

NOTES ON THE RIO TINTO IRON DEPOSITS

The following notes summarise the available information:-

The first report was made in 1903 by W.H. Twelvetrees the then Government Geologist.

The Rio Tinto lodes consist of lenses of magnetite, hematite and pyrrhotite encased in hornblendic and serpentinitous schist, which forms a belt of considerable width (over half a mile) striking a little west of north. It extends four or five miles north of the Savage River, and ten miles south of it to the Rocky River district. At intervals all along this line, deposits of magnetic iron ores and copper pyrites occur, accompanied by characteristic minerals (nickels, cobalt, talc, tremolite, asbestos, dolomite etc.) which point to the action of identical mineralising agents throughout the belt.

The lode was originally discovered by Surveyor-General Sprent. Subsequently a little prospecting was carried on by two associations, one of which, the Huzzar Gold Mining Company, began work on the north side of the Savage River, and the other, the Savage River silver-prospecting Company operated on the south bank.

The Huzzar-Company, either wholly or in part, drove two tunnels at about 15 feet above the river, nearly half a mile below the Savage River bridge. They were driven northerly and are closely parallel about 30 feet apart. One (No.2) follows the eastern wall of formation for about 100 feet, the other, the western tunnel, (No. 1) is driven 180 feet. From No.2 a crosscut has been driven 40 feet north westerly towards No.1 in lode material all the way (magnetic iron ore, iron and copper pyrites with a little asbestos).

The whole lode as exposed in the north bank, together with intercalculated schists, is approximately 300 feet wide and forms a bold ridge over 700 feet high, cleft by the Savage River.

The Savage River Company began work south of the river, early in 1891, driving a crosscut to intersect the lode at a depth of 400 feet. Auriferous lodestuff was met with after fifty feet of driving and the Company published the assay results as follows:-

- No.1 8 dwts, 20 grs. Gold; 4 ozs. 4 dwts. Silver; 22.25%
Copper.
- No.2 Iron pyrites containing 1 oz. 19 dwts. Gold; 5 oz. Silver
(certainly not representative samples)

The Rio Tinto Company, No Liability, was formed in 1895 and began work in 1896, continuing operations for about two years. Altogether 1550 feet had been driven, 1400 feet of which was on lode material. The conclusion was reached that it was necessary to sink to test the value of the unleached portions of the various deposits. By this time most of the capital had been expended and it was decided to close the mine pending construction of the road etc. and the introduction of the necessary fresh capital. Since then no further work has been done.

A No.2 or eastern lode is about one quarter of a mile east of the main lode. An adit has been driven on it but could not be examined owing to it having collapsed.

The nature of such large deposits renders sampling very difficult and misleading. It would be necessary to get average samples of the portions intended to be worked. No payable portions of any size have been discovered; numerous assays obtained by the Company serve to indicate the possibilities rather than the value of the lode worked.

The following assays were supplied by the Chairman of the Rio Tinto Mining Company:-

- (1) No.1 lode in No.4 adit, a vein of chalcopryite: gold, 2 dwts. 6 grs; silver, a trace; copper 29 per cent.
- (2) No.2 lode, gossan with pyrites, assayed every three feet; gold, from trace to 2 dwts. 12 grs; silver, traces.
- (3) No.1 lode in Adit No.4 169 feet of lode-matter, assayed every two feet; gold, from traces to 1 dwt. 7 grs; silver, from traces to 6 dwt. 12 grs.

These large deposits have not been sufficiently studied to be able to determine how much of the iron oxide is the result of oxidation of pyrites, but Twelvetrees believed it to be a comparatively small proportion. Sulphidic ores are associated with the oxides, intimately mixed and veining its mass.

In 1919, A. McIntosh Reid, the then Assistant Government Geologist, reported on the area and the following summarises his views where supplementing and differing from those expressed by Twelvetrees.

The ore consists chiefly of magnetite and subordinately of hematite. Associated with some of the deposits are small quantities of pyrites, pyrrhotite, chalcopryite and ores of nickel and cobalt, with also a little gold and silver. No trace of sulphidic minerals, however, has been observed at the outcrops, and they do not appear to become prominent within 200 feet of the surface. Moreover, they do not occur intimately admixed with the magnetite in the main ore bodies, but they are found in separate bands adjacent thereto.

The deposits are in great part steeply inclined and are conformable to the schists; while the ore, especially the hematite and limonite components thereof, exhibits the structure of the enclosing rock. In some lenses hematite is the dominant mineral, and magnetite is in unimportant amount; but, generally the ore almost exclusively consists of magnetite. Sulphuric minerals increase with depth, and effect the schistose appearance of the country-rock.

The length of the largest lens is 2000 feet, and the width about 100 feet. Others extend along the strike 1500 feet for over 400 feet along the dip, and are from 40 to 60 feet thick.

No.1 ore-body is a lenticular mass of magnetite outcropping on Section 4502/M in conspicuous crags overlooking Magnetite Creek. It courses a little east of north for about 800 feet north of the creek and has a massive outcrop 50 feet wide.

The main lens of the No.2 group is a very massive body of ore extending almost unbroken a distance of 2000 ft. It is 450 feet above the Savage River Valley and rises up the steep ridge southward to 1100 feet showing clean magnetite and hematite all the way. The width of this ore-body varies. Detrital material covers the hill slopes for about 200 feet; but actual width is approximately 40 to 60 feet.

Another small lens occurs on the west side of this ore-body, near its southern extremity; the ore is similar to that in the main ore-body.

South of Webster Creek, east of the northern extremity of the main ore-body, are two parallel lenses of very clean magnetite-hematite ore; their dimensions have not been determined. Pyritic ores have not been detected in any of the deposits already described.

Across a parallel formation, composed largely of semi-oxidised pyrite contained in graphitic-looking serpentinous schist, a tunnel has been driven eastward from the bank for 200 feet. A little gold has been detected in the pyritic ore and also in irregular quartz veinlets in the schist.

Referring to the ore-body exposed in adits, Nos. 1 and 2 (Twelvetees) Reid states the magnetite usually occurs in distinct bands 10 to 20 feet thick, but in parts it is seamed with veinlets of pyrite and other sulphidic ores. Here hematite blocks were found with cores of fine-grained pyrite: the magnetite, however, is primary and anterior to the pyrite. Later cross-fractures, dipping south easterly at 45° in the sulphidic ore-body are filled with dense pyrite.

On the other side of the river No.3 tunnel was driven south 178 feet through similar material. No.4 half a mile above the confluence of Savage River and Hall's Creek, was driven from the east bank of the latter 172 feet in a south easterly direction. Ore is cut at 147 feet and a few feet farther ahead is a band of chalcopryite. No.2 lode east of No.1, and has an outcrop of hematite and magnetite. A tunnel driven 386 feet along its course shows the lode 17 feet wide, composed of gossan, with native copper and cuprite and much siderite.

Between these two pyritic ore-bodies, 12 chains north of the bridge, another lens (No.3) of clean magnetite is exposed but its extent has not been ascertained.

Ore bodies No. 4 and 5 are the most extensive and richest exposed. No.4 commences $\frac{3}{4}$ mile north of the bridge and extends northwards for about 2000 feet. It is fully 100 feet wide and consists of clean magnetite of an extremely dense texture.

No.5 ore-body is of equal quality, and is perhaps even greater than No.4 from which it is separated by a band of schist 200 feet wide. It lies eastward of No.4 and follows the ridge northward for 1500 feet and southward into Savage River Valley. The western fall of the hill to Hall's Creek slopes at a very high angle, exposing a very long face of massive magnetite.

North of this outcrop basalt occupies the surface, but 30 chains north another outcrop is exposed and is of considerable extent, essentially similar in composition and nature to those already described.

The average of 17 samples indicates the composition of the ore:-

Iron.....	67.23 per cent		
Manganese Dioxide.....	2.37 " "	present in one	sample only.
Titanic Oxide.....	Trace	Present in one	sample only
Silica	.91 per cent	(highest 2.4 %)	
Phosphoric Acid.....	.075 " "	(highest 0.38%)	
Alumina.....	.11 " "	(average for 6	samples in which
		it was present.	
Sulphur.....	.045 " "	(average in first	nine samples. No.
		10 had 3.66% and	absent in remain-
		ing seven samples.	

Under working conditions it is considered that the average grade will not exceed 65 per cent iron.

All samples were taken from surface outcrop. There are no underground openings in the main magnetite ore-bodies, and consequently no means are available for ascertaining their extent and nature at depth.

Although precise estimates could not be made, sufficient information is available to serve as a basis for safe calculation. The quantities have been based on a vertical extent of 300 feet only and care exercised in restricting the superficial dimensions to the outlines of unbroken ore-bodies.

In the following statement no account has been taken of the quantities available from those deposits containing pyritic ore-bodies.- Under these conditions the probable high grade ore amounts to:-

No.1 ore-body	1,100,000 tons
No.2 ore-body	4,000,000 "
Associated ore bodies	1,500,000 "
No.3 ore-body	400,000 "
No.4 ore-body	6,500,000 "
No.5 ore-body	7,000,000 "
	<u>20,500,000 Tons</u>

The fact ~~remains~~ that the Rio Tinto iron field is comparatively difficult of access is the main reason why the deposits have not received more attention.

The Savage River could not be navigated even by small ships for more than a few miles from Pieman River so that as the natural outlet for these deposits is through Corinna, a twenty-five mile railway along the eastern bank of the Savage River would reach the most remote deposits and pass all others on the way. The load is with the grade.

The Pieman River at Corinna is 450 feet wide and 40 feet deep with a tidal rise of 5 feet. A little higher upstream the river widens considerably, providing a splendid swinging basin for vessels of large size. The entrance, eleven miles

from Corinna, is very broad, with large accumulation of sand on the south side. This sandbar extends right up to some rocks which lie right in the fairway - 40 chains beyond the entrance. It is stated that there is 16 feet of water over the bar at low tide.

Australian Iron and Steel Limited hold the only lease in this area - Section 9316/M - 5 acres.

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showed quartzite. The region consists of slates and schists with leached surfaces, and traces of iron in a number of places.

A short shaft was driven to intersect a pyrite lens a few feet west of No. 2 prospects; it consists chiefly of pyrite with a fair proportion of sphalerite, and a little galena. No chalcopyrite was observed.