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COMMONWEALTH OF AUSTRALIA.

DEPARTMENT OF NATIONAL DEVELOPMENT.

BUREAU OF MINERAL RESOURCES GEOLOGY AND GEOPHYSICS.

RECORDS:

1964/22

MINOR METALLIFEROUS INVESTIGATIONS.
N.T.RESIDENT GEOLOGICAL SECTION TO DECEMBER, 1963.

MINOR METALLIFEROUS INVESTIGATIONS - N.T. RESIDENT
GEOLOGICAL SECTION TO DECEMBER, 1963.

RECORDS 1964/22.

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MINOR METALLIFEROUS INVESTIGATIONS - N.T. RESIDENT GEOLOGICAL SECTION TO DECEMBER 1963.

GENERAL SUMMARY

This record comprises some of the shorter reports on metalliferous investigations carried out by the staff of Northern Territory Resident Geological Section during 1964.

The first three concern iron deposits. The iron enriched ferruginous sandstones near Elcho Island Mission were found to include about 600,000 tons of sandy hematite averaging 60.4% iron and an additional 500,000 tons of hematitic sand (averaging 40.4% iron) which may be amenable to upgrading. The Mount Tolmer iron deposit is near the old Blythe tin mine and occurs near the unconformity between Lower Proterozoic and Upper Proterozoic sediments; the deposit consists of lenses of dense hematite and cellular material, steeply dipping within the older rocks and flat-lying along the unconformity and within the younger rocks; chip samples from the dense material assay 61.8% iron and from the cellular material 56.7% iron; further pits and costeans are needed to indicate the size of the deposit. Neither the Elcho Island or Mount Tolmer deposits appear to have any economic possibilities in the immediate future. The iron deposits near Marrakai crossing are of the replacement type but because of their small surface area and low grade, are not of economic importance.

The Mary River Junction Mine consists of several pits and a small open cut near a small outcrop of malachite-bearing brecciated quartz and gossan. About 300 tons of material have been dumped on the surface and a channel sample across one dump assayed 5% copper. A wagon-drilling programme of the prospect appears to be warrented and financial assistance from the Northern Territory Administration for road construction is recommended.

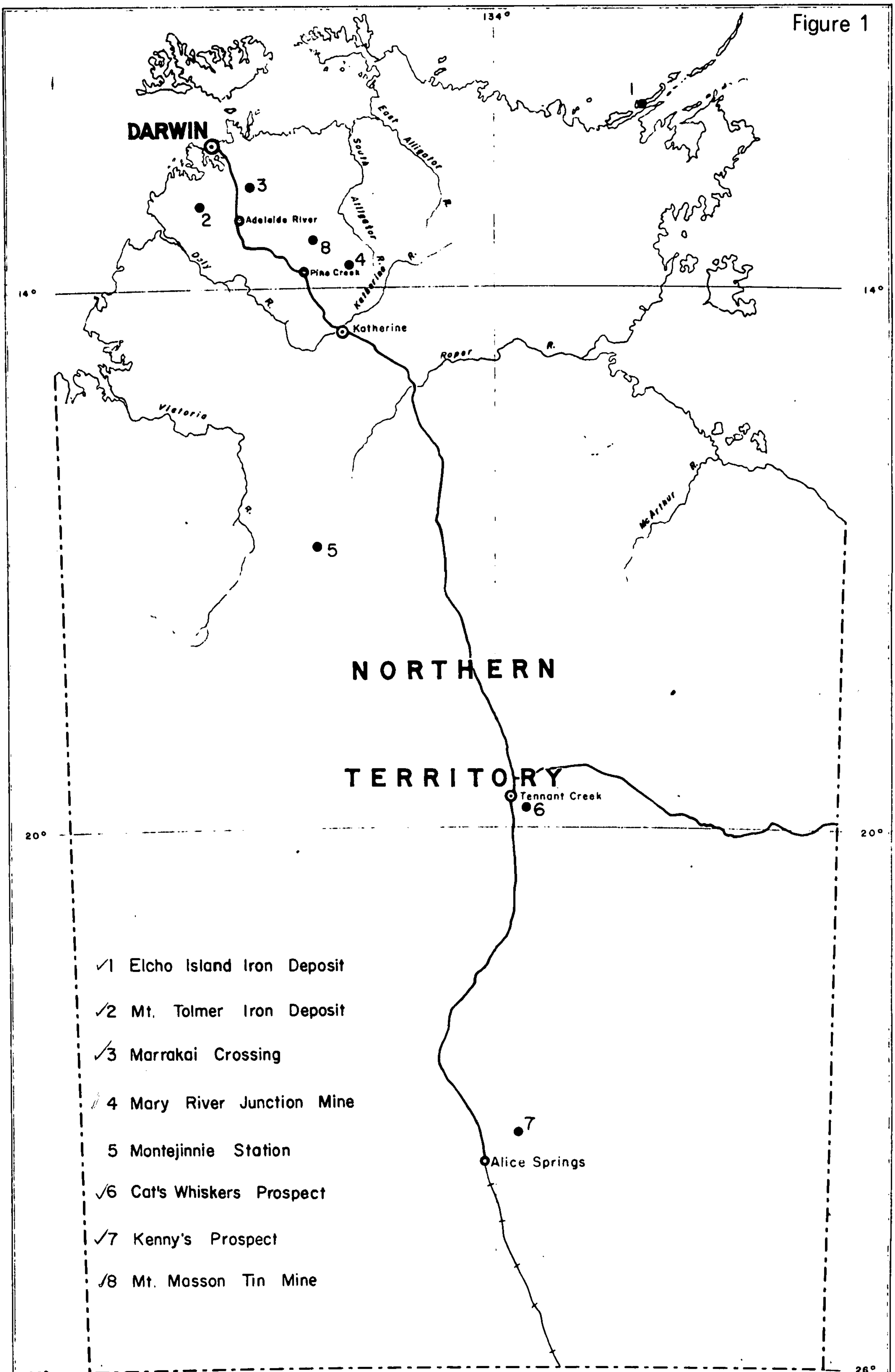
Two very small outcrops of malachite, cuprite and quartz occur in the basalts near Montejinnie Station; they are considered to be of no economic importance.

At the Cat's Whisker Prospect five diamond drill holes totalling 2316 feet were put down on a magnetic anomaly. The drilling proved the presence of a small copper ore shoot in an ironstone body, but did not delimit the total extent of the shoot. Because of the low grade of the copper ore and the lack of supporting gold values no further exploration is recommended.

Kenny's prospect, 41 miles north-east of Alice Springs, is a small vein deposit containing lead, silver, gold and some copper. The prospect appears to be too small to interest a mining company but an individual miner may be able to obtain parcels of ore containing up to 70% lead and 30 oz. of silver and 10 dwt. of gold to the ton.

Mr K. Jessop requested an inspection of the Mount Masson Tin Mine, north-east of Burrundie, to explain why tin values were cutting out in a winze. The cut-out may be due to a flexure in the lode-channel or a pitch in the lode itself.

Figure 1



MINOR METALLIFEROUS INVESTIGATIONS
NORTHERN TERRITORY

Bureau of Mineral Resources, Geology & Geophysics, Canberra, A.C.T. To accompany Record Nº 1964/22 1963 NT/A62

IRON ORE DEPOSITS, ELCHO ISLAND, NORTHERN TERRITORY

by

P. Rix

SUMMARY

An investigation of occurrences of iron-enriched ferruginous sandstones on Elcho Island was carried out to assess their potential as a source of iron ore. The occurrences were found to comprise an upper lens of hematite sandstone and a lower lens of sandy hematite. Assays of 21 representative chip samples obtained during the investigation showed that the hematite sandstone is too low grade to be considered as ore but that the sandy hematite is high grade iron ore, averaging 60.4% iron and 0.054% phosphorus, with negligible copper and no sulphur. The available reserves of iron ore are calculated to be approximately 600,000 tons, but it is doubtful if this can be regarded as an economic figure, due to the relative isolation of the deposit, 300 miles east of Darwin.

INTRODUCTION

Elcho Island, situated on the north coast of Arnhem Land 300 miles east of Darwin, was visited during May 1963 to assess the geological conditions relevant to water supplies in the southern end of the island (Rix, 1963). During the visit, a brief examination of exposures in the cliffs north of the Mission was carried out and it was observed that a bed of sandy hematite apparently overlies the laterite profile that has developed on rocks of the Proterozoic Elcho Island Formation.

The possible economic potential of this material was realised and a second visit was made to the island in August 1963, when detailed investigations of the occurrences of iron-rich beds were carried out.

PREVIOUS OBSERVATIONS

In 1922, N.C. Bell, who was Government Assayer in Darwin at the time, went to Elcho Island to check on a reported occurrence of mineral oil and asphaltum. His report (Bell, 1923) contains many detailed and accurate observations of geological features on the island. He noted and described the iron-rich beds occurring along the coastline north of the Mission, describing them as "ferruginous sandstone". He believed that the ferruginous sandstone was originally very porous and stated that "...strong solutions of iron, presumably from some thermal spring, over-ran the sandstone and were readily absorbed by it." (Bell, op. cit.). Later, he formed the opinion that "...the iron in the two strata of ferruginous sandstone ... may have come from meteoric dust ..." and expressed the hope that some time samples would be taken for chemical analysis"... to ascertain if either Nickel or Cobalt are present, thus proving, or disproving, any meteoric origin, and also to indicate whether the material in the strata has any commercial value." (Bell, Part 2, 1957). It is interesting to note that Bell did recognise the economic potential of the beds, but for the wrong reason!

In 1924, A. Wade visited the island during his tour of petroleum prospects in the northern part of Western Australia and the Northern Territory. He described the beds exposed along the coast near the Mission and mentioned "lateritic deposits" in the cliff exposures (Wade, 1924).

In 1962, K. Plumb visited the locality during the regional geological survey of Arnhem Land carried out by the Bureau of Mineral Resources. He described the beds of the Elcho Island Formation in some detail and observed that they graded upwards into a laterite profile that was capped by "blocky, black, ferruginous sandstone". (Plumb, 1963, field notes).

GEOLOGY

Regional Setting

The strata exposed on Elcho Island comprise the two upper units of the conformable sequence that makes up the Proterozoic Wessel Group (Dated by radiometric methods on glauconite). These rocks were deposited in the Arafura Basin, the arcuate southern edge of which can be traced across northern Arnhem Land. The lower of the two units is the Marchinbar Sandstone, which crops out along the south-east side of the island and forms its southern tip. The upper unit is the Elcho Island Formation, which crops out along the north-west side of the island, the regional dip of both formations being north-west at about 1°.

Lithologically, the Marchinbar Sandstone is a massive to thinly-bedded quartz sandstone, which is seen as scattered outcrops protruding from the ubiquitous sand cover on this formation. The Elcho Island Formation comprises ferruginous grit and sandstone, quartz sandstone, and micaceous and glauconitic shale, siltstone and fine-grained sandstone, (Plate 3). This formation is covered with a layer of laterite so that the majority of exposures are along the west coast, although in the valleys north of the airstrip the laterite has been stripped off and the bedrock is visible as loose surface fragments (Plate 2).

There is evidence that the Marchinbar Sandstone was not lateritised and it is considered that the patches of laterite remaining on this Sandstone are remnants of a formerly more extensive cover of lateritised Elcho Island Formation (see next heading).

A noteworthy feature of this part of Elcho Island is the evidence of very recent fault movements. It has been noted previously that small faults on the wave cut platform just north of the Mission cause considerable local variation in dip and strike of the beds (Rix, 1963), although no definite proof of the age of both these and the major faults in the Mission area was available. However, a thin compression rupture was discovered recently on the wave cut platform near the Mission; this shows as a thin crack with the ruptured edges of the bed on both sides protruding about 3 inches above the platform level. Movement is still going on, therefore, and it is probable that there has been post-laterite movement along all the faults in the south-west part of the island. Additional evidence for recent fault movement comes from two cliff exposures, 4 miles north of the Mission, where tension ruptures of post-laterite age were observed.

Mode of Formation of Iron-Enriched Beds

Lateritisation of the different rock types that constitute the Elcho Island Formation has been the dominant process in the production of both bauxite and iron ore on Elcho Island.

Gorabi cliffs, just north of the Mission, provide the best exposure of the Elcho Island Formation in the area (Plate 3). At this locality lateritisation has resulted in the presence of a classic profile of predominantly aluminous laterite about 12 feet thick, the upper zone having a reddish-orange colour. The marked contrast between this zone and the overlying bed of purple to black sandy hematite had previously been thought to indicate that the sandy hematite rests unconformably on the laterite profile, and it was thought that the bed had formed by recrystallisation of hematite in soil or sand, under swampy conditions. However, it is now thought more likely that the iron-rich beds are derived from a pre-existing bed of ferruginous sandstone, (probably similar to that now visible at the base of the cliff), which was enriched in iron by desilication and residual enrichment processes during lateritisation. The iron-enriched matrix of the rock recrystallised as hematite, producing a rock consisting of hematite with sand grains distributed through it.

Evidence for this mode of origin is provided by a cliff exposure 1½ miles north of the Mission (Plate 4, fig. 1). At this locality, the bed of sandy hematite, which occurs at the top of the cliffs near the Mission, occurs in the middle of the lateritised succession exposed in the cliffs, and is interbedded with a sequence of thin quartz sandstone and kaolinised beds, probably originally claystones or siltstones. The kaolinised beds generally show both red and white layers and some of the quartz sandstones have been slightly ferruginised. Also, a second iron-enriched bed occurs at the top of the cliff section, about 20 feet above the lower bed. This upper bed has not been iron-enriched to the same extent as the lower bed and has been termed hematite sandstone.

Thus, the iron-enriched beds are part of the laterite profile and the contrast between these beds and the remainder of the lateritised succession, which is particularly evident in Gorabi cliffs (Plate 3), is due to the marked difference in the original iron content of the beds.

Evidence that the Marchinbar Sandstone has not been lateritised is provided by a low cliff exposure 1 mile south-west of the Mission (Plate 4, fig. 2). This cliff exposes a section through a small patch of lateritised Elcho Island Formation resting on the Marchinbar Sandstone. Here, no classic laterite profile is developed; instead, a thick ferruginous zone overlies two thin beds of ferruginous grit that rest with a sharp contact on a saccharoidal sandstone bed within the Marchinbar Sandstone. The ferruginous grit comprises sub-rounded quartz fragments in a matrix of partially recrystallised hematite, and is probably the basal bed of the Elcho Island Formation. The ferruginous zone above it presumably developed on a thin sequence of predominantly arenaceous beds of that Formation. The sharp contact with the underlying Marchinbar Sandstone suggests that the quartzitic sandstones and quartz sandstones of that Formation were never lateritised.

Bauxite Occurrences on Elcho Island and Marchinbar Island

Over most of Elcho Island, the laterite is bauxitic. Pisolitic bauxite was seen during the present investigation in the area north-east of the salt flat (Plate 2), and bauxite was also recorded from a number of localities in the northern half of the island during the regional survey of Arnham Land done by the Bureau of Mineral Resources in 1962 (Plumb, 1963).

An interesting corollary to these observations concerns the origin of the Wessel Islands (Marchinbar) bauxite, which was visited by the writer during the regional survey of Arnhem Land. These deposits consist of large "cakes" of bauxitic laterite resting with sharp contacts on a surface of Marchinbar Sandstone (cf. Plate 4, fig. 2) and they are considered to have originated in the same way as the bauxitic laterites on Elcho Island, namely by lateritisation of beds of the Elcho Island Formation. The bauxitic laterite occurrences on Marchinbar Island are therefore the remnants of a formerly more extensive cover of lateritised beds of this Formation. These observations are compatible with those of Owen, who considered the parent rock of the Marchinbar bauxite to be a quartz-sericite siltstone, and who stated that "The lateritic process had no effect upon the quartzite beds ...." (Owen, 1954).

ECONOMIC GEOLOGY

Iron-Enriched Beds

The mode of origin of the two iron-enriched beds has been discussed above. The lower bed has been recrystallised to a greater extent than the upper bed, and consequantly the rocks have been termed sandy hematite and hematite sandstone respectively.

Sandy Hematite

The bed of sandy hematite is very broken up, due partly to jointing but chiefly to collapse of the relatively soft, extensively leached zones beneath. The soil horizon shown in Plate 3 is really part of the ferruginous layer, fragments having been broken up until they have produced a ferruginous sandy soil.

In the hand specimen, the sandy hematite is seen to have a cellular texture comprising "cells" of amorphous hematite cemented by crystalline specular hematite. The upper few inches of the bed, however, have been completely recrystallised and possess no cellular texture, the rock being virtually massive crystalline hematite. Sub-rounded quartz grains, less prominent in the massive material, are scattered throughout the rock. Some of the ferruginous material was found to be feebly magnetic, indicating the presence of magnetite. The specific gravity of the sandy hematite is generally about 3; that of the outer zone may be as high as 5, but such material forms only a very thin skin. The rather low average specific gravity does not imply impurities other than the quartz, because there are a number of air spaces in the rock.

The areas of outcrop of the sandy hematite are shown in Plate 2, the different divisions being based on ground traverses over the outcrops. Area A is the area with a continuous surface cover of boulders of sandy hematite, whereas area A^1 has only intermittent patches of this rock in large areas of sand. In view of the fact that the bed is a surface layer, area A^1 is regarded as containing only a few thin, scattered remnants of the sandy hematite. Test pitting (see below) confirmed that the bed of sandy hematite is lenticular and that it only consists of a layer of boulders on the eastern edge of area A.

Area A^2 was traversed but not sampled because the few outcrops round the edges of the plateau indicated that the layer is thin. At the north end of the plateau, where it falls away relatively steeply to the salt flat, exposures of sandy hematite show that the bed here is about 1 foot thick. Material in this area can be regarded as ore only as a supplement to area A, which contains the main reserves of sandy hematite.

In the areas designated B and B^1, the bed of sandy hematite occurs below the bed of hematite sandstone, at depths varying from about 5 feet below the upper bed at the southern end of area B, to 20 feet below it at the northern end of the outcrop area (Plate 2, and Plate 4, fig. 1). These differences are thought to be due to gentle undulations of the lenticular iron-rich beds. The thinness of the sandy hematite bed (thickness 1 foot) and the depth of overburden exclude it from being considered as ore in this area.

The only portion of the sandy hematite bed that is accessible as ore beneath area B is that which occurs in the inter-tidal zone, both as rubble and as a continuous terrace where the sandy hematite bed approaches beach level. Such terraces, formed by the purple-black sandy hematite, occur along most of the shoreline between the creek north of the airstrip and the sand dune at the north end of the deposits, with the exception of one or two places where the bed occurs a few feet above beach level due to the gentle undulations of the beds (Plate 4, fig.1). These terraces are generally about 1 foot thick and in places are broken up into a jumble of boulders. They are absent south of the creek north of the airstrip because the bed of sandy hematite in this vicinity occurs in the cliffs above beach level. There is, however, an extensive litter of boulders in the inter-tidal zone at the base of these cliffs.

These occurrences of sandy hematite in the inter-tidal zone are shown in Plate 2. They add only a small quantity to the ore reserves of area A.

Hematite Sandstone

In the hand specimen, this rock is purple in colour, friable, and comprises large numbers of sub-rounded quartz grains in a hematite-rich matrix. It is visually obvious that the quartz : hematite ratio of this rock is far higher than that of the sandy hematite, and assays have confirmed that the hematite sandstone is of a much lower grade.

An unusual feature of this bed is the recrystallisation of iron along joints and on exposed faces, so that a solid skin of recrystallised hematite develops on the jointed blocks, the interiors of which are composed of a friable hematite sandstone. In many cases, the interior has been leached or weathered out, leaving apparently solid blocks, both in outcrop and among the beach rubble, that disintegrate at the blow of a hammer, exposing large cavities inside. This effect was first noticed and described by Bell (1923).

The outcrop of the bed of hematite sandstone extends over areas B and B^1 (Plate 2). Area B has a continuous cover of boulders and the bed is considered to be continuous beneath this area. Area B^1 is similar to area A^1 and hence is unlikely to contain more than a few scattered patches of iron-rich material. The cliff exposures at the north end of area B also show that the bed of hematite sandstone is lenticular.

The northernmost exposures of iron-rich rocks are two shore-level ferricrete reefs (Plate 2), situated less than one mile north of the main exposure of the iron-enriched beds. The ferricrete consists of irregular fragments of sandy hematite cemented with ferruginous material. Exploration along the coast north of this point showed that there are no further occurrences of sandy hematite.

Sampling and Test Pitting

The cliff and shore-level exposures of the iron-enriched beds were sampled in the area between the oil bore hole and the sand dune 1¾ miles further north (Plate 2). At each of the sampled localities, a chip sample across the vertical thickness of the bed was taken, and 15 samples, each containing approximately 5 lbs. of material were obtained.

A series of 5 pits was dug across the outcrop of sandy hematite (Area A) to determine whether the bed exposed in the cliffs maintains its thickness eastwards. The pits had an average depth of about 3 feet and in all cases, except pit 2, they showed that a layer of mixed rubble and soil, varying from a few inches to 1 foot thick, overlies the jointed, broken-up bed of sandy hematite which varies in thickness from 9 inches to 1 foot 6 inches. Pit 2 showed that the sandy hematite at that point consists merely of a surface layer of cobbles and small boulders resting on the bauxitic laterite. Chip samples of the sandy hematite exposed in the pits were taken and 6 samples, each containing approximately 5 lbs. of material were obtained.

Unfortunately, therefore, the investigations indicate that the bed of sandy hematite which crops out over the area A is lenticular and that towards the eastern edge of area A, the bed consists merely of a thin surface layer of cobbles.

Ore Reserves

Grade

All the samples were crushed to a uniform size (about ½"), quartered and sent for assay to the Australian Mineral Development Laboratories. All samples were assayed for iron and phosphorus and five composite samples were assayed for copper and sulphur.

The results are given in the table below:

Sample No.	Description	Locality	Assay Results	
			Fe%	P%
145524	hematite sandstone	Area B (see Plate 2)	32.7	0.06
145526			42.4	0.07
145528			46.1	0.04

Sample No.	Description	Locality	Assay Results Fe%	P%
145525	sandy hematite	Area B, from cliff exposure and shore-level terraces. (see Plate 2)	56.1	0.05
145527			52.7	0.10
145529			53.2	0.06
145530	sandy	Area A	56.0	0.05
145531	hematite	(see Plate 2)	59.4	0.05
145532	"		59.7	0.12
145533	"		61.7	0.05
145534	"	From cliff	58.4	0.06
145535	"	exposures	62.1	0.06
145536	"		58.4	0.05
145537	"		59.2	0.04
145538	"		58.1	0.04
145539	"	PIT 1 -solid bed	62.2	0.05
145540	"	PIT 1 - rubble	61.7	0.07
145542	"	PIT 2	63.5	0.03
145543	"	PIT 3	56.8	0.05
145544	"	PIT 4	64.2	0.05
145545	"	PIT 5	64.2	0.05

COMPOSITE SAMPLES

Sample No.	Constituent Sample Nos.	Cu%	S%
145550	145524, 26, 28	0.01	Nil
145551	145525, 27, 29	0.01	Nil
145552	145530, 31, 32	0.01	Nil
145553	145533, 34, 35, 36, 37, 38	0.01	Nil
145554	145539, 40, 42, 43, 44, 45	0.01	Nil

From the table, the average grade of the hematite sandstone is 40.4% iron and 0.057% phosphorus. This grade of iron is very low and it would be uneconomic to exploit this material as iron ore.

The average grade of the sandy hematite within area A is 60.4% iron and 0.054% phosphorus. The copper content of the ore is negligible and sulphur is absent. The sandy hematite is therefore a high grade iron ore, but its exploitation depends on the presence of economic quantities of the ore.

The Australian Mineral Development Laboratories carried out heavy liquid separations on a composite sample made up from original samples assaying between 50% and 60% iron; the product was thus upgraded to 64.3% iron. It therefore appears that the ore is amenable to simple methods of upgrading.

Quantity

The average thicknesses quoted below take into account the material contained in both the lenticular bed of sandy hematite and in the surface rubble layer.

Area A. Assuming an average thickness of 1 foot and an ore density of 2 tons per cubic yard, area A is calculated to contain 500,000 tons of probable ore.

Area A^2. Assuming an average thickness of 9 inches and an ore density of 2 tons per cubic yard, area A^2 is calculated to contain 100,000 tons of possible ore.

The only other available high-grade material occurs as rubble or as terraces in the inter-tidal zone. It is estimated that 20,000 tons of probable ore occur in this way.

CONCLUSIONS

A total of approximately 600,000 tons of high grade iron ore is considered to be available from the deposits in the south-west of Elcho Island. The ore is of high grade and has a low phosphorus content, but the available tonnage may be uneconomic due to the relative isolation of the deposit, 300 miles east of Darwin.

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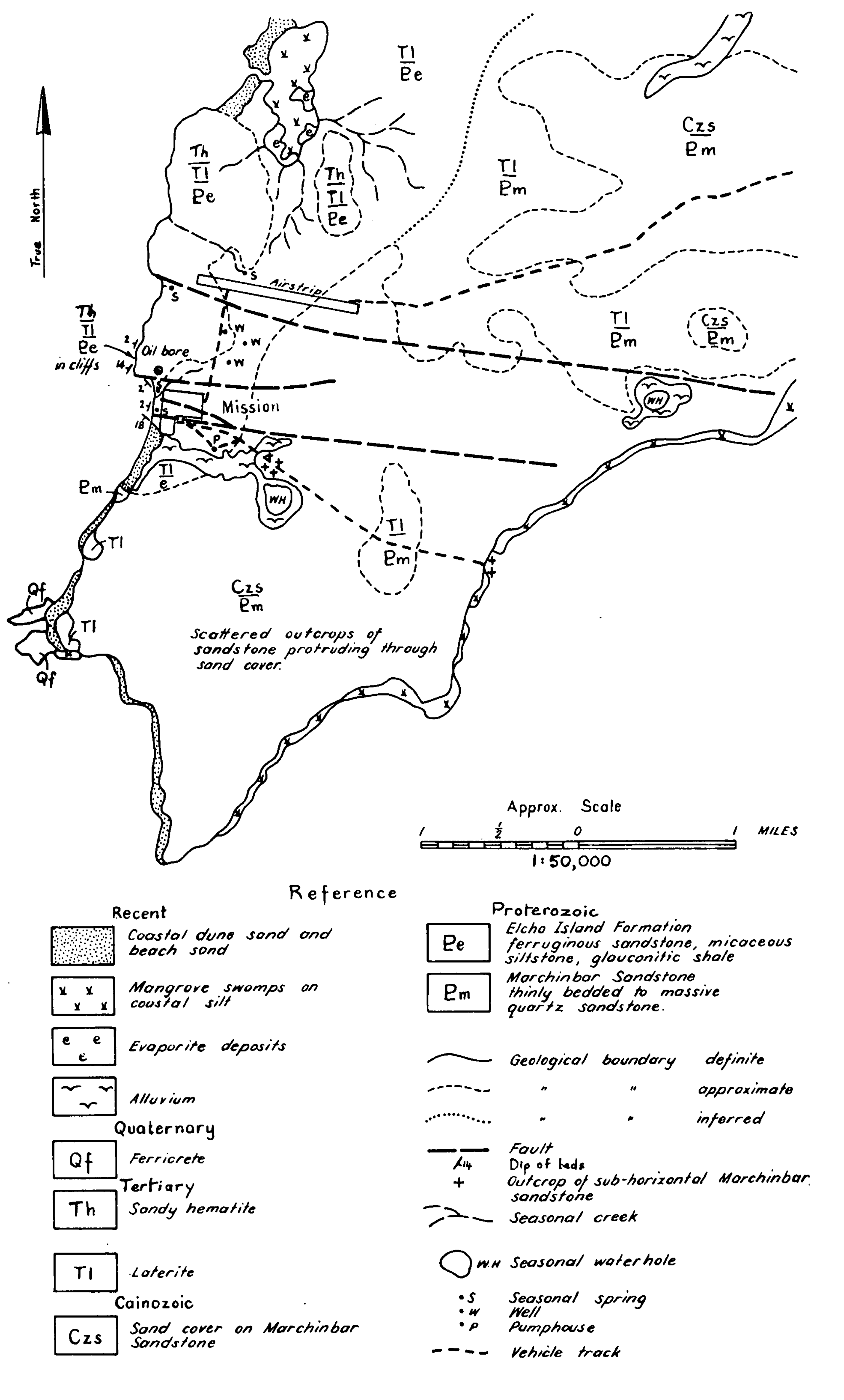
Plate I



GEOLOGICAL MAP - SOUTHERN END OF ELCHO ISLAND, N.T.

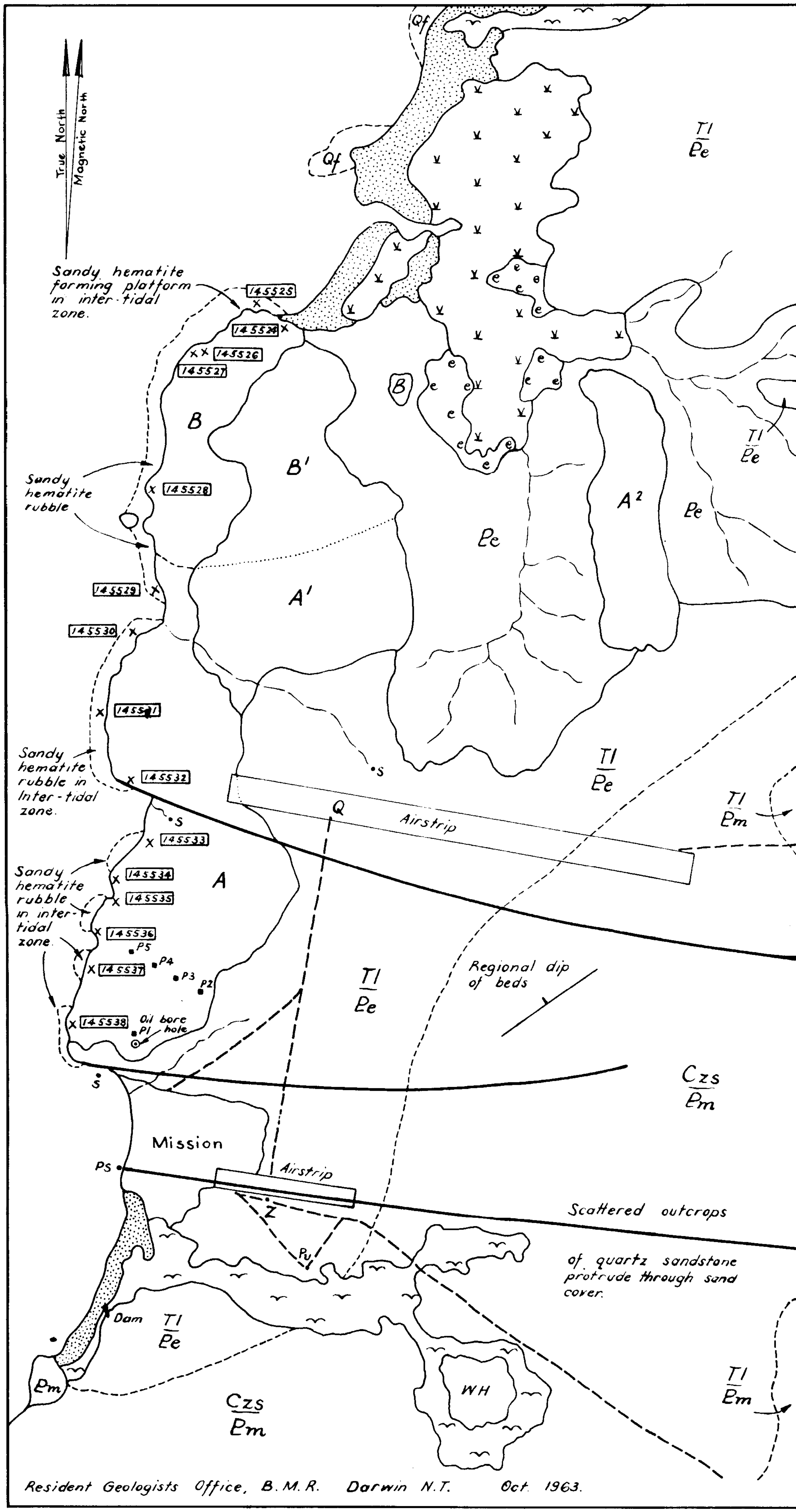
To accompany Record No 1964/22

Resident Geologists Office, Bureau of Mineral Resources, Darwin N.T. June 1963 C53/A15/1

C53/15/DM 1

Plate 2

IRON ORE OCCURRENCES – ELCHO ISLAND, N.T.



Reference

Recent
- Sand dunes
- Mangrove swamps on coastal silt
- Evaporite deposits
- Alluvium

Quaternary
- Qf — Ferricrete

Tertiary
- B — Upper iron-enriched bed (hematite sandstone) } in zone of lateritisation
- A — Lower iron-enriched bed (sandy hematite) } in zone of lateritisation
- Tl — Bauxitic laterite

Cainozoic
- Czs — Sand cover on Marchinbar Sandstone

Proterozoic
- Ꝑe — Elcho Island Formation - ferruginous sandstone, micaceous and glauconitic siltstone.
- Ꝑm — Marchinbar Sandstone thinly bedded to massive quartz sandstone with grit horizons.

- Geological boundary definite
- Geological boundary approximate
- Geological boundary inferred
- Fault
- Seasonal creek
- WH — Seasonal waterhole with permanent sub-surface water
- S • Seasonal spring
- PS • Permanent spring
- Pu • Pump house
- Vehicle track
- P2 ▪ Test pit
- × Location of chip sample
- 145330 Assay sample number

Map was made from Photo 5075, Run 1, Arnhem Bay

Q-Z is measured base line used for scale determination.

Occurrences of Iron-enriched beds.

Lower bed (sandy hematite)

A bed continuous but thins east from cliffs; average thickness 1 foot; high grade ore.

A' bed very patchy, much sand; not considered as ore.

A² bed continuous but probably thinner than A; average thickness may be 9 inches; probably high grade; considered as ore only as supplement to A.

Upper bed (hematite sandstone)

B bed continuous but thins east from cliffs; average thickness 2 feet; very low-grade ore. Bed A occurs in cliffs, 20 feet below Bed B.

B' bed thin and very patchy, much sand; not considered as ore

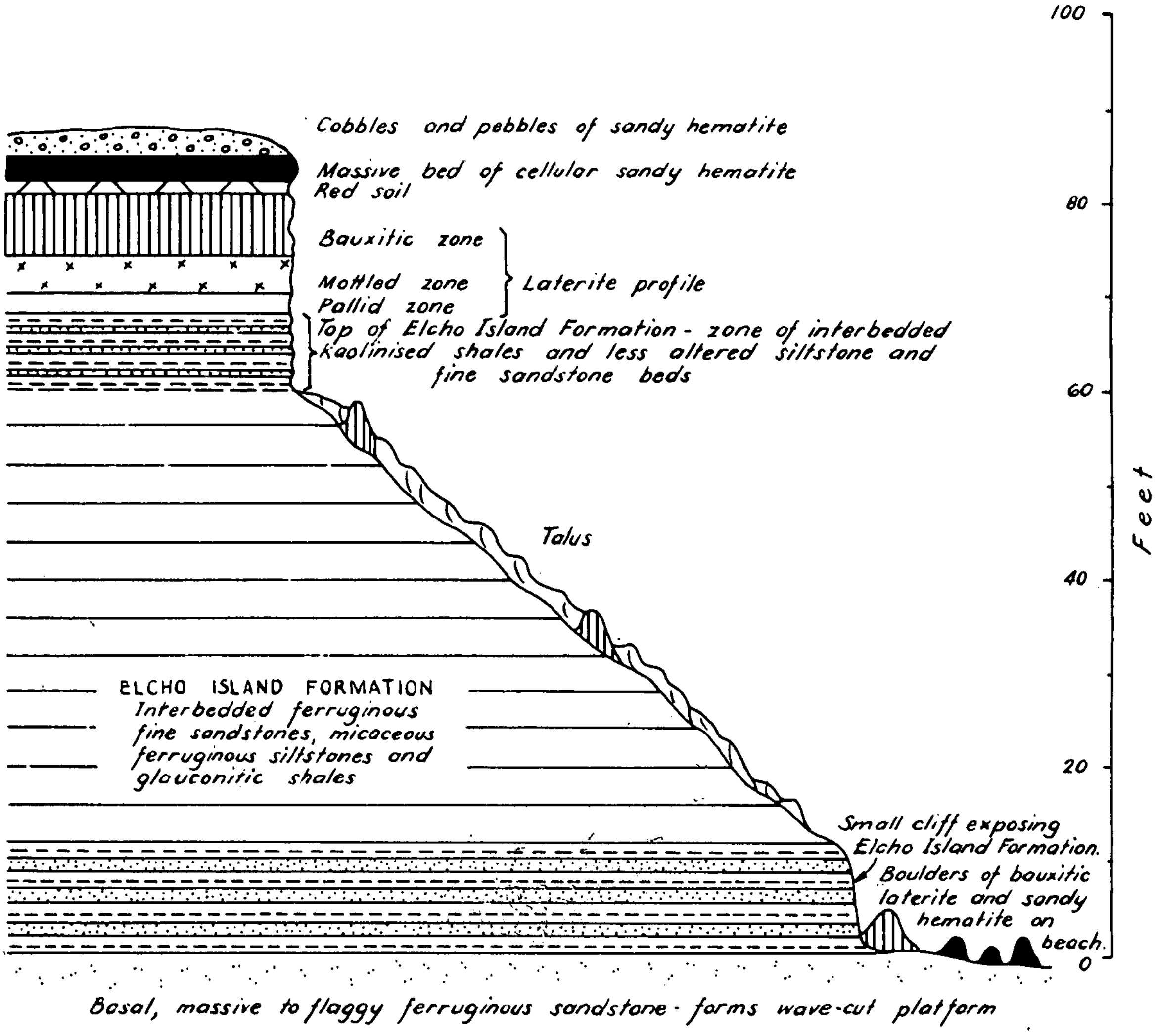
Scale (in feet)

4000 3000 2000 1000 0 4000

To accompany Record Nº 1964/22

C53/A15/2

C53/15/DM.3.



Scale : V= H

CLIFF SECTION

½ MILE NORTH OF ELCHO ISLAND MISSION, N.T.

To accompany Record № 1964/22

Resident Geologists Office, Bureau of Mineral Resources, Darwin N.T. July 1963 C53/A15/3.

C53/15/DM 2

PLATE 4

ELCHO ISLAND, N.T.

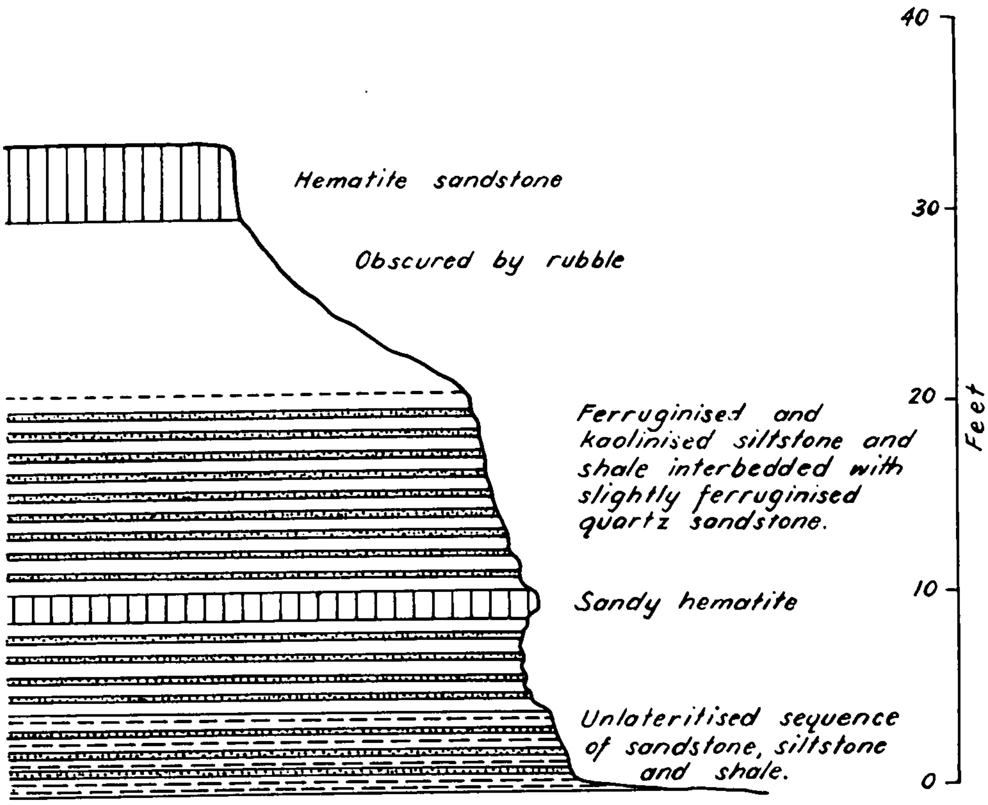


Fig. 1 Cliff Section $1\frac{3}{4}$ miles north of Mission
Scale: V=H

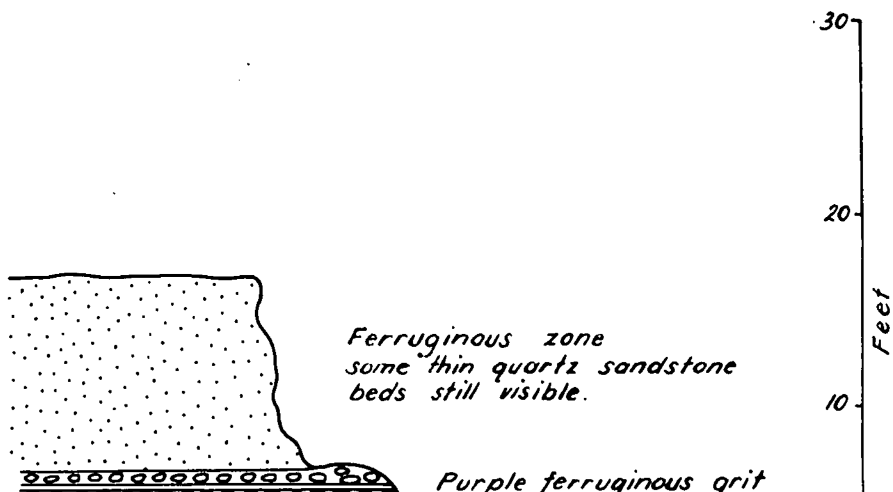


Fig. 2 Cliff Section · one mile south west of Mission
Scale: V=H

To accompany Record Nº 1964/22

Resident Geologists Office. B.M.R. Darwin N.T. Oct. 1963

C53/A15/4

C53/15/DM.4.

MOUNT TOLMER IRON ORE DEPOSIT

by

P. W. Crohn

INTRODUCTION

The Mount Tolmer Iron Ore Deposit was visited on July 23rd and 24th, 1963, in company with Mr B. Brown of Nevsam Mining Co., who hold an Authority to Prospect over the area.

The deposit is situated in rugged country on the south-west edge of the Tabletop Plateau, a few hundred yards north of the old Blyth Homestead. Access is by about 25 miles of rough bush track from Stapleton Station, but this is only suitable for four-wheel drive vehicles and would not be passable during the wet season.

The deposit had previously been inspected by P.G. Dunn (1962), who had recommended that some further exploration was warranted. During the present visit, a tape and compass survey of the deposit was carried out (Plate 5) and two chip samples of surface material were taken for assay.

The rocks of the area consist of steeply dipping siltstone and slate of Lower Proterozoic age, unconformably overlain by sub-horizontal ferruginous sandstone. On the Mount Tolmer 1 inch : 1 mile geological map, prepared by the Bureau of Mineral Resources, these slates are shown as part of the Noltenius Formation and the ferruginous sandstone as part of the Depot Creek Sandstone Member of the Buldiva Sandstone. The slates are intruded by numerous small quartz and pegmatite veins, some of which are tin-bearing, and the slopes below the iron ore deposit contain a number of old workings, comprising costeans, small open cuts and shallow shafts.

Description of the Deposit

The iron ore occurrences of this area appear to have been developed in three different environments. The western part of the main deposit is a steeply dipping tabular or lenticular body, apparently emplaced within the Lower Proterozoic rocks, although its contacts with the latter are entirely obscured by large ironstone boulders and scree. The eastern extension of this deposit, on the other hand, is a flat-lying body occurring at the unconformity between the slates and the ferruginous sandstone, while the two small isolated occurrences to the west and north of the main deposit are developed entirely within the ferruginous sandstone, probably on minor shear zones.

All these occurrences consist of two main types of material: one is a dense, fine-grained haematite, showing concretionary structures in some parts and slicken-siding in others; the other type is a strongly cellular material, generally composed of a mixture of hematite and limonite and usually containing a small admixture of sand grains. In places, the texture of this cellular material resembles a gossan, and minor amounts of secondary copper minerals were seen in a few specimens. Composite chip samples of the two types were collected from the western portion of the main deposit and forwarded to the Australian Mineral Development Laboratories, Adelaide, for assay:

	Total Iron	Phosphorus	Copper	Sulphur
Dense haematite	61.8%	0.19%	0.0058%	0.015%
Cellular material	56.7%	0.15%	0.0046%	0.025%

Both types of material are present in all of the three types of environment listed above. The proportions vary widely from point to point within each of the occurrences, but the cellular type of material is always predominant.

The total reserves within the deposit cannot be assessed from the available information, as its down-hill limits are largely obscured by ironstone boulders and heavy scree, while the possible northerly and north-westerly extensions of both the steeply dipping and the flat-lying portions of the main deposit are obscured by the overlying sandstone.

All that can be said at the present time is that the exposed portion of the steeply dipping body, which makes up the western part of the main deposit, may have a vertical extent of slightly more than 50 feet, and an average width of the same order, while the flat-lying portion - including that part which overlies and grades into the steeply dipping body - may have an average vertical thickness of ten feet and a maximum width of 500 feet in a north-east direction. In both cases, the extent in a northerly or north-westerly direction, underneath the ferruginous sandstone, is completely unknown. The minor occurrences within the ferruginous sandstone appear to be too small to be of economic importance.

From the appearance of all the exposed occurrences, it is clear that considerable redistribution of material has occurred, and at least some of this must be related to weathering at the present surface. By analogy with hematite occurrences in the Katherine-Darwin area, this may be expected to have resulted in surface enrichment, so that the average iron content of the whole deposit is likely to be lower than that of the surface material. On the other hand, it will also probably have a lower phosphorus content.

Recommendations

On account of the not very high grade and the relatively difficult access, the prospects of early exploitation of this deposit are not very good, but the present writer agrees with Mr Dunn's earlier opinion that some further testing is warranted.

As the first step in this investigation, it is recommended that three costeans be dug across the deposit in the positions shown on the accompanying plan. These costeans would enable the limits of the main ironstone body to be defined more accurately, and its trend underneath the ferruginous ironstone to be projected with greater confidence. They would also provide a better indication of the distribution of the massive and cellular type of material.

As a second stage, it is suggested that a small number of pits be sunk to depths of about 20 to 25 feet. Tentative positions for these could be the approximate centres of lines A - A' and B- B', and points approximately 200 feet north and north-west of the line B - B', (Plate 5), but the exact positions would be controlled by the results of the costeaning. The first two of these pits would give some indication of the vertical changes in grade to be expected within the ironstone body, while the more northerly ones would give at least a preliminary indication of the persistence of the body underneath the Depot Creek Sandstone Member.

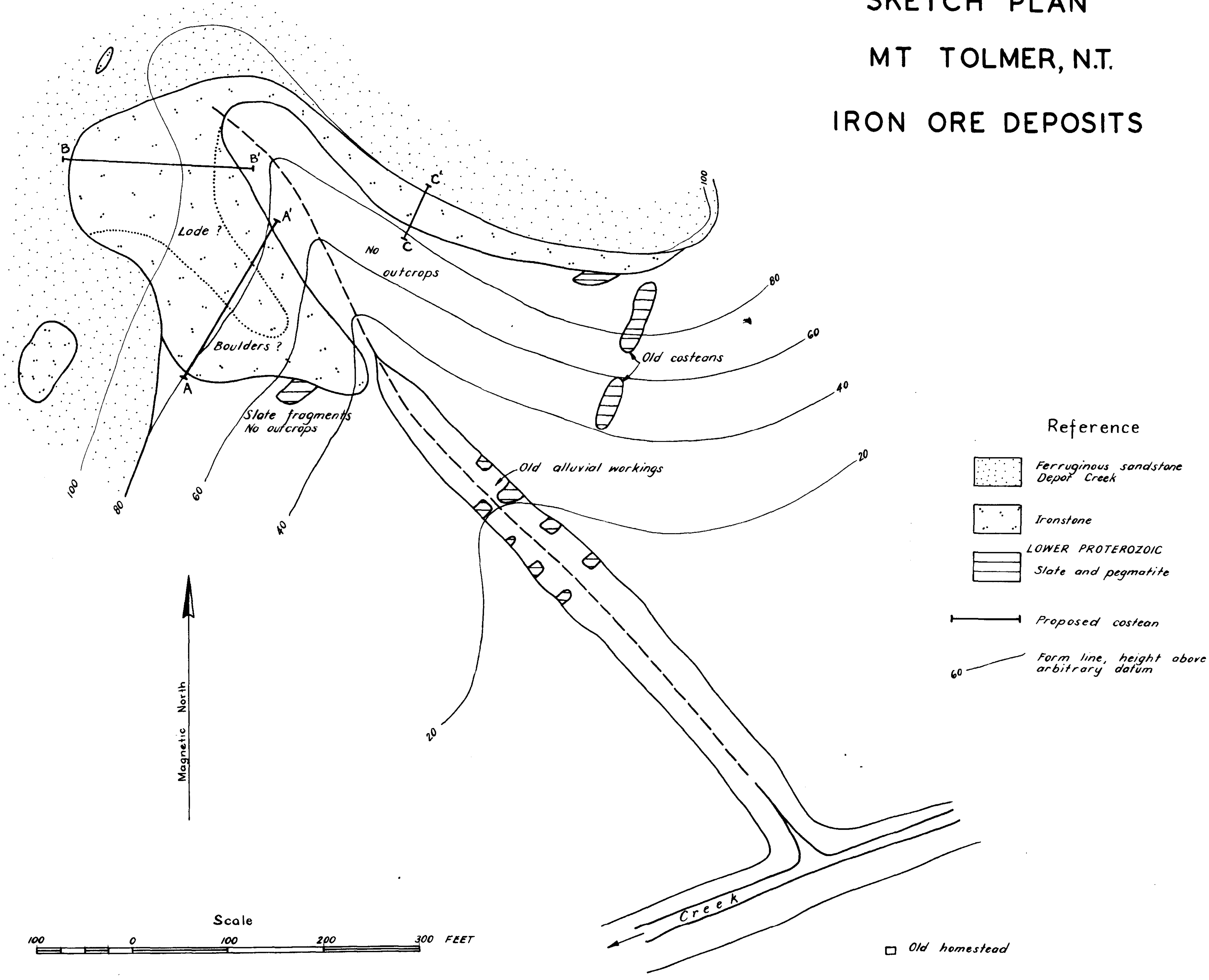
Ultimately, the possibility of economic exploitation of the deposit will depend on proving substantial extensions in a northerly or north- westerly direction underneath this sandstone, which could only be done by means of a major drilling or shaft-sinking programme, but such a programme should not be considered until the results of these preliminary investigations have been fully evaluated.

REFERENCE:

Dunn, P.G. 1962 Iron ore occurrences under investigation by Nevsam Mining Co. Pty Ltd. October, 1961. Bur. Min. Resour. Aust. Record 1962/29.

PLATE 5

SKETCH PLAN
MT TOLMER, N.T.
IRON ORE DEPOSITS



Resident Geologists Office, Bureau of Mineral Resources, Darwin, N.T. August 1963.

To accompany Record № 1964/22

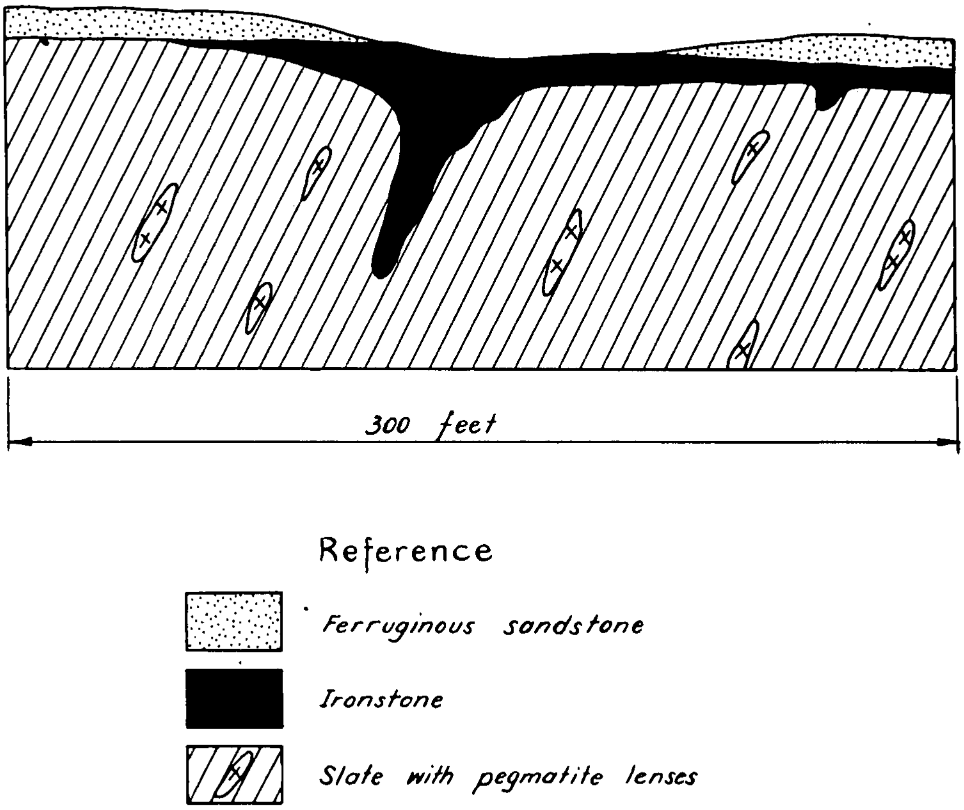
D52/A8/94

D52/8/DM31

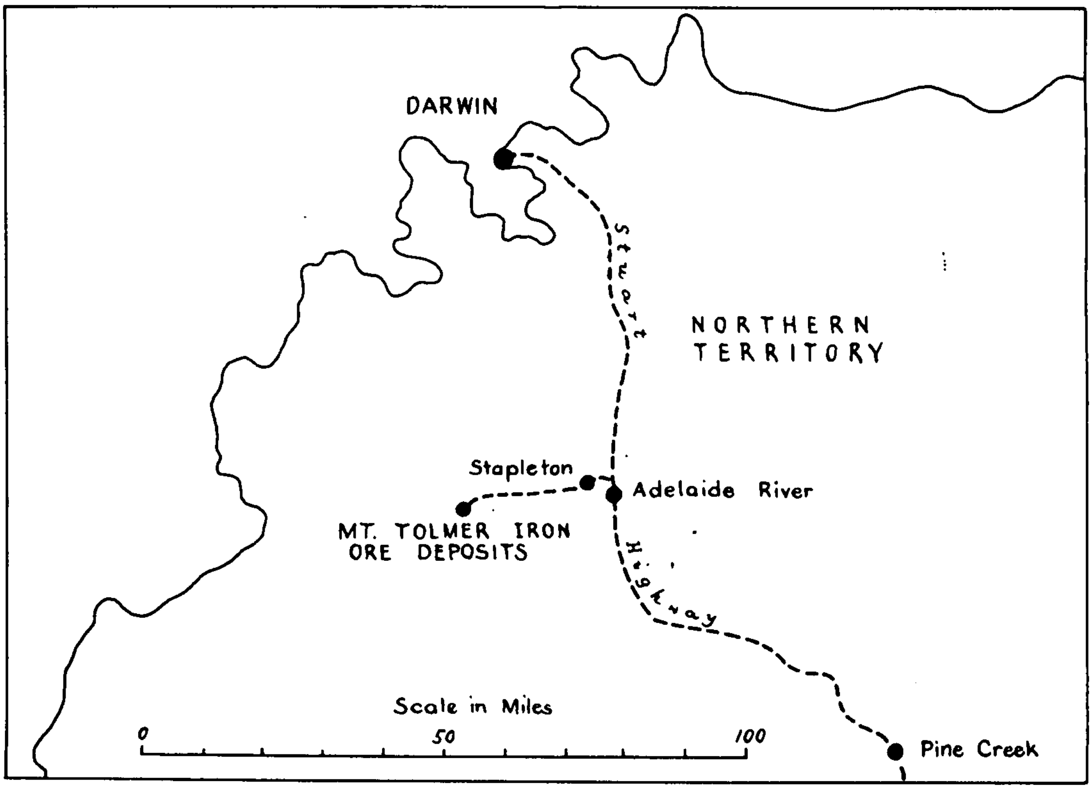
PLATE 6

MOUNT TOLMER IRON ORE DEPOSITS
N.T.

Diagrammatic Cross-section V=H



Locality Map



To accompany Record No 1964/22

Resident Geologists Office, Bureau of Mineral Resources, Darwin N.T.

D52/A8/95

D52/8/DM 30

LOW GRADE IRON DEPOSITS

NEAR MARRAKAI CROSSING, N.T.

by

J. Barclay

Several ironstone occurrences in an area from three to six miles to the north-west of the Marrakai Crossing (Figure 2) were examined on 25th July and 1st August, 1963, at the request of Mr. Hyam of Darwin.

The deposits are of the replacement type but because of their small surface area and low grade, they are of no economic importance.

GEOLOGY

The 1 : 63,360 Marrakai Geological Sheet issued by the Bureau of Mineral Resources, Canberra, indicates that the rocks of the area consist mainly of Lower Proterozoic siltstone of the Golden Dyke Formation. The siltstone is tightly folded on north-south axes and metasomatic replacement of siltstone by iron has taken place in brecciated zones along limbs and in the crestal parts of folds. The deposits consist mainly of limonite, with some hematite, containing numerous angular quartz fragments up to 2" in size.

The largest deposit examined appears to be situated along the limbs of a pitching fold. The western limb has a strike of 340° and the outcrop of limonite is 600 feet long by 10 feet wide. Chip samples were taken along the line of outcrop and a composite sample (No. 1) obtained. The eastern limb has a strike of 360° and the limonite outcrop is 750 feet long by 10 feet wide. A composite sample (No.2) was taken by chip-sampling along this outcrop.

Sample No. 3 was taken by chip sampling a small, isolated occurrence, 40 feet long by 20 feet wide, about three miles to the south of the above deposit.

Assay results of these samples are as follows:-

Sample No.	%Fe
1	31.6
2	35.2
3	51.2

CONCLUSIONS

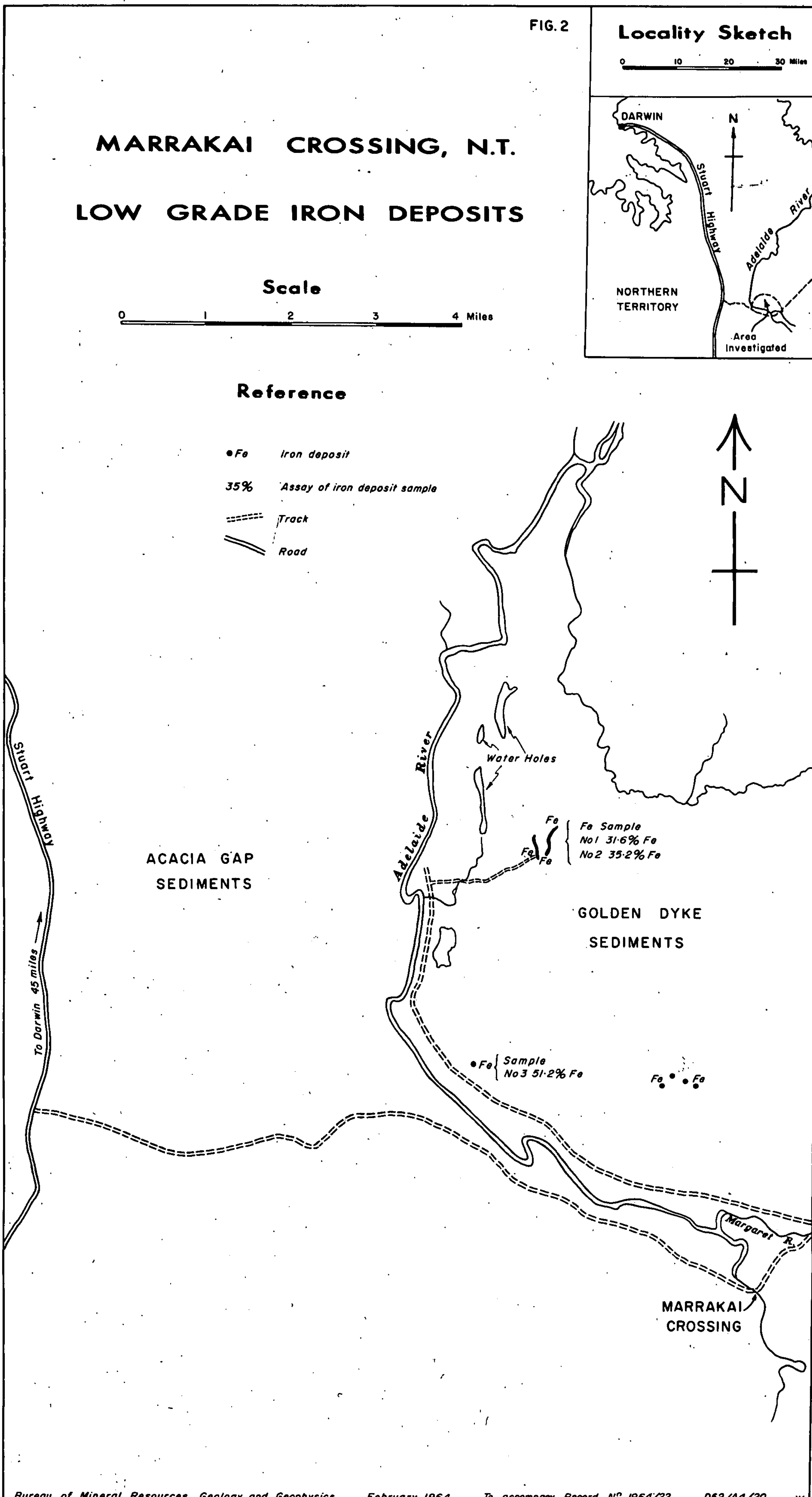
Although there are numerous iron rich outcrops in this area, all the known occurrences are of small surface extent and low grade.

No further work is recommended on these known occurrences, but the possible existence of larger or better quality deposits, should be kept in mind in any future geological investigations in this area.

FIG. 2

MARRAKAI CROSSING, N.T.

LOW GRADE IRON DEPOSITS



Bureau of Mineral Resources, Geology and Geophysics. February 1964 To accompany Record No 1964/22 D52/A4/20 JK

MARY RIVER JUNCTION MINE

by

P. Rix

INTRODUCTION

A brief examination of the Mary River Junction Mine was carried out on 29th October, 1963, at the request of the Director of Mines, to assess the economic potential of the prospect. An application for assistance to finance the construction of a road to the prospect has been made to the Northern Territory Administration by United Uranium N.L.

LOCATION

Map	:	Goodparla South one-mile geological sheet
Air Photo	:	Mount Evelyn, Run 10, Photo 5191, Quadrant D, x - 0.56 ins, y - 0.78 ins, diagonal - 0.97 ins.

The mine (also known as Radford's Claim) is situated on the south bank of the Mary River and is about six miles due north of Coronet Hills Mine. From Moline, the mine is reached by a track that turns eastwards off the Moline - El Sherana road on the north side of the Mary River, about 7 miles from Moline. This track is followed for about 8 miles to its point of termination on the north bank of the river, opposite to the mine.

GEOLOGY AND WORKINGS.

The most prominent geological feature in the vicinity of the mine workings is a very large white quartz reef which strikes approximately north-north-west and crosses the river at this locality. The main mass of this quartz reef appears to be barren, but several minor shear zones, indicated by brecciated quartz, occur within it and on its flanks.

The mine workings are situated on an alluvial flat on the east side of the quartz reef. The earliest workings consist of an open cut about 12 feet long, 6 feet wide and 10 feet deep, elongated north-west, with a shallow scrape extension south-east for 20 feet. A small outcrop of malachite-bearing brecciated quartz and probable gossan occurs on the south side of this open cut; this outcrop was the original indication of mineralised material in the area. This mineralised zone apparently dips south at about 30-40° and the open cut was designed to follow it down the dip.

Later, three shafts were sunk to the south of the open cut to intersect the vein at a greater depth. These shafts are 8 feet by 6 feet in cross section and about 18-20 feet deep. They are arranged roughly in a semicircle around the south-west side of the open cut at a distance of about 15 feet. No mineralisation is apparent in the walls of the shafts which appear to penetrate alluvial material and rubble, possibly brecciated quartz.

The dumps contain perhaps 300 tons of material, indicating that little, if any, material was transported from the mine. The dumps consist of fragments of quartz, quartzose rocks and iron-rich gossanous material, some of which exhibits malachite staining. The dumps have a surface crust of malachite-rich material which is thought to have resulted from leaching of the dumps since they were thrown up.

A channel sample across one dump, beneath the enriched crust, was taken by United Uranium N.L. and was reported to have assayed 5% copper. Two similar samples were taken from dump material during the present visit but they have not been sent for assay.

ECONOMIC POTENTIAL

There is no evidence of copper mineralisation other than that in the small outcrop and on the dumps, but the lessees, United Uranium N.L., intend to undertake a wagon drilling programme on the alluvial flat adjacent to the large quartz reef on the assumption that the copper mineralisation may be associated with this reef in some way, perhaps along a flanking shear zone.

RECOMMENDATIONS

The wagon drilling programme which is planned for this prospect is considered to be a reasonable one, and it is considered that some assistance to the Company is warranted.

A COPPER DEPOSIT NEAR MONTEJINNIE STATION, NORTHERN TERRITORY

by

J. Barclay

Location: Victoria River Downs 4-Mile Sheet.
Run 11, Photo 5221, Quadrant D.
X = 0", Y = 0.5", Diagonal = 0.5"

The deposit was examined at the request of Mr W.B. Crowson, Manager of Montejinnie Station.

It is reached by travelling from the Station for 2.5 miles to the main Top Springs - Wave Hill highway; thence for 7 miles south along the highway and 3 miles north-west through rough bush country to a broad low basalt hill.

Two small outcrops with copper minerals and quartz occur on the basalt hill (Antrim Plateau Volcanics). One is 5 feet long by 1.5 feet wide elongated in a west-north-west direction. The other is 160 feet distant from the first on a bearing of 201°. It is 15 feet long by 2 feet wide, elongated in a north-west direction.

Identifiable copper minerals are malachite and cuprite and these occur almost continuously along each outcrop.

A grab sample taken by Mr Crowson is reported to have an assayed content of 23% Cu. A composite sample taken by chip sampling along the larger outcrop has not yet been assayed but is expected to give a slightly lower assay result.

Basalt forms the country rock and crops out in many places on the hill. It is usually of a vesicular variety.

Montejinnie Limestone of Middle Cambrian age overlies the basalt at a distance of one mile to the south, otherwise the basalt extends for considerable distances in all directions.

Although the deposit is rich in copper, it is considered to be too small to be of economic importance.

However, the Station Manager was advised to excavate the ground around the larger outcrop to examine it in greater detail.

REFERENCE:

Traves, D.M., 1954 The Geology of the Ord-Victoria Region, Northern Australia. Bur. Min. Resour. Aust., Bull. 27

DIAMOND DRILLING RESULTS

CAT'S WHISKERS PROSPECT, TENNANT CREEK

by

P.G. DUNN

SUMMARY

The Cat's Whiskers prospect is a magnetic anomaly about 400 feet north-east of the Cat's Whiskers mine and about four miles south of Tennant Creek township and a mile east of the Eldorado mine.

The Cat's Whiskers mine, now abandoned, is in an ironstone body that occurs in a folded sequence of sandstone, slate, and hematite shale. The emplacement of this ironstone has apparently been controlled by the strong cleavage and by the favourable sedimentary horizons.

The ironstone body responsible for the magnetic anomaly is apparently controlled by the same factors. Five diamond drill holes, totalling 2,316 feet, have proven a small copper ore shoot within the ironstone which is probably 200 feet long, 150 feet in vertical extent, and ranges from four to sixteen feet wide.

The total extent of the ore shoot has not been determined, but because of the low grade of the copper ore and the lack of supporting gold values no further exploration is recommended.

INTRODUCTION

The Cat's Whiskers prospect is four miles south of Tennant Creek township and about one mile east of the Eldorado mine. It is a magnetic anomaly with the centre approximately 400 feet north-east of the Cat's Whiskers mine (Daly, 1057).

The Cat's Whiskers mine is a small working in an ironstone body that forms the crest of a low ridge. This mine produced 99.17 ounces of gold from 381.37 tons of ore (Ivanac, 1954). No work has been done since 1951.

Sampling of the ironstones in the Tennant Creek area showed a high geochemical copper anomaly in the ironstone at the Cat's Whiskers mine (McMillan and Debnam, 1961).

The recent testing programme, which began in May, 1962, involved the drilling of five diamond drill holes to test the magnetic anomaly. These holes were drilled under agreement between Eldorado Tennant Creek Limited and Mines Branch, Northern Territory Administration. The programme was completed in August 1963. Total drilling was 2,316 feet.

SURFACE GEOLOGY

The magnetic anomaly is beneath a dulldust-covered flat with rare outcrops. Immediately south of the drill sites is a low ridge of Warramunga sandstone, slate, and hematite shale, with several hematite lenses.

The sedimentary rocks occur in a series of folds, whose axes strike east and plunge to the east at approximately 20°. The folds seem to be fairly open although one bed is thought to be overturned. Axes of minor drag folds parallel the axes of the larger folds. A very strong vertical cleavage has been developed parallel to the fold axes.

The crest of the ridge that contains the Cat's Whiskers mine coincides with the crest of an anticline. The ironstone lenses are apparently controlled, in part, by the cleavage planes, although Barclay (1963) suggested that they are the result of replacement of favourable sedimentary horizons. It seems likely that both factors have influenced the shape of the ironstone lenses. The general alignment of the lenses with the cleavage suggests that the cleavage planes acted as planes of weakness for the introduction of iron, but replacement allowed a swelling of the lenses where the cleavage intersected a favourable sedimentary horizon.

The same controls were assumed to apply to the body causing the magnetic anomaly, and the later drill holes were sited on this assumption.

DRILLING RESULTS

The first hole was drilled vertically above the calculated centre of the body responsible for the magnetic anomaly (Daly, 1957). The body was expected to extend from 365 to 605 feet vertically. The drill hole, however, intersected leached ironstone from 113 feet to 212 feet, with only rare hematite below, to the bottom of the hole at 520 feet. It appeared that the drill hole was not over the centre of the anomaly.

This ironstone intersection showed no gold and no visible ore minerals. Samples, however, were sent to

Canberra for spectographic analysis for copper lead and zinc. The results are given below in parts per million.

Depth	Copper	Zinc	Lead
113'-114'	1,100	375	350
137'-138'	350	300	450
146'-147'	2,500	1,050	3,900
157'-158'	900	525	700
177'-178'	1,600	4,350	350
197'-201'	300	750	150
209'-210'	800	1,000	200

The second hole was drilled to intersect the lode near the water table to test for possible copper enrichment and to determine the amount of sulphides in the unoxidised portion of the lode. Daly (personal communication) determined that the lode was probably dipping steeply to the north, and the second drill hole was collared 222 feet north of the first at a depression of 60°. It intersected the lode from 323 feet to 395 feet (Plate 2), and was drilled to 410 feet. This ironstone was split and assayed for gold and copper. Only negligible gold was found; copper occurs as native copper, malachite, and chalcopyrite, and the section from 336 feet to 367 feet had an average assay of 2.6 per cent copper.

A third hole was drilled from the same site as D.D.H.2 at a depression of 75° to test the lode at a greater depth. Although the hole lifted badly, it intersected the lode about 100 feet lower than the second hole. Two ironstone bodies were intersected by D.D.H.3: a badly leached one from 402 feet to 425 feet, and a massive magnetite body body with abundant sulphides from 451 feet to 472 feet. Phyllite and greywacke with rare pyrite and magnetite were encountered between the two bodies.

The first badly leached ironstone body may be either part of the main ironstone body (as shown on Plate 2) or the top of a separate body. The only economic mineralisation, found between 460'8" to 472 feet, gave an average assay of 3.58 per cent copper. If this mineralisation is related to the economic section in D.D.H.2, the ore shoot within the ironstone dips to the south and has a vertical extent of at least 150 feet and a horizontal width of 16 feet in D.D.H.2 and of 8 feet in D.D.H.3.

The last two holes were drilled to test the strike length of the ore body. Diamond drill hole 4 was collared 100 feet west of D.D.H.2, and at a depression of 60°. Although the ironstone body was intersected between 313 feet and 386 feet, it was apparently intersected above the bottom of the oxidised zone, and only trace amounts of copper were found. No attempt was made to intersect the lode at greater depth, but it seems most likely that mineralisation similar to that in holes 2 and 3 would exist below D.D.H.4.

Diamond drill hole 5 was collared 100 feet east and 40 feet north of D.D.H.2 at a depression of 60°. The ironstone was intersected from 396 feet to 431 feet. Native copper was found at the top of the ironstone intersection giving an average assay of 1.9 per cent from 396 feet to 402 feet. All other assays were less than one per cent, except for the last six feet of the ironstone intersection where chalcopyrite was encountered. The section from 417 feet to 423 feet gave an average assay of 2.55 per cent copper. The section from 423 to 426 feet, which was chloritic schist, assayed at 1.1 per cent copper.

All the mineralised sections of the core from the five drill holes were assayed for gold. Most samples showed either no gold or only trace amounts; no sample assayed higher than 1.1 dwt/ton.

Because of the high lead and zinc concentration found in D.D.H.1, the core from D.D.H.4 was sent to A.M.D.L. to be assayed for zinc, lead, and silver. Neither zinc nor lead was higher than 0.16 per cent, and the highest silver assay was 6.0 dwts/ton.

Bismuth, both as a carbonate and as a sulphide, can be seen in the core, although it is very rare. None of the core has been assayed for bismuth.

RECOMMENDATIONS

Although the drilling to date has not proven the total extent of the ore body, further drilling is not warranted at the present time. The ore body is too small and the copper values are too low and unsupported by gold to allow economical mining.

REFERENCES

Barclay, J.	1963	Report on diamond drilling at the Cat's Whiskers Mine, Tennant Creek. May-August 1962 in Bur. Min. Resour. Aust. Rec. 1963/32 (unpubl.)
Daly, J.	1957	Magnetic prospecting at Tennant Creek, Northern Territory, 1935-1937; Bur. Min. Resour. Aust. Bull. 44.
Ivanac, J.F.	1954	The geology and mineral deposits of the Tennant Creek Goldfield, Northern Territory; Bur. Min. Resour. Aust. Bull. 22.
McMillan, N.J. and Debnam, A.H.	1961	Geochemical prospecting for copper in the Tennant Creek Goldfield, Northern Territory; Bur. Min. Resour. Aust. Rec. 1961/101 (unpublished).

APPENDIX

Diamond Drill Hole Logs and Assays

DIAMOND DRILL HOLE NO. 1

CAT'S WHISKERS PROSPECT

Collar Co-ordinates: 2830E, 2172S (B.M.R. Bull. 44 Plate 3, Sheet 3)

Course: Vertical

Acid Surveys:

Depth	Angle (corrected)
100'	89°
250'	90°
350'	89°
450'	89°

Assay Results: No visible copper minerals and the hematite was geochemically assayed. All core from 71'-81', 85'-85'6", and 113'-212' was assayed for gold and all samples showed nil gold.

Footage	Recovery	Description of Core
0' - 14'	5'	Pale reddish mudstone, bedding/core angle 30°, cleavage/core angle 0°.
14' - 71'	26'	dark chocolate coloured mudstone, becoming pale from 55' to 60', occasional fine-grained micaceous greywacke. Vertical shears from 15' to 24', cleavage/core angle 0°, bedding/core angle not evident.
71' - 80'	3'	quartz-hematite, mainly leached, limonitic and slightly magnetic in part.
80' - 85'	2'	80'-81' quartz-hematite, as above. 81'-85' mudstone, some greywacke, bedding/core angle 30°.
85' - 113'	14'	85'-86'6" quartz-hematite.
113' - 212'	58½'	Quartz-hematite, mainly leached, limonitic and magnetic in part.
212' - 213'	3'	Bleached, quartz-and kaolin-rich sediments.

Footage	Recovery	Description of Core
213' - 234'	19'	Mudstone, mainly massive, some thin-bedded greywacke, bedding/core angle 25°, cleavage/core angle 0°.
234' - 271'	25'	Mainly mudstone, some greywacke, quartz stringers and manganiferous staining in shears and cleavage at 45° to core length, other cleavage/core angle at 0°, bedding/core angles 80° (from 241'-246'), 60° (from 246'-253') and 50° (from 253'-261'). Base of strongly oxidised zone at 271'.
271' - 283½'	7'	Mainly fine greywacke, some mudstone in alternating partly oxidised and strongly oxidised zones; some brecciated greywacke in mudstone; tension gashes occasionally infilled with quartz and hematite stringers.
283½ - 306'	19'	Mudstone, some greywacke, occasional slumping and mud pellets, bedding/core angle 30°, cleavage/core angle 0°, ? segregation banding/core angle 20°, faulting from 304'-304½' with faulted quartz stringers.
306' - 384'	66'	Mainly fine greywacke, some mudstone Malachite on cleavages from 330'-334' slight faulting, some quartz stringers, bedding/core angle 50° (from 364'-384').
384' - 394'	6'	Mainly mudstone, some greywacke.
394' - 399'	5'	Mainly greywacke, some mudstone, graded bedding.
399' - 419'	18½'	Interbedded mudstone and greywacke, beds 1' and 3' thick respectively. Malachite on cleavages at 398', 407', 408'.
419' - 457'	36½'	Mainly mudstone, some greywacke, bedding/core angle 55°. Malachite on cleavages at 425'-426'; 445', 445'-456'.
457' - 460'	3'	Mudstone and greywacke.
460' - 490'	26½'	Mainly fine greywacke with ⅛" porphyroblastic feldspars, some mudstone; occasional quartz stringers and veins up to 3" thick, some slumping and faulting; bedding/core angle 55°, cleavage/core angle 0°, ? segregation banding/core angle 20°.

Footage	Recovery	Description of Core
490' - 520½'	24'	Interbedded greywacke and mudstone some slumping and faulting irregular quartz stringers. Bedding/core angle 55°, cleavage/core angle 0° - 10°.
END OF HOLE	'	STANDING LEVEL AT 300'

DIAMOND DRILL HOLE NO. 2

CAT'S WHISKERS PROSPECT

Collar Co-ordinates: 2830E, 1950S (B.M.R. Bull. 44, Plate 3, Sheet 3)

Bearing: 180°

Depression: 60°

Acid Surveys:

Depth	Angle (corrected)
150'	58°
250'	58°
350'	58°

Assay Results:

Footage	Copper (%)	Gold (dwts/ton)
323' - 324'	0.75	trace
324' - 330'	0.25	trace
330' - 333'	0.1	nil
333' - 336'	0.3	nil
336' - 341'	2.5	nil
341' - 344'6"	4.05	nil
344'6" - 347'	0.7	1.1
347' - 350'	2.1	0.8
350' - 351'6"	2.5	nil
351'6" - 354'	5.8	0.5
354' - 355'6"	2.55	nil
355'6" - 357'6"	1.25	trace
357'6" - 359'6"	1.65	0.3
359'6" - 361'	0.15	nil
361' - 363'	4.1	0.5
363' - 365'	1.65	0.2

DIAMOND DRILL HOLE NO. 2 (Continued)

Assay Results: (cont.)

Footage		Copper(%)	Gold (dwts/ton)
365'	- 367'	3.05	0.3
367'	- 371'	0.2	nil
371'	- 374'	0.35	nil
374'	- 377'6"	0.25	trace
377'6"	- 381'	0.6	nil
381'	- 384'3"	1.2	nil
384'3"	- 387'9"	2.45	nil
387'9"	- 391'	0.7	nil
391'	- 393'6"	1.05	0.3
393'6"	- 395'6"	0.25	0.3
407'	- 410'	0.1	nil

Footage	Recovery	Description of Core
0' - 30'	4'	Pale coloured mudstone, subordinate fine greywacke; bedding/core angle 20°.
30' - 111'	49'	Fine grained greywacke, subordinate mudstone, graded bedding, slump structures, bedding/core angles 20° (from 30' - 60'), 5° (from 60' - 70'), 75° (from 80' - 97'), 45° (from 97' - 111'). Cleavage/core angle 25° at 90' in same direction as bedding.
111' - 160'	39'	Mudstone, subordinate greywacke; graded bedding, some slumping, mud pellets, mudstone highly cleaved from 113'-115', bedding/core angles 70° decreasing to 40° with depth; cleavage/core angles 0°, 10°, 50°.
160' - 186'	23½'	Greywacke, subordinate mudstone; graded bedding, bedding/core angles 35°-40°, cleavage/core angle 35° in opposite direction to bedding.
186' - 241'	46'	Mudstone, subordinate greywacke; graded bedding, slump structures, mud pellets; highly cleaved mudstone from 196'-200' and 211'-213'; dominant cleavage/core angle 40°, bedding/core angles 35°-40°.

DIAMOND DRILL HOLE NO.2 (Continued)

Footage	Recovery	Description of Core
241' - 270'	26½'	Mudstone, subordinate greywacke; slight faulting at 264' and 270' faulting/core angle 0°, cleavage/core angles 0°, 50°, with manganiferous dendrites; bedding/core angles 60°-70° (from 262'-270').
270' - 324'	43'	270'-323' mudstone, occasional thin bedded greywacke; slight faulting at 15°, 30° to core length, irregular cleavage with manganiferous stringers and dendrites. Bedding/core angles 60°-65°. 323'-324' - 3" core quartz-hematite, leached, containing patches of kaolin.
324' - 401'	61½'	324'-395½' quartz-hematite, strongly leached to 344', slightly leached to 395'. Copper mineralisation from 336'-395½'. Malachite and some chrysocolla from 336'-348', and on cleavages to 351½'. Cuprite at 350½'. Native copper as stringers, blebs and crystals from 351'-351½'; 353½'-356'; 357'-359½'; 361'-362'; 366'-367'. Chalcocite? of sooty appearance from 352½'-353½'. Chalcopyrite as grains, blebs, irregular stringers from 351½'-359½'; 361'-367'; 371'-395½'. At 391' the chalcopyrite grains are thinly rimmed with a black alteration product. Iron pyrites at 352',very abundant from 373½'-374½'. Limonite is a common constituent to 371' and kaolin is frequent throughout. Jasper is rare. Ironstone/sediment contact at 395½' is banded and at an angle of 30° to core length. 395½'-397½' chloritic schists; schistosity/core angle 40° with some chalcopyrite grains. 397½'-401' mudstone, somewhat oxidised from 400'-401' with red iron ? spots. When slightly oxidised the mudstone contains small grains of pyrites.
401' - 410'	8½'	Mudstone, subordinate greywacke; sediments with pyrites and iron ? spots as above.

END OF HOLE

DIAMOND DRILL HOLE NO. 3

CAT'S WHISKERS PROSPECT

Collar Co-ordinates: 2830E, 1950S (B.M.R. Bull. 44, Plate 3, Sheet 3)

Bearing: 180°

Depression: 75°

Acid Surveys:

Depth	Angle (corrected)
150'	73°
250'	70°
350'	64°
425'	60°
500'	58°

Assay Results:

Footage	Copper (%)	Gold (dwts/ton)
394' - 402'	0.55	0.3
402' - 412'	0.45	trace
412' - 422'	0.25	trace
422' - 426'6"	0.95	nil
426'6" - 432'6"	0.25	trace
432'6" - 442'	0.15	nil
442' - 452'	0.1	nil
452' - 460'8"	0.25	0.4
460'8" - 466'	3.75	0.3
466' - 472'	3.45	1.1

Size of Hole:

0' - 75'	NX
75' - 165	BX
165' - 505'	AX

Footage	Recovery	Description of Core
0' - 45'	7'7"	Fine-grained red ferruginous sandstone with rare bands of claystone. Bedding/core angle 30°.
45' - 77'	9'7"	Fine-grained sandstone as above; thin claystone fragments and rare claystone bands. Bedding/core angle 65°.

Footage	Recovery	Description of Core
77' - 105'	17'2"	Sandstone as above with rare claystone bands. Bedding/core angle 45°.
105' - 135'	22'6"	Interbedded sandstone and bleached mudstone.
135' - 161'	20'9"	Fine sandstone, siltstone and mudstone beds interbedded; 3" chert band; limonite and clay partings; load casting and slumping. Bedding/core angle 35°.
161' - 196'	28'11"	Grey sandstone and red mudstone; bleaching along joints. Bedding/core angle 70°.
196' - 245'	43'0"	Red sandstone and mudstone; manganese staining along joints. Bedding/core angle 50°.
245' - 273'	24'1"	Reddish-grey thin bedded sandstone and mudstone; bedding slightly contorted. Bedding/core angle 50°.
273' - 294'	16'9"	Grey sandstone and mudstone; rare bands of red mudstone; load casting; bottom of oxidation at 294'.
294' - 335'	31'11"	Dark grey cherty mudstone and silicified phyllite. Bedding/core angle 60°.
338' - 365'	18'3"	Grey sandstone with rare beds of mudstone. Bedding/core angle 45°.
365' - 391'6"	24'10"	Interbedded mudstone and sandstone; rare quartz stringers. Bedding/core angle 45°.
391'6" - 402'0"	4'4"	2'0" phyllitic mudstone. 2'4" chloritic rock veined by quartz.
402' - 406'6"	3'6"	Very badly leached quartz-hematite.
406'6" - 421'	11'6"	Hematite with rare quartz and rare traces of copper carbonates.
421' - 422'	NO CORE	
422' - 437'	11'4"	2'6" hematite. Remainder of core is chloritic phyllite; pyrite and magnetite common; quartz and chalcopyrite rare; bands of talc (?), possibly a shear zone, near 430'.

DIAMOND DRILL HOLE NO. 3 (Continued)

Footage	Recovery	Description
437' - 440'	NO CORE	
440' - 454'6"	13'0"	Greywacke and chloritic phyllite; rare pyrite. Below 451' the core is magnetite with abundant pyrite and rare chalcopyrite.
454'6" - 472'	13'9"	Massive magnetite with abundant pyrite; chalcopyrite common below 460'8"; rare bornite and quartz; chlorite becomes more abundant; sulphides appear to be parallel to some original planar structure, possibly bedding.
472' - 493'	18'5"	Chloritic phyllite; no visible sulphides; bedding/core angle 45°; hematite on cleavage surfaces.
493' - 505'	11' 5"	Black fine-grained mudstone.

END OF HOLE.

DIAMOND DRILL HOLE NO. 4

CAT'S WHISKERS PROSPECT

Collar Co-ordinates: 2730E, 1950S (B.M.R. Bull. 44, Plate 3, Sheet 3)

Bearing: 180°

Depression: 60°

Acid Surveys:

Depth	Angle (Corrected)
150'	58°
250'	57°
350'	55°
430'	55°

Assay Results:

Footage	Copper (%)	Gold (dwts/ton)
313' - 326'	0.1	Nil
326' - 335'	0.15	Nil

DIAMOND DRILL HOLE NO. 4 (Continued)

Assay Results: (cont.)

Footage	Copper (%)	Gold (dwts/ton)
335' - 348'	0.2	Nil
348' - 355'	0.15	Nil
355' - 362'	0.1	Nil
362' - 370'	Nil	Nil
370' - 375'	0.2	0.3
375' - 381'	0.25	0.2
381' - 386'	0.15	0.4

Size of Hole:

0' - 70'	NX
70' - 297'	BX
297' - 431'	AX

Footage	Recovery	Description of Core
0' - 40'	7'1"	Pale pink fine-grained sandstone; some vein quartz.
40' - 70'	17'0"	Interbedded brown mudstone and greywacke; contacts very irregular.
70' - 95'	13'2"	Reddish to pink greywacke and mudstone. Bedding/core angle 70°.
95' - 118'	18'1"	Interbedded greywacke and mudstone as above.
118' - 155'	26'10"	Mudstone and greywacke as above. Bedding/core angle 70°.
155' - 186'	27'6"	Principally red greywacke interbedded with red mudstone; bleaching along joints; rare manganese staining. Bedding/core angle 45°.
186' - 220'	27'11"	Pale red to brown fine-grained sandstone; some cross bedding; limonite along joint planes; bedding/core angle 75° at 195', 30° at 220'.
220' - 253'	22'10"	Pale red mudstone. Bedding/core angle 30°-45°.
253' - 287'	32'2"	Red mudstone as above to 278'; grey mudstone and sandstone with rare red bands beneath 278'. Bedding/core angle 90°, manganese staining common.

DIAMOND DRILL HOLE NO. 4 (Continued)

Footage	Recovery	Description of Core
287' - 313'	10'6"	Mudstone as above; bedding contorted. Bedding/core angle approximately 45°. Last 1" of core is quartz-hematite-magnetite, badly leached.
313' - 317'	3'9"	Badly leached quartz-hematite; rare magnetite; limonite on joints.
317' - 321'	3'4"	As above, higher proportion of quartz.
321' - 328'	2'0"	Leached quartz-hematite; rare pyrite.
328' - 347'	4'11"	Very badly leached quartz hematite; rare malachite staining.
347' - 362'	12'4"	Quartz-hematite; magnetite below 349'. Malachite and azurite stains and stringers; rare pyrite; some chlorite bands below 355'. Magnetite is brecciated and fragments are surrounded by chlorite; very rare chalcopyrite.
362' - 380'	9'2"	Mostly chlorite-magnetite rock; some quartz. Magnetite with up to 10% pyrite and rare chalcopyrite between 372' and 374'; some brecciated magnetite surrounded by talc (?).
380' - 386'	3'11"	6" of very fine white clay, followed by talc (?) with discontinuous bands of pyrite.
386' - 408'	21'9"	Chloritic mudstone with rare greywacke and rare quartz stringers.
408' - 431'	20'6"	Chloritic mudstone and greywacke; greywacke shows graded bedding. Bedding/core angle 70°.

END OF HOLE

DIAMOND DRILL HOLE NO. 5

CAT'S WHISKERS PROSPECT

Collar Co-ordinates: 2930E, 1910S (B.M.R. Bull. 44, Plate 3, Sheet 3)

Bearing: 180° (Magnetic)

Depression: 60°

Acid Surveys:

Depth	Angle (corrected)
75'	63°
150'	60°
250'	58°
350'	53°

Assay Results:

Footage	Copper (?)	Gold (dwts/ton)
393' - 396'	0.15	Nil
396' - 399'	2.6	Nil
399' - 402'	1.2	Nil
402' - 405'	0.55	Nil
405' - 408'	0.9	Nil
408' - 411'	0.1	Nil
411' - 414'	Nil	Nil
414' - 417'	0.8	trace
417' - 420'	2.7	trace
420' - 423'	2.4	0.5
423' - 426'	1.1	0.4

Size of Hole:

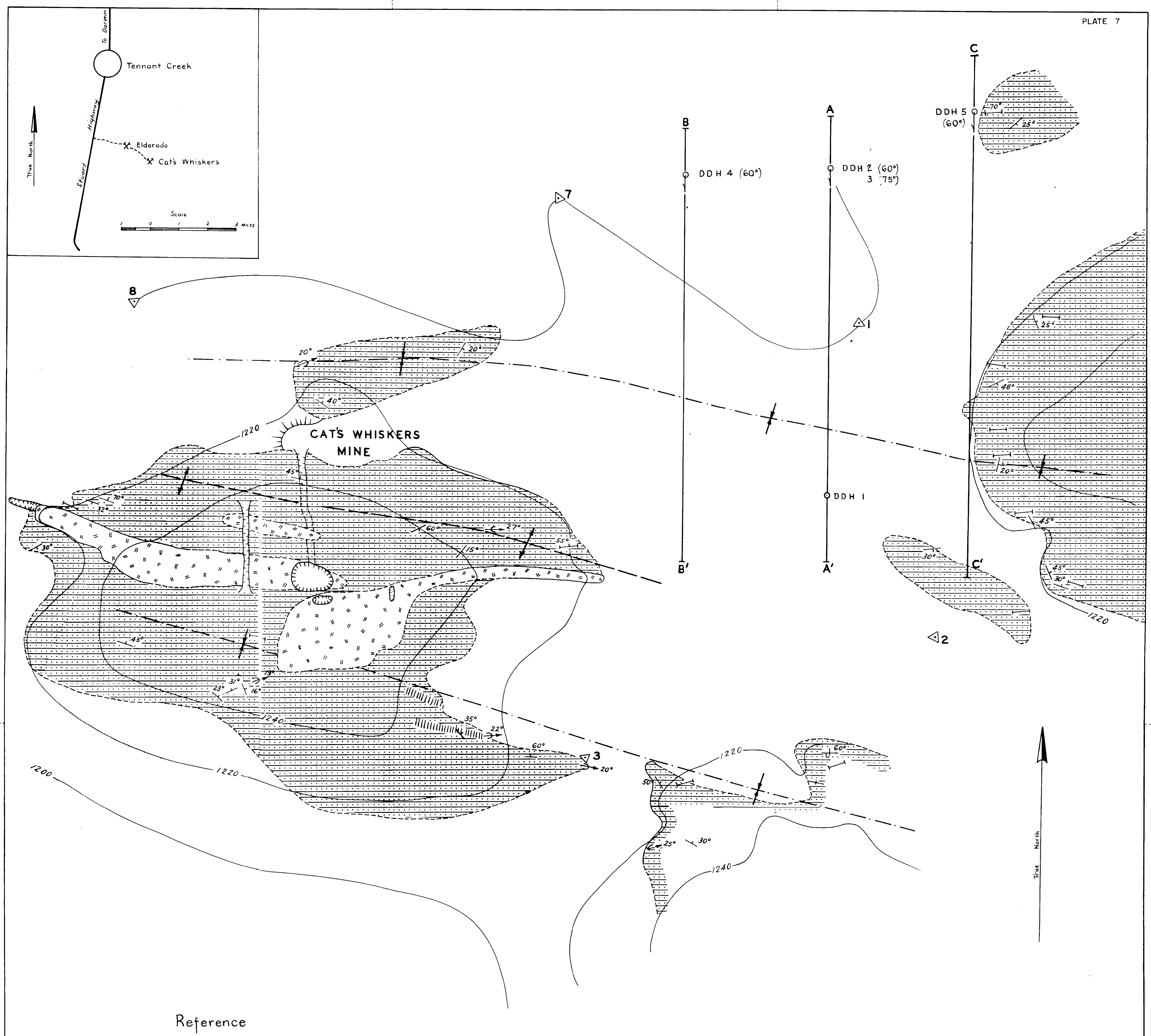
0' - 236'	BX
236' - 450'	AX

Footage	Recovery	Description of Core
0' - 50'	10'11"	Pale red fine-grained greywacke with rare siltstone bands.
50' - 90'	26'4"	Interbedded pale red greywacke and siltstone. Bedding/core angle 50°.
90' - 119'	24'7"	Interbedded pale red mudstone and greywacke; rare manganese staining; rare thin quartz stringers.
119' - 143'	20'7"	Mostly pale red greywacke with some mudstone. Bedding/core angle 70°-75°; manganese staining on joint planes.

DIAMOND DRILL HOLE NO. 5 (Continued).

Footage	Recovery	Description of Core
143' - 173'	20'10"	Red greywacke and mudstone to 155'; fine grey mudstone below 155'.
173' - 203'	25'10"	Interbedded red greywacke and mudstone. Bedding/core angle 45°.
203' - 229'	21'9"	Red greywacke with some chloritic mudstone; some quartz veinlets; greywacke somewhat mottled along joint planes.
229' - 256'	22'11"	Interbedded greywacke and mudstone; leaching and manganese staining on joints. Bedding/core angle 80° at 234'; 40° at 246'.
256' - 280'	23'3"	Red mudstone and dark yellow-brown greywacke.
280' - 310'	28'6"	Mostly red mudstone with some yellow-brown greywacke.
310' - 329'	16'3"	As above; mudstone grey below 326'.
329' - 348'	17'10"	Hematite shale at 329'. Bedding/core angle 45°. Red fine greywacke and fine silicified mudstone from 338'; bottom of oxidation at 344'.
348' - 371'	17'7"	Fine grey silicified mudstone and fine greywacke.
371' - 396'	20'9"	Interbedded greywacke and mudstone; last 1' very chloritic.
396' - 406'	10'0"	Quartz-magnetite; principally quartz; rare chlorite; rare pyrite and native copper.
406' - 431'	23'10"	Quartz-magnetite lode as above to 424'; up to 1% chalcopyrite; rare bismuth (?). Chlorite schist from 424'-431'.
431' - 450'	17'4"	Green greywacke with rare quartz stringers.

END OF HOLE



Reference

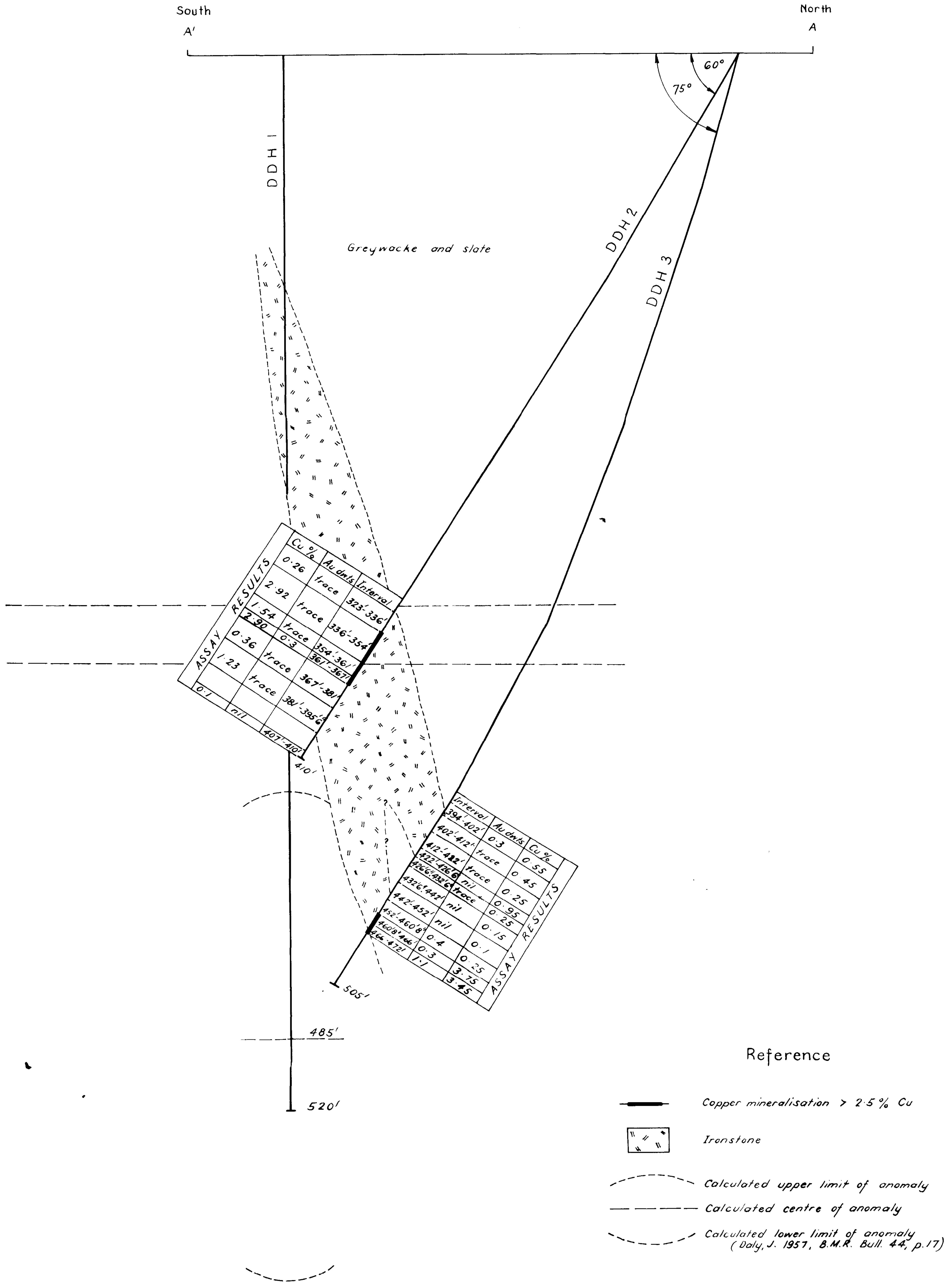
- Ironstone
- Greywacke and slate
- Hematite shale
- Strike and dip of bedding
- Overturned bedding
- Plunge of minor anticline
- Plunge of minor syncline
- Vertical cleavage
- Anticlinal axis - position approximate
- Synclinal axis - position approximate
- Open cut
- Dump
- Adit
- 1200 Contour - assumed datum
- DDH 1 Vertical diamond drill hole
- DDH 4 (60°) Diamond drill hole bearing and depression
- Plane table station
- A —— A' Line of cross section

SURFACE GEOLOGY

CAT'S WHISKERS PROSPECT, TENNANT CREEK N.T.

Topography I. Faulks : plane table & alidade.
Geology P.G.Dunn: compass & tape.

Scale
40 0 40 80 120 FEET



VERTICAL SECTION AA' · CAT'S WHISKERS PROSPECT, N.T.

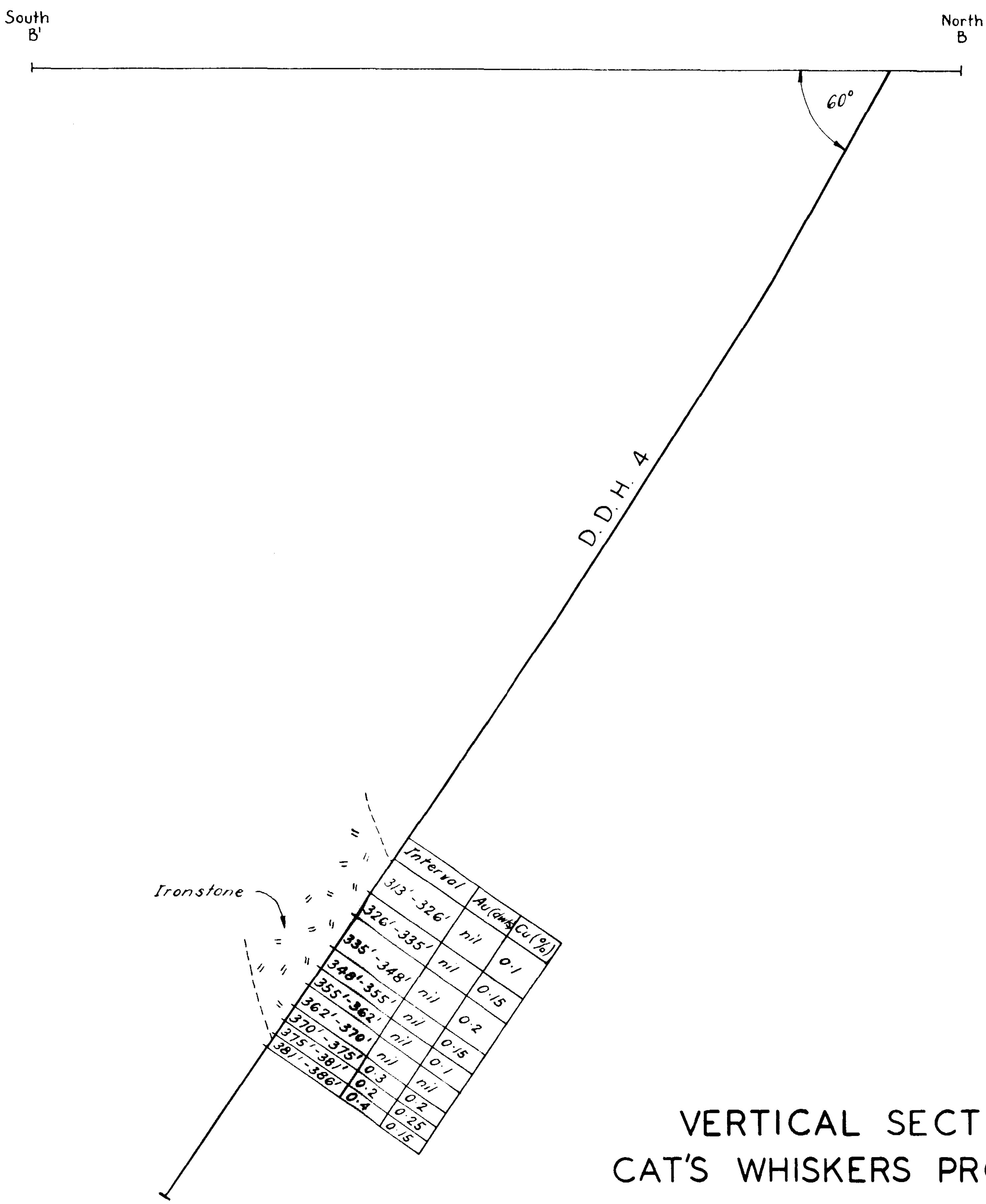
Scale

40 0 40 80 120 Feet

Resident Geologists Office, B.M.R. Tennant Creek, N.T. October 1963 To accompany Record № 1964/22

E53/A14/21

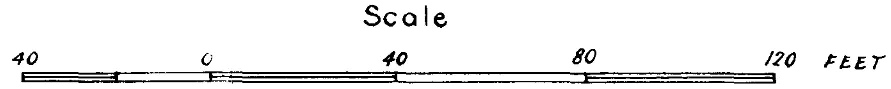
E53/14/TC M207



Interval	Au(dwts)	Cu(%)
313'-326'	nil	0·1
326'-335'	nil	0·15
335'-348'	nil	0·2
348'-355'	nil	0·15
355'-362'	nil	0·1
362'-370'	nil	nil
370'-375'	0·3	0·2
375'-381'	0·2	0·25
381'-386'	0·4	0·15

VERTICAL SECTION B B'
CAT'S WHISKERS PROSPECT, N.T.

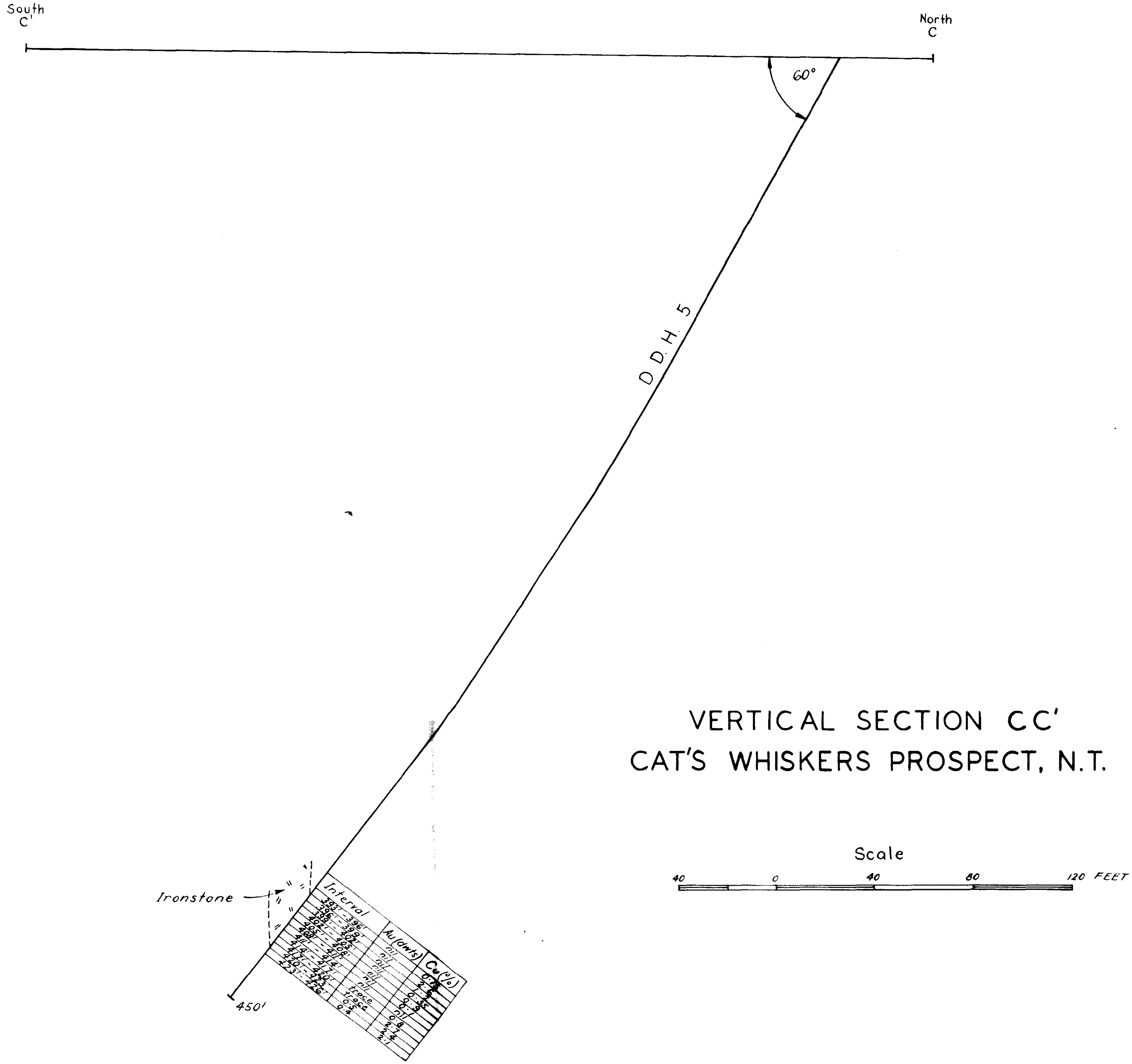
Scale



Resident Geologists Office, B.M.R. Tennant Creek, N.T. October 1963 *To accompany Record Nº 1964/22* E53/A14/23

E53/14/TC M203

PLATE 10



VERTICAL SECTION CC'
CAT'S WHISKERS PROSPECT, N.T.

Resident Geologists Office, B.M.R. Tennant Creek N.T. October 1963 To accompany Record № 1964/22 E53/A14/24

E53/14/TC M204

KENNY'S GOLD-SILVER-LEAD PROSPECT, NEAR GARDENS, ALICE SPRINGS, N.T.

by

I.P. Youles

INTRODUCTION

Kenny's prospect is situated six miles southwest of Gardens Homestead, 41 miles north-east of Alice Springs. Access from the Homestead is via the old Winnecke Goldfield road for 4 miles, then northwest through hilly country for 3 miles. The prospect is situated immediately to the north of the Winnecke Goldfield.

The mine workings were known originally as the Gander claim, and were described by Brown (1903) and Matthews (1905). The workings were also the subject of a report by Hossfeld (1937) when the property was known as the Glankroil Mine. Finally Ruxton (pers. comm.) reported on the workings as Kenny's Prospect.

The photo co-ordinates of the prospect are quadrant C, X = 1.1 inches, Y = 0.15 inches, diagonal 1.1 inches, photo No. 5021, Run 5, Alice Springs, Survey 843.

PRODUCTION AND GRADE

PRODUCTION

The recorded production of silver-lead ore from these workings up to 1938 was 48 tons, which was estimated to contain 30 tons of lead (Fisher, 1947). These figures give an overall grade of approximately 60% lead, but no information is available on the silver content. No production is recorded for the period 1939 to 1945 and local information indicates that no mining has been carried out since then. There is no information on the mining of the gossanous material which generally carries high gold and silver values especially where quartz is present; it appears therefore that the material could not be treated profitably in the past, probably due to the complex nature of the ore.

GENERAL GEOLOGY

The geology of the area was described by Ruxton (pers.comm.) as follows: "A bedded series of intermediate and acid schist and gneiss of the Arunta complex is folded in an open anticline plunging at about 20 degrees northeast. The prospect is situated on the nose of this anticline and the two mineralised lodes occupy vertical faults striking north-north-east. These faults are parallel with the axes of minor crenulations on the major fold".

THE PROSPECT

(i) Structure of the Mineralised Area

The two lodes occur in reverse faults which generally dip at 80 to 85 degrees east. The movement on the faults does not appear to have been large. At No. 2 lode, 50 feet south of No. 2 shaft, the apparent horizontal displacement is 6 feet, west block south; no measurement of the vertical component was possible, although drag-folding of the country rock is evident.

The mineralisation has been traced for 450 feet along the line of No. 2 lode and for about 50 feet along No. 1 lode, but the workings on No. 1 lode may not have exposed the full extent of mineralisation.

The existing workings on No. 1 lode consist of No. 1 shaft and two small costeans. No. 1 shaft has partly collapsed and only the top 15 feet are accessible.

The workings on No. 2 lode consist of No. 2 and No. 3 shafts and many costeans. No. 2 shaft is now filled with water but Hossfeld recorded it as the main inclined drive with an approximate grade of 1 in 2 and extending in plan 60 feet northwards. No. 3 shaft is vertical but inaccessible.

In some of the exposures on No. 2 lode the fault zone is up to 1 foot wide and consists mostly of massive limonite with some fault breccia. In other exposures the zone is up to 4 feet wide and consists of sub-parallel veins and stringers predominantly of limonite; fault breccia is present in some of the larger veins. It appears, therefore, that the massive sections of the lodes are open cavity infillings, probably associated with the more competent beds of the country rock, and are likely to continue in depth. Their pitch within the fault plane appears to be parallel to the bedding of the country rock.

(ii) Description of the Lodes

In detail the lodes are discontinuous, and consist of mineralised pods which pitch at about 30 degrees north-north-east within the fault plane.

The following minerals were identified, in an unspecified sample, by the School of Mines, South Australia (Assay Reference No. 306/37, July 1937) - galena, cerussite, massicot (PbO), quartz, malachite, azurite and antimony ochre. Antimony, arsenic and bismuth have been identified in the ore.

The main mineral visible is dark brown massive limonite, often seen as definite pseudomorphs of galena; remnants of unreplaced galena are also visible. Boxworks of light brown limonite, probably after chalcopyrite, are more common on the old dumps than in the accessible portions of the workings. Extensive showings of malachite and azurite further suggest that chalcopyrite was originally present in the ore.

Blue-black quartz appears to be the main gangue mineral, forming up to 10% of the lode. The greater part of the quartz is evidently later in age than the sulphides, as it forms ramifying veinlets in the massive parts of the lode, and forms a central zone bordered by sulphides in smaller veins (up to 2 inches wide) at the extremities of No. 2 lode.

Samples No. F53/14-1 to 14-5 indicate the close association of the gold, and part of the silver values, with the quartz. In sample No. 4 the quartz contained many small cavities, some of which were filled with limonite and others with malachite and azurite. From the evidence at this exposure, (see Fig. 4) the quartz with its associated copper and gold is later than the galena.

The relatively low silver values for most of the gossan samples combined with the high silver values for the massive galena indicate the probability of a secondary enrichment zone for silver below the surface. The gold does not appear to have been similarly leached from the surface.

Dark brown massive limonite pseudomorphing a rhombohedral carbonate, probably siderite, was observed in sample No. F53/14-5 (Plate 11); the presence of carbonate is not apparent in the other samples.

CONCLUSIONS

From the assay results (see Appendix) the bulk of the potential ore in this prospect is essentially a silver-lead ore. By selective mining and hand sorting, it may be possible to maintain a grade of 40% to 70% lead and 20 ozs. to 30 ozs. silver per long ton. The gold content will be more variable but the assay evidence indicates that average values from 5 dwt. to 10 dwt. per long ton may be obtainable.

It is reasonable to expect that the grade of the ore may change abruptly at the base of the weathered zone. As the depth of weathering and the lateral extent of the ore pods are unknown, no estimate of reserves can be made.

The composite assays quoted in Section 3, 4 and 5 of the Appendix, show that the mineralization is complex, and will probably require special treatment. Hossfeld (1937) stated that some ore was shipped to Germany for treatment, and Broken Hill Smelters Pty Ltd indicated, in 1937, that a consignment of ore from these workings would be unacceptable due to its high bismuth content (0.096%). Metallurgical advances may have eased this restriction since then, but if the original limit still operates, the ore would probably have to be sent overseas for treatment.

The prospect, as outlined to date, is too small to be of interest to mining companies. Whether individuals will be able to work the lodes profitably, will depend largely on what treatment processes are necessary, and whether the ore can be treated within Australia. At present insufficient development work has been done to permit any estimate of the reserves to be made.

REFERENCES

BROWN, H.Y.L., 1903 - Report on the gold discoveries near Winnecke's Depot, and Mines on the Arltunga Goldfields, Macdonnell Ranges; S. Aust. Parl. Pap. 59 Adelaide.

FISHER, N.H., 1947 - Lead; Bur. Min. Resour. Aust. Summ. Rept., 23.

HOSSFELD, P.S., 1937 - The Glankroil Mine, Winnecke Goldfield; Aer. Surv. N. Aust., N. Terr. Rep., 39.

MATTHEWS, W.H., 1905 - Report on Arltunga and Winnecke's Goldfields and Hart's Range Mica Fields; S. Aust. Parl. Pap. 75 Adelaide.

APPENDIX

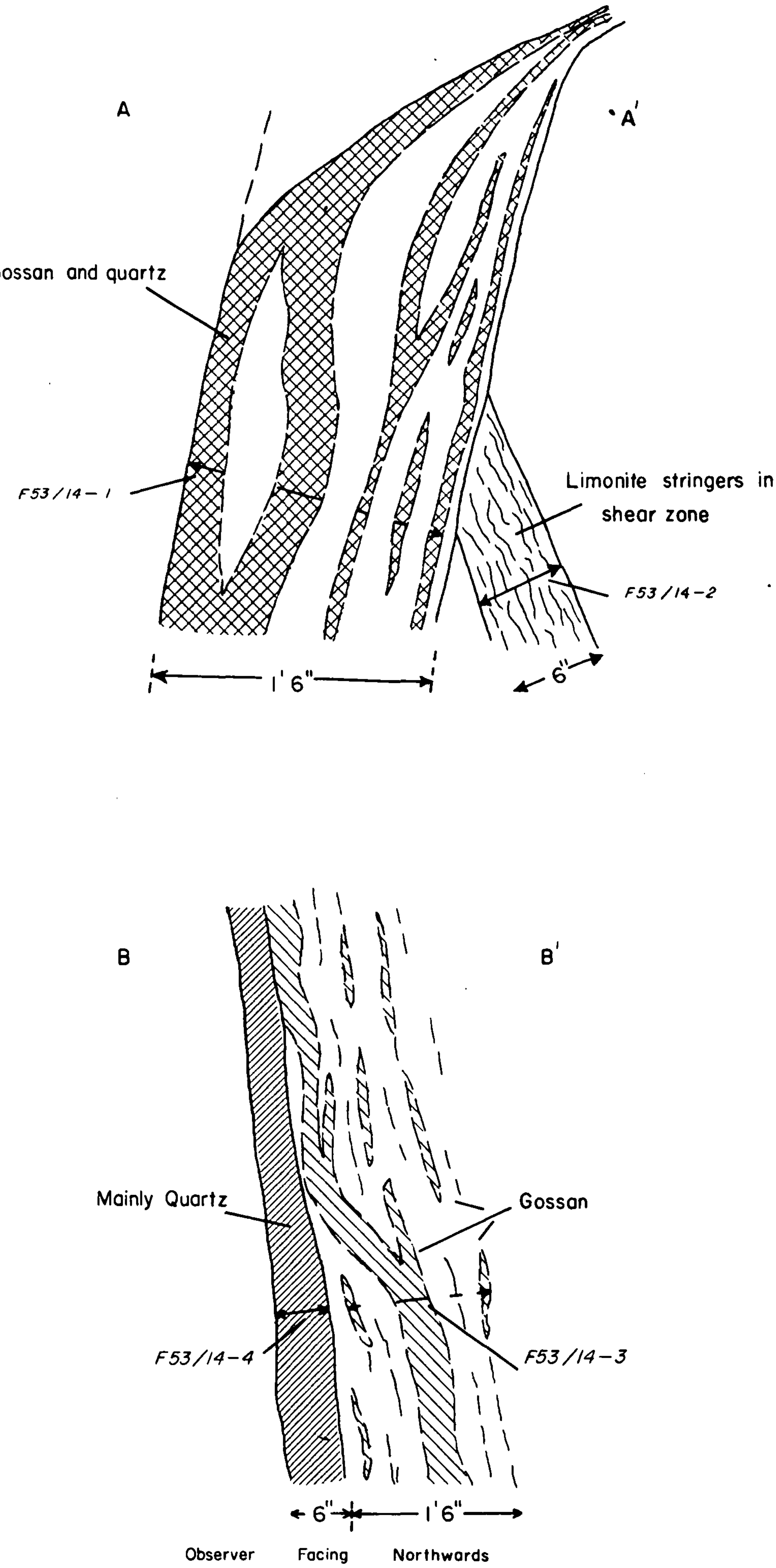
ASSAY RESULTS

1. W.H. Matthews (1905)

Sample No.	Gold	Silver	Lead	Copper
No. 1	4 dwts/ton	6.6ozs/ton	3.4%	0.54%
No. 2	Nil	32 "	8.5%	7.8%
No. 3	1 oz/ton	144 "	44.3%	7.7%
No. 4	3dwts/ton	23.3 "	72.0%	0.5%

No details are available as to the location, widths or descriptions of these samples.

Figure 3



SKETCHES SHOWING POSITIONS OF
SAMPLE Nº F53/14—1 to 4

Bureau of Mineral Resources, Geology and Geophysics March 1964 To accompany Record Nº 1964/22 W.W.

F53/A14/25

2. P.S. Hossfeld (1937). For location see fig.4.

Note: samples (H)1, (H)2 and (H)89 are underground

Sample No.	Width	Gold	Silver	Lead	Copper	Description
(H)1	9"	6.6dwt/ ton	26.5oz/ ton	51.7%	3.42%	Highly mineralised galena predominating.
(H)2	24"	2.0 "	6.0 "	13.1	0.28	White, less mineralised
(H)89	18"	2.1 "	6.9 "	21.5	0.39	Oxidised material
(H)107	-	1.2 "	2.1 "	2.6	Trace	Dump grab sample
(H)129	48"	Trace	0.26 "	0.2	Nil	Cossan
(H)281	15"	8.0 "	32.6 "	41.3	1.43	Galena

*3. Assay Report No. 306/37 (South Aust. School of Mines, 1937).

composite sample

Gold	Silver	Lead	Copper	Antimony	Arsenic
4dwts/ long ton	10.3ozs/ long ton	57.3%	3.9%	2.4%	0.2%

*4. Assay of composite sample sent to Broken Hill Associated Smelters Pty. Ltd., in 1937.

Gold	Silver	Lead	Copper	Silica	Arsenic	Bismuth	Zinc
9.2dwts/ ton	32.64 ozs/ton	32.5%	4.0%	25.8%	0.02%	0.096%	1.4%

*5. Assay of composite sample

Gold	Silver	Lead	Copper	Antimony	Arsenic	Bismuth	Zinc	Tin
12.8 dwts/ ton	30.7oz/ ton	42.5%	2.2%	0.1%	1.8%	0.03%	0.1%	0.5%

6. B. Ruxton (1963) - for location see fig.4.

Sample No.	Gold	Silver	Description
196225	-	30.5ozs/long ton	Galena
196226	1oz.11dwt/long ton	14.3ozs/long ton	Gossan

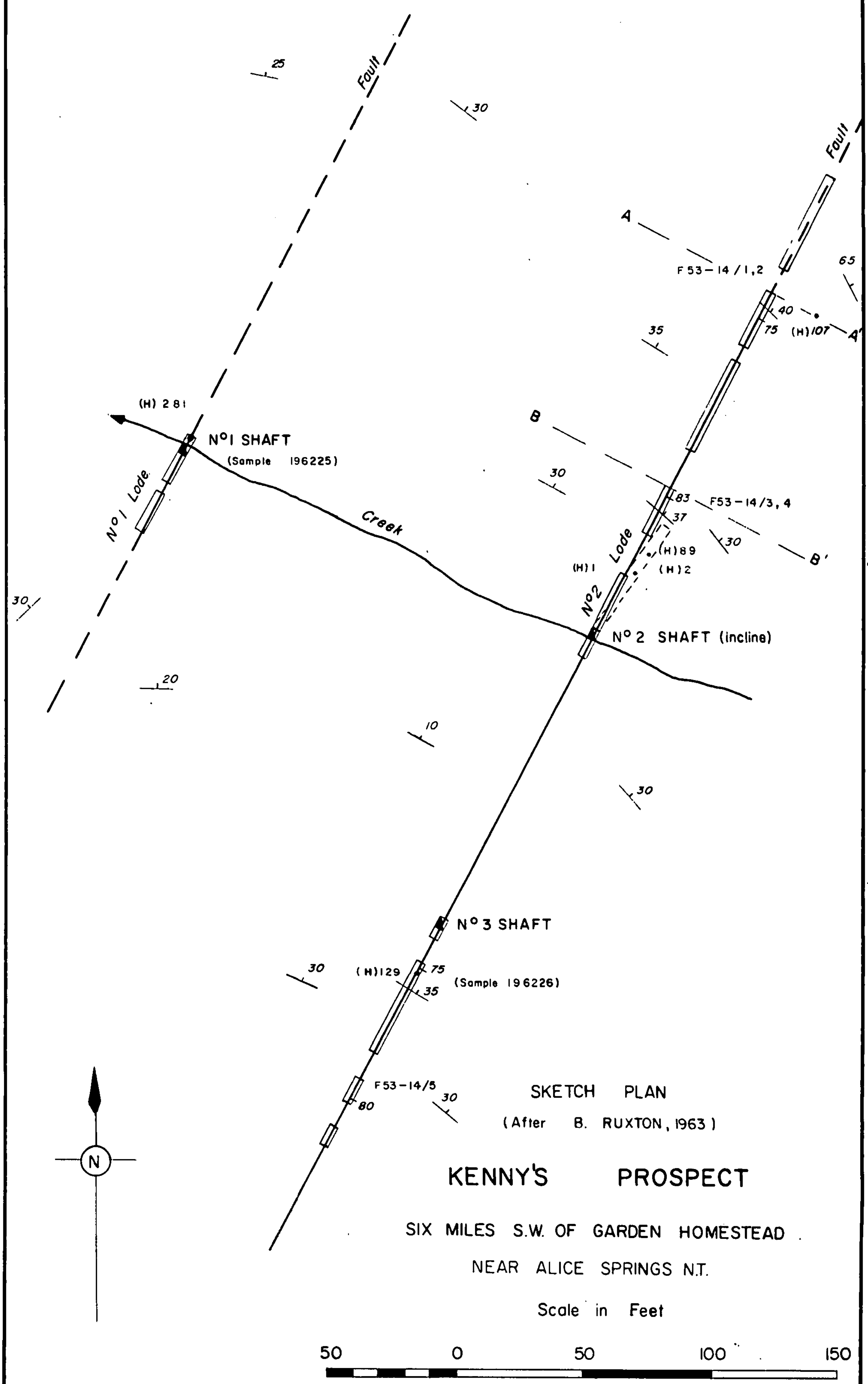
* Information extracted from the correspondence files of the Resident Geologist's Office, Mines Branch, N.T. Administration, Alice Springs.

Appendix ii.

7. Sampling by author - for location see fig. 4.

Sample no.	Width	Gold	Silver	Description
F53/14-1	12"	17.3dwt/ton	8.1oz/ton	Gossan with 10% quartz.
-2	6"	0.3 "	Nil	Limonite in shear zone
-3	8"	2.6 "	4.6 "	Gossan
-4	6"	2oz9.4 "	12.1 "	Mainly quartz
F53/14-5	12"	4.6 "	0.5 "	Gossan

The relative positions of Samples No. F53/14-1 to 14-4 are shown on Plate II.



SKETCH PLAN
(After B. RUXTON, 1963)

KENNY'S PROSPECT

SIX MILES S.W. OF GARDEN HOMESTEAD.
NEAR ALICE SPRINGS N.T.

Bureau of Mineral Resources, Geology and Geophysics, March 1964 To accompany Record No 1964/22 F53/A14/24

AN INSPECTION OF MOUNT MASSON TIN MINE. N.T.

by

J. Barclay

An inspection was carried out on 19th November, 1963, of the Mount Masson Tin Mine at the request of Mr. K. Jessop, of Darwin, who holds an option on the mine.

A reason was sought by Mr Jessop to explain why tin values had cut out in a winze, (No. 2 winze), which has been sunk to a depth of 30 feet from the adit below the southern extremity of the stope.

GEOLOGY

The lower limit of the values appears to coincide with an easterly flexure of the lode, and it is possible that a recurrence of ore may take place below the flexure if the lode-channel resumes its usual vertical attitude.

Alternatively, it is possible that the ore-shoot may pitch northwards across the winze at this depth, and that the occurrence of the flexure is not significant.

Another winze, (No. 1 winze), has been sunk to a depth of 26 feet from a point 71 feet north of No. 2 winze below the northern extremity of the slope. At 24 feet a similar easterly flexure occurs in this winze, but the values in this case do not cut out.

RECOMMENDATIONS

It is recommended that No. 1 winze should be deepened as long as values are encountered, and No. 2 winze should be deepened to test the lode-channel below the flexure. No stoping below the adit should be undertaken until this work has been carried out, as the lay-out of the stopes will be affected by the results of this work.

Accompanying this report is a sketch map showing details of the workings.

REFERENCE:

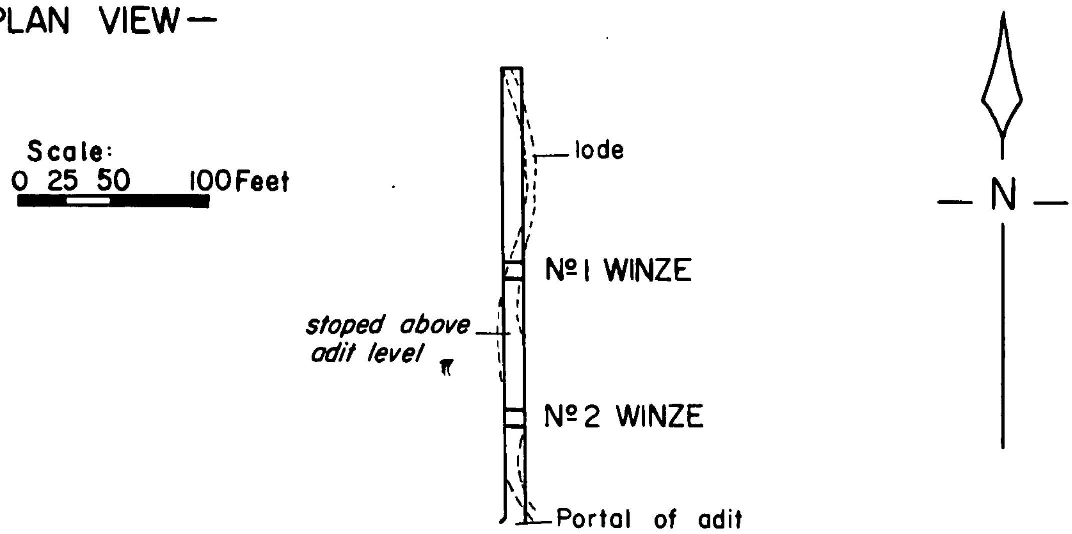
J. Hays : The Geology of the Mount Harris Tin Field, N.T. Bur. Min. Resour. Aust. Rec. 1960/2 (unpubl.).

Figure 4

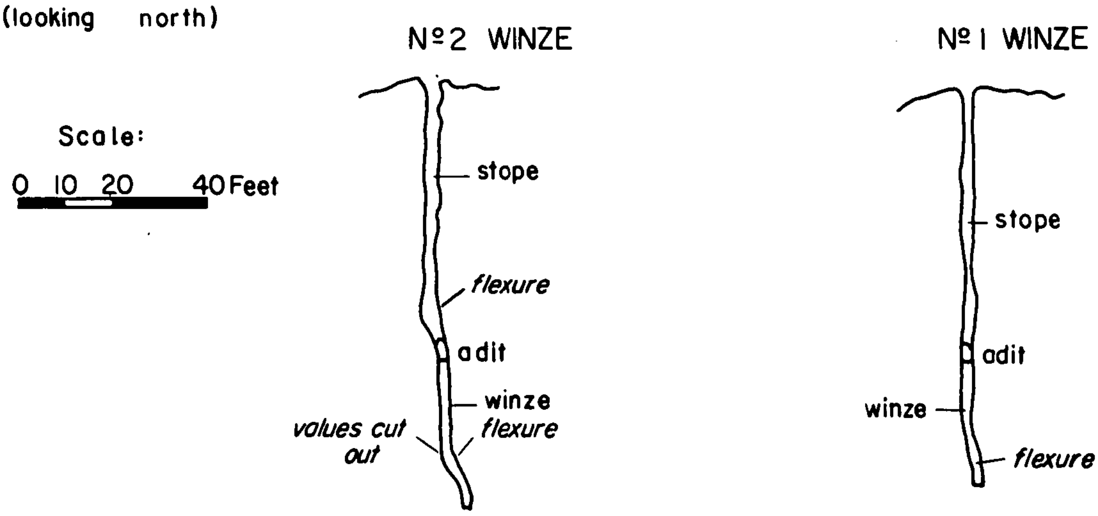
MT. MASSON TIN MINE N.T.

Sketch of Workings.
(not surveyed)

PLAN VIEW—

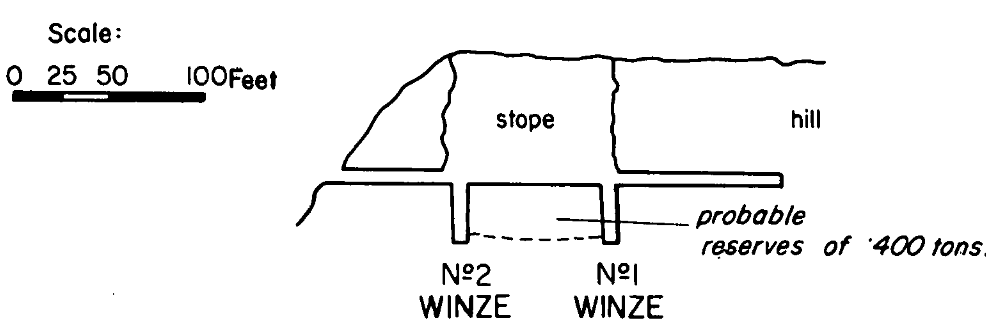


CROSS SECTION—
(looking north)



Average width of lode is 3 feet

LONGITUDINAL SECTION—
(looking west)



Bureau of Mineral Resources, Geology and Geophysics. February 1964 To accompany Record Nº1964/22 D52/A8/96