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RIO TINTO AUSTRALIAN EXPLORATION PTY LTD

REPORT ON THE

ROCKY RIVER AREA

IRON DEPOSITS

NORTH WEST TASMANIA

By

W J Atkinson

30th June 1960

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AMG REFERENCE POINTS ADDED

328002

REPORT ON THE ROCKY RIVER AREA IRON DEPOSITS

N. W. TASMANIA

by

W. J. Atkinson

C O N T E N T S

(* In the course of preparation) — NOT SUPPLIED WITH THIS REPORT

P L A N S

		Scale
T688	Locality Plan of Iron Deposits, N. W. Tasmania	4 Miles to 1 inch
T687	Geological Plan of Rocky River Iron Deposits	400 ft. to 1 inch
T686	Regional Geological Plan with Aeromagnetic Contours	40 chains to 1 inch

328003

REPORT ON THE ROCKY RIVER AREA IRON DEPOSITS

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SUMMARY

Geological mapping, sampling of mineral exposures and aerborne and ground magnetic surveys have established that the Rocky River iron deposits are small, consisting of hardly more than 2,900 tons per vertical foot of high grade (greater than 50% HCl. Sol. Fe.) magnetite ore. Magnetite mineralisation of chlorite schists associated with appreciable quantities of pyrite and quartz is much more extensive (say 2,000 x 200 ft. surface dimensions) but grade is very low (approximately 15% HCl. Sol. Fe.) and for this reason not of interest.

An appraisal of aeromagnetic results, correlation with results obtained over Rocky River, and re-examination of previous reports indicates that iron occurrences to the south at Paradise and Merideth Rivers are probably of lesser extent than the Rocky River deposits.

The writer does not recommend at this stage further investigational work on these deposits.

INTRODUCTION

This survey, carried out intermittently during the 1959-60 field season, was made as a part of the investigation programme of iron ore deposits in North-West Tasmania, in co-operation with the Tasmanian Department of Mines, the Rocky River and adjoining deposits to the south occurring within the boundaries of Statutory Licence No. 5650.

This examination has taken the form of a review of previous work and aeromagnetic results and active field investigations, comprising geological mapping at regional and semi-detailed scales, sampling of available exposures and ground geophysical surveys. The extremely rugged nature of the terrain, thick soil and vegetation cover and poor weather conditions hampered the investigations.

These deposits, which at Merideth River form the southern limit of the 25 miles long zone of discontinuous magnetic iron mineralisation of the Long Plains

field, were first noted in the late 1800's when work on the alluvial gold deposits in the area commenced. Interest in the iron deposits at first centred on their potential as a host for economic gold or copper ores, and during this phase the outcropping iron and pyritic schists were investigated by means of numerous pits, costeans, shallow shafts and from the Whyte River an adit was driven 800 ft. along the main Rocky River deposit. Reid and Twelvetrees (Mineral Resources No. 6) commented on the deposits in 1919 as possible iron ore bodies but it was not until 1926 that Reid made the first comprehensive report on the iron deposits extending from the Whyte River south to the Merideth River and thus embracing the Rocky River and Paradise River occurrences also. At this time, interest in the iron resources of Tasmania had revived and leases were held covering most of the major occurrences. From then on interest waned until 1956 when aerborne magnetic surveys established appreciable anomalies coinciding with the previously reported iron deposits.

LOCATION AND ACCESS

The Whyte and Rocky River deposits, situated 21½ miles south-west of Waratah, are reached by means of an old pack track branching off to the east from approximately the 3¼ mile peg on the Waratah-Corinna Road. This track is accessible to four-wheel drive vehicles for ½ of a mile where it traverses a button-grass plain, thence for foot traffic only to the Whyte River, a distance of approximately 1½ miles. The Whyte River is crossed by a cage (at H.E.C. Water Gauge Station), but can also be easily forded in the dry season. From the Whyte River Crossing the iron deposits are reached by means of old tracks, water races and cut traverses as shown on attached plans.

The Paradise and Merideth River deposits, etc., south of Rocky River, are extremely difficult of access. Although discussed in this report they were not visited during the course of the examination. These deposits are situated in the rugged and inaccessible area between the Rocky and Pieman Rivers and would be very difficult to approach from the Rocky River end. (Refer Plan No. T686). In the event of an examination being attempted, the best mode of access would probably be via the old Pieman River-Mt. Ramsay track which joins the Pieman River between the junctions with the Merideth and Paradise Rivers. Clearing of this track would be necessary.

PHYSICAL FEATURES

Similar to Savage River, the Rocky River area consists of a deeply and youthfully dissected peneplain, the residual surface of which is clearly visible to the west and south of the area, sloping almost imperceptibly towards the Pieman River and the western coastline and sparsely capped by generally horizontal Tertiary fluvio-lacustrine sediments and rare basalt outcrops. At Rocky River the approximate altitude of the peneplain surface is 1,000 feet, at Savage River 1,600-1,700 feet, and at Waratah about 2,000 feet. To the east the peneplain abuts against the monadnock of the Merideth

Range granite massif.

The principal streams draining the area are the Whyte River, which traverses the northern extremity of the iron deposits, its tributary the Rocky River and the Paradise and Merideth Rivers, which flow direct into the Pieman River. With the exception of the Whyte, the other rivers are torrential mountain streams originating only a few miles away in the Merideth Range and Mt. Livingstone areas and flowing strongly only at times of high rainfall. They occur in steeply graded, actively downgrading gorges in which rapids and waterfalls are common and are fed by numerous dendritic, minor tributaries which have minutely dissected the peneplain. The Whyte River, which has its source a few miles west of Waratah and is within a hundred feet of base level at its junction with the Rocky River, is only slightly degrading and has formed minor alluvial deposits from which some of the early alluvial gold was won.

Annual rainfall is in the vicinity of 80 to 100 inches.

Vegetation consists of temperate rain forest, the dominant varieties being myrtle and sassafras, eucalypts on the higher ridges and an undergrowth of leatherwoods, horizontal scrub, dogwood and large ferns.

GENERAL GEOLOGY

The principal geological units occurring in the area under consideration are -

Recent	-	Localised deposits of stream gravels containing alluvial gold.
Tertiary	-	Basalt, rare, erosion remnants of a once extensive sheet overlying fluvio-lacustrine siliceous coarse to fine conglomerates and sands in the Brown's Plains area. Subject to surface silicification.
Devonian?	-	Merideth Granite.
U. Cambrian?	-	Gabbro-amphibolite intrusives and various metamorphic derivatives epidote amphibolites, chlorite-schists. Host rocks to magnetite deposits.
Upper Pre-cambrian to Lower Cambrian?		Oonah Quartzites and Slates (Spry) occur east of Rocky River area, (=Bischoff Series, Carbine Series?).
Pre-Cambrian	-	Whyte Schists (Spry and Forde), Quartz-mica-schists, mica-schists, phyllites with subordinate quartzite and slate beds.

The amphibolite series is the only unit of economic importance in that it acts as host to the iron deposits and it alone shall be described in any detail.

In the Tectonically unaltered state these rocks are texturally gabbroic, metamorphic influences, however, have produced a mineral assemblage characteristic of an epidote-amphibolite facies, hornblende, acid plagioclase, epidote with subordinate amounts of quartz, apatite and ilmenite. Introduced quartz and pyrite is common. Alteration of these rocks (epidote-amphibolite facies) by shearing stresses along linear zones coupled with the formation and introduction of secondary minerals due to the thermal effects of the nearby granite has produced a wide variation in mineral assemblages from unaltered gabbro-amphibolite to amphibolite-schists, chlorite-schists, talc-schists each modified by the presence of quartz, magnetite and pyrite in varying amounts and localised in distinct zones, the magnetite rich varieties forming the iron deposits. No dolomitic rocks, as occur at Savage River, have been observed in the Rocky River area.

The zone of amphibolite intrusives at Rocky River appears to be continuous with similar rocks at the R.T.A.E. iron deposits, but is subject to considerable thinning and possibly bi-furcation of lenses; iron mineralisation is discontinuous and the formation of deposits of significant size is apparently controlled locally by the degree of alteration to talcose and chloritic types and also the width of the amphibolite zone. Aerial magnetic surveys indicate that the R.T.A.E. and Savage River amphibolites may not be continuous or at best linked by extremely tenuous basic zones.

At Rocky River mineralisation has produced two distinctly different iron deposits, both in a schist host rock but distinguished by characteristic textures and mineral assemblages. These will be described in greater detail in the paragraph on economic geology, but in brief are -

1. Talcose-magnetite-amphibolite rocks localised along narrow shears in massive gabbro-amphibolites and forming the main Rocky River deposits, as exposed in the Whyte River adit. These are similar in all respect to the Savage River deposits.

2. A broad zone, situated to the east of the main deposits, of chlorite-quartz-magnetite distinctly banded pyritic schists. Composition varies from chlorite-schists through a broad range of rocks modified by varying proportion of pyrite, quartz and magnetite to locally iron rich magnetite-schists which approach ore grade. Haematite is a common near surface alteration product and although distinctly magnetic these are the "haematite deposits" of Reid's Report.

AEROMAGNETIC SURVEYS

Two airborne magnetic surveys over this area, carried out by the B.M.R. and Adastra Hunting Geophysics in 1956, produced roughly similar total magnetic intensity contour plans. Minor differences in intensity and shape, due to dissimilar instrument calibration and flight line spacing, are insignificant. The anomalous areas co-incided with the previously recorded iron deposits

(Reid 1924) embracing a zone extending from the Whyte to the Merideth River. No new occurrences were indicated and thus ground investigations could be limited to the known iron deposits. Aeromagnetic contours (Adastra Survey) are superimposed on Plan No. T686.

The two "major" magnetic "highs" at Rocky and Merideth Rivers (9500 and 6300 gammas, respectively) are linked by a narrow, relatively weakly anomalous zone corresponding with, and aligned parallel to, the regional trend of the basic amphibolite host rocks of the iron deposits. Although they occur within this zone, the recorded iron occurrences at Paradise River, South Branch Creek and Coundon Creek have not caused significant anomalies. In view of this, and as a result of the examination of the Rocky River deposits and correlation with magnetic results, it is considered that these deposits are not worthy of further examination.

Similarly, the magnetically anomalous zone at Merideth River, of lesser intensity than that at Rocky River, does not promise an iron deposit of economic interest.

The relatively broad contours and higher intensity of the Rocky River anomaly in comparison with the anomalous zone covering the R.T.A.E. iron deposit, at first led to the hope that this deposit might be somewhat larger than indicated by previous reports. However, this does not seem to be the case, the source of the anomaly being a broad zone of chlorite-schists, containing appreciable quantities of magnetite, which crop out to the east of the main deposits and coincide with the centre of the anomaly. That a broad anomalous zone may indicate a large deposit in depth does not accord, in this case, with geologic evidence.

ECONOMIC GEOLOGY - THE ORE BODIES

A. ROCKY-WHYTE RIVER DEPOSITS

I. Main Rocky River Deposits (Savage River Type)

These deposits, of smaller size, but similar structurally and mineralogically to the Savage River deposits, were exposed in an adit driven south from the Whyte River along the line of lode. This adit was driven a distance of 800 feet, several cross-cuts intersecting the lode which reputedly attained a maximum width of 30 feet. Except for the first 200 feet this adit is now inaccessible, due to caving.

The fresh ore consists of massive, fine grained, somewhat friable, granular pyritic magnetite in an altered talc-amphibolite-schist-matrix. At the surface the lode crops out over a total distance of 4,000 feet as discontinuous lenses of varying width. Surface ore is high grade, weathered and enriched (by removal of most impurities) with minor amounts of haematite and limonite oxidation products. (Refer to detailed sample results).

Due to excessive soil and vegetation cover and the structural nature of the deposits, it is almost

impossible at this stage to produce even a near accurate estimate of tonnage. The following figures for "tons per vertical foot" should, therefore, be considered as tentative only. A factor of 7.5 cubic feet per ton of ore was used in calculation. Iron deposits north of the Whyte River NEAR 14N and 26N (average widths 3 and 15 feet, respectively) are negligible.

Block		Block Length	Average Width	Tons/ Vert. Feet
7N	To 4N	300 Feet	10 Feet	400
4N	To 2S	600 Feet	18 Feet	1,440
2S	To 6S	400 Feet	12 Feet	640
10.30S	To 13.50S	320 Feet	10 Feet	427
				2,907

Say 2,900 tons/vert. foot.

The deposits dip steeply east, at angles varying from 60° to 80° and are aligned parallel to the schistosity planes of the host talcose amphibolite-schists.

Assay results indicate that grade is in no way appreciably different from that of the Savage River deposits except for sample L904 which contains an abnormally high TiO_2 content, and this has not been included in the calculation of average values as it represents a separate iron occurrence (Refer Plan No. T687).

N.B.: Table set out on Page 7.

Sample No.	Location	Width	Description	HCl. Sol. Fe. %	TiO_2 %	SiO_2 %	Mn %	P_2O_5 %	S. %	Al_2O_3 %
L903	Whyte River Adit Dump	100 Lb. Grab.	Fresh Pyritic Magnetite	55.8	0.35	5.46	0.04	0.17	4.71	0.53
L904	Pit 10'N of 330'-340'E; 28'N	Grab.	Altered, fresh Magnetite & Amph.	45.9	2.26					
L906	25'N; 1'W	Grab.	Boulders, weathered Magnetite, Haem.	64.7	0.63					
L909	26'N; 1'W	Grab.	O/c Weathered Mag.	66.5	0.72					
L910	14.30'N; .20'W	2 Ft.	O/c Mag. Pyr. Clay	64.4	0.27					
L911	13'N; B.L.	3 Ft.	O/c Mag. Haem. Weathered	68.1	0.36					
L914	.10'N; 1.40'-1.60'N	20 Ft.	O/c Weathered Mag.	65.6	0.24	0.99	0.04	0.35	0.09	0.63
L915	1'N; 1.50'W	Grab.	" " "	66.3	0.46					
L916	3.60'S; 2.30'W	Grab.	" " "	69.6	0.20					
L918	4'N; .65'W	Grab.	" " "	63.0	0.22					
L928	12S; 3.75'W	10 Ft.	" " "	64.1	0.23					

Average value outcropping weathered magnetite and haematite HCl. Sol. Fe. 66.03%
TiO_2 0.37%

Sample L903 represents primary ore that has undergone a minimum of oxidation; the iron value of 55.8% is high but equivalent to narrow lenses of high grade material encountered in bore holes at Savage River. The TiO_2 value of 0.35% is less than the average for weathered material, but this can be attributed to local variations common to these deposits that cannot be averaged except by a much more detailed sampling programme than was carried out.

II. Banded Magnetite Deposits

To the east of the previously described magnetite deposits at Rocky River occurs a zone 200 to 300 feet in width of distinctly banded green chlorite-schists containing appreciable quantities of magnetite, pyrite and quartz. Surface alteration to haematite is common and these appear to be the magnetite-haematite bodies mentioned by Reid in his report. Bordering this zone are chlorite-schists with only minor amounts of magnetite and quartz, but often extensively pyritic.

The texture and mineral assemblage of these rocks are interesting in that they exhibit many features foreign to the typical Savage River type iron ore normally found in this area. In the hand specimen, although undoubtedly derived from basic material, these rocks show extreme alteration from the "normal" amphibolites being typically a banded schist composed of "chlorite", quartz, magnetite and pyrite generally present in that order and characterised by -

(i) The relative abundance of quartz;

(ii) Rarity or absence of amphiboles (hornblende or actinolite) epidote and talc;

(iii) The banded structure, previously mentioned, in which the various minerals (with the exception of pyrite which occurs as disseminated grains, sometimes in irregular bands) occur in the form of layers, lenticular in part, 1-5 m.m. thick and controlled by schistosity. Iron rich members, the apparent cause of the Rocky River aero-magnetic anomaly, occur throughout this zone, generally less than 4 feet wide and in which the magnetite seems to occur at the expense of chlorite minerals.

Due to the extreme paucity of adequate exposures of this material (boundaries shown on Plan No. T687 should be considered as approximate only) an accurate assessment of grade and quantity is impossible at this stage; however, it would appear that the iron rich portion of these schists, which coincides with the centre of the aeromagnetic anomaly, is of the order of 2,000 feet by 200 feet and that HCl. Sol. Fe. values over this zone would be approximately 15% although locally developed higher values are present. Although sufficient to cause the magnetic anomaly this material would not approach "ore" grade. TiO_2 values seem to be in no way different from the Savage River type magnetite.

Sample No.	Location	Width	Description	HCl. Sol. Fe. %	TiO_2 %	SiO_2 %	Mn %	P_2O_5 %	S. %	Al_2O_3 %
L913	CL; 15E	4 Ft.	Banded, Siliceous Mag. and Haem.	52.3	0.02					
L922	36S; 8.20W	Grab.	" " " + Pyrite	43.6	Nil					
L924	41S; 10.50W	10 Ft.	Chlorite-Magnetite, Pyr-Quartz Schist	28.8	1.10					
L926	Cr. Bed Near 20S; 2½E	25 Ft.	" " "	16.6	1.67					
L927	Adjoin. L926	15 Ft.	" " " Iron Rich	32.8	0.44	37.9	0.19	0.13	0.61	4.39

Sample L926 probably approaches closest to an average HCl. Sol. Fe. value for these rocks, the other samples representing iron rich members of limited width.

Average TiO_2 content = 0.65%.

B. PARADISE, MERIDETH RIVERS, ETC., IRON DEPOSITS

These deposits, due to inaccessibility, were not studied in the field during the investigation of the Rocky River deposits. However, as mentioned previously, after consideration of the aeromagnetic results, correlation with the results of the Rocky River survey and careful re-examination of Reid's Report (Appendix B), it is felt that at this stage, they are not worthy of further investigation, for the following reasons -

(i) The largest deposit , in this southern part of the area, i.e. Merideth River, is described by Reid as 30 feet of magnetite, of high grade, but obviously too small to be of interest. Bordering this is 300 feet of "haematite" iron (Reid's usage of the term) but this would be of very low grade material, similar to the banded chlorite-magnetite (+haematite) schists at Rocky River.

(ii) Very low anomalies over all deposits with the exception of Merideth River, were produced during the aeromagnetic survey.

(iii) Previous reports do not indicate any large widths of high grade magnetite, in contrast to the low grade "haematite" deposits, anywhere south of Rocky River.

Relevant portions of A. MacIntosh Reid's Report on the various mining properties in this area, plus assay results, which are apparently of selected speciments only, are appended to this report.

C. OTHER MINERAL OCCURRENCES

Although previous reporters record the presence of copper, nickel, cobalt and gold minerals in the area, generally associated with the magnetic deposits, these have never proved to be of economic significance and no indication of concentrations sufficient to be of interest were noted during recent examinations. Gold placers were worked in the area early in the history of the field but were not extensive.

Pyrite is very common throughout the area, either associated with the iron minerals or in otherwise barren chlorite schists. Occurrences up to 40% pyrite were commonly observed but at no place was economic mineralisation present. Sample L923 from 36S; 6.20W of chlorite-schist carrying about 30% pyrite assayed "nil" gold and copper.

CONCLUSIONS AND RECOMMENDATIONS

As a result of this survey estimates have been given, admittedly within fairly broad limits, of the surface extent and grade of the Rocky River and associated iron deposits. Also, after analysis of results, examination of existing underground workings and preliminary geophysical surveys, it can be stated that it is unlikely that further sub-surface exploration, i.e. diamond drilling, would indicate deposits of greater size or better grade than are visable at the surface.

Results are not encouraging, the "normal" Savage River type magnetite deposits are very small and the more extensive banded magnetite-rich chlorite-schists are of sub-ore grade and, therefore, coupled with the extreme inaccessibility of the deposits, are of little immediate interest.

Many assays quoted in this report are possibly some-what misleading as they represent, unless described as of a definite width, grab samples which always tend to illustrate the grade of "richer" ore specimens. These, therefore, should be referred to as illustrative only of the "high" grade occurrences and especially in the case of the banded chlorite-magnetite-quartz-pyrite schists (haematite ores of Reid) the lower values taken over finite widths (e.g. sample L926) would more nearly approach an average for the deposits as a whole.

The writer, therefore, does not recommend, at this stage, any further investigation of the Rocky River, Paradise River, Merideth River, etc., iron deposits.

W. J. ATKINSON,
GEOLOGIST.

Waratah, Tas..

30th June, 1960.

REFERENCES

Hughes T. D. 1957	Report on the Savage River Iron Deposits. Department of Mines Report.
Reid A. MacIntosh 1924	Preliminary Report on the Occurrence of Iron Ore at Merideth, Paradise, Rocky and Whyte Rivers. Department of Mines Unpublished Report.
Scott J. B. 1926	Report on Brown and Little Plains Rocky River District. Department of Mines Unpublished Report.
Spry A. H. 1958	Geological Reconnaissance Report Zeehan-Stringer Creek area, Pieman Development. H.E.C. Unpublished Report.
Twelvetrees W. H. and Reid A. MacIntosh 1919	Iron Ore Deposits of Tasmania. Geo. Surv. Min. Res. No. 6.

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APPENDIX B.

Extract From Report

by

Reid A. MacIntosh, 1924

PRELIMINARY REPORT
ON
THE OCCURRENCE OF IRON ORE
AT
MEREDITH, PARADISE, ROCKY, AND WHYTE RIVERS

(Pages 8, 10, 11, 12, 13 only)

TABLE OF ANALYSES NO. 2. Appendix B.

Number	Locality	Nature of	Iron Ferrous Oxide	Iron Ferric Oxide	Silica	Alumina	Manganese Oxide	Titania	Chromic Oxide	Lime	Magnesia	Phosphoric Acid	Iron Sulphide	Loss on Ignition
381	Nolan Creek	Magnetite and Limonite	13.58	78.66	2.40	3.31	-	0.40	-	-	Trace	Trace	0.068	1.40
382	Nolan Creek	Magnetite and limonite	22.57	64.47	8.80	3.18	-	0.30	Trace	-	Trace	Trace	0.054	
384	Meredith River	Magnetite	10.32	87.52	1.00	2.54	-	Trace	-	-	Trace	-	0.027	
385	Paradise River	Hematite			15.40	2.91	-	Trace	-	-	Trace	-	0.74	
386	Paradise River	Hematite	7.20	70.21	21.08	1.78	-	Trace	-	-	Trace	-	0.12	
387	Rocky River	Magnetite	16.20	53.85	22.24	5.22	-	-	-	-	-	0.03	3.33	
388	Rocky River Association	Magnetite and Limonite	17.22	71.75	2.68	6.04	-	-	-	-	-	Trace	0.91	
393	Cataract Creek	Hematite	10.28	54.34	29.36	4.74	-	-	-	-	-	Trace	2.58	

Appendix B.

THE MINING PROPERTIES.

AREA ETC..

Two areas on the Iron Belt are now held under lease from the Crown by J. T. Wynne and S. Coundon. The northern one is known as the Rocky River area and comprises two 40-acre sections; the southern or Paradise-Meredith area comprises eight 80acre sections and is separated from the other by two miles of unleased land.

These sections enclose a group leased many years ago for gold but long since abandoned. During the period of early operations a large area was cleared of forest and thereby made easy of access. Now it is covered with very dense scrub, more difficult to penetrate than the original forest, and the tracks, completely overgrown, are impassable.

LEASE 9111M, 80 ACRES.

MEREDITH RIVER DEPOSIT.

In the valley of Meredith River four miles east of its debouchure, a body of iron ore 300 feet in width is exposed to a depth of 100 feet. It extends beyond the southern boundary of the section; northward it is well exposed in Duffer Creek and crops out again on a high hill farther on.

The ore consists chiefly of hematite (derived from pyrite) and subordinately of magnetite. Associated with it are pyrite, pyribotite and chalcopyrite in small proportions, with also a little gold and silver. As a rule the ore is compact and hard, fine in grain, and very massive. Magnetite, 30 feet in width, occupies a position in the centre of the ore-body and apparently is of high quality and free of pyrite.

The deposits, especially the hematite, are conformable to the enclosing igneous schists which have a north-easterly trend and dip south easterly at a high angle. It is seen that the hematite, limonite and pyrite components exhibit the structure of the rock in which they are contained, but the respective crystals show no sign of deformation and are otherwise unaffected.

How far this lenticular body extends it is impossible to tell. It has been traced nearly 1,000 feet, and the magnetite portion nearly 500 feet. An adit has been driven northward from the bank of the river in the hematite portion of the body. In the adit the rock is quite soft and is not wholly replaced by hematite. As an ore of iron it is of no value. The massive ore on the west side of it consists largely of magnetite and stands out in bold crags 100 feet above river level. This constitutes the valuable section of the deposit. An idea of its average content may be formed by reference to the tables of analyses.

LEASE 9112M, 80 ACRES.

DUFFER CREEK DEPOSIT.

This is evidently the northern continuation of the Meredith River lens the nature of which it so closely resembles. In the bed of the creek hematite in massive blocks occurs, part of it of high quality, part poor and contaminated by quartz and pyrite. Magnetite does not show out prominently here, but it may be in a larger body than it appears. Here, as in every other occurrence on the line of lode, the data available relating to the dimensions and quality of the ore is very scanty, and quite insufficient to form an opinion nor even hazard a guess as to the value of the deposit.

LEASE 9113M, 80 ACRES.

FINLAY CREEK DEPOSIT.

North-westward of the Meredith lens of ore in the valley of Finlay Creek a parallel body of hematite is exposed. The outcrop is marked by many very large boulders of hematite and by a water-fall of fifteen feet in the creek bed. This lens appears to peter out at the creek for no ore can be seen on the north side. The actual dimensions of this ore-body are impossible of determination until developmental works have laid bare the unbroken lode. In consequence of this no attempt was made to ascertain the quality of the ore nor of the quantity available.

LEASE 9114M, 80 ACRES.

Near the southern boundary of this lease a shaft was sunk 20 feet in soft pyritic schist for gold. No iron oxide ore occurs there, but further northward in the bed of Tandy Creek large boulders of limonite are found. The source of the boulders is evidently near at hand as the lode lies only a few chains east of the track.

On the ridge south of Tandy Creek the lode is completely covered with soft clay.

LEASE 9115M, 80 ACRES.

SOUTH BRANCH DEPOSIT.

This body shows in the creek bed as thin bands of pyrite and hematite four to six inches wide. Sixty feet above creek level and on the north side the ore-body widens to 12 feet and 70 feet higher it is 16 feet in width. At this point the body consists of a band of clean magnetite encased in hematite and limonite. Near the sides of the deposit the ore consists of alternate bands, $\frac{1}{8}$ inch thick, of hematite and pyrite with a fairly high proportion of quartz. Pyrite occurs as Kernals in large blocks of hematite, and even in magnetite it is occasionally found. The outcrop can be traced 200 feet farther northward, whence the lode dips beneath the clay soil and is not seen at any other point on the hill.

LEASE 9116M, 80 ACRES.

No ore of any kind has been uncovered on this property, nor has an attempt been made by exploratory works to discover any.

LEASE 9117M, 80 ACRES.

PARADISE RIVER DEPOSIT.

A very large body of ore 200 feet in width showing replacement of schist by pyrite and its ultimate or part transformation into hematite occurs in the valley of Paradise River. The ore being of replacement formation conforms in strike and dip to the containing country rock which here trends 14 degrees east of north and dips at 55 degrees to the eastward. Magnetite is entirely absent, and very little high grade hematite is seen, the ore consisting of pyrite, hematite, and quartz in banded formation. A striking feature is the close banding of hematite and pyrite which tends to suggest that the hematite here is not an oxidation product of pyrite, but of independent deposition and contemporaneous with it and the accompanying quartz. There is evidence of intense silicification in the containing schists. This quartz should not be confused with the earlier development exemplified by the veins of quartz which may be seen ramifying through the schists at every point of exposure. The ore-body stands out prominently in the form of cliffs rising upwards of 200 feet above the valley floor.

From the foregoing it will be seen that as a source of iron ore the lode is valueless at this point. It is interesting to record that over 1,000 ounces of coarse gold was obtained from the river bed a few chains down stream.

CAMP PROSPECT.

At the camp site near the northern boundary of this section a few large boulders of hematite-magnetite ore project through the clay soil. This may prove to be directly connected with the Paradise River lens which however has not been traced far along its course. The boulders when broken show typical steel-grained magnetite altering to hematite and limonite. The dimensions of this lens cannot be determined until it has been exposed by exploratory works.

LEASE 9118M, 80 ACRES.

Neither hematite nor magnetite has been found on this section. Some years ago a shallow trench was cut into the ore-body and fairly rich gold-bearing pyrite and chalcopyrites was revealed, but no other exploratory works have been performed.

LEASE 9109M, 40 ACRES.

CATARACT CREEK DEPOSIT.

A few chains down stream from the eastern

boundary of this section the lode is marked by many large boulders of hematite and smaller boulders of magnetite. The ore could not be seen in place because it is covered with boulders in the stream bed and clay on the banks. In every respect it resembles the ore of this class found in other deposits and is gold-bearing. The proportion of magnetite is small at this point. Pyrite and quartz accompany the hematite and take away its value as an ore of iron. This stream has been worked up to the lode for gold.

LEASE 9110M, 40 ACRES.

ROCKY RIVER DEPOSIT.

At the Rocky River Mine, situated in the angle formed by the junction of Whyte and Rocky Rivers, extensive underground workings have been cut into a large body of magnetite. These workings were not accessible at the time of the recent investigations. From old records it is found that they consist of an adit driven from the bank of Whyte River a distance of 800 feet in a direction 12 degrees east of south, and several crosscuts from the adit driven at intervals to determine the extent and nature of the ore-body at particular points. These works, over 200 feet below the outcrop, show it to be a lenticular mass of magnetite, attaining a maximum width of 30 feet, and coinciding in strike and dip with the schists.

Nearby is a very large body of fresh gabbro which almost invariably accompanies the massive bodies of magnetite. In the accessible part of the adit clean talc has been developed in the schists and other metamorphic effects are much in evidence. Associated minerals are ores of copper, barium, nickel and cobalt, with also asbestos, gold and silver--none, however, in payable quantity. The magnetite ore, to be seen in the dumps near the entrance of the tunnel, contains a rather high proportion of pyrite and other impurities. Ore of that nature is of no value for the purpose in view, but according to earlier reports the magnetite body cut in the west crosscut is of higher quality and almost free of pyrite. It is interesting to note that the water flowing from this adit contains only traces of iron in solution, thereby indicating a low pyrite content.

Another long adit has been driven east of and higher than main adit in massive gabbro. An examination of the material on the dump shows that no ore was intersected in this opening.

About 200 feet west of the entrance to main adit a shaft has been sunk to a depth of 40 feet in quartz schist. This is outside the magnetite zone.

NOLAN CREEK OUTCROP

At the head of a very small creek flowing into Rocky River a large body of magnetite occupies the summit of a well-defined ridge 200 feet above river level. This ore-body is 30 feet wide and as it appears to form the southern part of the lens cut in main adit, it is one of very considerable importance. It occurs in decomposed non-schistose gabbro which in its altered condition is a soft yellowish-white rock with the component minerals

easily distinguishable. The ultimate decomposition product of this rock is the deep yellow clay found at all points on the line of lode.

The magnetite is generally compact and hard, but alteration to hematite and limonite is conspicuous on weathered surfaces. Quartz and pyrite, apparently, are absent. Barytes is reported as occurring in the neighbouring schists.

ROCKY RIVER ASSOCIATION MINE.

A body of altered magnetite outcrops on the north bank of Rocky River about 450 feet above its junction with Whyte River. An adit, now caved at the entrance, has been driven northerly on the course of the ore-body from the river bank. At this point 8 feet width of ore has been exposed by the removal of the vegetable and soil cover. Its other dimensions could not be obtained.

The magnetite is much altered, the ore now consisting largely of limonite.

The Rocky River group of iron ore deposits is easily accessible from Corinna. Many years ago an engineer named Studholme in the employ of the Rocky River Company surveyed the route of a railway from Corinna along the north bank of Whyte River to the mine. The distance was found to be seven miles, the grades easy, and no serious obstacles to railway construction were passed on the way. A railway along this route would serve also the Graham Creek area.

CONCLUDING REMARKS.

The examination of this area shows that a large number of lenticular bodies of iron ore, many in association with others of a sulphidic nature, are distributed through a basic igneous member of the Pre-Cambrian schist formation. It is found also that ore is exposed at every point where this belt is intersected by streams, that is, at the weakest places. As magnetite is a stable mineral and, in massive formation, strongly resistant to erosion it is justificable to assume that the more important bodies occur in the interstream sections. The ridges are so thickly covered with vegetation and the clay decomposition product of the containing schists that the ore-bodies in these sections of the belt are almost completely concealed. It is significant that where outcrops do occur in the ridges magnetite is more prominent than hematite or pyrite and appears to be in massive form indicating that the trenched portions are near the ends of lenses. But as no artificial openings have been made into the ore-bodies at these points to test their extent and value, it is idle to speculate on possibilities. The remarks contained in this report with reference to the untrenched parts of the ore-bodies are accordingly indefinite and inconclusive.

The conditions under which the examination was performed were unsatisfactory to the investigator and to the lessees of the properties. A true estimation

of value cannot be made until the interstream sections of the lodes have been intersected by bores ore by mine openings.

(Sgd.) A. McIntosh Reid,
GOVT. GEOLOGIST.

Mines Department,
Hobart.

13th June, 1924.

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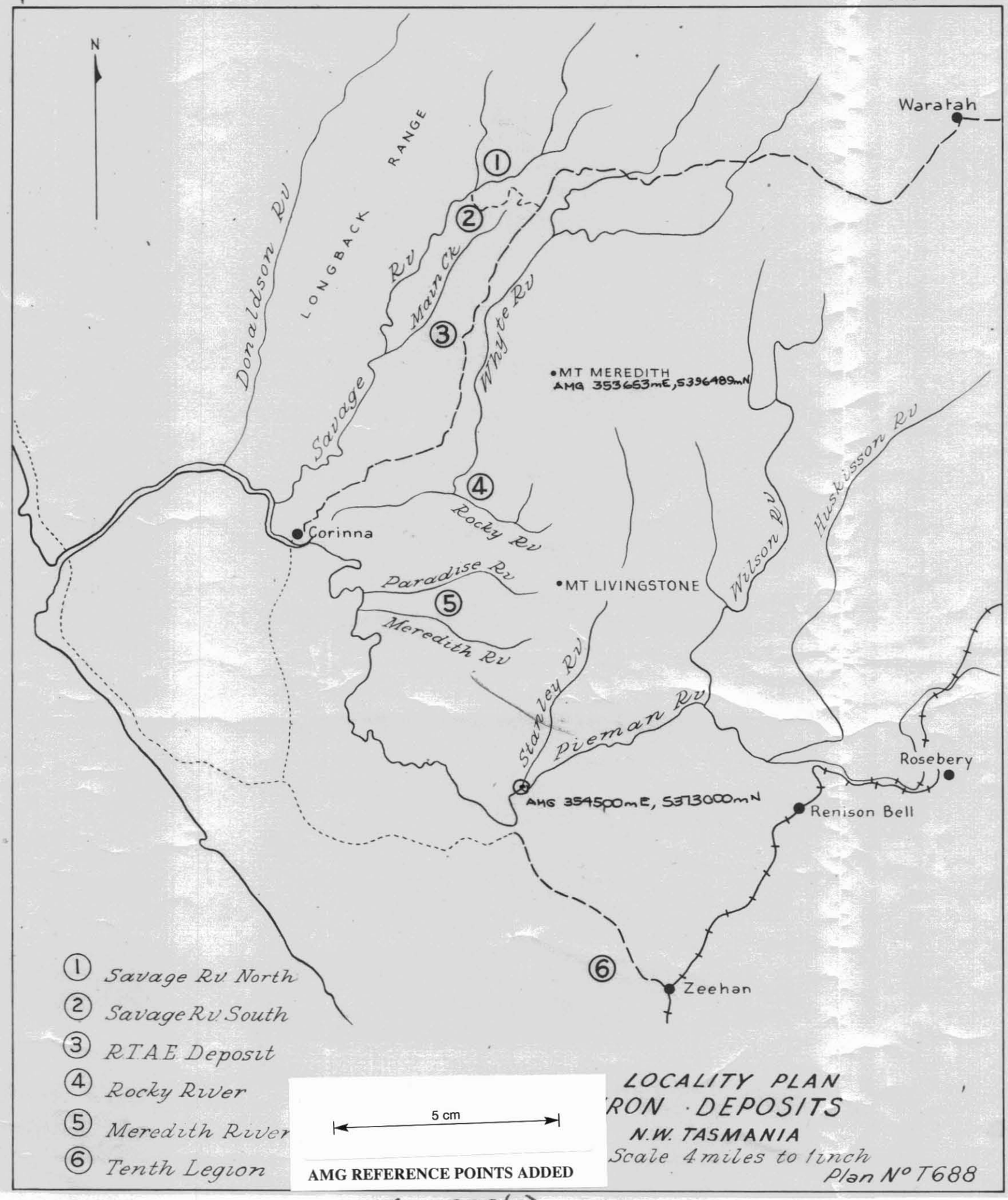

AMG REFERENCE POINTS ADDED

LOCALITY PLAN
IRON DEPOSITS
N.W. TASMANIA
Scale 4 miles to 1 inch
Plan No T688

60-300(2)

328024

REFERENCE

Costean

Shaft or Pit

Old workings (alluvial Au).

Strike & dip of bedding

Strike & dip of schistosity

Sample position - value HCl sol Fe and width. If width not shown, assume to be grab sample. Fe 47·1 TiO_2 1·43 10'

Approximate position of Aeromagnetic contours (interval 1000γ) Adastra Survey. Contour shape and position are distorted due to inaccuracy of grid and topography of map. 7000

N

Camp
Whyte
Cage
Au
graph. chl. sch. & slates
Lode 2
Fe 64·4 TiO_2 0·27 2'
Lode 3
Fe 68 TiO_2 0·36 3'
Fe 55·8 TiO_2 0·35
Adit
gabbro amphibolite
pyr
River
gabbro
gabbro amphibolite
Water Rock
Fe 63·0 TiO_2 0·22
Fe 65·6 TiO_2 0·24 20'
Fe 66·3 TiO_2 0·46
Scree
pit
quartzite
Fe 69·6 TiO_2 0·20
quartz-sericite schists
iron boulders
quartz
soil cover extensive
Fe 64·1 TiO_2 0·23 10'
Old Cage Crossing
Cliffs
Fe 16·6 TiO_2 1·67 25'
Waterfall
Fe 32·8 TiO_2 0·44 15'
Scree
Boundary indistinct
Approximate Boundary
Rocky River
Water
Fe 43·6 TiO_2 Nil Au Cu Nil
scree
cliff
% Hematite boulders
graphitic-schist
Gabbro
Fe 28·8 TiO_2 1·10 10'
chlorite schist may be of sed. origin
pyr pyrrh chalco.
chlorite schist only very small amounts magnetite, pyrite and quartz.
intercalations of sed. quartz-mica-schists in chl.-amph.-sch.
Fe 52·3 TiO_2 0·02 4'
quartz veins
hidden
floaters
chlorite-schist highly pyritic
Boundary generally
Iron content decreasing northward
Boundary position Approximate
Iron content decreases to south
9000
8000
7000

R.L. 527
R.L. 451
R.L. 691
R.L. 537
R.L. 574
R.L. 464
R.L. 284
R.L. 110
R.L. 371
R.L. 484
R.L. 339
R.L. 303
R.L. 317
R.L. 317
R.L. 261
R.L. 506
R.L. 601
R.L. 526

40N
36N
32N
28N
26N
24N
20N
17N
14N
12N
8N
7N
4N
4S
8S
12S
16S
20S
24S
28S
32S
36S

BASELINE

magnetite floaters
iron boulders
gabbro amphibolite
serp-chl-actinolite sch.
iron floaters
gabbro amphibolite

LEGEND

Weathered outcrop, massive, granular, magnetite iron ore (Savage River type) Pyritic and talcose when fresh.

2 — Fine grained green massive amphibolites, gabbro-amphibolites, amphibolite-schists, partially chloritised and serpentinised but original textures often still apparent. Host rock to Savage River type magnetite.

3 — Prominantly banded, chlorite-quartz-magnetite-pyrite-schists and basic chlorite-schists. (Hematite ores of Reid, contain appreciable quantities of hematite at surface.). Individual small bands contain up to 80% magnetite but overall iron content is small.

4 — Chlorite-schists, chlorite-quartz (porphyroblastic in part)-schists, often highly pyritic, very minor amounts of magnetite. Basic igneous origin obscured by intense alteration and shearing. Host rock to 3 merges into 2 in south of area.

5 — Quartz-schists, quartz-sericite-schists, talc-schists, quartzites and graphitic-schists and slates of sedimentary origin.

5 cm

RIO TINTO AUSTRALIAN EXPLORATION PTY. LIMITED.

GEOLOGICAL PLAN

ROCKY RIVER IRON DEPOSITS

N.W. TASMANIA

SCALE: 400FT TO 1 INCH

W.J. ATKINSON — PRP 7/100/1 — APRIL 1960 — T687

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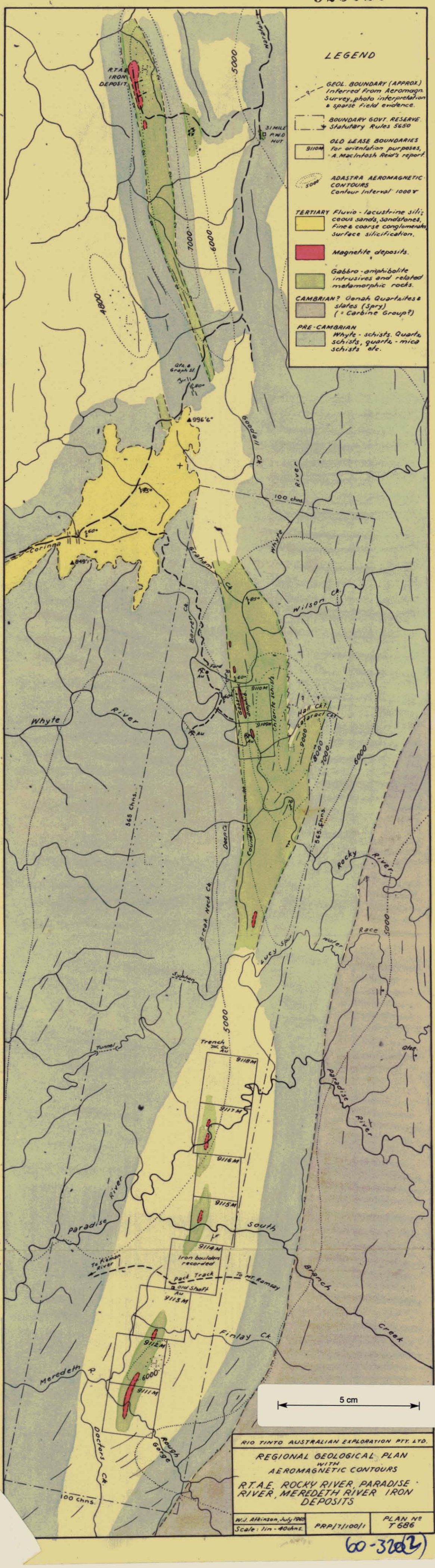

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