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RECORDS 1959/30

MARY VALLEY MANGANESE DEPOSITS

Report of an inspection, February 1959

by

K.G. Smith.

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INTRODUCTION

On February 11th and 12th, 1959, the author, accompanied by J.A. Brooks of the Queensland Geological Survey, inspected manganese ore bodies in the Mary Valley area, about 80 miles north of Brisbane. The object of the inspection was to assess ore reserves on mineral leases either held or operated by Sanders Bros, Amamoor, who had applied for an export licence.

The leases inspected are all operated by Sanders Bros; some of the leases are held by other people, to whom Sanders Bros pay royalties. All of the leases are in the Imbil, Kandanga, Amamoor and Dagun districts. Amamoor, near the centre of the area, is about 14 miles south of Gympie.

At the time of the inspection Sanders Bros either held or operated the following sixteen Mineral Leases: Nos. 120, 124, 131, 158, 159, 217, 218, 219, 220, 222, 223, 224, 225, 227, 228, 234, Some of these leases are held because they contain small surface showings of manganese ores and are adjacent to deposits which are in production at present. On this inspection ore reserves were assessed on six leases namely M.L.s 120, 228, 234, 227, 131 and 159. The method of mining is to strip soil cover by means of bulldozers and then to employ open cut methods. Eight men are employed at present. Ore is forwarded either by road or by rail to Broken Hill Pty Ltd, Port Kembla. No ore has been exported between 21st June, 1956 and 12th February, 1959. An export permit for 300 tons has already been granted in respect of M.L. 159 but it has not been availed because overseas buyers are not interested in such small quantities.

Details of current prices paid by Broken Hill Pty Ltd are:

£17/6/- per ton F.O.R. Port Kembla, ±5/- per ton per cent above or below 48% Mn. and - 7/6 per ton per cent below 40% Mn. (the right is reserved to reject entirely shipments below 40% Mn.) and minus 1/6 per ton per cent for SiO_2 content above 8%. 1% moisture is allowable.

The manganese deposits are located in strongly-dissected country which generally has a dense cover of sub-tropical vegetation. Rainfall is high and ore production is frequently suspended because of the difficulty of accurate visual assessment of manganese ores in wet weather. The boggy nature of the outlet roads often delays the transport of ore. For inspections of leases in this country, a Landrover or other four-wheel drive type of vehicle is a necessity.

THE DEPOSITS

(a) MINERAL LEASE 120

This lease, located 3½ miles west of Amamoor township, is held in the name of W. O'Neill but is operated by Sanders Bros under royalty. The lease contains the Amamoor mine, from which the bulk of Sanders Bros' production, since April 1958, has come.

The lease has been worked in the past; except for a narrow adit (filled) exposed near the top of one face, no trace of the former workings is visible in the area which is being mined at present. Some old workings were observed west of this area; they have not been re-opened. Sanders Bros. began work on M.L. 120 on 16th April, 1958, and it can be safely considered that all of their work has proved new reserves.

Between 16th April 1958 and 12th February 1959, 4150 tons of ore have been sold from this lease and 350 tons of ore were at grass on 12th February 1959: that is, production has averaged 100 tons per week.

Some assay figures for ore from M.L. 120, taken at random from Broken Hill Pty Ltd's assay returns to Sanders Bros, are as follows:

Quantity	SiO_2	Fe	Mn	H_2O	P
45 tons	9.80	2.63	43.40	3.56	0.076
100 tons	8.12	1.61	50.65	1.91	0.050
71 tons	8.70	2.35	46.32	3.20	0.074.

The lodes occur in the Neranleigh-Fernvale Group of sedimentary rocks, of (?)Silurian age. Outcrops of the country rock in the Amamoor mine are poor, and little regional information is available. The lease is located on the western side of Skyring Creek and the lodes are on the top and the steep eastern slopes of a large hill.

Open-cut operations have exposed measurable reserves in five lenses of Psilomelane-type ore. From information provided by limited exposures of country rock it seems probable that there is a bedding control for the accumulation of manganese ores, modified somewhat by a control exerted by strong joints or fractures. These joints or fractures frequently form a plane of sharp cut-off between good ore and country rock. The result of this control is to produce bulges in the ore-bodies.

No. 1 Lens. This is the largest lens worked at present. It is on the hillside and dips at an angle slightly greater than the slope of the hill. The dimensions are:

Length	112 feet
Width	20 feet
Average depth	25 feet.

Within this lens there are some bodies of country rock. The ore is of massive type; visual estimations of grade within the measured lens suggested that it would be 40% Mn or better. A reasonably conservative estimate of the proportion of country rock in this lens placed it at one third, and this figure was used in calculating reserves. Reserves, calculated on the basis of one ton per 9¼cu.ft. are 4036 tons.

On the floor of No.1 lens good ore was visible but no depth had been proved. Approximately half-way along the length of the lens, a bulge extended westward for about 30 feet; over a width of 6 feet good ore was visible on the bottom of bulldozer cuts but no depth was proved and therefore reserves were not calculable.

Lens No. 2. Situated 40 feet south-east of Lens No.1. Strike 360°.

Dimensions:		
	Length	45 feet
	Average width	12 feet
	Depth	20 feet.

An estimate of ore to country rock in this lens is 1:1. Reserves calculated on this basis are 584 tons.

Lens No. 3. Situated 15 feet south-east of Lens No.2. Strike 350°.

Dimensions:		
	Length	45 feet
	Width	7 feet
	Depth	14 feet

An estimate of ore to country rock in this lens is 2:1. Reserves calculated on this basis are 318 tons.

Lens No. 4.

Dimensions:		
	Length	38 feet
	Width	6 feet
	Depth	5 feet.

An estimate of ore to country rock in this lens is 2:1. Reserves calculated on this basis are 82 tons.

This lens has not been exposed completely; overburden has been stripped to the above dimensions only; also, at the base of bulldozer cuts good ore is visible over an appreciable area but no depth has been proved.

Lens No. 5. Situated 120 feet south-west of Lens No.2. Strike 20°.

This lens contains ore of lower grade than Lenses 1-4 inclusive. The average grade is 35% Mn. The ore is used to dilute higher grade ore from the other lenses.

Dimensions:		
	Length	75 feet
	Width	8 feet
	Depth	13 feet.

An estimate of ore to country rock in this lens is 2:1. Reserves, calculated on this basis, are 560 tons.

TOTAL RESERVES for M.L.120 are therefore	4,036 tons
	584 "
	318 "
	82 "
	560 "
	5,580 tons
Plus ore at grass	350 tons
	5,930 tons
i.e., say	6,000 tons

Total ore sold to Broken Hill Pty Ltd is 4,150 tons. Therefore on M.L.120, Sanders Bros have proved 10,150 tons of ore between 16th April, 1958 and 12th February, 1959.

(b) MINERAL LEASE 227

This adjoins M.L.120 and is on both east and west banks of Skyring Creek. On the western bank, soil cover has been stripped by bulldozer to expose a rectangular, shallow deposit of low grade ore whose average grade, by visual estimation is 35%.

The strike of the deposit is 320°.

Dimensions:	Length	62 feet
	Width	37 feet
	Depth	3 feet

An estimate of ore to country rock is 1:2.

Reserves, calculated on this basis, are 248 tons. In addition, there are 50 tons of ore at grass, giving a total of 300 tons. It is proposed to use this ore to dilute high grade ore from this lease (if discovered below the present exposures) or from other leases adjacent.

On the eastern bank of Skyring Creek there are a number of old costeans sunk to test an arcuate belt of manganese-bearing country. These were inspected by T.D.Dimmick (then of the Queensland Geological Survey) in 1954.

Dimmick did not calculate ore reserves, but sampled some of the costeans for assay. From one costean he recognised two layers of ore - a top layer of 2 feet, assaying 52% Mn, and a lower layer of 4 feet which assayed 35% Mn. In 1958 Sanders Bros bulldozed a costean situated 35 feet north-west of this costean and 95 feet south-east of another old costean. In the new costean a face of ore 6 feet deep is exposed over a width of 5 feet. The bottom foot of the face contains a considerable amount of chert; the remaining five feet contain ore which on visual estimation would average 40% Mn. Ore reserves resulting from the new work are calculated at 90 tons. This calculation is based on an estimation of ore to country rock of 1:3.

Therefore total new reserves for M.L.227 are 300+90 = 390 tons.

(c) MINERAL LEASE 228.

This lease, approximately ¾ mile north of M.L.120, is held by Sanders Bros. The deposits on M.L.228 were discovered during prospecting operations by Sanders Bros; ore has been exposed by bulldozer cuts on both sides of a steep, narrow ridge which trends north-west. The bearing from the Amamoor mine to the southern workings on M.L.228 is 20°.

On the south-western flank of the ridge, ore has been exposed in the face of a bull-dozed costean which strikes 300°. The length of the costean is 70 feet; the depth of ore exposed ranges from 3 feet to 6 feet. No soil has been stripped from the surface over the ore and therefore there was no third dimension available for calculation of reserves. There were 10 tons of ore at grass. Assays of the ore from this costean, and from the prospect on the north-eastern side of the ridge, showed 45% Mn and 19% SiO_2.

On the north-eastern side of the ridge ore crops out on the steep slope and soil cover has been stripped by a horizontal, bull-dozed cut.

Dimensions are: Length 20 feet
Width 15 feet
Depth 6 feet.

Reserves calculated here are 200 tons.

Total reserves for M.L.228, therefore, are 210 tons.

(d) MINERAL LEASE 234.

This lease is located about ¾ mile north-west of the village of Dagun, which is 1½ miles north of Amamoor. M.L.234 is the only one where battery-grade ore might be produced.

Over a distance of about ½ mile is a belt of discontinuous outcrop, and numerous scattered boulders, of manganese ores. These are associated with bars of jasper of the Neranleigh-Fernvale Group. The strike of the belt is roughly 340°. At the southern extremity of the belt there are some abandoned workings in ore estimated at 35% Mn; in the central and north-western sectors Sanders Bros. have sunk several pits and have bull-dozed two costeans.

In the central sector the deposit has been tested by the sinking of three pits; each pit is at one corner of a triangular area and each one is 11 feet deep. Assays, made by Broken Hill Pty Ltd, of the ore from these pits showed 75% MnO_2 and 52% Mn. There were 15 tons of ore at grass.

Reserves, calculated on the basis of ⅓ ore and 2/3 waste, are 540 tons,

i.e., a total of 555 tons.

At the north-western extremity of the belt, Sanders Bros have sunk a pit, 11 feet deep, in ore which assays 75% MnO_2, 50% Mn and 4% Fe.

The assays were done by Broken Hill Pty Ltd. No reserves are calculable at this locality.

(e) MINERAL LEASE 131.

This contains the Kandanga Mine, situated about 5 miles south-west of the small township of Kandanga which is three miles south of Amamoor. The lease is held by W. O'Neill and worked by Sanders Bros. under royalty.

Sanders Bros. began to operate the mine in March, 1958; between that date and February 12th, 1959, 450 tons of ore have been sold to Broken Hill Pty Ltd. A feature of ore from this mine is the high silica content. The following assay figures were taken at random from Broken Hill Pty Ltd's assay returns to Sanders Bros.

Quantity	H_2O	SiO_2	Fe	Mn	P.
47 tons	0.23	20.35	0.81	47.28	0.080
13 tons	0.35	23.74	0.71	45.10	0.076
21 tons	0.75	20.36	0.75	46.20	0.076
15 tons	0.70	23.71	1.05	45.67	0.083

The mine is located in a gully. On the western bank, former workings are visible; none of the 450 tons sold since March 1958 has come from the old workings. There is a clear line of demarcation between old and new workings and all of the deposits described below are new reserves. There are three bodies of ore which are measurable, plus one which is partly exposed in the flat floor of the workings. The bodies of ore are not separate lenses.

A. A blocked-out body of ore 22 feet long, 8 feet wide and 6 feet deep. Reserves, calculated on a basis of ore: waste as 3:1 are 85 tons.

B. A face of ore 20 feet long, 5 feet deep and exposed for a width of 13 feet. Contains very little country rock. Reserves here are 140 tons.

C. A block of ore 30 feet long, 5 feet deep and exposed over an average width of 20 feet. Contains an estimated $\frac{1}{3}$ waste. Ore reserves 215 tons.

D. Floor of workings, 40 feet long, 10 feet wide, exposed to a depth of 2 feet in several places.

Reserves here are 85 tons.

There are 50 tons of ore at grass.

Total Reserves, therefore, on M.L.131 are 85+140+215+85+50,

i.e., 575 tons.

(f) MINERAL LEASE 159

Situated one mile north-west of the village of Imbil, which is 8 miles south of Amamoor, this lease is held by G.A. Campbell and operated by Sanders Bros under royalty. The workings are known as the Imbil Mine which has previously been inspected by officers of the Queensland Geological Survey - J.A. Brooks in 1956 and D.H. Wyatt in 1957.

The following assay figures were taken at random from Broken Hill Pty Ltd's essay returns to Sanders Bros.

SiO_2	Fe	H_2O	Mn	P
26.42	1.19	1.40	40.37	0.078
19.36	0.86	0.97	45.25	0.072
18.10	0.60	0.73	47.26	0.067

In 1956, J.A. Brooks assessed reserves at this mine as 300 tons. After further work had exposed additional ore, D.H. Wyatt assessed reserves at 1200 tons. Of this increase of 900 tons, G.A. Campbell was granted an export licence of 300 tons. This quantity has not yet been exported.

The present position at this mine is that a lens which has been followed a considerable distance for the production of 1500 tons of ore is now too deep (overburden, including some lenses of low grade ore, is 60 feet) to permit economical open-cut methods. A short underlay cut has been made into the main lens and this reveals that the lens pinches out rapidly. Whether it is split locally by a lens of country rock is unknown. Reserves of ore in this lens total 60 tons. There are 50 tons of ore at grass.

To the east of the main working face there is a rectangular area of country rock which contains several bands, ranging in thickness from 6 inches to 1 foot, of manganese ore. Assays of this ore, made by Broken Hill Pty Ltd, gave 38% Mn. Reserves here are calculated at 50 tons.

On M.L.159 another prospect, noted by D.H. Wyatt, has not yet been tested but the operators intend to test it later on.

Total Reserves for M.L.159 are 60+50+50 tons,
i.e., 160 tons.

Thus the position arises where proved reserves remaining are insufficient at present to fulfil the export permit granted already for this lease.

(g) MINERAL LEASES 124 and 158

These were not inspected. Mr. T. Sanders stated that on both leases, bulldozed costeans had revealed ore but that no surface stripping had been done and that the inspection party would not be able to measure any reserves at present. At each lease, 20 tons of ore were at grass, awaiting

shipment. An exemption of 6 months duration had been obtained for each lease.

(h) MINERAL LEASES 222 and 223

These were not visited. Mr. T. Sanders stated that bulldozed costeans at each lease had revealed low-grade ore.

SUMMARY OF RESERVES

M.L. 120	6,000 tons
M.L. 227	390 "
M.L. 228	210 "
M L. 234	555 "
M.L. 131	575 "
M.L. 159	160 "
TOTAL:	7,890 tons

Plus Ore sold since June, 1956, to Broken Hill Pty Ltd.

M.L. 120	4,150 tons
M.L. 131	450 "
M.L. 159	1,500 "
TOTAL:	6,100 tons

Therefore total ore proved by operations of Sanders Bros. is 7890+6100 tons

i.e., 13,990 tons, or roughly 14,000 tons.

CONCLUSIONS AND RECOMMENDATIONS

The tonnage of ore sold by Sanders Bros in the recent past, plus the tonnage proved on this inspection, reveal that at least some deposits of manganese in the Mary Valley are larger than previously shown. During this inspection it was apparent that the operators did not fully understand the requirements for the proof of reserves of manganese ores. On some leases, a small number of pits or costeans, or some additional stripping of overburden may have revealed additional, measurable reserves.

The size of some of the lenses of ore suggest that exploratory drilling may be a useful tool in the calculation of reserves and also to block out ore without the need to use a bulldozer to strip barren ground. A drill which could penetrate 50 feet would probably be adequate for the purpose. Although there is a high rainfall the hill slopes are well-drained and therefore a Wagon drill might be employed profitably; water tends to collect in the bottoms of the open-cuts and such a drill would be of no use there.

Mr. T. Sanders is to be commended for the way in which he keeps his records of production and assays. These include a small museum of samples from shipments, marked with the assay results from the buyers.

A considerable amount of successful prospecting has been done and the syndicates hopes to intensify this effort if the application for an export quota is successful.

K.G. Smith.

17/2/59.

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DIMMICK, T.D.,

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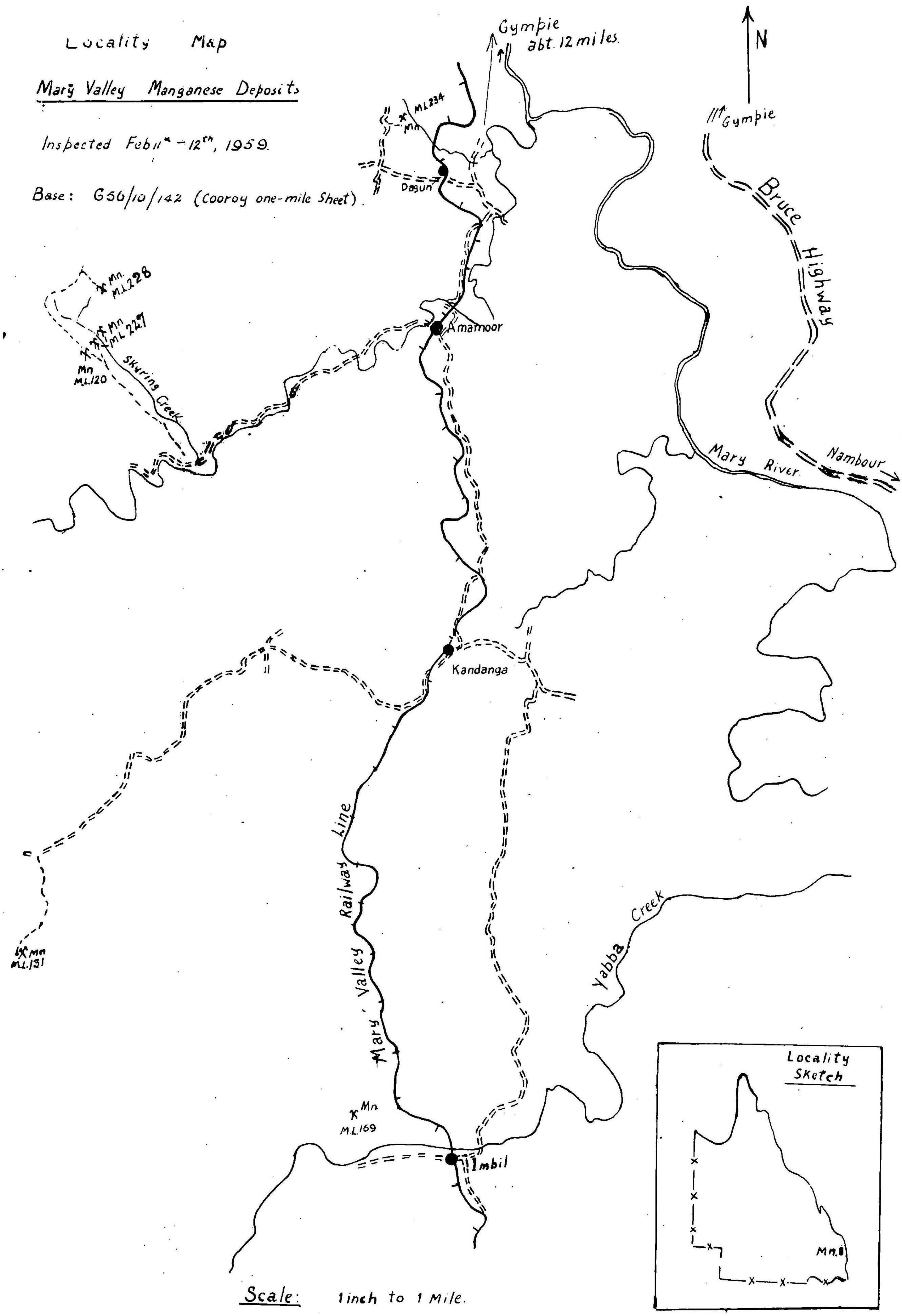
Unpublished report of an inspection on 21/10/57 on B.M.R. File 58Q/1.

Locality Map

Mary Valley Manganese Deposits

Inspected Feb 11th – 12th, 1959.

Base: G56/10/142 (Cooroy one-mile Sheet).



Scale: 1 inch to 1 Mile.