcrop.

Widths of the lodes vary, in general though, the wider ore-bodies occurring several hundred feet above river level. Federal Government investigators at the time of the first World War considered that the decrease in the width of the lode at river level (30 ft.) indicated a general diminution of width in depth over the whole of the deposit. This

would have to be an important consideration in any tonnage calculation. Twelvetrees and Reid (1919) do not accept this, considering that the river has merely intersected the ore-body at its weakest i.e. thinnest point. It is most noticeable however, that when viewed from the southern wall of the valley, the large crags marked A & D (Plan No. T.459) occur at identical RL's and along strike with only minor widths of ore between them.

Across the ore zone, the ore-bodies are bounded by altered slates containing little or no iron mineralisation.

Of the three adits driven into the deposit, only one, "the Old Central Tunnel" is accessible at present, although clearing at the entrance would serve to drain the other two. The "Old Central Tunnel" was driven for 110 feet at 315° about 280 feet above river level, passing through the northern extremity of one of the main ore-bodies.

The following description of the rocks exposed illustrates the nature of the wall rocks and lode material:-

	0'-16'	Scree. Ore pebbles and siliceous rock in a partially consolidated clayey matrix.
	16'-42'	Weathered, blue-grey and buff clayey slates. Some evidence of shearing and development of minor slip-planes. Becoming broken towards wall of lode.
Lode	42'-47'	F.gr. med. to high grade haematite, some minor siliceous patches. Blocky jointing.
	47'-64'	F.gr. siliceous lode material, minor veinlets and patched of haematite and red jasper. Not ore.
	64'-70'	Soft, earthy material. Limonitic clay.
	70' -93'	F.gr. siliceous lode material. Contact with slates 17°/75°E.
	93'-110'	Well bedded buff slates with minor quartzite beds. Bedding 18°/80°E.

Twenty chains north from the river, Tertiary basalt up to 200 feet in thickness covers the line of lode for about 30 chains. Similarly, to the south the ore disappears beneath the basalt sheet and its reappearance at Natone several miles away indicate that ore-bodies covered by the basalt may be quite extensive.

Sampling of the deposit was not undertaken during the recent examination but the results of some previous investigations, considered reliable, are listed. Twelvetrees (1919) sampled the cross-cuts of the lower river level adit. This adit, now inaccessible, is driven from the footwall 225 feet with cross-cuts to the east into the ore-body. Samples by Twelvetrees are apparently grab-samples of selected ore only. Footages given are from the mouth of the tunnel and a more complete description is given in Twelvetrees and MacIntosh Reid (1919).

66'	-	Fe% -	46.0	SiO_2% -	34.2
77'	-	"	65.0	"	7.0
142'		"	67.2	"	3.8
167'		"	68.1	"	2.4
199'		"	65.5	"	2.0
225'		"	68.7	"	1.6

C'wealth Investigators at time of 1st World War:-

40 ft. sample across lode near mouth of lower tunnel
54.0% Fe, 31.0% SiO_2.

The ore at this point appears more siliceous than that in the centres of the ore-bodies. Twelvetrees and Reid (1919).

Northern tunnel about 80 feet below outcrop. Average assay over 84 feet in the ore-body

Fe 54.3%, SiO_2 25.0%.

This tunnel did not completely traverse the ore-body and they remark that the ore in the tunnel appears more siliceous than the outcrop above it. Thus, it appears that in common with most of the Tasmanian iron deposits examined the grade of surface, weathered ore is generally higher than that of the primary material.

	Darby 1900 Av. surface sample of whole deposit	C'wlth. Investigators (World War I) Av. 23 samples of good ore.
Fe_2O_3	86.954%	89.68%
FeO	3.074	1.2
Fe	63.259	63.71
SiO_2	7.318	7.76
Al_2O_3	1.756	0.620
CaO	0.068	0.165
MgO	0.071	Trace
S	0.024	0.054
P_2O_5	0.083	0.052
Titanic Acid	0.03	Nil
Cu	Trace	Trace
As	Trace	-
Mn	Trace	(MnO_2) 0.078
Cr	Nil	Nil
Combined Water	0.324%	0.54%
Moisture	0.160	0.13

The general similarity of these assays is encouraging but it is stressed that they only represent selected generally high grade ore and make no allowance for the bulk of siliceous material intimately mixed in varying proportions with the ore material. Only by very selective mining methods could the above grades be adhered to. The following sample taken by C'wlth. workers during World War I across the old quarry in the northern deposit (56.4% Fe, 19.11% SiO_2) demonstrates this point. The first impression of the ore in this quarry is that of a high grade haematite, but careful examination reveals much siliceous material scattered through the ore.

(c) Ore Reserves

Estimates of ore available by previous investigators were listed previously. The first three estimates (Montgomery, Darby and Twelvetrees) appear to be based on sub-surface extensions of the lode between outcrop but in the opinion of the writer this assumption is not warranted.

An approximation of ore reserves, by the writer, based on the extent of the ore exposed in the main outcrops, amounted to 9,011,000 long tons. The S.G. of average Blythe ore was taken as 299 lbs./ft.^{3}, as calculated by J.H. Darby for his estimate, and the continuation of the ore-bodies to river level without diminution in width was assumed. Adding the ore from minor ore-bodies including the nearby Natone deposit, it is not considered that the total reserve would be more than 10 million tons.

However, the possibilities for ore extensions beneath the basalt, both to the north and south of the main ore-bodies are good, particularly to the south where the basalt flows appear to be somewhat thinner than the flow (200 ft. thick) transgressing the northern ore-bodies.

NATONE (RUTHERFORDS) IRON DEPOSIT

(a) Location and Access

The haematite deposits at Natone, once the site of Rutherford's Iron Mines, are situated nine miles by road S.S.E. of Burnie. They are easily accessible to vehicles by a track branching off the main Natone Road at Rutherfords farm house. This track, less than a mile long leads to the old quarry sites.

The ore-bodies outcrop on a lightly timbered hill surrounded by farming and grazing land.

(b) General Geology

The country rocks at Natone differ little from those at the Blythe River deposits, consisting of Carbine,? slates and quartzites, striking N.E. and dipping steeply to the S.E.

About 20 chains east of the ore-bodies typically Dundas rock types (cherts, tuffs and conglomerates) are poorly exposed. Whether these Cambrian rocks overly the host rocks of the ore-bodies or belong to the same series cannot be ascertained for certain from the field evidence available at present. However, due to the widespread nature of haematite mineralisation in the Burnie-Penguin district, the search for ore-bodies cannot be limited to any particular rock series of Pre-Cambrian to Ordovician age.

The Tertiary basalt sheet surrounds the area.

(c) The Ore-Bodies

There is little structural or mineralogical difference between the Natone iron deposits and the larger Blythe deposits. The Natone deposits are regarded as extensions of the Blythe deposits, the connection between them being concealed beneath the Tertiary basalt flows. It is this concealed area, over two miles in length, that provides the most likely area for examination in any search for ore extensions.

Small quarries have been opened in the ore-bodies and these, combined with information from the numerous costeans, define the widths of the ore-bodies fairly conclusively. To the S.W. scree material and the basalt sheet mask the termination of the ore zone at this end.

A minor iron deposit exposed at the northern end of the baseline (Plan No. T.460) appears to be terminated in the Natone Road cutting by manganiferous material containing little or no haematite.

The main ore-body has a maximum width of 90 feet and exposed along strike for 210 feet. The smaller ore-body has exposed dimensions of 130 feet by 60 feet. The ore-bodies as exposed in the quarries appear similar in grade and texture to Blythe River material. The wall rocks of slates and broken clayey iron rich material (not ore) are also similar.

A shaft, 550 feet to the S.W. of the main deposit, has been sunk through the surrounding basalt sheet and, although now inaccessible, it contains high grade haematite on the dump indicating extensions of the ore zone beneath the basalt.

In the vicinity of the main deposits scattered outcrops of siliceous low grade haematite occur.

The two shafts adjacent to the ore-bodies (Plan No. T.460) but not in ore, were sunk early in the century to test small copper showings, evidence of which is no longer apparent.

Sampling of the Natone deposits was not undertaken but on appearance it is considered that the grade corresponds to that of the Blythe iron ores. The deposit is not large, probable reserves to a depth of a hundred feet would be to the order of a quarter of a million tons. Their importance lies in that they indicate the possible extension of the larger Blythe deposits at least two miles beneath the Tertiary basalt sheet.

PENGUIN CREEK IRON DEPOSITS

During the early 1900's these deposits were the site of Tasmanian Iron Mines Ltd. from which the estimated total production was 40,000 tons of high grade haematite (66-68% Fe; 2-3% SiO_2). But since highly selective quarrying methods were used this does not indicate the overall grade of the deposit. The ore was shipped to N.S.W. and production ceased in 1909. In recent years however, small quantities of limonite have been obtained from shallow pits. Hughes (1953) records 2,000 tons.

(a) Location and Access

The Penguin Creek deposits are situated about three miles south of Penguin and are reached by way of the "Iron Cliffs Road". Most of the old quarry sites are accessible to vehicles by way of unmetalled tracks.

The ore-bodies occur on either side of Penguin Creek and are exposed in quarries that have been cut into the low hills forming the sides of the valley and the foothills of the Dial Range.

(b) General Geology

Steeply dipping Dundas slates are the oldest rocks in the area and form the host rocks of the iron deposits. Penguin Creek has cut through the surrounding Tertiary basalt sheet exposing the older rocks in the valley, but due to their highly weathered nature no determination of structure in the vicinity of the deposits can be made. It appears that they dip steeply and trend roughly north-south. To the east, the Owen Conglomerate of the Dial Range and its foothills overlies the Dundas Series. Although the main iron deposits are in the slates, conglomerates in the vicinity of the deposits show minor haematite mineralisation. The valley-floor of Penguin Creek, a mature stream, is covered by a variable thickness of alluvium; and iron scree, also of recent origin occurs as a thin veneer on the hill slopes.

(c) The Ore-Bodies

Except where intersected by the numerous quarries definite boundaries of the deposits could not be established, surface outcrop being rare. However, Plan No. T.461 gives the writer's estimate of the extent of the main deposits.

Four main areas were mapped as ore-bearing, occurring on either side of the creek, and all have been extensively quarried during the period 1897-1909. As stated previously the estimated production was 40,000 tons of high grade haematite, but judging from the mullock dumps remaining, more than twice this amount of material was extracted from the deposits, the high grade material being sorted prior to shipping.

The ore consists of a high grade haematite silimar in appearance to Blythe River material, and the proportion of impurities (silica, sulphur and phosphorus) is reported to be negligible. The selected ore is recorded as averaging (Hughes 1953) 68% Fe and 2% silica.

Where exposed the ore consists of angular and rounded boulders of almost pure haematite, varying in size from pebbles to lumps many tons in weight. The matrix in which the boulders occur consists of clays and altered country rock, containing little or no iron and occupying much more than half by volume, of the ore zone. Without resorting to extensive sampling an accurate estimate of overall grade could not be made. However, it is unlikely that the average grade of the deposit would be more than half that of the selected ore i.e. less than 35% Fe.

This, although the deposits were mined successfully many years ago by highly selective methods, it is doubtful if they can be utilised today. At no time during the investigation was there evidence for an improvement in grade away from the areas opened by quarries.

Hughes (1953) summarises the various theories of origin for these deposits.

DIAL IRON DEPOSIT

The Owen Conglomerate of the Dial Ranges south of Penguin, commonly exhibits partial or complete haematite mineralisation of certain conglomerate horizons. This is a feature met with throughout the Owen Conglomerate of western Tasmania, generally in more or less minor amounts. They are considered to be replacement deposits similar in origin to the Blythe River and other haematite deposits in the older Dundas rocks. However, the sporadic nature of the higher grade ores in the highly siliceous conglomerates appears to indicate that they are much less favourable to complete replacement than the slates.

The Dial Iron Deposits are situated about a mile and a quarter north-east of Riana township, at about 1,400 feet above sea level. A cleared track leading to them could not be found and they are reached by climbing the range (about 700 feet) and are situated in a densely wooded gully. Two adits (one inaccessible) were located but other reported workings in the form of trenches could not be found owing to the very dense undergrowth.

Descriptions of these deposits are recorded in Twelvetrees 1903 and Hughes 1953. Briefly the ore consists of a fine grained haematite with negligible impurities, except silica, replacing either the matrix or pebbles, sometimes both of the conglomerate. The conglomerate, where unaltered, is the normal Owen type, consisting of coarse quartzite pebbles in a finer siliceous matrix. As mentioned previously replacement is very patchy, high grade ores and almost completely unaltered conglomerates occurring within a few feet of one another.

The mineralised zone trends approximately north-south and can be traced along strike for about 800 feet. The width is variable and is masked by the soil and scree cover. However, it is estimated to vary between 50 and 150 feet.

Four samples made by W.H. Twelvetrees of selected high grade ore average 65% Fe, 2.5% SiO_2 with traces of sulphur and phosphorus. These of course give no indication of the overall grade of the deposit which is considered by the writer to be very low. An adequate sampling plan to determine this would involve extensive clearing and trenching of this rather inaccessible and unattractive deposit. It is considered that more detailed work is not warranted at present.

SOUTH PENGUIN HAEMATITE PROSPECT

A small haematite prospect several hundred feet east of the Iron Cliffs Road, two miles south of Penguin was investigated. It is of similar type to the Dial Range deposit, being an incomplete replacement of the matrix of medium grained Owen Conglomerate. Rarely is the replacement complete and thus the average grade is low. The deposit is exposed over a width of thirty feet in a small quarry and float ore occurs at the surface over about 200 feet in a north-south direction.

Except as an indication of a mineralised horizon in the Owen, the prospect is not worthy of further investigation.

The occurrence of these two deposits (Dial Range and S. Penguin) indicates that the Owen Conglomerate is a series in which iron ores may be looked for. However, the present indication is that replacement is generally very sporadic and not conducive to the formation of ore-bodies of economic size or grade.

CONCLUSION

This preliminary investigation has indicated that, although generally small, the haematite deposits of the north-west coast are widespread and in the case of the Blythe-Hatone deposits offer ample opportunity for extensions beneath the Tertiary basalt sheet. It is recommended that any future work be concentrated on this group and on the examination of the extensive basaltic areas surrounding them. A topographic survey should serve to give a fair indication of the thickness of the basalt covering the ore zone extensions.

Unfortunately however, due to the dense and magnetic nature of the covering sheet, sub-basaltic geophysical examination may not be easily applicable to the search for haematite ore-bodies.

Until the possibilities of the Blythe-Hatone group are exhausted the further investigation of the deposits in the Owen Conglomerate Series and at Penguin Creek is not warranted.

10th September, 1958.

N.J. Atkinson,
Geologist.

REFERENCES

Darby J.H. 1900. Report on the Blythe River Iron Mines (Private Report).

Hughes T.D. 1953. The Dial Range Mineral Field (Dept. of Mines Report)

Hughes T.D. 1952. Iron Deposits at Penguin Creek. (Dept. of Mines Report).

Montgomery A. 1894 Report on a Deposit of Iron Ore at Blythe River (Geol. Survey, Tas.)

Reid A.M. & Nye P.B. 1923. Rock & Mineral Resources of Tasmania (Geol. Survey Report).

Smith J.H. 1898 Report on the Penguin & Dial Range Mineral Fields.

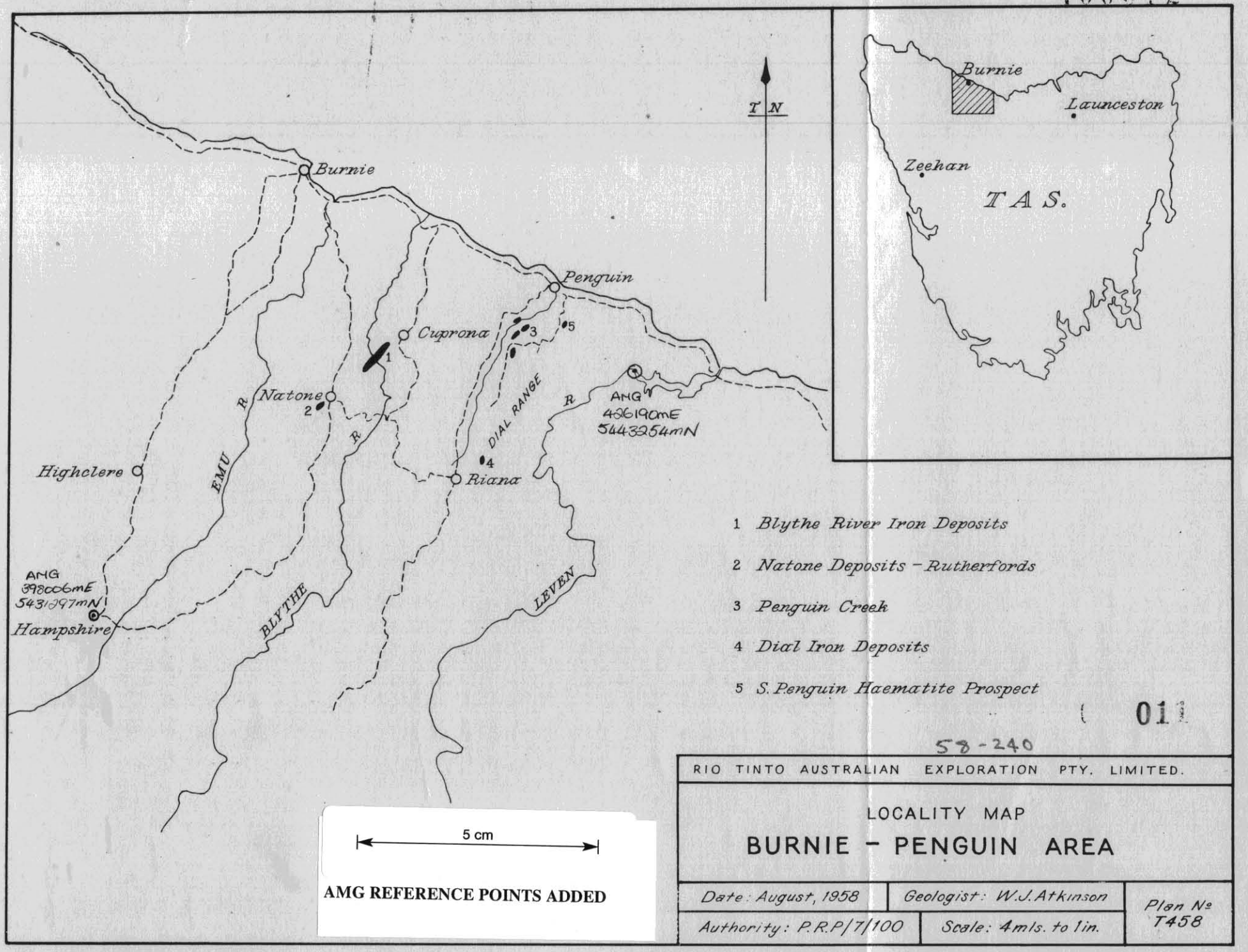
Thomas & Henderson 1943. Some Iron Deposits in the Vicinity of Burnie (Dept. of Mines Report).

Twelvetrees W.H. & Reid A.M. 1919 The Iron Ore Resources of Tasmania. Mineral Resources No. 6.

Twelvetrees W.H. 1901. Report on the Blythe River Iron Deposit (Dept. of Mines Report)

Twelvetrees W.H. 1903 Report on the Dial Range and some other mineral districts of the North-West Coast of Tasmania. (Govt. Survey Report).

400012



01

58-240

RIO TINTO AUSTRALIAN EXPLORATION PTY. LIMITED.

LOCALITY MAP

BURNIE – PENGUIN AREA

Date: August, 1958	Geologist: W.J. Atkinson	Plan No. T458
Authority: P.R.P/7/100	Scale: 4 mls. to 1 in.	

LEGEND

- Haematite ore exposed as outcrop, in trenches, adits etc.
- Siliceous lode material, iron bearing but not ore.
- Iron and siliceous host rock scree and some soil cover. Mainly underlain by slates, may conceal minor ore bodies
- Carbine? wall rocks. Buff slates and shales, minor quartzite beds
- Owen conglomerate
- Tertiary basalt
- Base line and cleared traverses
- Access roads
- Adits
- Costeans
- Quarries

5 cm

T N

2400'N

R.L.930' 2200'N

R.L.856' 1900'N

R.L.694 1500'N

1250'N R.L.653

E

D

Crag Ht. 45'

R.L.518' 850'

In adit slates

Siliceous Not ore

Old Central Adit

Ore occurs as prominant ridge up to 25 Ft. high

C

R.L.376' 650'

Adit fallen in For description see text

R.L.280' 450'

R.L.184' 250'N

Creek

Iron boulders

Blythe River

Boulders?

R.L.200' 00'

R.L.286' 200'S

Creek

Ore forms ridge rising up to 20' above country

B

400'S

Outcrop not prominent much sil. material

Oo.

M.gr. conglomerate siliceous and iron stained

R.L.437' 600'S

Much siliceous material

Boulders?

R.L.535

A

800'S

Blue Creg R.L.600

Iron becomes progressively more siliceous to south

Siliceous patches

1000'S

1200'S

R.L.656' 1350'S

Iron scree No outcrop. Some conglomerate boulders

R.L.483' 5835'N

R.L.642' 5000'N

Creek

R.L.705' 4700N

R.L.762' 4400N

Adit fallen in

R.L.811' 4200N

R.L.837' 4000N

F

To Caprona

3800'N R.L.821

3600'N

3400'N

3000'N R.L.943

R.L.949' 2600'N

R.L.944' 2400'N

2200'N

RIO TINTO AUSTRALIAN EXPLORATION PTY. LIMITED.

PRELIMINARY INVESTIGATION

014

BLYTHE RIVER IRON DEPOSIT

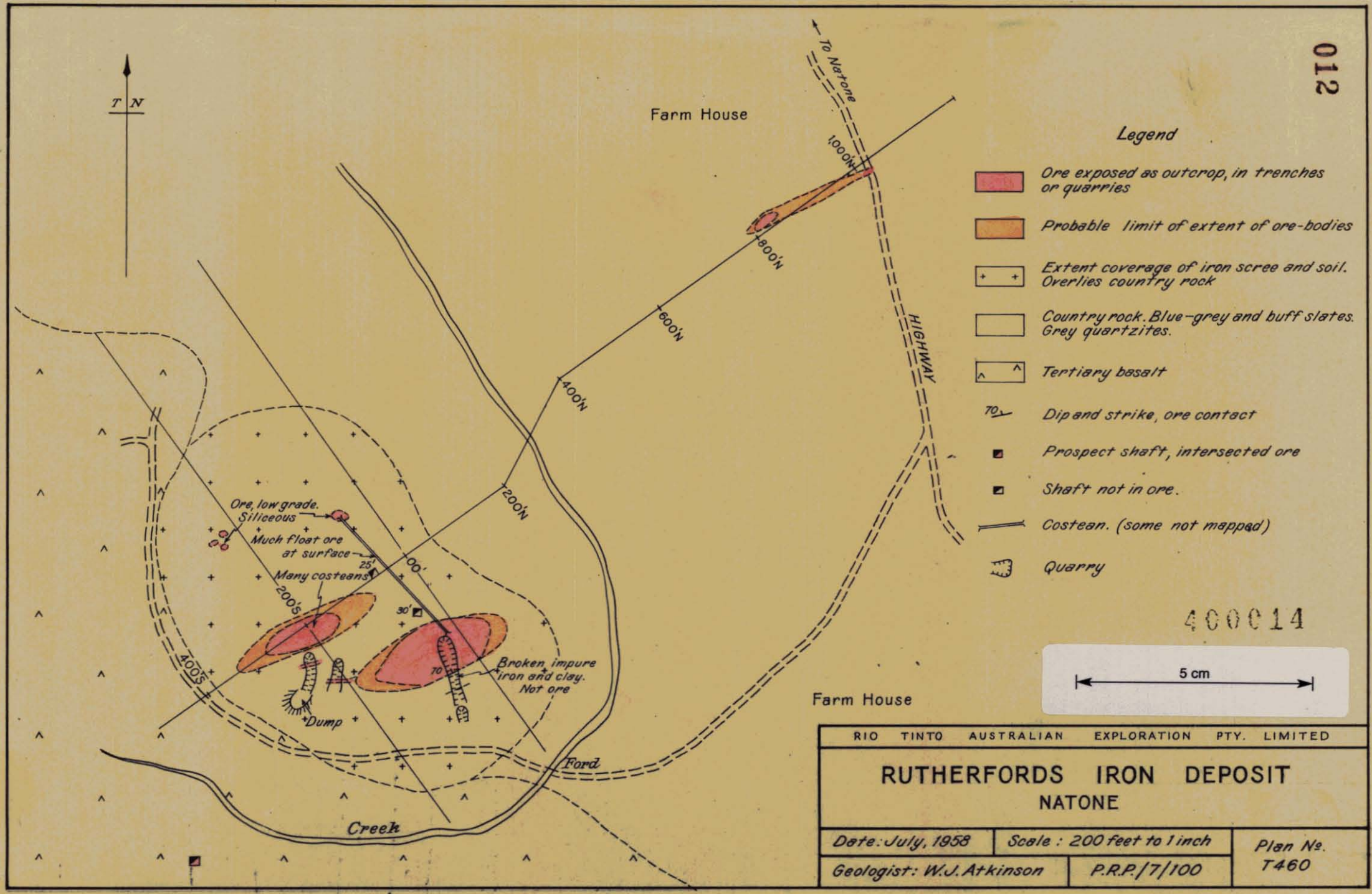
GEOLOGICAL MAP

400013

Date: August, 1958	Scale: 200 feet to 1 inch	Plan No. T459
Geologist: W.J. Atkinson	Authority: P.R.P.1/7/100	

58-240

012



RIO TINTO AUSTRALIAN EXPLORATION PTY. LIMITED

RUTHERFORDS IRON DEPOSIT
NATONE

Date: July, 1958	Scale : 200 feet to 1 inch	Plan No. T460
Geologist: W.J. Atkinson	P.R.P./7/100	

LEGEND

Haematite ore exposed in quarries and as outcrops

Estimated extent of main deposits. Does not include minor ore-bodies possibly concealed beneath float ore and soil cover

Dundas slates and quartzites. Poorly exposed except where silicified

Tertiary basalt

Recent alluvium

Quarries

Dumps

5 cm

Penguin Creek

Silicified Dundas

2600'N

Penguin

ROAD

To Penguin 5mls.

CLIFFS

IRON

Buff, weathered slates

400's

800's

1200's

1600's

MacBrides Ck

Partial replacement of conglomerate. Not ore. (Owen Cong.?)

Siliceous haematites some limonite

400015

013

58-240

RIO TINTO AUSTRALIAN EXPLORATION PTY. LIMITED

GEOLOGICAL MAP

PENGUIN CREEK IRON DEPOSIT

(EX. TASMANIAN IRON MINES)

Date: August, 1958	Geologist: W.J. Atkinson	
Scale: 400 feet to 1 inch	P.R.P/7/100	Plan No T461