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1961/144

DRILLING RECOMMENDATIONS : IRON BLOW AREA

by

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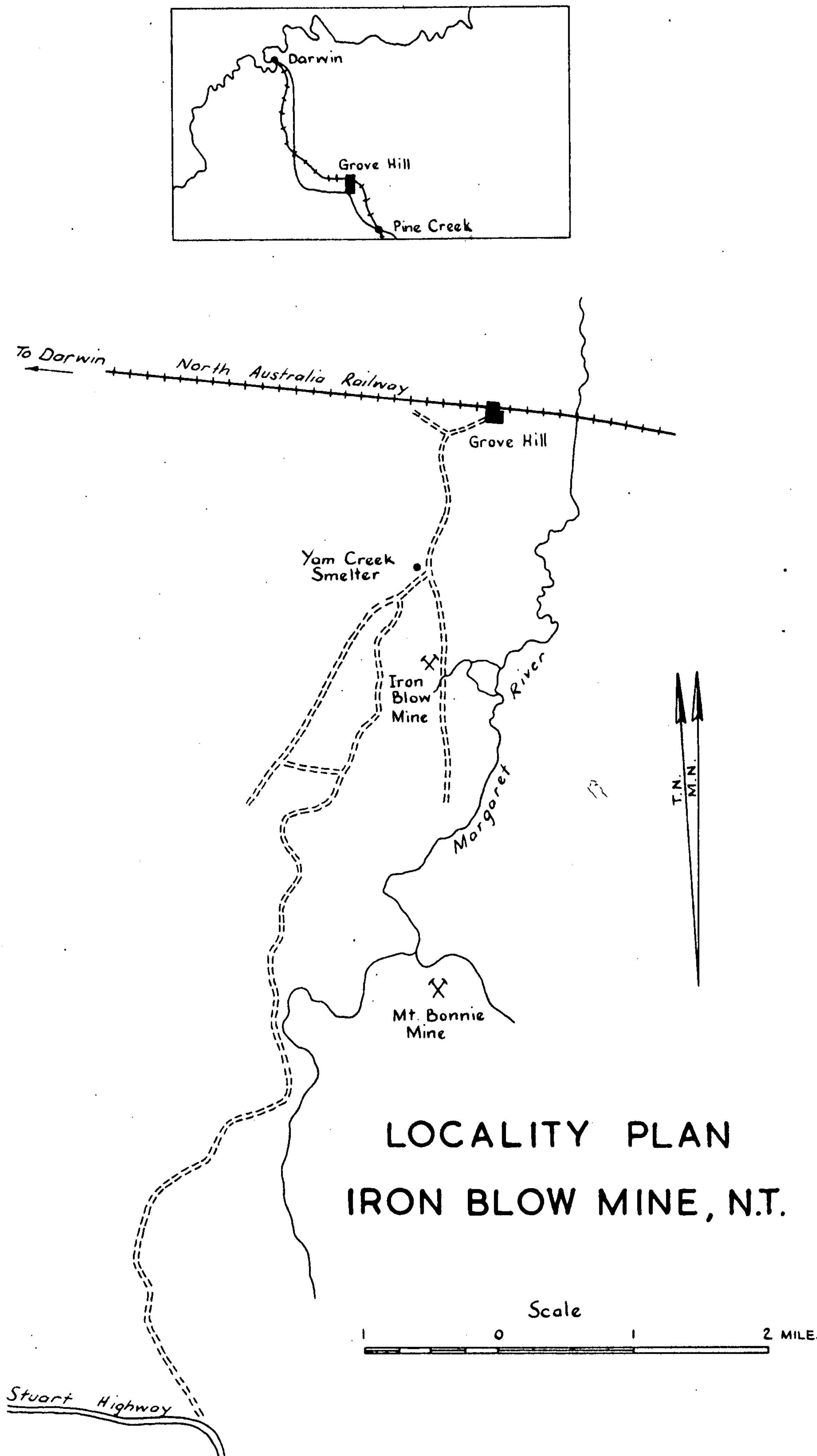

LOCALITY PLAN
IRON BLOW MINE, N.T.

Resident Geologists Office, Bureau of Mineral Resources, Darwin March 1961

SUMMARY

The Iron Blow mine was examined by the author in conjunction with geophysicists of the Bureau of Mineral Resources in November, 1960. The orebody contains sulphides of lead, zinc, and copper, with some gold and silver. Five diamond drill holes are recommended to evaluate the prospect.

INTRODUCTION

The Iron Blow mine is about 130 miles from Darwin by road. It can be reached by turning north off the Stuart Highway 123 miles from Darwin, and then following the track to Grove Hill as far as the old Yam Creek smelter. From there a faint track extends south for about one mile to the Iron Blow. During the wet season the mine could be reached only with a four-wheel drive vehicle, and might be inaccessible for short periods.

This report is the result of a geological survey done in November, 1960, in conjunction with geophysicists of the Bureau of Mineral Resources. A separate geophysical report has been prepared (Skattebol,1961). The aim of these surveys was to determine whether the Iron Blow would be a favourable target for diamond drilling, and, if so, to locate the best drilling sites. Mapping was originally done by compass and tape, using the geophysical grid as a base, but in August, 1961, a plane table survey of the mine area was carried out to check the accuracy of old mine plans.

PREVIOUS WORK

The orebody was discovered in 1873, but no mining was done until 1886. It was then worked until 1906 when it was abandoned; several unsuccessful attempts to re-open it were made between 1906 and the beginning of the First World War (Hossfeld,1937).

In 1912, a diamond drill hole was put down which intersected a total of 76.5 feet of low grade vein material (Jensen, 1915; Hossfeld,1937).

A geological and geophysical survey of the area was made in 1937 by members of the Aerial, Geological, and Geophysical Survey of Northern Australia (Hossfeld, 1937; Rayner and Nye, 1937), and in 1957 geologists of the Australian Mining and Smelting Co. Ltd. also mapped the area (Thomas, 1957).

In 1959, the Bureau of Mineral Resources carried out reconnaissance geochemical prospecting in the area (Corbett, 1960). A geochemical anomaly was found along the Margaret River downstream from the Iron Blow, but this may be due to material washed into the river from the dumps around the mine.

GEOLOGY

The Iron Blow mine lies on the south-east flank of a range of low hills surrounded by alluvial flats. Outcrops are sparse and mainly on the hills. The rocks are mostly slates, some of which are carbonaceous or sericitic, with a thick lens of siliceous slate immediately west of the main mine excavations. Some thin bands of impure quartzite occur about 600 feet north-east of the mine in a small area of quartzite float.

Boulders of gossan form a ridge along the western side of the open cut and are remnants of the outcrop from which the mine was named. This gossan consists of hematite with some quartz-hematite breccia and, in places contains curved, elongate boxworks.

Samples of ore from the dump contain pyrite, arsenopyrite, galena, sphalerite, chalcopyrite, and minor amounts of covellite and bornite. Two small outcrops contain minor amounts of sulphides.

The bedding of the country rock cannot be determined in every outcrop, but wherever it could be seen it was parallel to the slaty cleavage, striking slightly west of north and dipping between 70° and 90° to the west, except in the No.1 North prospecting shaft where the dip is 75° to the east.

A poorly defined shear zone, (the "main shear" of the area), extends from the No. 2 South shaft along the long axis of the open cut to the No. 2 North prospecting shaft. The shear is exposed only in mine excavations, and its dip, wherever it could be measured, is approximately vertical. A few outcrops of gossan occur along the line of the shear, and a large outcrop of gossan occurs south-east of the No. 2 South shaft, suggesting a possible extension of the shear beneath the alluvium. The shear zone is about five feet wide at the No. 2 South shaft, bulges to about 20 feet near the north end of the open cut, and narrows to about one foot at No. 2 North prospecting shaft. It has not been seen north of the No. 2 North prospecting shaft.

A similar shear may be present about 150 feet west of the main shear. This shear is exposed in a shaft west of the main workings (No. 3 shaft in Hossfeld's report). A small outcrop of unoxidised ore north of the shaft and a gossanous outcrop to the south of the shaft may be on the same shear which would thus be approximately parallel to the main shear.

About 450 feet north-west of the No. 2 North prospecting shaft a long costean with an enlarged excavation at one end exposes a zone of conformable quartz veins. The zone is about 15 feet wide and not more than 50 feet long. No mineralization is associated with these veins.

ECONOMIC GEOLOGY

Mineralization at the Iron Blow seems to be associated with one or both of the shear zones, and the eastern or main shear localized the ore that was mined from the Iron Blow Mine.

According to Hossfeld's plans, the workings of this mine consist of two development levels at depths of 100 feet and 200 feet, with sublevels and stopes between the 100-foot level and the surface.

On the 100-foot level, the ore occurs in two lenses; the northern lens is about 170 feet long and about 25 feet wide, and the southern lens is about 90 feet long with a maximum width of 27 feet. These lenses are connected by a narrow lode. On the 200-foot level the two lenses are separated bya barren gap of 70 feet. The northern lens is about 120 feet long and has a maximum width of 35 feet on this level. The southern lens was cut by the drive, but was developed for only about 20 feet, and its total dimensions are not known (Hossfeld,1937). All these workings are now inaccessible.

Past Production

Records of the amount and grade of ore raised from the mine are incomplete. A total of 13,700 tons was mined and smelted in 1904 and 1906 (Hossfeld,1937) and it seems likely that the total production was about 20,000 tons.

Reserves

Hossfeld (1937) reports that at least 30,000 tons of ore remain in the northern lens between the 100 and 200-foot levels, and an unknown but probably smaller amount in the southern lens. Samples taken on the 100-foot level in 1905 and again in 1912-1914, and samples taken by Hossfeld from the dumps in 1937 gave the following assay results, which suggest that the bulk of this material is probably of economic grade:-

Date		Gold dwt/ton	Silver oz/ton	Zinc percent	Lead percent	Copper percent
1905	:	5	12	6	5	0.5
1912-1914	:	4.8	22	not determined		1.2
1937	:	6.0	15.3	14.3	4.5	0.24

(Assays from Hossfeld, 1937)

Previous Drilling

In 1912, a diamond drill hole was put down to a depth of 467 feet, depressed at 65° to the west. The hole intersected a mineralised zone directly beneath the open cut at a vertical depth of 342 to 411 feet from the surface (Hossfeld,1937).

The core from the mineralized zone was assayed in two bulk samples which gave very low results. The low assay results may be due either to poor core recovery or to the samples including both high and low grade material. The first section, from 377.5 to 439 feet, measured along the drill hole, gave the following assay results :-

Copper	...	0.53	per cent
Zinc	...	4.50	per cent
Gold	...	2	dwt. per ton
Silver	...	13	dwt. per ton

The other section, from 439 to 454 feet, contained :-

Copper	...	0.16	per cent
Zinc	...	7.00	per cent
Gold	...	19	grains per ton
Silver	...	13	dwt. per ton

(Assays from Hossfeld,1937).

According to Hossfeld's plans, the main shear between the surface and the 200-foot level dips east at about 75°, and if these plans are accurate the presence of this mineralization vertically beneath the open cut can be explained in one of three ways :- by a reversal of dip of the main shear; a downward east-dipping extension of the western shear; or separate lode that does not crop out. The geologists of the Australian Mining and Smelting Co. Ltd. preferred the second possibility (Thomas,1957).

However, since all the known ore in the mine was associated with the main shear, it seems more likely that there has been a reversal of dip, and that the eastern shear extends downwards beneath the open cut. There is some evidence of possible dip reversal of the main lode in the area south of the No. 2 South shaft, between the surface and the 200-foot level. If the large gossanous outcrop south of this shaft is part of the lode, the lode must dip to the west down to the 100-foot level, and then dip back to the east from there to the 200-foot level.

The recent plane table survey of the mine area shows that the plans accompanying Jensen's report (1916) are not accurate. The plans of the 100 and 200-foot levels that are included in Hossfeld's report are based on these earlier plans of Jensen, and may also be inaccurate. The cross-sections attached to this report are based on Hossfeld's plans because no others are available, but it could well be that the positions of the 100 and 200-foot levels should in fact be adjusted by as much as 20 feet in an east-west direction. Similar errors in the plotted position of the drill hole could also account for the apparent reversal of dip.

RECENT GEOCHEMICAL RESULTS

Corbett (1960) suggested that there might be an extension of the Iron Blow lode to the north, since his geochemical sampling of the banks of the Margaret River showed a reaction, probably due to zinc, that persisted for several miles downstream from the Iron Blow mine. The geophysical survey carried out in 1937 (Rayner and Nye,1937) also suggested a northern extension of the Iron Blow lode.

It seems unlikely, however, that base metal mineralization continues very far north of the Iron Blow mine, despite the persistence of zinc found by Corbett in the river sediments. Any such continuation would pass within a few hundred yards of the Yam Creek mine. Nearly 12,000 ounces of gold were produced from this mine, but the veins consisted primarily of quartz and gold, with only minor amounts of pyrite and arsenopyrite (Cottle,1937). The area between the Iron Blow and Yam Creek mines must have been thoroughly prospected during the time these mines were in operation, and any outcrop that could supply metallic material to the Margaret River would probably have been discovered.

Probably the dumps around the Iron Blow are the source of all the metals found in the geochemical survey. Material from these dumps has been washed into the Margaret River by the small stream that flows along the foot of the dumps. The Margaret River in this area flows on a wide alluvial flat and has very few tributaries, so that the small stream from the Iron Blow is about the only possible contributing source.

RECENT GEOPHYSICAL RESULTS

A geophysical survey, using Self Potential, Turam, and Magnetic methods, was made of the Iron Blow area at the same time as this geological investigation, (Skattebol,1961). The results of the survey are summarized below.

The Self Potential results show an area of negative potential in the mine area, but are difficult to interpret accurately because of abundant oxidizing sulphides on the mine dumps. No drilling sites can be recommended from these results.

The Turam survey outlined two anomalies. One of these is centred at 1030N/800W and appears to be part of the known northern orebody. The second anomaly is centred at about 1200N/780W and does not correspond with any known feature. It may represent a sulphide body farther north than the two lenses known at present. From old reports on the Iron Blow mine, it appears that the existing workings would not have intersected any orebody that might be causing this anomaly (Hossfeld,1937).

The Magnetic method was tried because of the possibility that the orebodies might contain minerals of high magnetic susceptibility such as magnetite or pyrrhotite. A large symmetrical magnetic anomaly centred at 650N/830W, is interpreted by Skattebol as being due to a body approximately 150 feet in diameter with its centre at a vertical depth of 250 feet from the surface. This anomaly could be caused by a sulphide body similar to the original Iron Blow orebody. It might be either a southern extension of the known lode, or a related, but separate, orebody. It is also possible that this anomaly is due to unexposed amphibolite, which causes magnetic anomalies elsewhere in the area, although no amphibolite outcrops are known within two miles of the mine.

PROPOSED DRILLING

The following five diamond drill holes are recommended:-

No.	Location of Collar	Bearing	Depression	Approx Length of Hole
1	980N/525W	270°	50°	440'
2	838N/575W	270°	50°	370'
3	650N/700W	270°	60°	300'
4	1200N/650W	270°	60°	250'
5	870N/890W	270°	65°	250'
			Total footage	1610'

The workings are now completely inaccessible, and the drilling sites have been picked as a result of the surface mapping, geophysical work, and data taken from earlier reports on the Iron Blow mine.

The first two drill holes are to test any downward extension of the two lenses of the known orebody. These two holes are sited on the assumption that the two lenses have an average pitch of 75° to the north, which is suggested by the longitudinal projection taken from Hossfeld. It has also been assumed that there has been a reversal of dip and that the mineralized material intersected in the 1912 drill hole is an extension of the southern lens. These two drill holes, however, would also intersect the western shear if it dipped beneath the open cut, and would also intersect any new lode that might be found beneath the open cut.

No. 1 drill hole should intersect the northern lens and the No. 2 should intersect the southern lens; both should intersect the lode at a vertical depth of approximately 260 feet from the surface. This entails about 350 feet of drilling in each hole before the lode is intersected.

The deflection of these two holes will have to be kept to a minimum. If the holes lift very much they may intersect the old workings. On the other hand, if the holes are drilled at a steeper angle, there is a possibility that they may be nearly parallel to the lode and may only intersect it at a much greater depth.

No.3 drill hole is to test the magnetic anomaly found by the recent geophysical work. It should be drilled to a vertical depth of 250 feet.

No.4 drill hole is to test the second Turam anomaly. It should be drilled to a vertical depth of about 220 feet.

No.5 drill hole is designed to test the western shear. It is located to pass beneath the only place where the western shear is actually exposed. The attitude of this shear is unknown, so that the intersection might take place at any vertical depth from 100 to 220 feet. If the shear is not intersected after 250 feet of drilling, it will indicate either that the shear does not continue to that depth or that it dips to the west.

All the core containing evidence of mineralisation should be split and assayed in lengths from one foot to five feet, depending upon hand examination of the core. The sludge should also be collected unless the core recovery is better than 80 per cent. Both core and sludge samples should be assayed for gold, silver, lead, zinc, and copper. Since cassiterite has been identified in the nearby Mount Bonney orebody, a few samples might also be assayed for tin.

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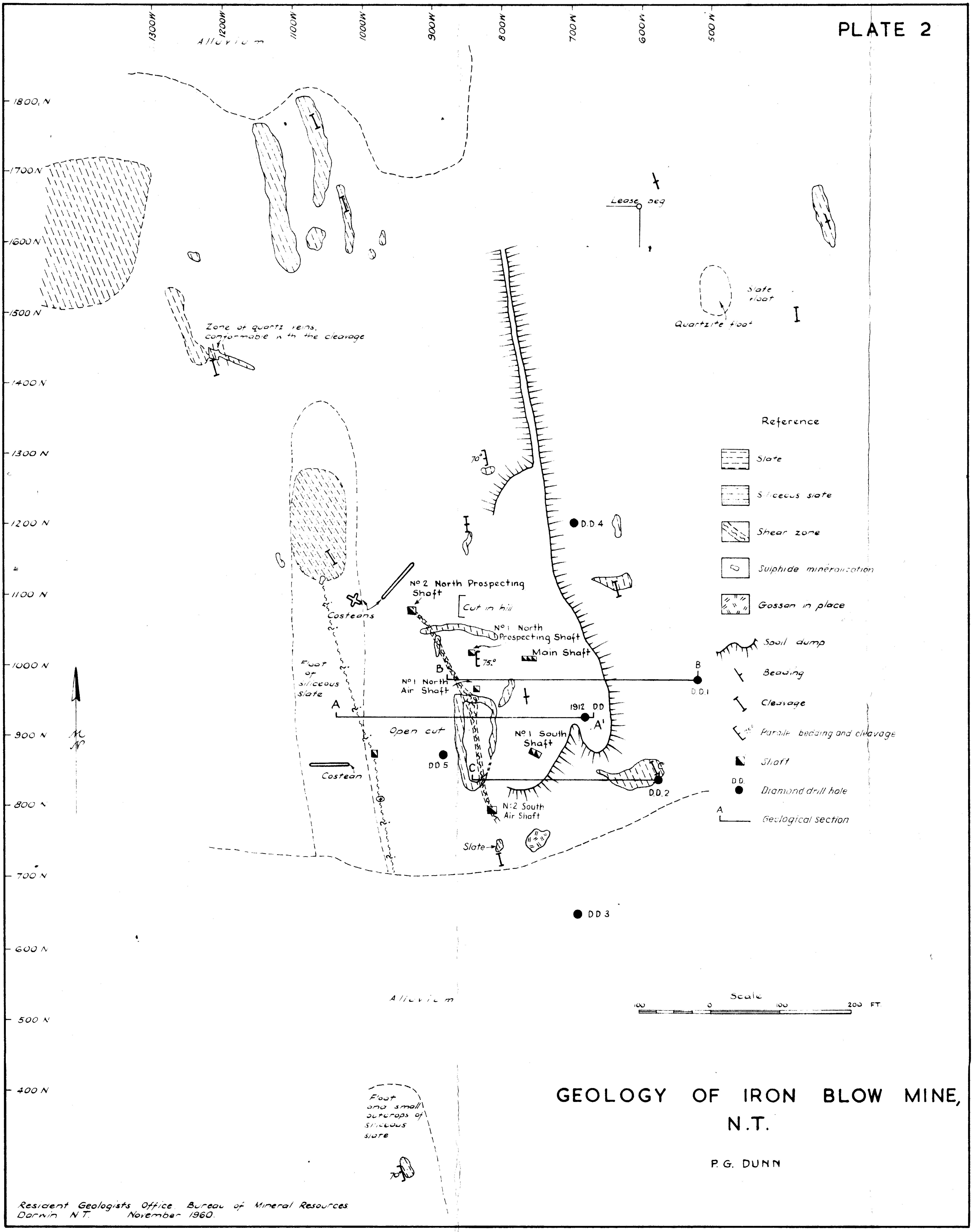


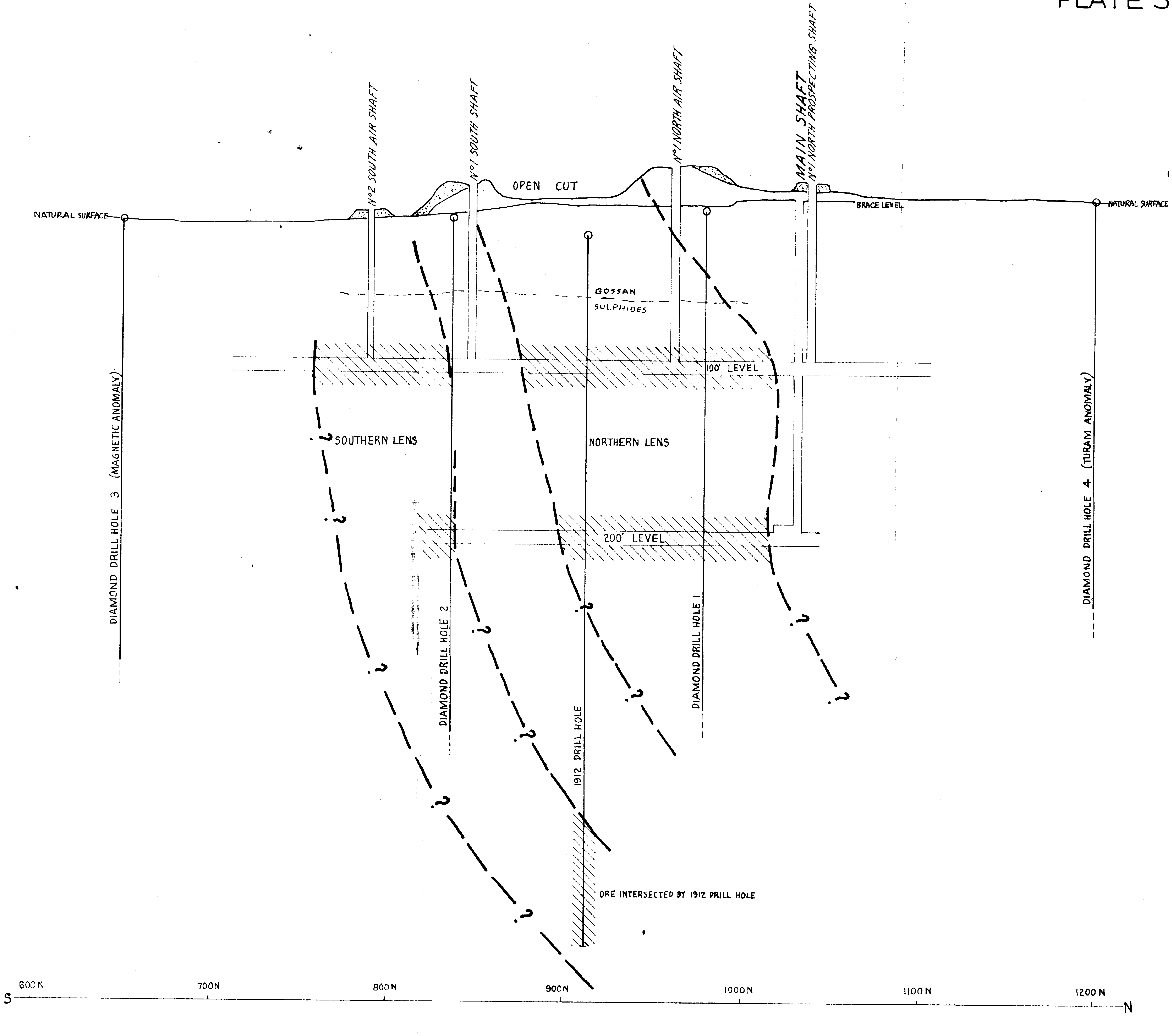
PLATE 2

GEOLOGY OF IRON BLOW MINE, N.T.

P.G. DUNN

Resident Geologists Office Bureau of Mineral Resources
Darwin N.T. November 1960.

PLATE 3



LONGITUDINAL PROJECTION IRON BLOW MINE

MODIFIED AFTER HOSSFELD, 1937

SCALE 0 100 200 FEET

Resident Geologist's Office, Bureau of Mineral Resources, Darwin, N.T. March, 1961

PLATE 4

CROSS SECTIONS
IRON BLOW MINE

SCALE 0 100 200 FEET

Resident Geologist's Office, Bureau of Mineral Resources, Darwin, N.T. March, 1961