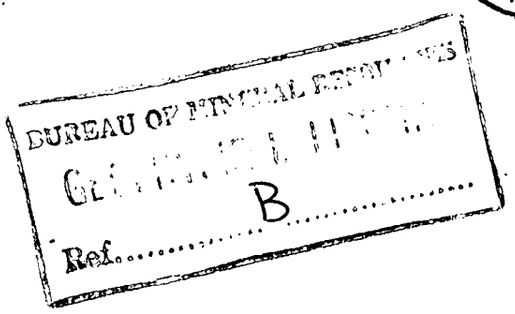
COMMONWEALTH OF AUSTRALIA.

DEPARTMENT OF NATIONAL DEVELOPMENT.

BUREAU OF MINERAL RESOURCES GEOLOGY AND GEOPHYSICS.

RECORDS.

1962/29



IRON ORE OCCURRENCES UNDER INVESTIGATION BY NEVSAM MINING COMPANY PTY.LIMITED, OCTOBER, 1961.

---

by

Peter G.Dunn

IRON ORE OCCURRENCES UNDER INVESTIGATION BY NEVSAM MINING COMPANY PTY. LIMITED - OCTOBER, 1961

by

Peter G. Dunn

RECORDS 1962/29

CONTENTS

PLATES

IRON ORE OCCURRENCES UNDER INVESTIGATION BY NEVSAM MINING COMPANY PTY. LIMITED - OCTOBER, 1961

by

Peter G. Dunn

SUMMARY

Seven areas of iron ore occurrences under investigation by Nevsam Mining Company Pty. Ltd. were examined by the writer. One area contains hematite rubble; three areas are thought to be gossanous lodes; one area contains iron as surface enrichments, banded iron formation, and magnetite schist; and two areas are thought to be surface enrichments, although one of these last two may be a sedimentary hematite deposit.

Little exploratory work has been done except on part of the rubble occurrence, and it is not possible to give any estimates of tonnage or grade except for part of the rubble area, where there may be between 30,000 and 40,000 tons of ferruginous material per vertical foot. The depth is not known, but it is probably not much greater than ten feet.

The rest of the rubble area, the three gossanous areas, and the possible sedimentary hematite deposit all warrant some exploratory work.

INTRODUCTION

From October 11th to 17th, 1961, the writer examined six iron ore occurrences that are at present being investigated by Nevsam Mining Company Pty. Ltd. Another occurrence, that at Mount Tolmer, was examined on the 25th and 26th of July. Mr. B.D. Brown, the local representative for Nevsam Mining Company Pty. Ltd., accompanied the author in all these examinations.

Although a large area has been prospected by Mr. Brown, very little exploratory work had been done at the time of the inspection, except on one of the rubble areas; hence it is not possible to give any accurate estimates of tonnages and grades.

The locations of the seven different areas are shown on Plate 1. Each of these seven areas will be considered separately.

IRONSTONE RUBBLE OCCURRENCES : HUNDRED OF WATERHOUSE

These occurrences are located immediately south of the Waterhouse Granite, along the Little Finniss River. The area can be reached by following an all-weather road from Batchelor to Banyan Homestead, and a bush track from there to the rubble occurrences. It is approximately seven

miles from Batchelor to Banyan, and then a farther ten miles along the bush track. During most of the wet season a four-wheel drive vehicle could reach the area, and an all-weather road could be constructed fairly easily.

There are two separate occurrences, known as 'Grid 1' and 'Grid 3'. Grid 1 is 20 acres in area and is part of mineral claim 51B; Grid 3 consists of four mineral claims, numbers 57B to 60B inclusive, of 40 acres each. Mr. Brown hopes to treat the rubble by removing the fines and the slate and quartz fragments, leaving only hematite. He stated that the lower cost of mining would offset the cost of up-grading, but he was unable to give details of the proposed up-grading technique.

Grid 1 consists of hematite rubble that has developed in place over a zone of thinly-bedded iron-rich slates that include lenses of solid hematite. Weathering and subsequent erosion have removed much of the slate and quartz, leaving a concentration of hematite pebbles. These range in size from material too fine to use as iron ore to boulders one foot or more in diameter. The individual pebbles are high grade iron ore.

Pits and auger holes dug in the area have exposed approximately 800,000 square feet of rubble. The minimum depth of rubble over the entire area is probably about six feet. A few pits, however, have been dug ten feet deep, and they are still in rubble. The bottom of the rubble has not been determined anywhere in the area.

A sample of the better-quality rubble, estimated to contain at least 90% hematite, weighed approximately 175 pounds per cubic foot before it was screened to remove the fines. Screening removed nearly one third of the material, leaving 128 pounds of material from the cubic foot of unscreened material. Therefore nearly 20 cubic feet of unscreened rubble are required to make one ton of screened material suitable for treatment in the up-grading plant. Grid 1 would therefore contain approximately 40,000 tons of screened material per vertical foot. Removal of quartz and slate during the up-grading process will reduce this further, so the actual tonnage in Grid 1 is probably somewhere between 30,000 and 40,000 tons per vertical foot.

Grid 3 is about one half mile farther south along the Little Finniss River. The entire 160 acres is on a river flat with almost no outcrops. Part of the area contains some hematite rubble, but the proportion of quartz and slate is higher than at Grid 1. Only a few pits had been dug at the time of the inspection, so that the areal extent and the average depth of the rubble could not be determined.

Some of the pits on Grid 3 exposed a band of phyllite nearly 100 feet wide. There is some malachite disseminated through this phyllite, and the area should be investigated for copper as well as iron.

BEETSON DEPOSIT

This comprises nine claims, mineral claims 61B to 69B, of 40 acres each, situated less than a half mile west of the railroad, about 30 miles south of Darwin. The deposit can be reached by following the Stuart Highway to the 35-mile peg; then along the all-weather road to the R.A.A.F. quarry at the Darwin River; and then across the Darwin River and south along the railroad for about three miles. During the wet season the Darwin River could only be crossed on the railroad bridge, and the track along the railroad south of the river would be impassable for part of the wet season.

The nine claims form a square with sides three quarters of a mile long. A low ridge striking at 20°, and about 2,200 feet long, and 100 feet wide, crosses the central leases. Outcrops are rare, and the ridge is not continuous.

The material in the outcrops consists mostly of hematite and goethite, with abundant quartz, and it is thought to be part of a lode or lodes. The quartz occurs as angular fragments, some as much as one inch long, and as rounded grains with a diameter approximately 1/32 of an inch. Some of the hematite contains boxwork, Owing to poor exposures, it was not possible to determine whether the ridge is formed by a single hematite lode or by several en echelon lodes. The actual width of the lode or lodes is also unknown. The material seems to be too low grade to be classed as iron ore at this time, but testing of the deposit is recommended.

Extensive areas of hematite rubble exist on the claims east of the low ridge. The diameter of most of the hematite pebbles are between ¼ inch and one inch. The depth of the rubble is unknown. There is less rubble in the western side of the ridge.

DARWIN RIVER : BRODRIBB AREA

There are three claims in this area, each of 40 acres. Two of them, mineral claims 70B and 71B, adjoin; the third mineral claim is 72B and is approximately three miles east of the other two. 70B and 71B can be reached by following the Stuart Highway to the 35-mile peg; then about 11 miles along the all-weather road to the R.A.A.F. quarry; and then east across the railroad 200 yards to the claims. These would be accessible for the entire year. The third claim is 3.2 miles east along the Brodribb track from the railroad, and would be inaccessible to vehicles for part of the wet season.

The first two claims include a ridge approximately 1,600 feet long striking at 280°. It is made up primarily of vertically dipping slates or dipping between 60°N and 60°S. A band of quartz-hematite gossan is parallel to the slates, and apparently extends the length of the ridge. From the western end of the ridge for about 400 feet the gossan is about 20 feet wide; for the rest of its length it is much

narrower. It is unlikely that this ridge contains an economic deposit, and no exploration had been done at the time of the inspection.

The third claim, mineral claim 72B, includes another ridge striking at 280° and about 900 feet long. It is a gossan with abundant quartz veins and some fragments of country rock. The gossan is 75 feet wide and possible wider in some places. This ridge might contain a large tonnage, but again costeaning will have to be done to prove the total width of the lode and to determine the grade of the material. It seems likely to be too siliceous to be useful at this time.

MOUNT PAQUALIN DEPOSITS

These deposits are on Authority to Prospect Number 899, and lie near the western boundary of the Burnside Granite, about 5 miles north of Brocks Creek. They can be reached by following south along the railroad from Adelaide River for approximately 22 miles, and then going east for about three miles. No track exists from the railroad to the deposits, and they would be inaccessible during the wet season.

The Mount Paqualin deposits are part of a series of gossans that are conformable with the metasediments and amphibolites that surround the Burnside Granite. This line of gossans extends as discontinuous bodies for at least 20 miles around the western periphery of the Burnside Granite They consist mainly of hematite and limonite, with some chert, slate, and brecciated quartz, and most outcrops show boxwork. They are the oxidation products of rocks rich in sulphides, principally pyrite, and therefore the sulphur content will increase at depth.

Mr. Brown is particularly interested in six separate gossanous bodies in the vicinity of Mount Paqualin, but at the time of the visit no exploration work had been done on any of them. The southern-most one is a ridge above the river flat. It is actually composed of two collinear bodies, one 500 feet long and one 150 feet long, separated by a gap of 150 feet. The greatest exposed width of lode is about 30 feet. The ridge, however, is approximately 200 feet wide and covered with large boulders of the gossan, some of which may be in place and it is possible either that the lode is wider than the 30 feet exposed, or that there are two more parallel lodes separated by country rock. Boulders of slate on the ridge suggest that there are two parallel lodes separated by country rock.

The only other body that warrants any exploration is just north of Mount Paqualin and about one mile north of the southern-most body. It appears to be a continuation of the same line of gossans. This lode is approximately 1,500 feet long and up to 40 feet wide, but contains a greater proportion of slate than the first body.

A small body lies north of this second lode on the same line, but it contains very little ferruginous material. The three other deposits lie north of these three deposits and were not visited. Mr. Brown reports that they are similar to the first three, but not as large as the southern-most deposit.

MOUNT MABEL AREA

This area is on Authority to Prospect Number 858, and lies along the south-western periphery of the Waterhouse Granite. It can be reached along a track that runs to the north-west from the rubble occurrences on the Little Finniss River. The area is inaccessible to vehicles during the wet season.

Iron occurs as hematite in a zone of surface enrichment, as hematite in banded ironstone, and as magnetite in a magnetite schist. The zone of surface enrichment has apparently developed on ferruginous lenses of the Depot Creek Sandstone. There are small patches of high grade hematite, but all the areas seen during this inspection were far too small to warrant exploration.

The banded ironstone has been brecciated and contains angular fragments of quartz several inches long. No attempt was made to estimate the tonnage of this material, as it is regarded as too low-grade to be classed as ore at the present time.

The magnetite grains in the schist are approximately 1/16 of an inch in diameter and make up between ten and thirty per cent of the rock by volume. Because this schist rarely crops out, its total extent could not be determined. It was only seen over a small area, and it is doubtful that it would form an economic deposit.

Mr. Brown stated that the up-grading technique to be used on the rubble occurrences requires a certain amount of magnetite and that he hopes to be able to obtain the necessary magnetite from this schist. He was unable to explain how the magnetite is to be used or how much would be required.

TABLETOP AND FLORENCE CREEK AREAS

These areas are also on Authority to Prospect Number 858, lie west of the Finniss River and are part of a high, gently undulating plateau capped by Depot Creek Sandstone. The areas can be reached either by following a bush track for 20 miles west from Batchelor or by another bush track 10 miles west from the rubble occurrences south of the Waterhouse Granite. The areas are accessible only to four-wheel drive vehicles and only during the dry season.

The plateau extends for about 120 square miles and is partly covered by laterite which has probably developed over ferruginous lenses in the sandstone. The total area of laterite is not known, but is probably about one tenth of the total area of the plateau.

The thickness of the laterite ranges from a few inches to about 30 feet.

The material contains abundant small rounded quartz grains. In a few places almost all of the silica has been leached out, leaving nearly pure iron oxides, but these occurrences are too rare to have any economic significance.

In a few places iron oxide concentrations similar to those in the laterite have been found in structures resembling bands of iron discordant with the sandstone. These occurrences are interpreted as having been formed by secondary concentrations along open vertical fractures in the sandstone.

Although a large tonnage of ferruginous material may occur in these areas, the known occurrences are too low in grade and too scattered to be a practical mining proposition, especially in view of the difficult access. The areas warrant some further prospecting, however, since larger concentrations of higher grade iron ore might be found on the plateau.

MOUNT TOLMER DEPOSIT

This deposit is also on Authority to Prospect Number 858 and lies on the western edge of the Tabletop plateau approximately 24 miles from Batchelor. It can be reached with a four-wheel vehicle from the Waterhouse rubble occurrences, but it would be inaccessible to vehicles during the wet season.

The deposit is a flat-lying body of hematite beneath the Depot Creek Sandstone and above the vertically dipping slates. The hematite was nowhere seen to be thicker than 40 feet, and in most places it is less than 30 feet. The areal extent could not be determined since it lies on a steep hill slope and the sandstone covers most of it.

The ore is high grade, the only visible impurity being approximately ten per cent quartz. This body may be either an original hematite lens deposited over the vertical slates, or a body due to secondary enrichment that has developed on the side of the hill. If it is an original sedimentary deposit it may extend back into the hill, but if it is due to secondary enrichment it will probably be restricted to the side of the hill.

Some further exploration is warranted on this occurrence, but due to the inaccessibility of this area, a very large tonnage would need to be proved before it could be considered.

PLATE I.

IRON ORE INTERESTS OF NEVSAM MINING CO. PTY. LTD.

REFERENCE

(1) Rubble Areas (Waterhouse)
(2) Beetson Deposit
(3) Darwin River-Brodribb Areas
(4) Mt Paqualin
(5) Mt Mabel
(6) Tabletop
(6a) Florence Creek Area
(7) Mt Tolmer

——— Sealed Road
===== Road
- - - - - Vehicle Track

GD129

Bureau of Mineral Resources, Geology and Geophysics. February 1962. To accompany Record No. 1962/29.

D 52/2 EJ