DEPARTMENT OF MINES
SOUTH AUSTRALIA

GEOLOGICAL SURVEY
IRON EXPLORATION SECTION

REPORT NO. 1

ON

THE GREENPATCH JASPILITE STRUCTURE

HD. LINCOLN, SOUTHERN EYRE PENINSULA.

by

W. G. Shackleton
Geologist

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ABSTRACT

The major structure is probably an overturned north plunging anticline, the nose possibly containing 450,000 tons per vertical foot and averaging 45.8% iron. Preliminary tests at Australian Mineral Development Laboratories suggest that the ore may be amenable to beneficiation.

A small high grade body assaying 57.4% iron possibly containing 1,250 tons per vertical foot was located.

Recommendations for testing both areas are made.

1. INTRODUCTION

Detailed geological mapping of the Greenpatch area (Hd. Lincoln) was initiated as part of a programme of mapping the known iron formations of the Lincoln Uplands on enlarged aerial photographs. Mapping during the periods 27.2.63 to 6.3.63 and 12.3.63 to 19.3.63 showed that the structure was exceedingly complicated and further mapping of the nose of the major structure was carried out during the period 11.6.63 to 28.6.63 on photographs enlarged to a scale of 400' to 1 inch.

The structurally complex area of jaspilite coincides with an aeromagnetic anomaly and it is necessary to determine the structure in this area to locate exploratory drill holes.

2. PREVIOUS INVESTIGATIONS

Johns (1961)*, being based on 15 1-mile maps, is the authoritative work on Southern Eyre Peninsula.

A high level (1500') aeromagnetic survey of the whole of the Southern Eyre Peninsula was flown at 1 mile spacings by Adastra Hunting Geophysics Ltd. for the Department of Mines in 1954. The same company flew a low level (300') aeromagnetic survey at ½ mile spacings over the Lincoln Uplands for the Department in 1961. Both surveys were reduced by the Exploration Geophysical Section of the Department. The surveys indicate a strong WSW-ENE lineament which extends across the Greenpatch district. To the north of this lineament is a positive anomaly and to the south a smaller negative anomaly.

The results of ground gravity and magnetic traverses over the Greenpatch district carried out by the Exploration Geophysical Section as part of the present project will be shown in the relevant geophysical report. However, plans 63-620 and 63-621 show the relation of geology to ground magnetic and gravity traverses.

A representative bulk sample of 200 lbs. of jaspilite [No. 1 (Surface) sample, Greenpatch area] was taken from body F (21000E 23500N) by the writer and sent to Australian Mineral Development Laboratories (A.M.D.L.) for metallurgical testing. The results of this work are discussed in a report by R. Lorenz entitled "Examination of Iron Ore from Greenpatch Area", a preliminary copy being received in June 1963.

3. REGIONAL GEOLOGY

The Lincoln 1 mile sheet (Johns 1958) shows the jaspilites of the Greenpatch district as forming a narrow, south plunging syncline with a north-south axial plane. The eastern beds of the Greenpatch area are on the same limb as the jaspilite

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* Johns, R.K., 1961. Geology and Mineral Resources of Southern Eyre Peninsula. Bull. Geol. Surv. S. Aust. 37.

beds west of Little Swamp. In addition to the Iron Formation, the Hutchison Group includes quartzite and amphibolite which are distinguishable from the undifferentiated metasediments. Very little Archaean outcrop is shown on the map, basement being shown covered by Tertiary laterites and Recent alluvium. The recent mapping, being more detailed, has thrown doubt on the original structural interpretation.

4. DETAILED GEOLOGY

4.1. LITHOLOGIES

4.1.1. Jaspilite. This rock type is of Upper Archaean age (Hutchison Group). Typically the jaspilite consists of 1/16 - 1/2" alternating bands of martitised magnetite and silica in beds approximately 150' in width. Some specimens contain rare hematite. Minor unoxidised magnetite remains in some specimens. Jaspilite breccia has been found which shows that the brecciated siliceous bands have been healed by mobilised iron oxides. Along strike, in some cases, the jaspilites appear to grade into breccias which are low in iron content and which are similar to quartz breccias found in the near vicinity of jaspilite outcrops. Intra-formational breccias have been found on a small scale (See fig. 2, plan S 3447). Examples of typical jaspilite may be found in both bodies D and M (Grid Refs. 20500E 21000N and 21500E 21000N).

The jaspilites have been folded at all stages of consolidation from a plastic to brittle condition, these conditions resulting in fold types illustrated in figs. 1-6 plan S 3446, and fig. 1 plan S 3447. Folds measure from $\frac{1}{8}$" across limbs in minor folds to the major structure with a distance of $2\frac{1}{4}$ miles across the limbs. Fold axes generally trend northerly but there are many exceptions with apparent random axial directions.

Reversal of sense of folds, i.e. one bed which exhibits an east limb north plunging anticline structure adjacent to a west limb north plunging anticline structure, is visible on all

scales from 3" between the two folds to several tens of feet (see figs. 2 and 4 plan S 3446 and the structures of jaspilite bodies D and M).

On a larger scale, approximately 100' across limbs, are folds in several of the jaspilite bodies e.g. D, E (20500E 23000N) and at 20500E 24000N with axes striking up to 45° to the general strikes of the beds. Such folds appear in the same sense across the nose of the structure, this sense not being compatible with either a north plunging anticline or a south plunging syncline. Other folds of similar size but opposite sense to those above appear in body J (20250E 22600N) and at 12500E 26000N. The jaspilite body to the west of Little Swamp has two folds of opposing sense.

4.1.2. Quartzite. The type of Upper Archaean quartzite which occurs most frequently is schistose and flaggy, generally white but also pink and grey and having a prominent foliation. Less common quartzites are structureless and are very compact. Others grade into white to pink very friable sandstones. Frequently, in the schistose varieties, plates of muscovite up to $\frac{1}{4}$" diameter are contained in the foliation planes. Typical quartzite can be found in the first railway cutting south of the Flinders Highway crossing (6500E 27250N).

4.1.3. Schists of the Upper Archaean Hutchison Group are commonly purple to red, rarely white, highly sheared quartzitic schists. The schists are identified by the sheared appearance of the clay and mica minerals which are probably the result of retrogressive metamorphism accompanying the shearing. A rare biotite quartzite schist is found as float only.

4.1.4. Canga is a Tertiary (?) rock herein defined as consisting of martite and/or iron rich jaspilite fragments cemented by an iron mineral or contained in a sandy matrix which is cemented

by an iron mineral. In some localities (e.g. between bodies E and F, 21000E 23500N) the canga is of relatively high iron content, containing fragments of martite and martite rich jaspilite up to 2" in diameter. This rock may indicate jaspilite in the vicinity.

4.1.5 Minor Lithologies

These are:

(a) a black manganiferous ore of Upper Archaean age which is slaggy in appearance. It is found at the western edge of body E (20500E 23500N) at 19500E 24200N and, as float, at 21000E 26000N.

(b) Proterozoic(?) Conglomerate. This consists of well rounded quartzitic pebbles in a well cemented sandy matrix. It has a well defined strike with the impression that the rock is steeply dipping. It is found only at 9500E 26500N.

(c) a hematite and/or limonite sandstone which is a completely structureless yellowish brown to purple rock. The quartz grains are generally of remarkably uniform size, about 1/16" diameter. The rock is widespread and is probably a derived sediment allied to a laterite. It is thought to be Tertiary in age.

(d) a sandy laterite of Tertiary age which is a limonitic rock containing up to 20% quartz grains. It is found only as float.

(e) A Tertiary nodular laterite which is widespread and commonly thin but with the thicker areas worked for road metal in scattered quarries.

(f) A Tertiary(?) conglomerate. There are only three or four small outcrops. (e.g. on the north shore of Little Swamp).

(g) a steely blue high grade hematite rock occurs at location 147 (8500E 23500N). It is highly brecciated and has

been healed by secondary quartz. Some of the hematite has been altered to goethite. As the brecciation suggests faulting, age correlation is impossible with the present information.

(h) Limonite. This is generally pure except for a small percentage of included angular quartz grains. Goethite is a rare form. It is probably of Tertiary age.

4.2. STRUCTURE

At location 147 (8500E 23500N) the high grade hematite outcrop trends NE which is subparallel to a gravity trend obtained from the geophysical survey of the area (see plan 63-620 and S 3440). This trend is also sub parallel to the western extremity of the west limb of the major structure and is off-set by 3000 feet normal to the strike. It is thus possible that the high grade body is a faulted continuation of the west limb. Alternatively, the west limb may continue NW around the northern edge of the north plunging anticline in quartzite found in that area. The presence of the Proterozoic(?) conglomerate at 9500E 26500N suggests the existence of a major unconformity, although this is by no means proved.

A number of water bores and wells in the area (see plan 63-620) encountered basement at shallow depth, a maximum of 103'(?), all bottoming in "gneiss". Attempts were made to contour the basement surface but although considerable data were available for the area west of the railway, there were insufficient data to construct a reliable basement contour map for the area covered by the geophysical survey. As much of this area is low lying, bores and wells are shallow and have not been completed to basement. To the far west, a trough in the basement rock could conceivably be considered to correspond to the western extremity of the strong lineament of the aeromagnetic surveys.

Two jaspilite beds outline the complexly folded major structure of the Greenpatch district.

The east limb of this structure is extended south through small outcrops of quartz breccia, limonite and ferruginous quartzite, through the Flinders Highway body and thence through the jaspilite beds west of Little Swamp. A possible west limb north plunging anticline structure exists in the ferruginous quartzite 2250' SSE of the Greenpatch cross roads. The Flinders Highway body (C) is an east limb north plunging anticline structure 200' in width. Most of the east limb dips vertically or steeply west with rare easterly dips. This limb could not be followed for much more than a mile north of the Greenpatch cross roads.

The west limb does not outcrop well but geophysical trends suggest a continuity between outcrops. This limb is folded into a north plunging syncline to the west of the nose of the major structure with smaller north plunging anticlines and synclines further to the west. Its most western extremity is marked by a jaspilite and a ferruginous quartz breccia. A small north plunging syncline exists in body K (13500E 25500N).

The steep westerly to vertical dips on the eastern limb and the flatter north to north west dips on the western limb are consistent with an overturned north plunging anticline with the axial plane dipping steeply to the west. See plan S 3445.

The large scale folds found in bodies D and E and discussed in section 4.1.1. have axes which are sub parallel with the axes of a larger NW plunging syncline between bodies E and F (21000E 23500N) and smaller folds to the NW (20600E 24200N). Such agreement in axial directions of minor folds across the axis of the major fold suggests a second order deformation. Complex structures such as found at 17000E 24000N are difficult to explain although it is possible that large scale slumping of the jaspilites has taken place.

The above interpretation suggests that the major structure is not synclinal. A syncline does exist to the west of the main anticline (19500E 24000N), however, and this, together with the several minor synclines (e.g. 21000E 23500N) could possibly provide traps for a substantial amount of ore. Sections 159 and 160 are thus the most promising areas for exploration.

5. SAMPLING

Chip samples were taken across the general strike of all the important outcropping jaspilite bodies during the first visit to the area, the lines of sampling being shown in plan S 3448. The samples were sent to A.M.D.L. for assay for iron and insolubles, the results being shown in table 1.

Table 2 gives the result of a full analysis of a chip sample taken from the high grade body at location 147.

TABLE 1

Analyses of samples from Greenpatch Jaspilite Bodies

Sample Mark	Sample Number	Outcrop Number	Iron Fe%	Insolubles %
A 399/63	2	A	41.6	31.8
A 400/63	3	A	41.1	33.1
A 401/63	8	C	47.8	23.4
A 402/63	14	D	44.4	31.4
A 403/63	15	E	44.2	32.6
A 404/63	16	F	44.9	31.2
A 405/63	43	J	49.2	23.6
A 406/63	57a	L	40.1	36.4
A 407/63	64a	M	51.9	20.4
A 408/63	65a	O	40.4	37.6
Average	-	-	44.6	-

TABLE 2
Analysis of Sample A451/63 from High Grade Body

Component		%
Acid Soluble iron	Fe	57.4
Acid Insoluble Matter		15.8
Silica	SiO_2	15.4
Aluminium Oxide	Al_2O_3	0.41
Calcium Oxide	CaO	0.29
Magnesium Oxide	MgO	0.06
Titanium Oxide	TiO_2	0.011
Phosphorus pentoxide	P_2O_5	0.10
Manganese	Mn	0.044
Sulphur	S	0.007

6. CONCLUSIONS AND RECOMMENDATIONS

The jaspilites of the Greenpatch district probably form an overturned north plunging anticline which contains several ore traps. Near the nose of the structure where the jaspilites are medium grained it is possible that they may be beneficiated easily. Assuming an average bed width of 150' over an aggregate strike length of 6.8 miles, the potential resources of this area (see plan 63-621) could possibly approximate 450,000 tons of ore per vertical foot. The average grade of ore in this area would be 45.8% iron. As the district is only 7 miles from Port Lincoln an exploration programme is recommended. Sections 159 and 160 contain the two most promising drilling targets in the form of synclinal traps, one at 16500E 26000N and a larger one at 19500E 24000N.

Assuming a length of 300' and a maximum width of 75', the resources of the small high grade body at location 147 are possibly 1,250 tons of direct shipping ore per vertical foot. This body should have priority for drilling to determine grade and it is therefore recommended that a diamond drill be sited as shown on plan S 3440. This site has yet to be pegged. Further drilling in this area will depend on the results obtained from this first hole. Results of the geophysical

work indicate that this body extends further to the S.W.

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WGS:AGK
15/7/63

GREENPATCH JASPILITE STRUCTURE

DIAMOND DRILL HOLE NO. GD3.

ANALYSIS
Per cent

Depth		Sample Mark	Acid Soluble Iron Fe	Insolubles.	Calcium. Ca	Magnesium Mg
From	To					
110'	120'	A1059/64	5.5	39.2	15.5	4.55
120'	130'	A1060	9.25	42.3	13.5	3.25
130'	140'	A1061	12.9	64.8	6.20	0.95
140'	150'	A1062	18.9	54.6	6.75	0.95
150'	160'	A1063	19.2	54.7	6.55	0.40
160'	170'	A1064	20.9	56.8	5.20	0.45
170'	180'	A1065	13.6	57.2	7.70	1.75
180'	190'	A1066	13.5	48.9	9.60	2.55
190'	200'	A1067	16.9	49.3	6.75	1.70
200'	210'	A1068	17.2	53.3	5.90	1.05
210'	220'	A1069	19.5	56.6	5.20	0.80
220'	230'	A1070	19.9	60.2	4.30	0.25
230'	240'	A1071	24.3	56.8	3.10	0.30
240'	250'	A1072	18.4	37.0	10.4	2.70
250'	260'	A1073	19.5	47.1	7.0	1.35
260'	270'	A1074	19.3	50.8	6.55	1.35
270'	280'	A1075	21.5	51.0	6.05	0.95
280'	290'	A1076	17.9	55.2	5.70	1.35
290'	300'	A1077	19.2	47.4	6.90	2.10
300'	310'	A1078	21.1	40.6	8.65	2.50
310'	320'	A1079	21.0	36.2	10.0	2.80
320'	330'	A1080	27.2	33.7	8.85	1.85
330'	340'	A1081	21.7	30.9	11.6	3.10
340'	350'	A1082	29.5	37.5	7.75	0.65
350'	360'	A1083	33.4	37.3	5.70	0.40
360'	370'	A1084	28.6	38.3	7.25	1.05
370'	380'	A1085	25.3	32.7	9.35	2.90
380'	383'	A1086	26.9	38.6	7.60	1.75
383'	390'	A1857/64	15.3	42.2	10.1	3.10
390'	400'	A1858	4.90	43.2	11.3	5.60
400'	410'	A1859	17.9	45.6	8.6	2.10
410'	420'	A1860	27.1	39.3	7.8	0.90
420'	430'	A1861	21.5	36.7	8.7	2.55
430'	440'	A1862	5.25	43.8	13.1	5.05
440'	450'	A1863	3.50	53.6	11.1	4.50
450'	460'	A1864	2.00	48.7	12.3	5.35
460'	470'	A1865	6.25	44.4	12.3	4.60
470'	480'	A1866	9.35	47.9	10.8	3.70
480'	490'	A1867	8.35	42.5	12.3	4.50

GREENPATCH JASPILITE STRUCTURE

DIAMOND DRILL HOLE NO. GD3

ANALYSIS
Per cent

Depth		Sample Mark	Acid Soluble Iron Fe	Insolubles	Calcium Ca	Magnesium Mg
From	To					
490'	500'	A1868/64	13.6	48.9	9.0	3.05
500'	510'	A1869	8.05	37.4	13.3	5.65
510'	520'	A1870	4.10	40.9	11.4	4.85
520'	530'	A1871	9.55	54.7	8.90	3.40
530'	540'	A1872	13.0	50.3	8.90	2.90
540'	550'	A1873	5.30	42.2	13.3	5.05
550'	560'	A1874	14.7	55.7	6.30	2.14
560'	570'	A1875	13.0	48.8	9.00	3.05
570'	580'	A1876	9.05	50.4	9.50	3.65
580'	590'	A1877	20.9	58.9	3.70	0.80
590'	600'	A1878	21.1	65.4	1.40	0.50
600'	610'	A1879	29.0	55.9	1.05	0.40
610'	620'	A1880	24.1	63.7	1.00	ND
620'	630'	A1881	16.1	74.1	1.40	ND
630'	640'	A1882	23.3	59.1	3.00	ND
640'	650'	A1883	25.1	56.6	3.10	0.20
650'	660'	A1884	24.2	52.3	4.2	0.50
660'	670'	A1885	11.1	43.0	11.6	3.35
670'	680'	A1886	8.40	31.4	14.7	5.15
680'	690'	A1887	8.10	33.5	14.7	4.80
690'	700'	A1888	9.60	39.7	12.3	3.95
700'	710'	A1889	7.80	28.0	15.1	5.80
710'	712'6"	A1890	10.2	30.9	14.9	5.25

ND indicates not detected.

GREENPATCH JASPILITE STRUCTURE

DIAMOND DRILL HOLE NO. GD4

ANALYSIS
Per cent

Depth From	Depth To	Sample Mark	Acid Soluble Iron Fe	Insolubles.	Calcium. Ca	Magnesium Mg
0'	4'	A1920/64	37.6	36.9	0.17	0.08
4'	9'	A1921	37.7	37.3	0.04	0.03
9'	14'	A1922	27.3	45.3	ND	0.03
14'	19'	A1923	27.2	42.2	ND	0.05
19'	24'	A1924	26.2	53.8	ND	0.02
24'	30'	A1717/64	0.91	93.5	ND	0.02
30'	40'	A1718	21.5	59.6	ND	0.02
40'	50'	A1719	18.8	67.2	ND	0.02
50'	60'	A1720	30.2	51.3	ND	0.02
60'	70'	A1721	32.8	43.3	ND	0.02
70'	80'	A1722	34.7	43.9	ND	0.03
80'	90'	A1723	25.4	59.1	ND	0.03
90'	100'	A1724	20.1	64.7	ND	0.04
100'	110'	A1725	18.3	71.4	ND	0.01
110'	120'	A1726	20.2	69.1	ND	0.03
120'	130'	A1727	12.9	80.3	ND	0.01
130'	140'	A1728	23.6	61.8	ND	0.03
140'	150'	A1729	36.4	35.6	ND	0.03
150'	160'	A1730	36.2	42.1	ND	0.03
160'	170'	A1731	22.2	64.4	ND	0.03
170'	180'	A1732	4.7	92.0	ND	0.01
180'	190'	A1733	20.1	67.1	ND	0.03
190'	200'	A1734	2.15	96.3	ND	0.01
200'	210'	A1735	41.5	33.1	ND	0.03
210'	220'	A1736	32.7	46.3	ND	0.03
220'	230'	A1737	29.9	50.9	ND	0.01
230'	240'	A1738	21.3	63.5	ND	0.01
240'	250'	A1739	39.3	32.5	ND	0.02
250'	260'	A1740	14.1	65.6	0.24	0.26
260'	270'	A1741	24.2	54.3	0.22	0.34
270'	280'	A1742	18.0	55.0	0.17	0.84
280'	290'	A1743	4.25	81.7	1.75	0.05
290'	291'	A1744	5.35	89.4	ND	0.05

ND indicates not detected.

GREENPATCH JASPILITE STRUCTURE

DIAMOND DRILL HOLE NO. GD5

ANALYSIS
Per cent

Depth		Sample Mark	Acid Soluble Iron Fe	Insolubles.	Calcium. Ca	Magnesiu Mg
From	To					
80'	90'	A1745/64	5 9	82.8	0.01	0.25
90'	100'	A1746	15.8	65.0	0.04	0.15
100'	110'	A1747	16.8	62.3	0.16	0.15
110'	120'	A1748	14.3	66.4	0.20	0.14
120'	130'	A1749	12.3	70.4	0.01	0.11
130'	140'	A1750	27.2	55.0	0.18	0.12
140'	150'	A1751	30.3	50.0	0.30	0.14
150'	160'	A1752	26.8	56.8	0.22	0.10
160'	170'	A1753	2.55	89.5	0.22	0.03
230'	240'	A1754	5.55	81.8	0.13	0.66
240'	250'	A1755	30.1	38.5	0.65	0.35
250'	260'	A1756	19.7	56.3	0.45	0.35
260'	270'	A1757	32.9	27.7	0.85	0.35
270'	280'	A1758	22.3	42.3	1.90	1.15
280'	290'	A1759	35.1	22.1	1.05	0.65
290'	300'	A1760	35.0	20.8	1.20	0.85
300'	310'	A1761	37.4	19.8	1.45	1.10
310'	320'	A1762	29.3	41.9	1.20	0.90
320'	330'	A1763	32.6	30.6	1.65	1.30
330'	340'	A1764	23.2	33.7	4.75	2.35
340'	350'	A1765	20.1	51.8	2.75	1.25
350'	360'	A1766	14.3	32.2	11.1	3.95
360'	370'	A1767	6.90	27.8	15.9	6.8
370'	380'	A1768	7.95	3.8	18.7	9.2
380'	390'	A1769	7.55	9.0	17.1	8.8
390'	400'	A1770	30.8	30.0	1.05	0.45
400'	410'	A1771	32.0	20.7	2.35	0.35
410'	420'	A1772	33.0	25.0	0.85	1.15
420'	430'	A1773	34.9	26.5	0.85	0.70
430'	440'	A1774	20.7	44.2	1.40	1.00
440'	450'	A1775	6.75	75.4	1.30	0.60
450'	460'	A1776	18.7	53.9	1.50	0.80
460'	470'	A1777	27.1	41.0	1.40	0.70
470'	480'	A1778	14.7	45.5	8.30	2.50
480'	490'	A1779	15.8	51.4	7.80	2.0
490'	500'	A1780	2.15	71.7	8.0	1.45
500'	510'	A1781	7.05	38.0	16.0	3.15
510'	520'	A1782	16.2	56.4	6.05	1.35
520'	530'	A1783	15.2	60.8	5.70	0.75

GREENPATCH JASPILITE STRUCTURE

DIAMOND DRILL HOLE NO. GD5

ANALYSIS
Per cent

Depth		Sample Mark	Acid Soluble Iron Fe	Insolubles.	Calcium. Ca	Magnesium Mg
From	To					
530'	540'	A1784/64	22.4	49.7	5.70	1.3
540'	550'	A1785	19.0	60.7	4.1	0.40
550'	560'	A1786	23.2	56.8	3.4	0.4
560'	570'	A1787	18.0	51.2	6.6	1.4
570'	580'	A1788	17.6	51.7	7.1	1.2
580'	590'	A1789	21.1	45.0	7.8	1.4
590'	600'	A1790	24.3	45.6	6.6	1.0
600'	610'	A1791	6.25	75.3	4.9	1.1
610'	620'	A1792	3.75	53.2	11.1	4.4
620'	627'9"	A1793	18.0	39.0	8.2	3.1

GREENPATCH JASPILITE STRUCTURE
DIAMOND DRILL HOLE NO. GD6

ANALYSIS
Per cent

Depth From	Depth To	Sample Mark	Acid Soluble Iron Fe	Insolubles.	Calcium. Ca	Magnesium. Mg
80'	90'	A1906/64	14.3	66.3	0.06	0.11
90'	100'	A1907	14.7	68.8	ND	0.10
100'	110'	A1908	20.2	58.0	0.02	0.39
110'	120'	A1909	11.2	70.6	0.29	0.34
120'	130'	A1910	13.4	54.5	1.3	3.15
130'	140'	A1911	25.1	53.7	0.52	0.40
140'	150'	A1912	20.3	63.9	0.52	0.40
150'	156'	A1913	14.1	73.6	1.45	0.35
156'	160'	A1593/64	18.0	56.5	4.55	0.80
160'	170'	A1594	22.6	54.9	3.65	0.80
170'	180'	A1595	19.9	55.5	5.40	0.60
180'	190'	A1596	20.8	56.4	4.30	0.60
190'	200'	A1597	21.1	55.9	4.10	0.60
200'	210'	A1598	23.9	51.5	4.75	0.55
210'	220'	A1599	23.1	46.9	6.15	1.10
220'	230'	A1600	18.5	38.2	9.95	2.75
230'	240'	A1601	21.5	37.4	9.85	2.10
240'	250'	A1602	22.9	42.6	8.65	0.95
250'	260'	A1603	30.1	38.3	6.70	0.45
260'	270'	A1604	21.5	42.3	7.90	1.45
270'	280'	A1605	26.7	39.4	6.50	1.00
280'	290'	A1606	16.5	44.1	8.65	2.20
290'	300'	A1607	8.2	61.5	6.05	3.15
300'	310'	A1608	5.4	76.6	2.25	2.05
310'	320'	A1609	12.7	60.1	5.20	2.20
320'	330'	A1610	1.15	93.0	1.05	0.50
330'	340'	A1611	10.0	81.2	1.20	0.10
340'	350'	A1612	14.0	73.0	2.35	0.30
350'	360'	A1613	17.5	52.1	6.80	1.65
360'	370'	A1614	17.0	51.7	7.45	1.75
370'	380'	A1615	9.25	76.2	3.65	0.10
380'	390'	A1616	16.4	58.3	5.80	1.10
390'	392'	A1617	20.2	58.8	3.95	0.70
392'	400'	A1914/64	23.5	58.8	2.25	0.50
400'	410'	A1915	16.5	69.8	2.25	0.20
410'	420'	A1916	19.0	64.8	2.60	0.40
420'	430'	A1917	16.0	63.4	4.60	0.70
430'	440'	A1918	21.5	55.0	4.50	0.85
440'	441'6"	A1919	14.8	67.9	3.80	0.50

ND indicates not detected.

GREENPATCH JASPILITE STRUCTURE

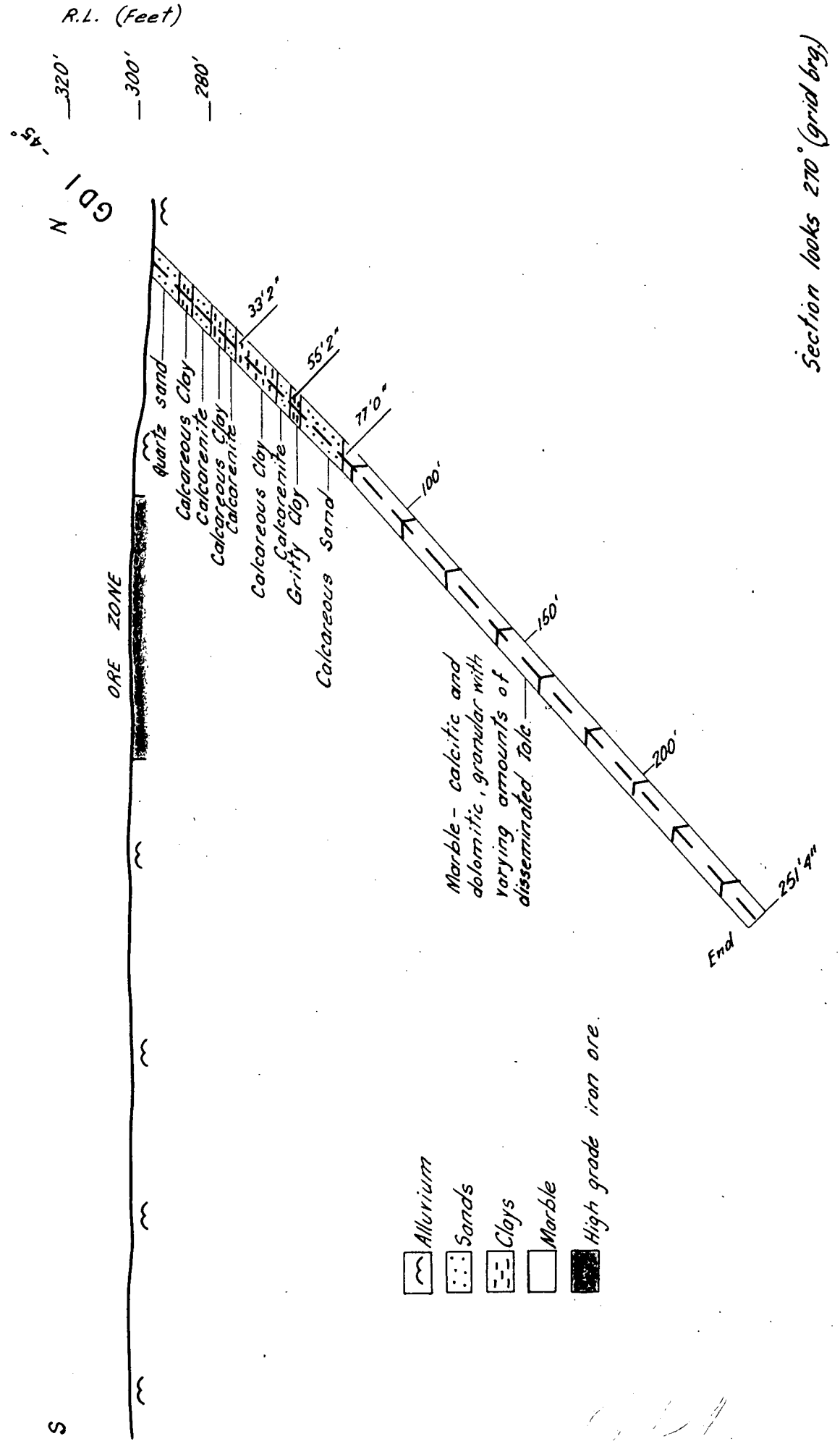
DIAMOND DRILL HOLE NO. GD7

ANALYSIS

Per cent

Depth		Sample Mark	Acid Soluble Iron Fe	Insolubles.	Calcium. Ca	Magnesium. Mg
From	To					
60'	70'	A1794/64	18.0	66.4	ND	0.03
70'	80'	A1795	27.2	55.3	ND	0.01
80'	90'	A1796	23.8	61.4	ND	0.01
90'	100'	A1797	21.2	66.3	ND	0.01
100'	110'	A1798	36.4	37.7	ND	0.02
110'	120'	A1799	26.1	57.0	ND	0.01
120'	130'	A1800	37.5	40.4	ND	0.02
130'	140'	A1801	36.8	39.9	ND	0.03
140'	150'	A1802	21.0	66.4	ND	0.01
150'	160'	A1803	33.5	34.0	ND	0.25
160'	170'	A1804	20.7	53.3	0.06	0.60
170'	180'	A1805	15.2	62.7	0.06	0.50
180'	190'	A1806	1.28	96.7	ND	0.02
190'	200'	A1807	7.55	87.1	ND	0.01
200'	210'	A1808	9.15	84.1	ND	0.01
210'	220'	A1809	17.3	70 0	ND	0.03
220'	230'	A1810	20.6	64.6	ND	0.03
230'	240'	A1811	5.45	89.6	ND	0.09
240'	250'	A1812	23.7	53.8	ND	0.04
250'	260'	A1813	35.8	40.5	ND	0.06
260'	270'	A1814	4.90	81.4	ND	1.55

ND indicates not detected.



To accompany a report by W. Shackleton.

S.A. DEPARTMENT OF MINES

Approved	Passed	Drn.	GREENPATCH JASPILITE STRUCTURE HIGH GRADE BODY SECTION ALONG BGOOE LOOKING GRID WEST	D.M.	Scale 1" to 40'
		Tcd. B.S.		Req.	S 3570
		Ckd.			Dn 13.
Director		Exd.			Date 25-1-64

300 - 6.60 6049

GREENPATCH JASPILITE STRUCTURE

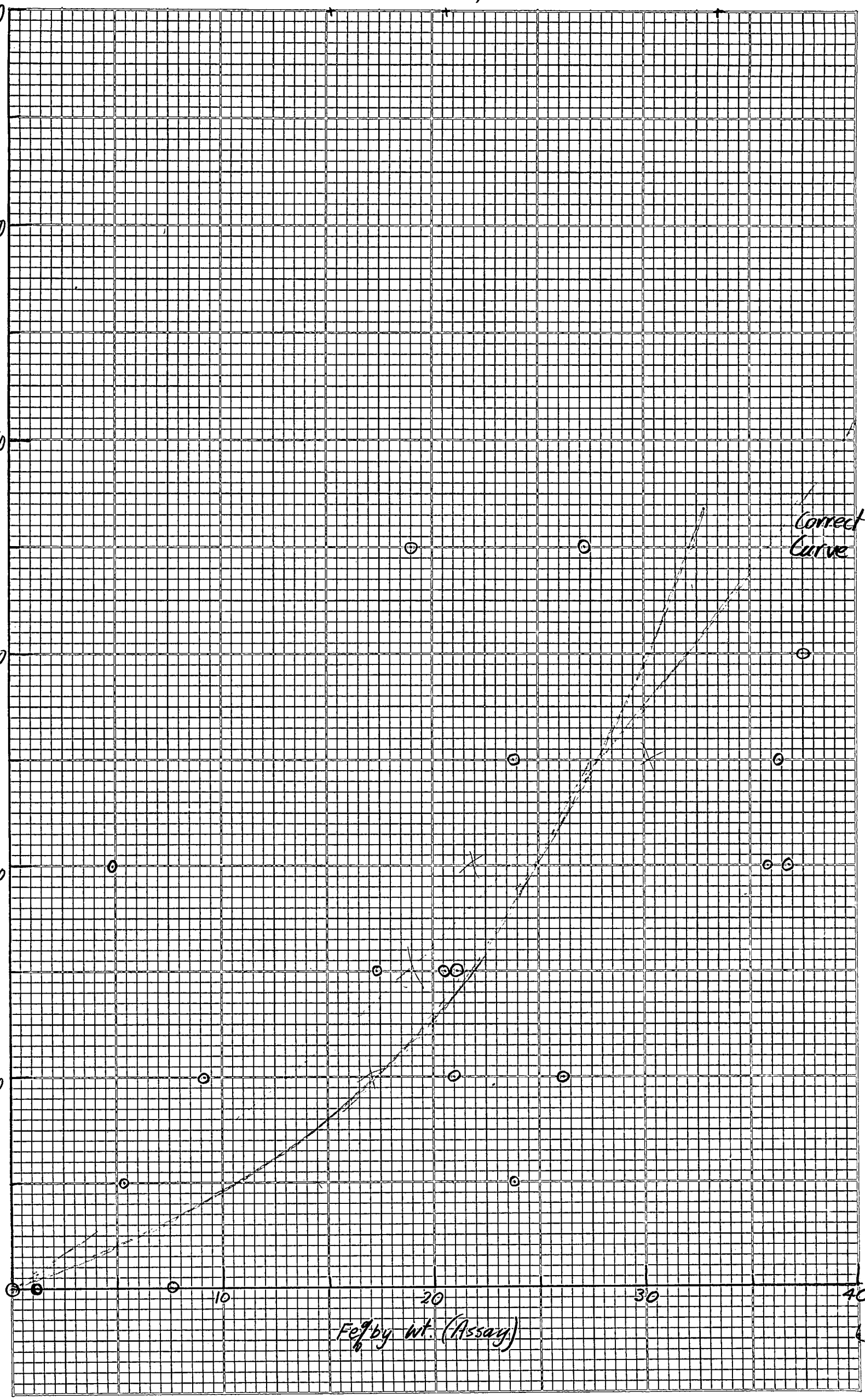
DIAMOND DRILL HOLE NO. GD2.

ANALYSIS
Per cent.

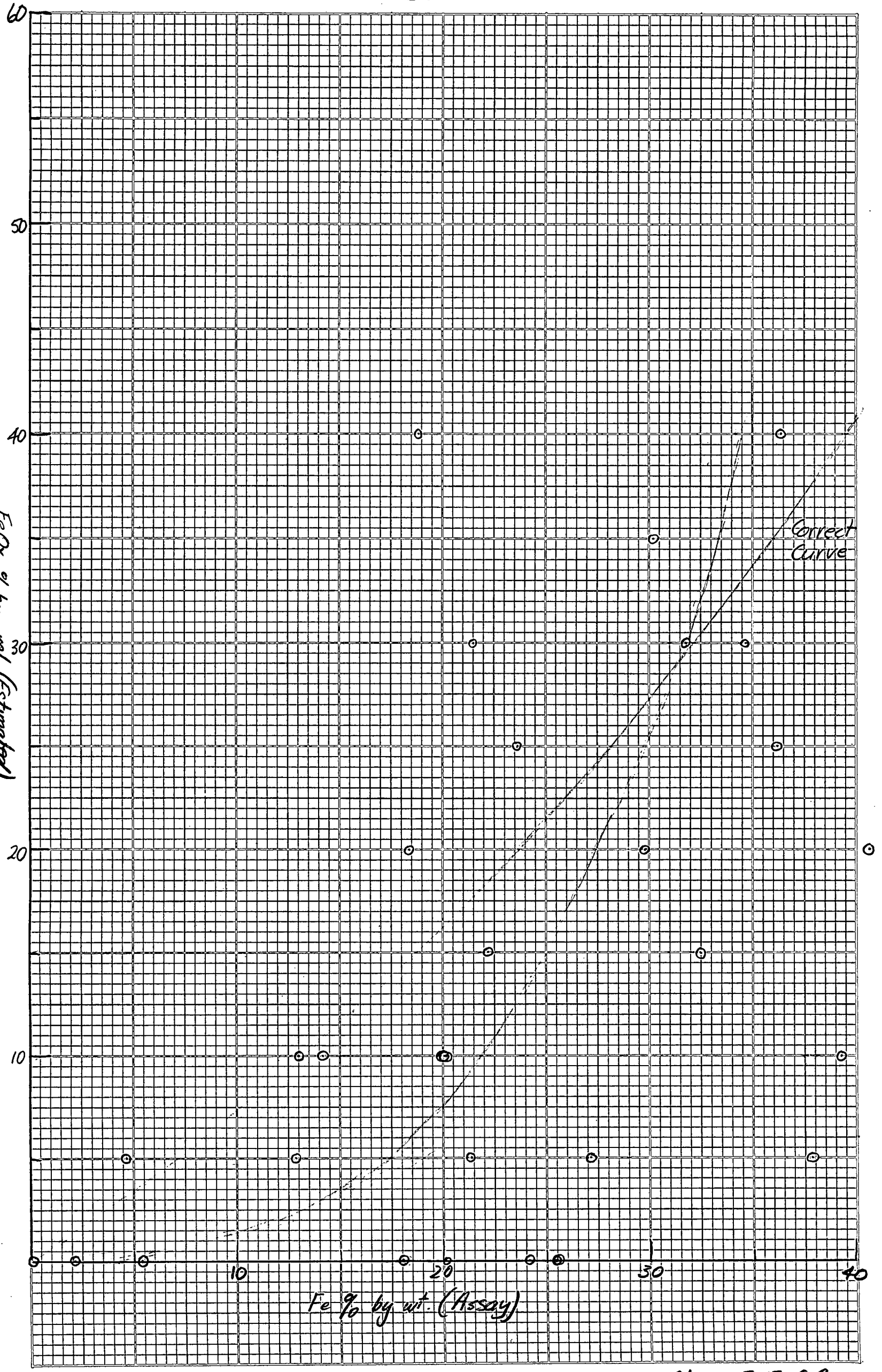
Depth		Sample Mark	Acid Soluble Iron Fe	Insolubles.	Calcium. Ca	Magnesiu Mg
From	To					
33'	43'	A1422/64	20.9	65.4	0.03	0.01
43'	53'	A1423	25.2	56.6	ND	0.01
53'	63'	A1424	29.8	50.3	ND	0.01
63'	73'	A1425	24.4	61.0	0.03	0.01
73'	83'	A1426	29.1	51.8	0.04	0.02
83'	93'	A1427	23.6	62.7	0.05	0.01
93'	103'	A1428	20.6	67.1	0.18	0.03
103'	113'	A1429	22.8	56.8	3.80	0.35
113'	123'	A1430	19.1	58.3	4.95	0.65
123'	133'	A1431	15.8	44.0	9.70	2.25
133'	143'	A1432	10.4	47.6	11.0	2.90
143'	153'	A1433	19.4	41.1	9.05	2.50
153'	163'	A1434	20.4	53.2	5.60	1.20
163'	173'	A1435	21.7	51.6	5.30	1.10
173'	183'	A1436	23.7	55.9	3.25	0.65
183'	193'	A1437	24.7	49.2	4.75	1.25
193'	203'	A1438	22.0	38.2	8.95	2.40
203'	213'	A1439	20.2	37.0	9.40	3.20
213'	223'	A1440	19.0	37.7	9.70	3.65
223'	233'	A1441	19.6	44.8	8.40	2.10
233'	243'	A1442	25.8	42.6	6.9	1.25
243'	253'	A1443	13.6	41.2	11.3	3.70
253'	263'	A1444	5.0	63.7	8.2	3.25
263'	273'	A1445	5.1	65.0	8.0	2.80
273'	283'	A1446	5.4	62.4	8.5	3.00
283'	293'	A1447	2.1	82.7	4.6	1.15
293'	303'	A1448	2.0	70.3	7.6	2.95
303'	313'	A1449	1.6	79.0	5.6	1.75
313'	323'	A1450	7.3	18.1	17.9	7.45
323'	333'	A1451	8.3	63.8	7.35	2.10
333'	343'	A1452	4.2	43.6	13.5	5.20
343'	353'	A1453	7.1	59.9	8.10	2.90
353'	363'	A1454	10.9	43.6	10.7	3.75
363'	373'	A1455	9.5	35.8	13.2	5.20
373'	383'	A1456	9.1	55.0	8.95	3.20
383'	393'	A1457	9.3	55.8	8.65	2.60
393'	403'	A1458	13.4	61.6	6.05	1.60
403'	413'	A1459	12.9	45.0	10.6	3.55
413'	423'	A1460	9.3	51.6	10.0	3.35
423'	430'	A1461	8.65	39.3	11.9	5.10

ND indicates not detected.

GD 7

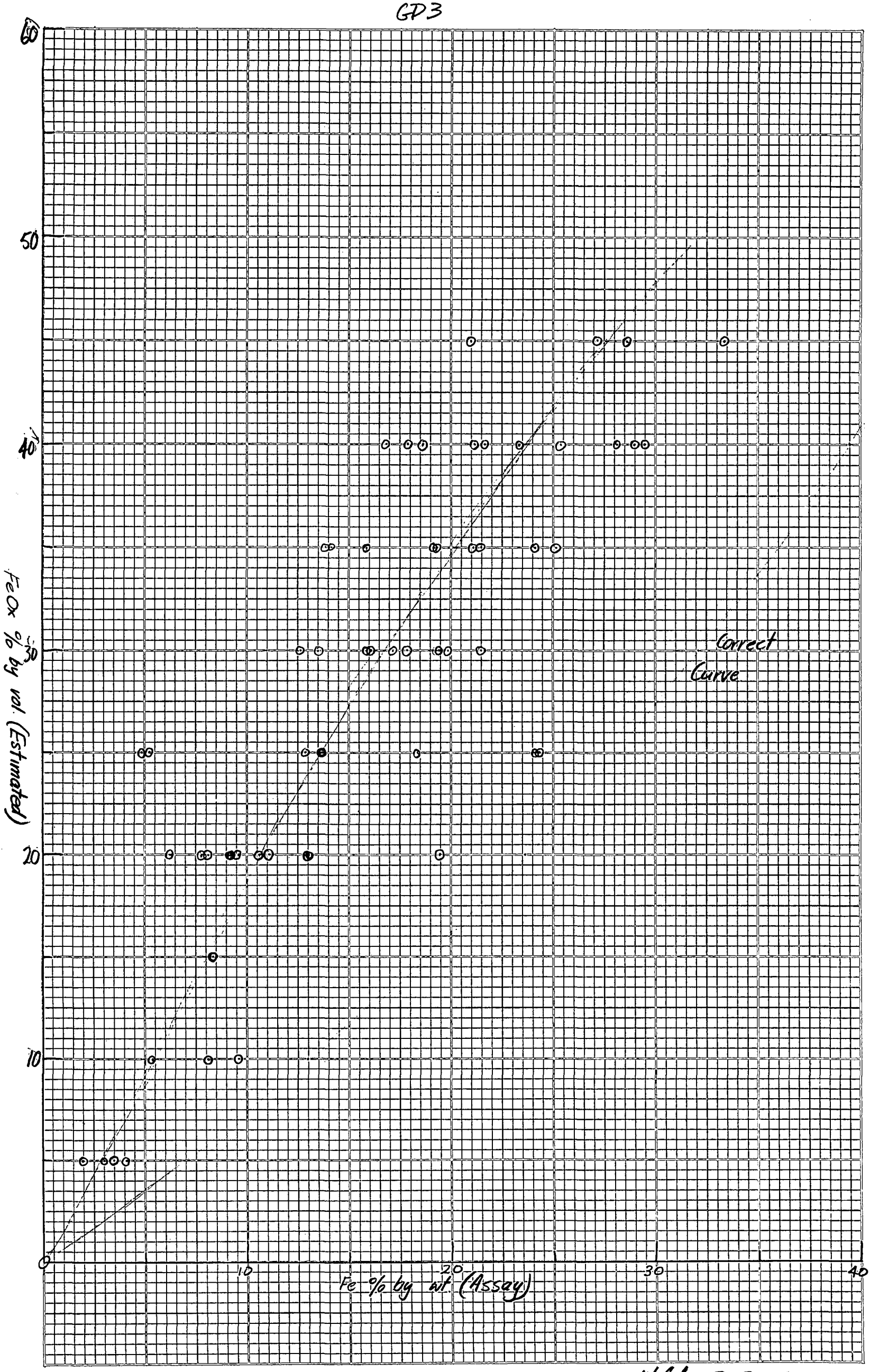

60
50
40
30
20
10
FeOx % by vol. (Estimated)
Correct Curve
10
20
30
40
Fe % by wt. (Assay)

GD4



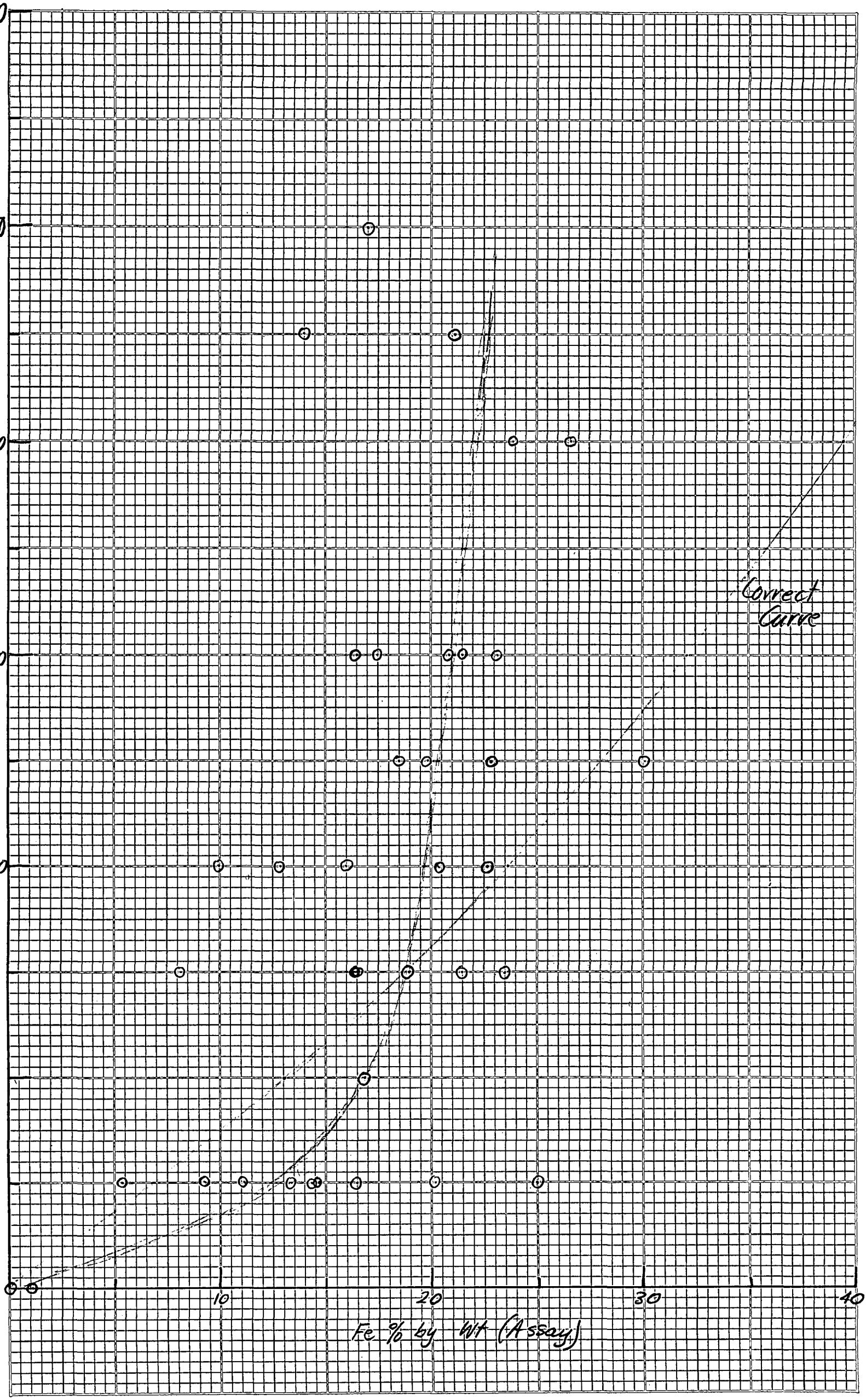
WGS 15-5-64.

GD3



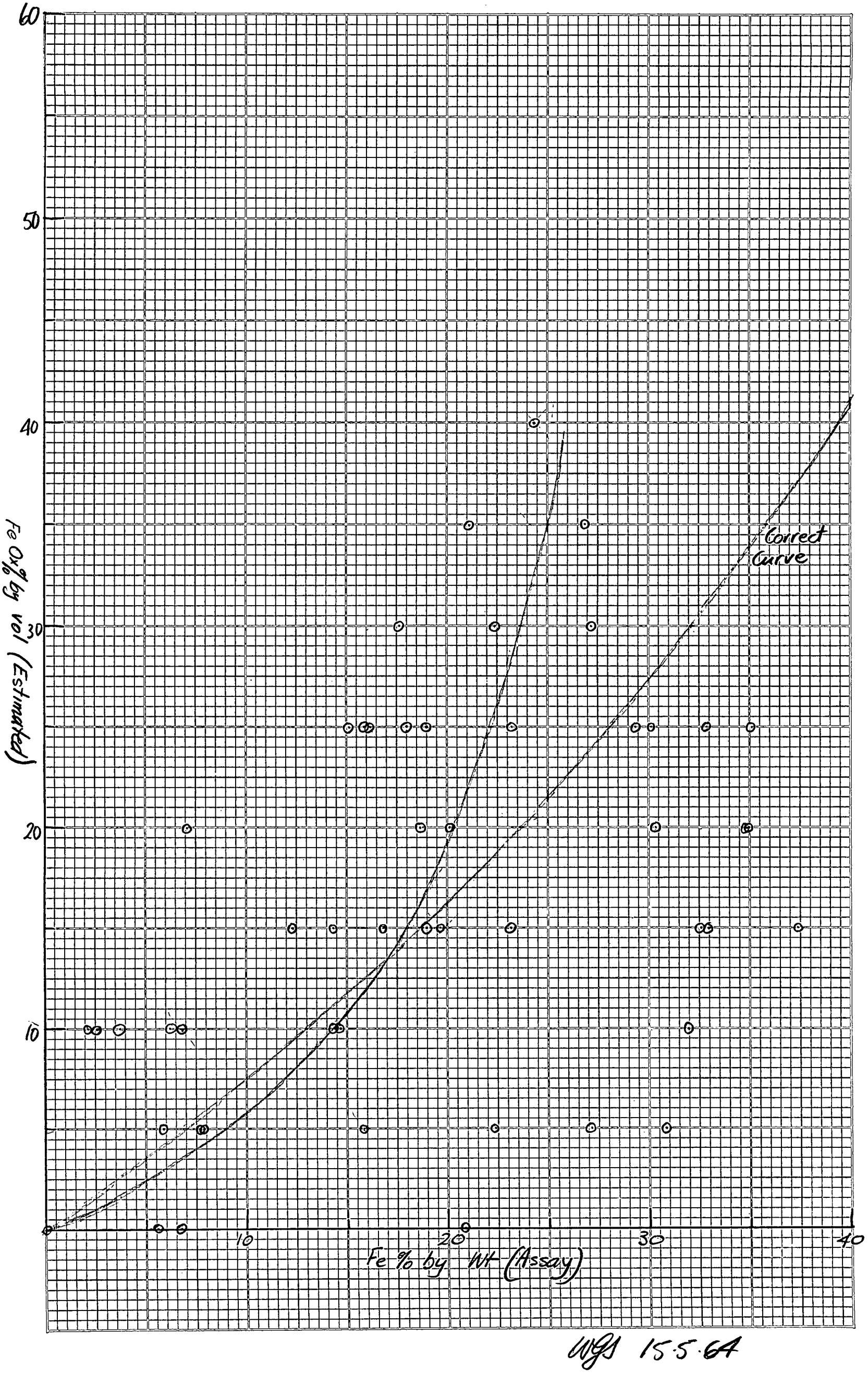
WJS 15-5-64

GDG


60
50
40
30
20
10
FeOx% vol (Estimated)
Correct Curve
10
20
30
40
Fe % by Wt (Assay)

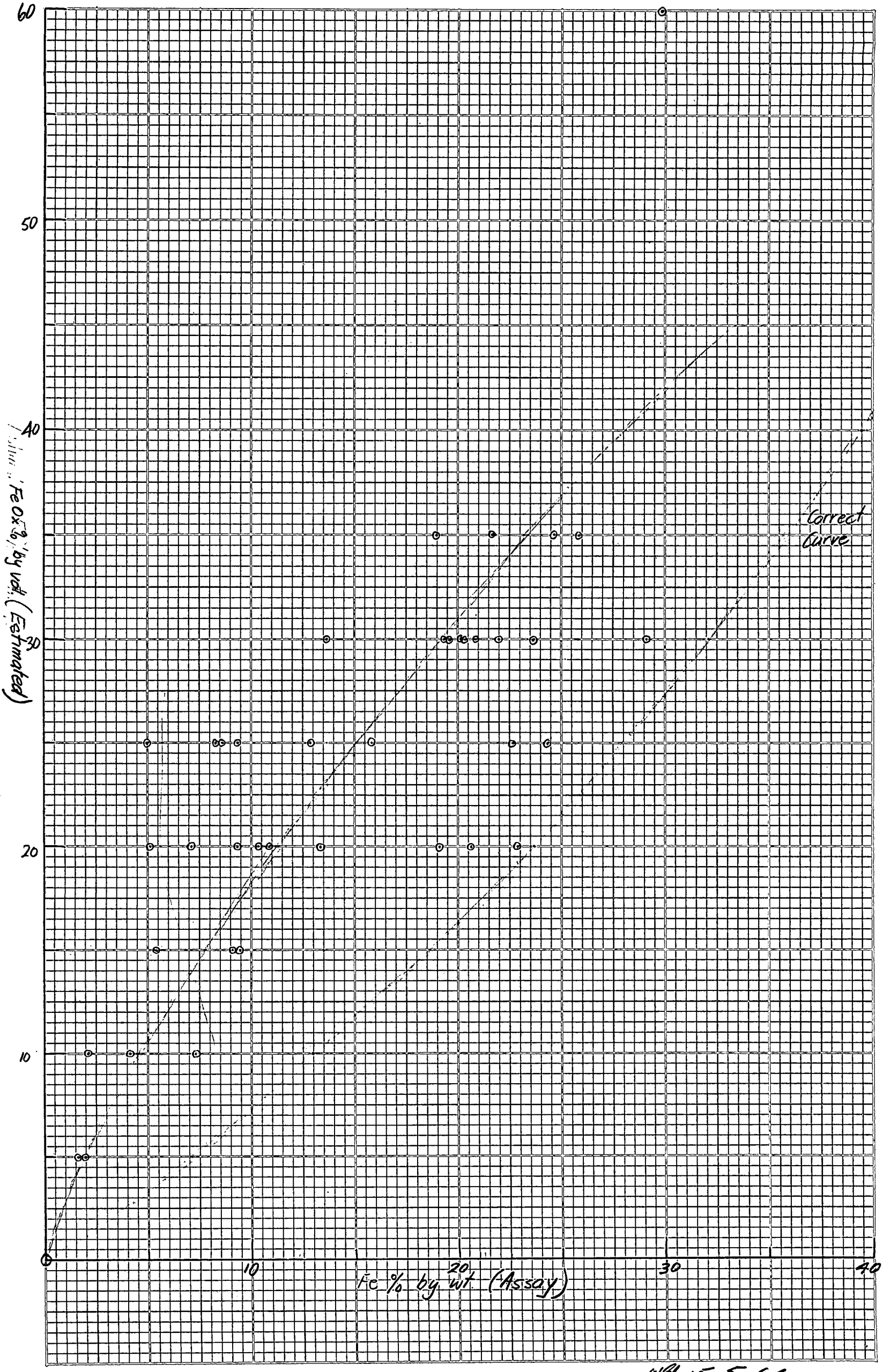
15.5.64

GD 5

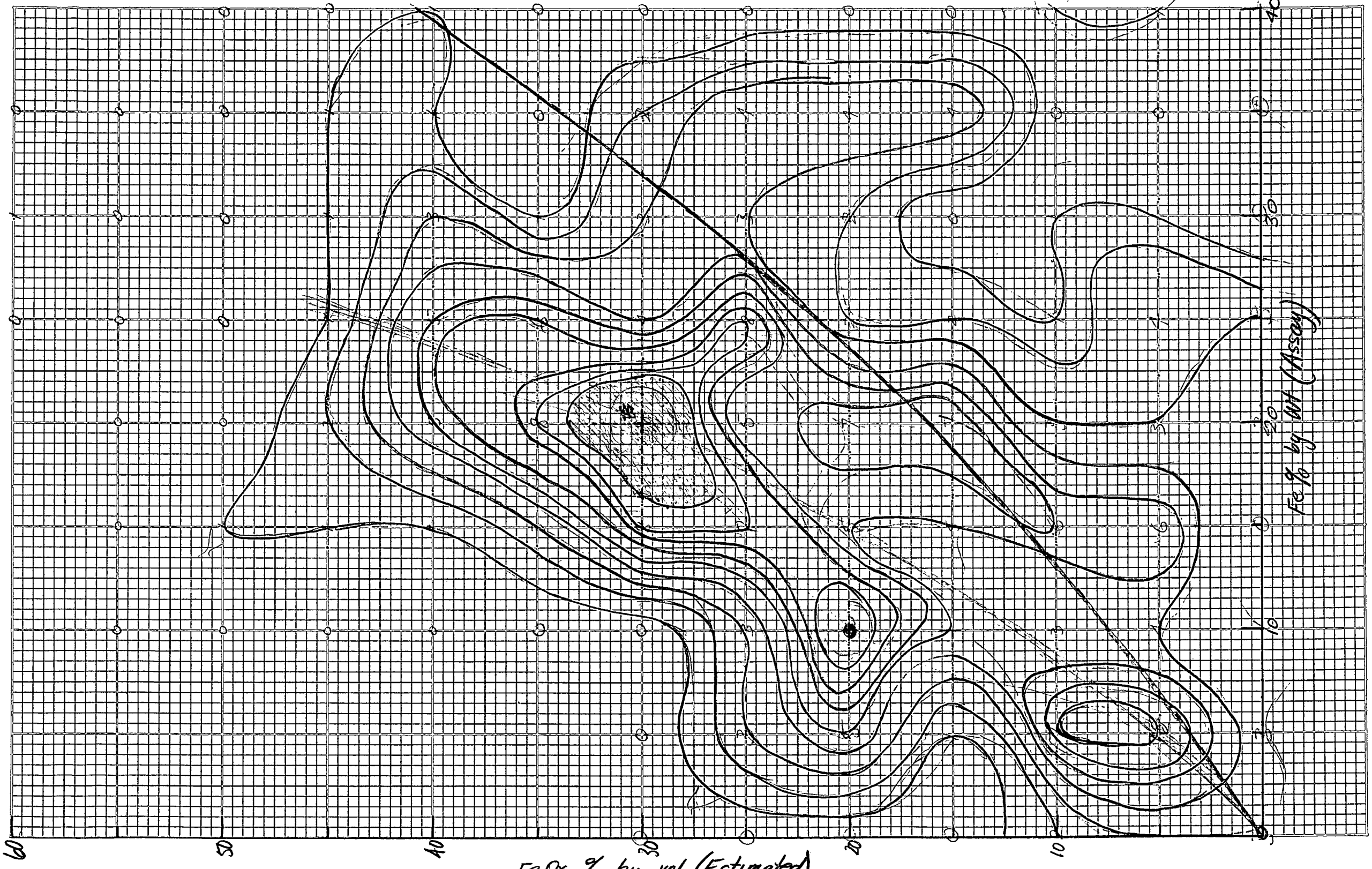


WGS 15·5·64

GD 2


60
50
40
30
20
10
Fe % by vol. (Estimated)
Correct Curve
10
20
30
40
Fe % by wt. (Assay)

15.5.64


60
50
40
30
20
10
0
FeOx % by vol (Estimated)
40
30
20
10
0
Fe% by Wt (Assay)

40%
30%
20%
10%
0%
20%
10%
0%
20%
10%
0%
20%
10%
0%

GD7

Clayey Limonite

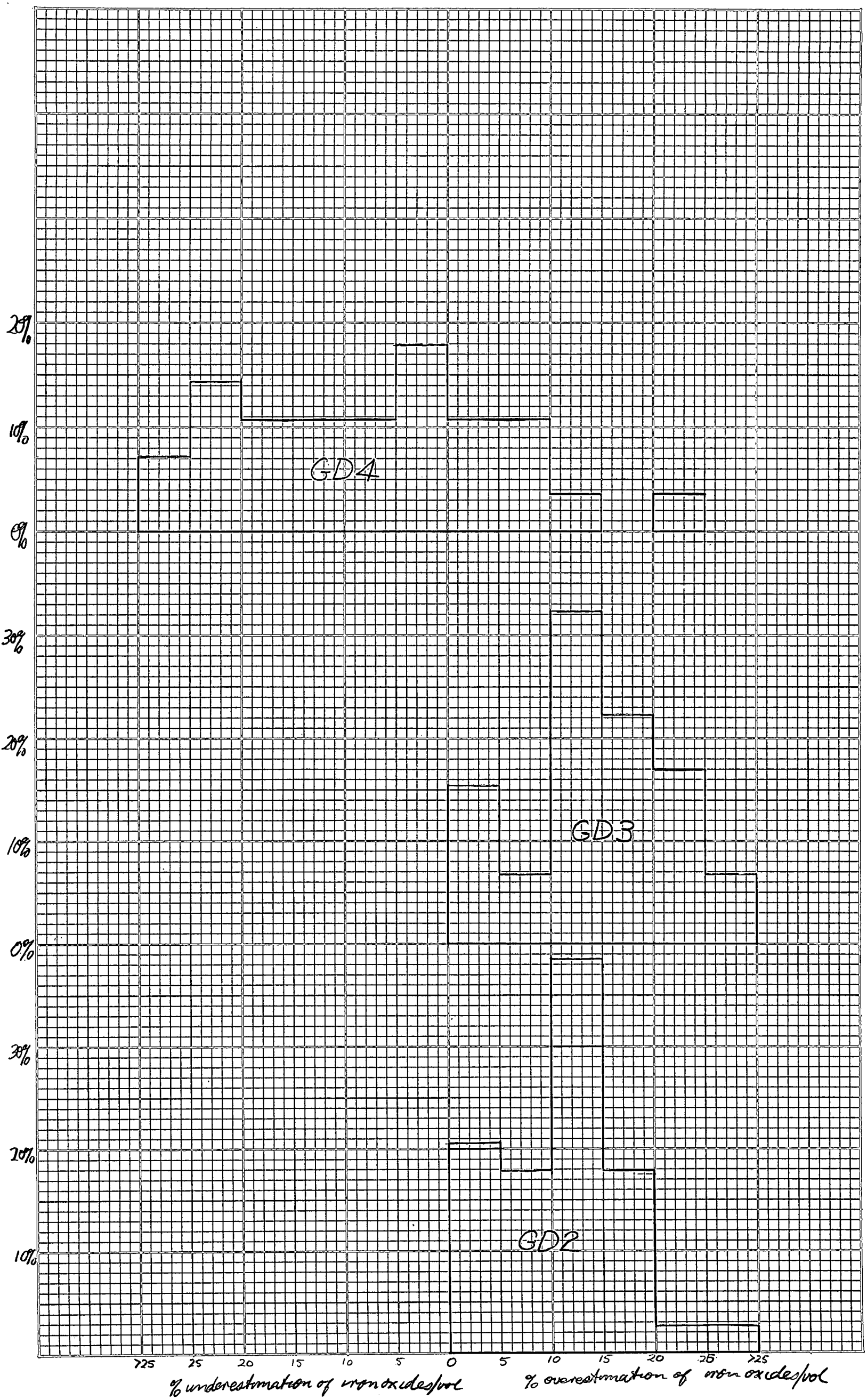
GD6

GD5

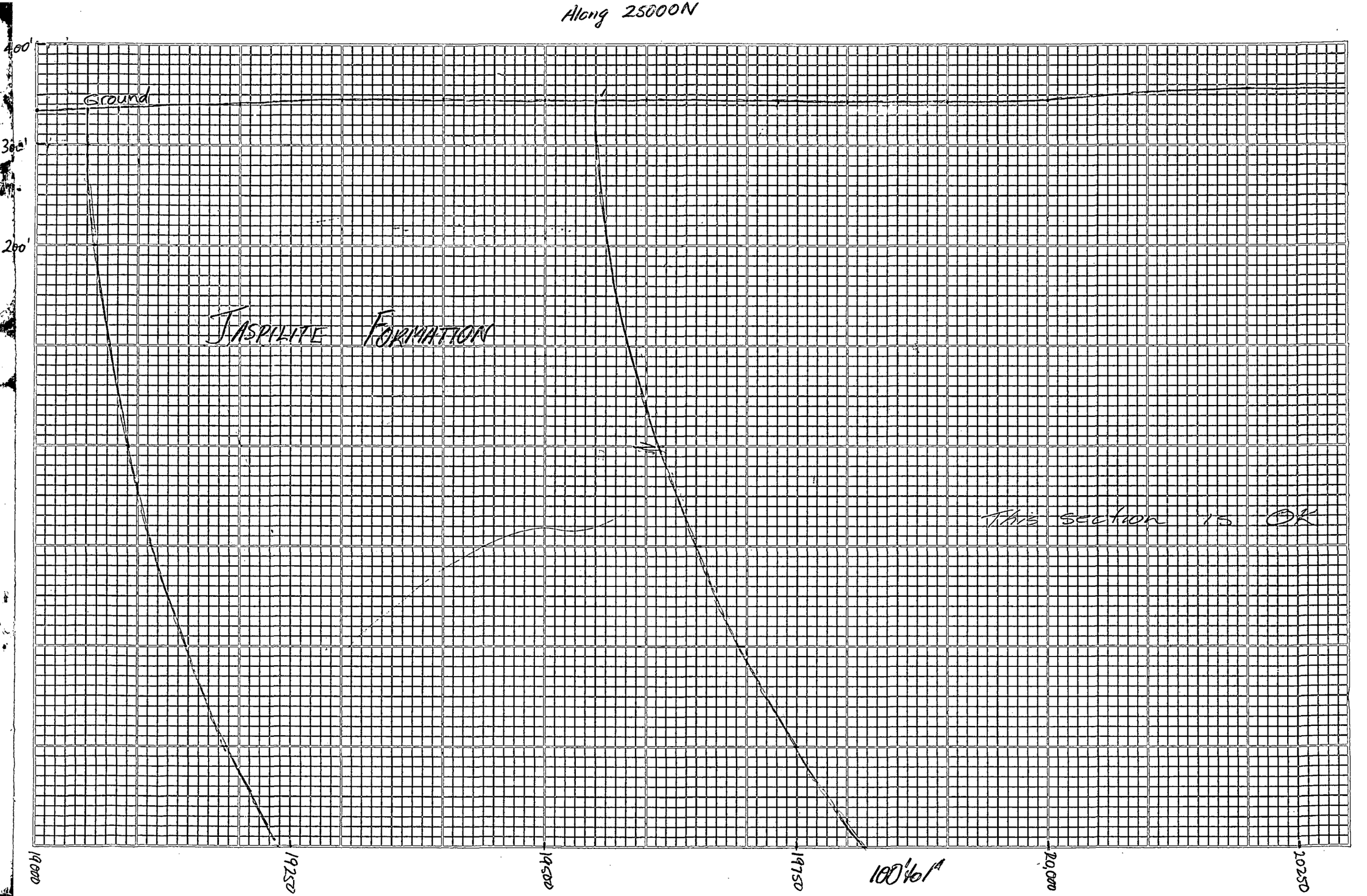
>25 25 20 15 10 5 0 5 10 15 20 25 >25

% underestimation of iron oxides/vol

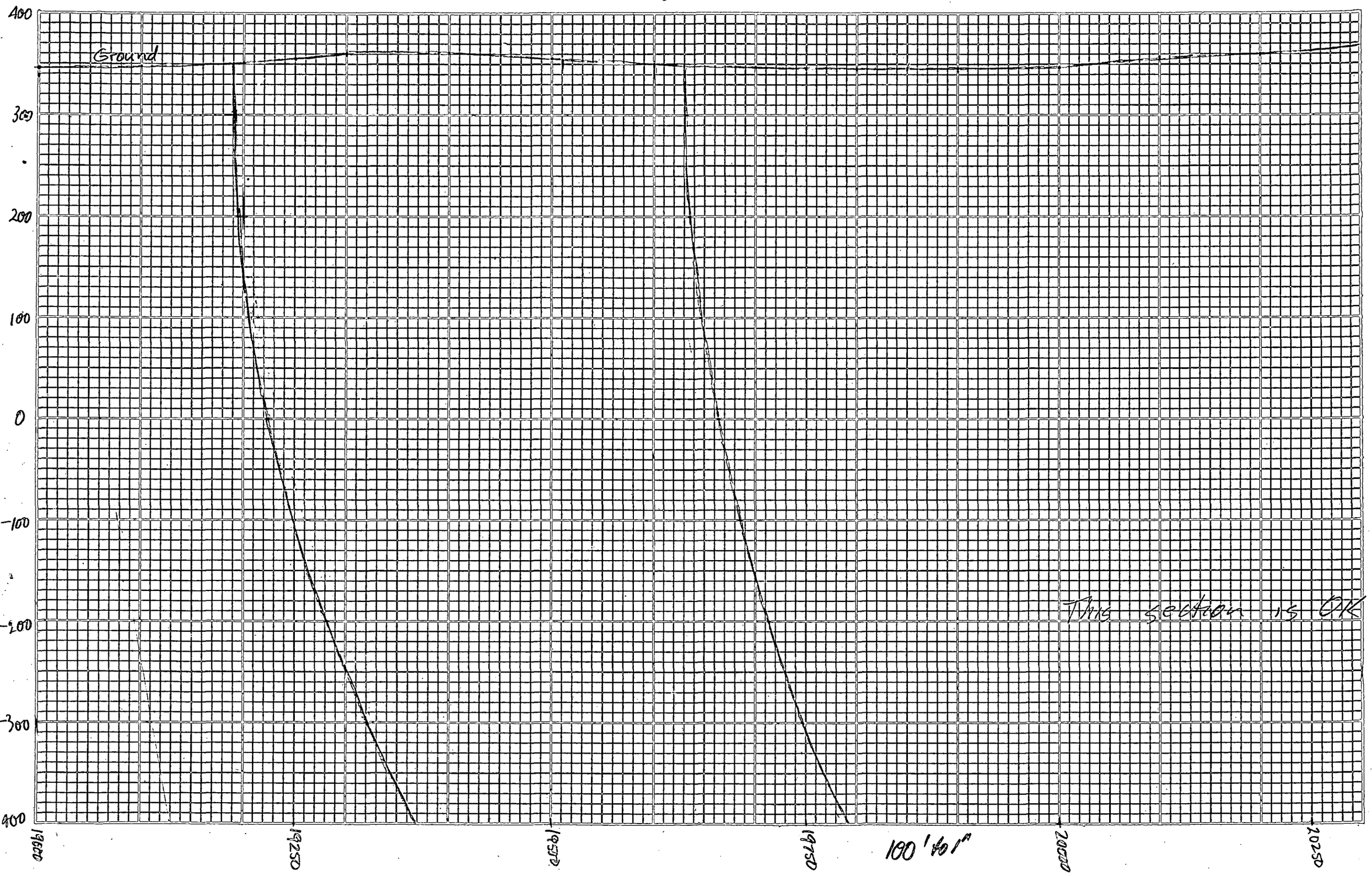
% overestimation of iron oxides/vol


GD4
GD3
GD2
20%
10%
0%
30%
20%
10%
0%
30%
20%
10%
25 20 15 10 5 0 5 10 15 20 25
% underestimation of iron oxides/vol
% overestimation of iron oxides/vol

Along 25000N



Along 24800N



Along 24600N

400
300
200
100
0
-100
-200
-300
-400

Ground

AS

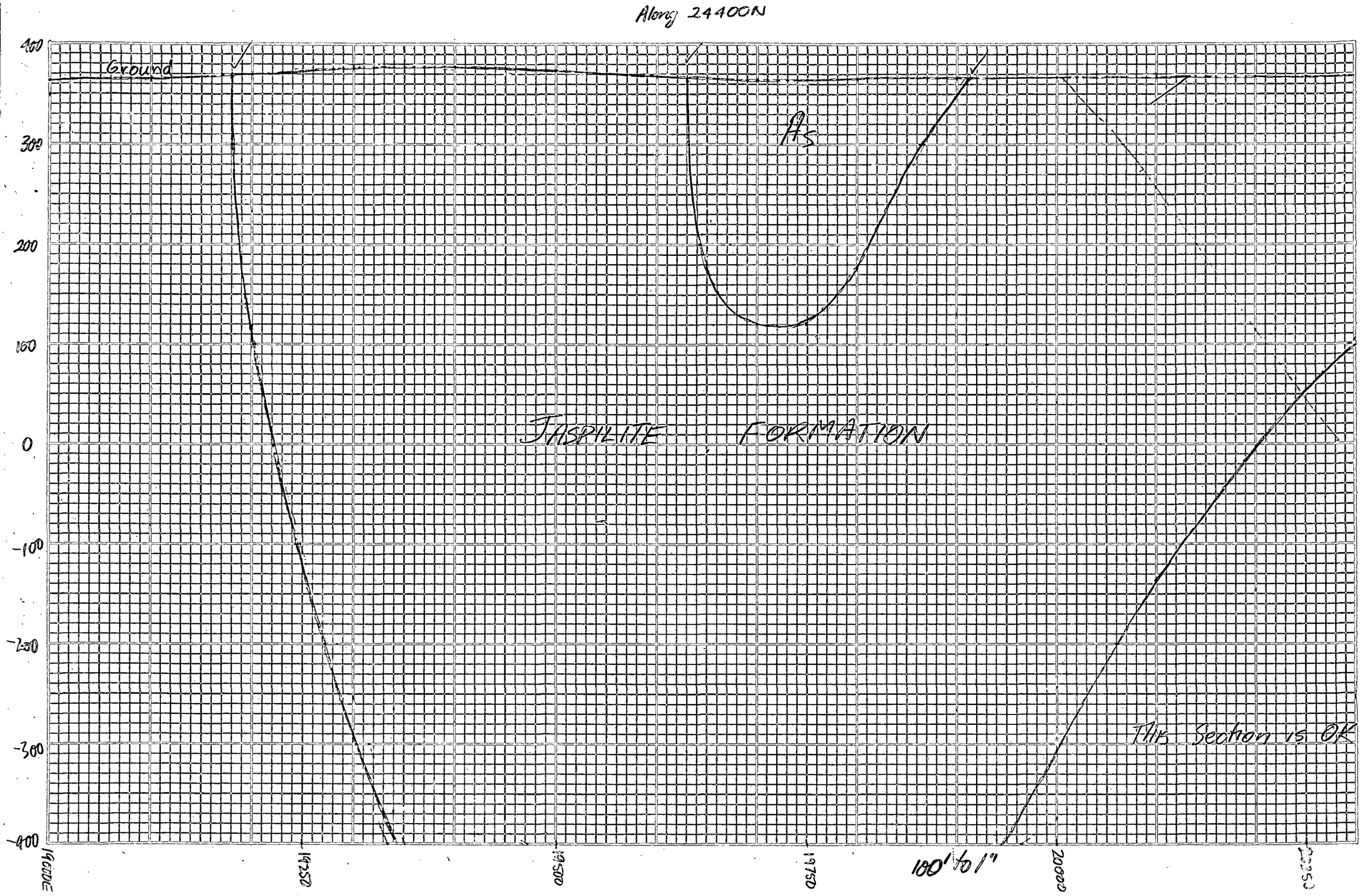
JASPILITE FORMATION

This section is OK

18000E 18250 18500 18750 19000 19250

100' to 1"

Along 24400N



Along 24200N

400
300
200
100
0
-100
-200
-300
-400

Ground

AS

JASPILITE FORMATION

19000E
19250
19500
19750
20000
20250

100'101"

Along 24000N

400

Ground

300

200

100

0

-100

-200

-300

-400

JASPILITE FORMATION

This section is OK

19000E

19250

19500

19750

100' to 1"

20000

20250

Along 23,600N

400

Ground

160

JASPILITE FORMATION

This section is OK.

0

-100

-200

-300

19000E

19250E

19500

19750

20000

20250

100'/1"

Along 23600N

400

300

200

0

Ground

JASPILITE FORMATION

This section is OK

19000E

19250

19500

19750

20000

20250

Along 23400N

400

300

200

Ground

JASPILITE FORMATION

2

0+00

1+00

2+00

1+50

1+75

2+25

1+00 to 1+50

1+50 to 2+00

1+75 to 2+25

1800E

1825E

1850E

1875E

2000E

2025E

GD #3

220 Gu

210 Gu

400 25000γ

190 Gu

300 20000γ

15000γ

10,000γ

5000γ

0000γ

19500E
25,000N

19750E
24800N

20,000E
24600N

20250E
24400N

20500E
24200N

GREENPATCH JASPILITE STRUCTURE

DIAMOND DRILL HOLES

SUMMARY LOGS

Subject to change as further information is received

GD 1 Co-ordinates 23600N 8600E

From	To	Description
0	- 55'0"	Sands, clays and calcarenites. White to buff, fine grained (up to 1/16" diameter). Carbonates associated with all types. Generally only small amounts (< 5%) of quartz grains. Quaternary.
55'0"	- 251'0"	Marble. Impure, containing varying percentages of green ferromagnesian minerals. Occasional masses of quartz are present. Bedding appears to average 60° to 80° to axis of core. Numerous joints averaging 45° to axis of core are filled with secondary calcite. Grain size varies from 1/16" to ¼" diameter. Graphite coats a joint at 226'7". Archaean.
		END OF BORE.

GD 2 Co-ordinates 25500N 17000E

From	To	Description
0	21'0"	Clay. Yellow, pink, dark brown, gritty containing an increasing number of fragments of white quartzite with depth.
21'0"	- 33'2"	Quartzite. White, fine grained, brecciated in places and healed by quartz grains and red-brown iron oxides. Some small white clay bands.
33'2"	- 59'9"	Iron formation Brecciated and healed bedded magnetite-martite/quartz-carbonate rock. Heavily weathered. Averages 35-40%. Magnetite-martite.
59'9"	- 103'0"	Iron formation. Brecciated bedded magnetite martite/quartz - carbonate rock. Heavily weathered. Averages 30% magnetite-martite. 103'0" marks bottom of severe oxidation.
103'0"	- 246'10"	Iron Formation. Magnetite-martite/carbonate/green FeMg mineral rock. Generally well bedded containing rare quartz and averaging 40-50% magnetite-martite.
246'10"	- 276'6"	Magnetite-Carbonate rock. Generally featureless coarse grained and containing only 20% magnetite. Contains 20% of both quartz and green FeMg mineral.

GREENPATCH JASPILITE STRUCTURE

DIAMOND DRILL HOLES

(Contd.)

GD 2

From	To	Description
276'6"	393'8"	Marble. Magnetite, green Fe Mg mineral carbonate rock, containing 20% magnetite poorly bedded.
393'8"	430'0"	Marble. As above but fine grained and well bedded containing 35% magnetite.

END OF BORE

GD 3 co-ordinates 24690N 19890E

From	To	Description
0'	94'0"	Sand . Fine grained, sub-rounded, well sorted, quartz. White to pink. Occurrences of laterites and sedimentary manganiferous ore.
94'0"	109'6"	Quartz. White, recrystallised, fairly well bedded.
109'6"	147'3"	Magnetite / martite - carbonate-green FeMg mineral rock. Generally poorly bedded. Contains 15-30% magnetite-martite.
147'3"	243'0"	Magnetite/martite-carbonate-green FeMg mineral rock. Similar to above but containing 30-45% magnetite/martite. Martite ceases at 220' indicating bottom of oxidised zone.
243'0"	279'5"	Magnetite-carbonate rock with traces of green FeMg mineral. Generally poorly bedded containing 35% magnetite.
279'5"	383'6"	Magnetite-carbonate rock. Well bedded, containing 35% magnetite. Silica occurs in fine grained beds.
383'6"	405'2"	Marble. Coarsely crystalline white, grading down to grey white and green banded calc. silicate rock.
405'2"	431'6"	Magnetite rich zone. Containing 40% magnetite.
431'6"	501'	Marble.
501'0"	511'6"+	Iron Formation - in progress

GREENPATCH JASPILITE STRUCTURE

DIAMOND DRILL HOLES

(contd.)

GD 4 Co-ordinates 23620N 20960E

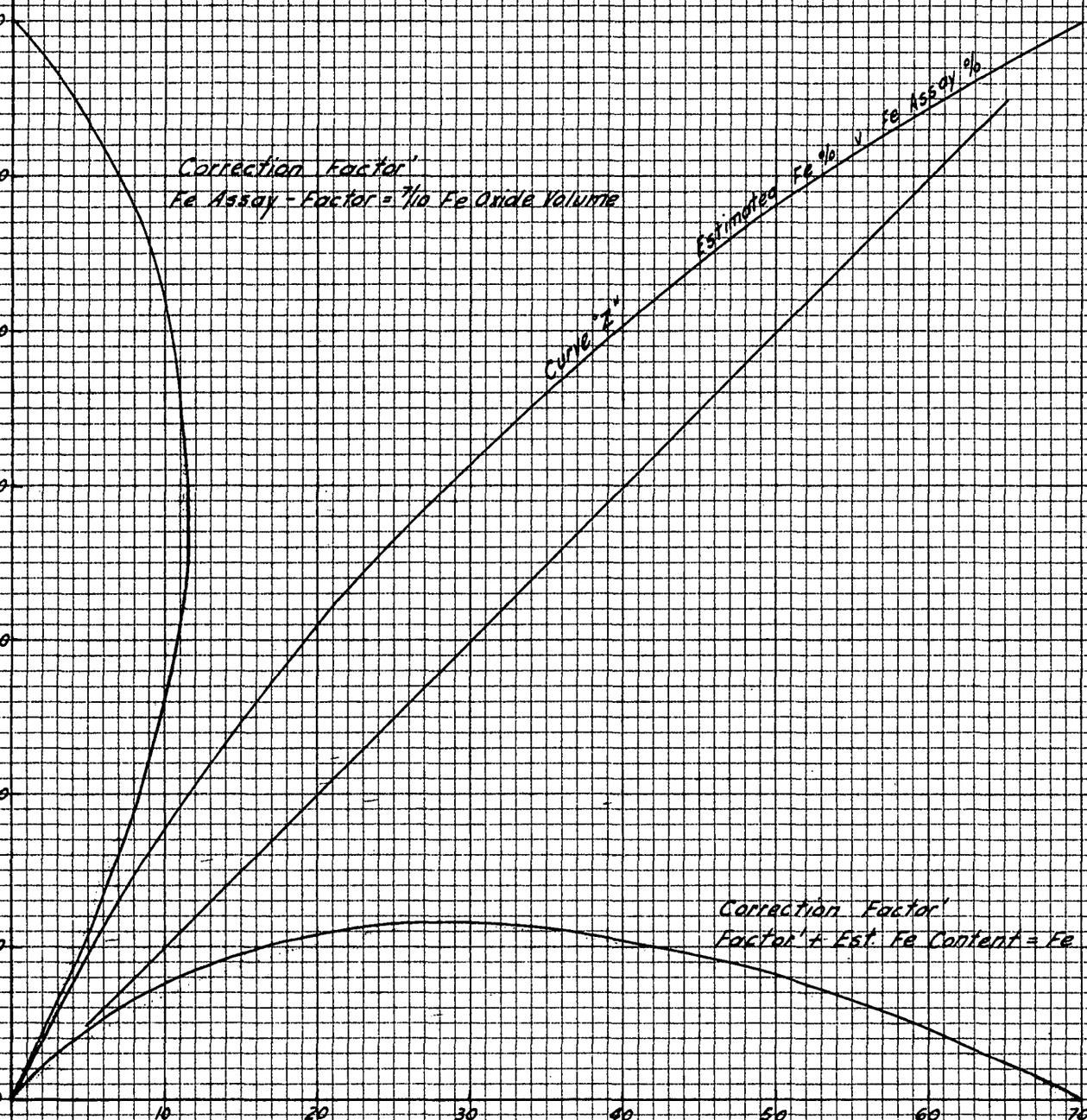
From	To	Description
0	27'0"	Sands, gravels, clays.
27'0"	34'10"	Quartzite - thin beds with sands, gravels and clays.
34'10"	43'2"	Jaspilite- magnetite/martite - silica. Highly weathered. Interbedded with rare thin quartzite beds. Averages 20% iron oxides.
43'2"	259'3"	Jaspilite with lesser quartzite interbedded. Averages 30% iron oxides.
259'3"	289'+	Poor core recovery - Quartzite with clay bands, disseminated pyrite and chlorite. Graphite at 220'. In progress.

GD 6 Co-ordinates 22510N 21080E

From	To	Description
0	84'0"	Clay. White to buff, containing small amounts (< 10%) of iron oxides (mainly magnetite).
84'0"	160'0"?	Schist - brown, highly weathered.
160'0"?		Calc.silicate magnetite rock.
	295'0"	Silica magnetite rock averaging 45% Magnetite.
295'0"	313'0"	Amphibolite.
313'0"	316'8"	Iron Formation - well bedded.
316'8"	345'3"	Quartzite white to pink with < 10% disseminated magnetite.
345'3"		Magnetite-carbonate-chlorite rock. In progress.

N.B. 1. Mineral percentages quoted are field estimates only and will be modified when assays are available.

2. Measurements of SG and susceptibility are in progress.



S.A. DEPT. OF MINES
WARRAMBOO ANOMALY
CORRECTION FACTORS -
ESTIMATED IRON CONTENT (ie. Vol. %)
VERSUS IRON ASSAY (ie. Wt. %)

53170
Dh 13
14-6-62

To accompany report by G.F. Whitten.

A.W.

Sun 15.12.63 12.30 pm

Phone call from Sydney

GD2 - 0-21 clay etc
21-33 Quartzite
33-103 Dacite/Andesite Jasperlite
103-247 Jasperlite
247-430 Mudstone with Fe Ox

GD3 115'

GD4 50'

GD5 Defer till after X'mas

GD6 Rig plant from GD2

Met Reports Reps 1, 2, 3 on Greenschists
5/6/7

Met Report Warrawoona

TAB Sam Warren - Chief Geol Assist.
Hopes to get career before X'mas.

Tom Sends card of Jon - Canter - Pres of Patino
Mining area with an Eng - went to
Caracas on Mon - Going over to Gifford.

Mgr of Hob - Rand Mathieson Thurs.
Jim Doe - Rand Mat Perth - Miyagawa

Dalhousie – Other Tourists – visited TAB, Brunnies & coast & Perth.

Bill Pike – Keen to know how things are going.

Ferry Jamil Coy & 100 additional co – I Coy – W.H & last to Patricio, Ampfield, Kahemarka.

Will be here on 5th Jan for exhibits.

Weekly Report.
Kobi Report

4 of Wie. GD2

Greenpatch

75'

GD3 305' still in Mag. Carb. Rock.
Increased grunt - now
40% Mag = 26% Fe.
at 220' Martite out.

45'

GD4 Very weathered jaspilite.
from 75' to 153'
alt. bands of jaspilite &
extraneous recrystallised
quartzite. - Cg.

GD6 at 90'
Hard weathered metased.
no jaspilite as yet.

W. G. Shimbaleton
6th Jan 1964 - Celtic Monarch

Sam ~~Hanna~~ - arriving in New Years
Nasr - Egypt. - Oil

Cyprus Area TAB 18.12.62

Greenfields

① Middle Jan. + for Leave allow 1 month afterwards.

② Shackleton leave to Thurs 23.1.63. Oldeen?

③

Khyber

Rescue Area Till Nov.
DA 400 recall nothing as soon as practicable.
Then reserve if req.
No Gurkhas del rescues.

Kyrenia

This unit accounts to Co.
Coy would till Greenfields clearance.
No work on recharge basis.

Hole co-ordinates 21200E ✓
23950N ✓

~~Depression~~ Angle 40°-50° ✓

Direction Grid 135° ✓

Length 500' ✓

Use peg [redacted] 23900N ✓
on line 21250E as a
foresight.

Turn off a line at right angles
(Hgrid W) at 23950N
on line 21250E
and measure 50' Grid W along
this line. This is then the [redacted]
collar of the hole. ✓

Plane is a line 21250E ✓
or peg at 24000N

Plan 63.621 160

N 88° 32' E
S 12° 15' E
P
1.0"
1.91"
1.80'
N 78° 30' W

Mr Wallace 21.1.64. 1.50 p.m.

Bill Pike

Have you have field estimate.

Restrict to GD2 & 3.

GD4 — too equivocal

GD6

Brad Wallace

Could we borrow Savage River Perspectives.

Burnetta Reports - 2-3.

18-20 Martin Place

N.S.W.

Geoff. Olivier. 1.16 p.m. 20.1.64.

GD3 Back in I.F at 501'6" for 10'
Shadge to 511'6" is black in I.F.

GD6 Back in I.F. - Mag. Carb. Green Mica Rock.
at 345'3"

∴ GD3 + 6 to go 50' East min.

GD4 20 ounces - at 289'
Go in A.M. - Shot Runs - at least 50' to 340

Getting extra bonus - 6d nuggets 2'

Note from R.K.J. & enlarged photos.
Letter from Doug Jarvis.
Ashton & Wells at Table Show at Tumby.

Coming back Friday morning
Have latest drill logs. as of 10 pm
night.

Phone Call. G.I.M. Mr Ollier 7am 20.1.64 /

Mr Wallace rang.

Report to Sat night – Stan Jones

GD3

Down to 491' Sat night

In Marble about 30'

To 460-470 was in Banded Iron Formation.

Has scattered magnetite crystals – less than 10% – green mineral – pale talc.

GD4. Last hit at 288' – 289'

In I.F. at 210

Fine pyrite bands in weathered garnetite.

At 260 – strong graphite

9" for 5' of drilling.

Now clay with ~~pyrite~~ chlorite.

In last run is grey calcareous grit or greywacke with pyrite – 6 fragments for 5'

Another hole?

GD6. In Banded iron rich talc silicate (340'?)

Calcite magnetite – Silica magnetite

Average 40% magnetite

Rich in white pyrite – e.g. – 2 mins

50' part ore.

Coarse May. 2 10%

Will want to stop early this week.

Rig at lunch time:

Lengths of Drillholes

GD2 See notebook

GD3 0-94' sand (f.g. quartz) ch
94-109 Quartzite
109-147' Magnetite martite Marble < 30% Fe Ox
147'-470' Mag - " " 30-40% Fe Ox
martite varies at 220' ~~230°~~
470-501' Marble
501-511'6" Iron Formation Grade ?

GD4 0-35' Sand - Gravel, Quartzite
35-43 Very weathered martite magnetite-carbonate rock with thin interbedded quartzite 20% Fe Ox.
43-260 ~~Dr~~ Jasplite with lesser quartzite beds interbedded 30% Fe Ox
260+ chloritic clay, quartzite, some graphite
289' +

GD6 0-84 Clay, with up to 10% magnetite.
84-160? ~~Brown ch~~ Weathered Schist
160-200' Calc silicate magnetite rock
Silica magnetite rock
averaging 45% Mag.
300 White Quartzite. < 10% Mag
345'3" Mag. carb. chlorite rock.

Remarks.
GD3 Drill on in I.F +50' at least 560'
GD4 Change to AM. Go to 350'
GD6 As GD3. at least 480'

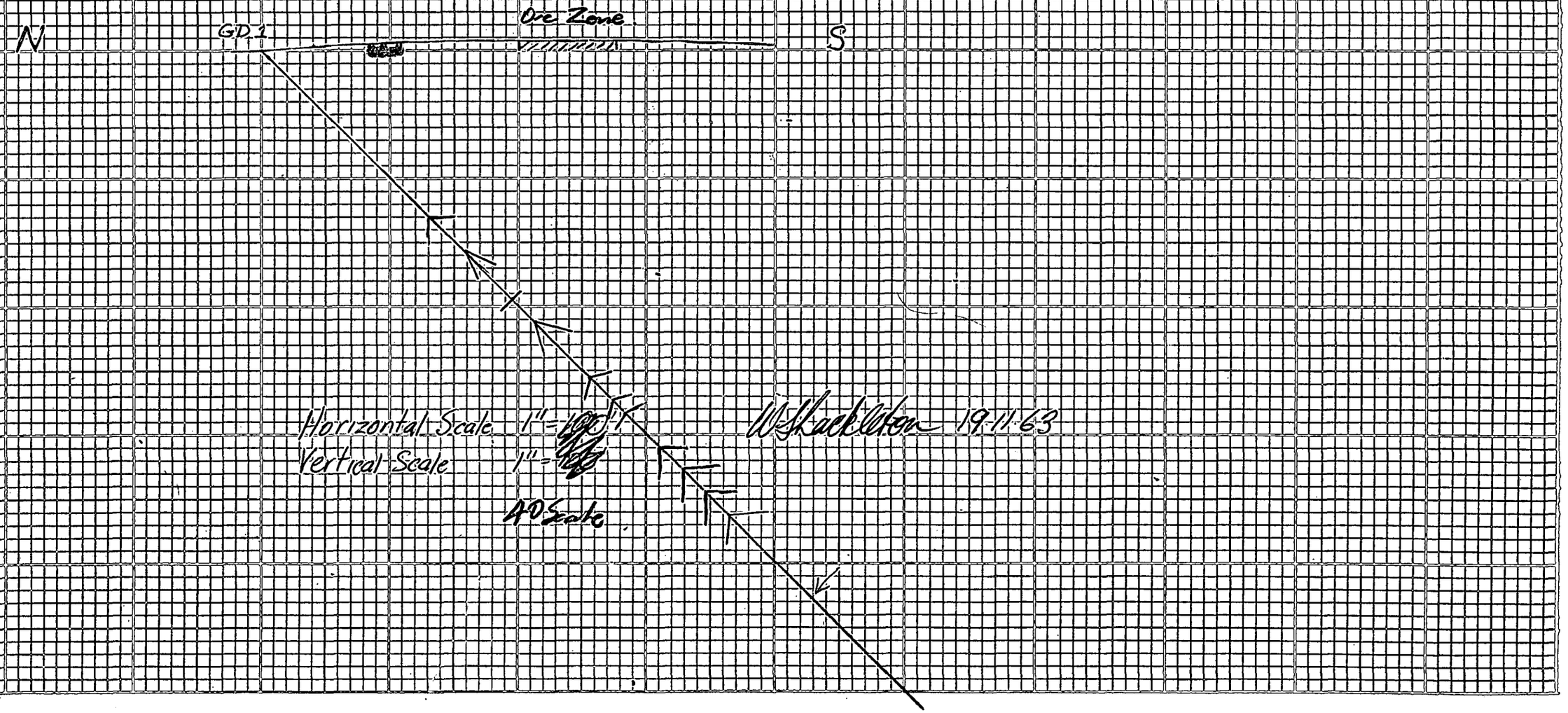
GDA a Have ready by Thursday.
Burns, Hopkins + Tanaka.

Staggis back today.
Back
Summary drill logs, XS, detailed logs for you
computer SGS & susceptibility
Splitting next

① GD5 will start about end of week
2 crews on G.D.5. — 2 weeks.
Any Friday week may be near end. + 2 days holiday

Bill Pike will ring before end of week
Sat or Sun for drilling figures.
Details of G.D.6

Section through G.D.1, Greenpatch, 100 ft Lincoln



Horizontal Scale 1" = 100'

Vertical Scale 1" = 100'

A.D. Scale

W. Shackleton 19.11.63

G.D.1.

360' 5000γ 200Gm

190Gm

330' 0γ 180Gm

280'

Magnetics

Land Surface

Gravity

50°

GD 1

40°

GD 1

40°

GD 1

40°

50' 110' 170' 230' Fwd.

Th.S end

50' 110' 170'

250'

300'

300'

GD 1

A0 Scale

Elevation = 302.4'
Coordinates = 21250E 23900N
Depression = 40°
Direction = 130° Grid
Length = 250'

W. Mackleton
21.1.63

To 21500E
23700N

21250E
23900N

To 21000E
24100N

190 Gu

180 Gu

5000 ff

6000 ff

320'

280'

Gravity

Magnetics

Ground Surface

GD1

-40°

GFW body

Hole on 21000E, dep 50° S, to 5th at 23400N. Will test bed & small magnetic anomaly. 200' hole.

Division.

check boundability of Charles Lake Grid E.

(3)

400

300

200

300'
-70°

350'
-60°

-40°

-25°

This one.

4.10.63

G.D.A as drilled.

W. Shackleton 4-10-63

21000E
23600N

21250E
23500N

21000E

21250E
Along 23400N (ct 23500N)

21500

Section along line 21000E Greenpatch Anomaly

190 Gu
180 Gu
170 Gu
Gravity
400'
Ground
300'
20000 γ
15000 γ
200'
10000 γ
Magnetics
5000 γ
0000 γ
60°
300'
165°
350'
40'
Dep
50°
PYRRHOTITE
FAULT

22700N 22800N 22900N 23000N 23100N 23200N 23300N 23400N 23500N 23600N 23700N 23800N 23900N 24000N

Scale: 100' to 1"

W. Shackleton 4·10·63

200 Gu

190 Gu

180 Gu

400'

Gravity

Ground

300'

20,000 f

=50°

200'

15,000 f

300

100'

10,000 f

0'

5000 f

Magnetics

0000 f

Possible position of bed

Probable " " "

20750E
24000N

21000E
23800N

21250E
23600N

21500E
23400N

Structure at 19750E 24800N

Two possible positions of formation but both would be tested by hole as shown on section & plan. The hole would be ~~depressed~~ 55° & be 500' long. Even so, the hole would have to be approx. 700' long & depressed at a steeper angle to ~~the~~ test ~~the~~ formation, and gravity and magnetic anomalies.

Decision:

Drill A @ 500' ∠ -60°
with homeliberty ~~of~~ ×E.

(1)b

220 Gu

210 Gu

200 Gu

190 Gu

Ground

County

400'

300'

200'

100'

0'

20,000γ

15000γ

10,000γ

5000γ

0000γ

-55°

JASPILITE FORMATION

500'

Magnetics

65

65

Position of fm. from bedding readings

Probable position of formation

GD3

19,500E
25,000N

19750E
24800N

Scale: 100' to 1"

20000E
24600N

W. Shackleton 4-10-63

20250E
24400N

GD3

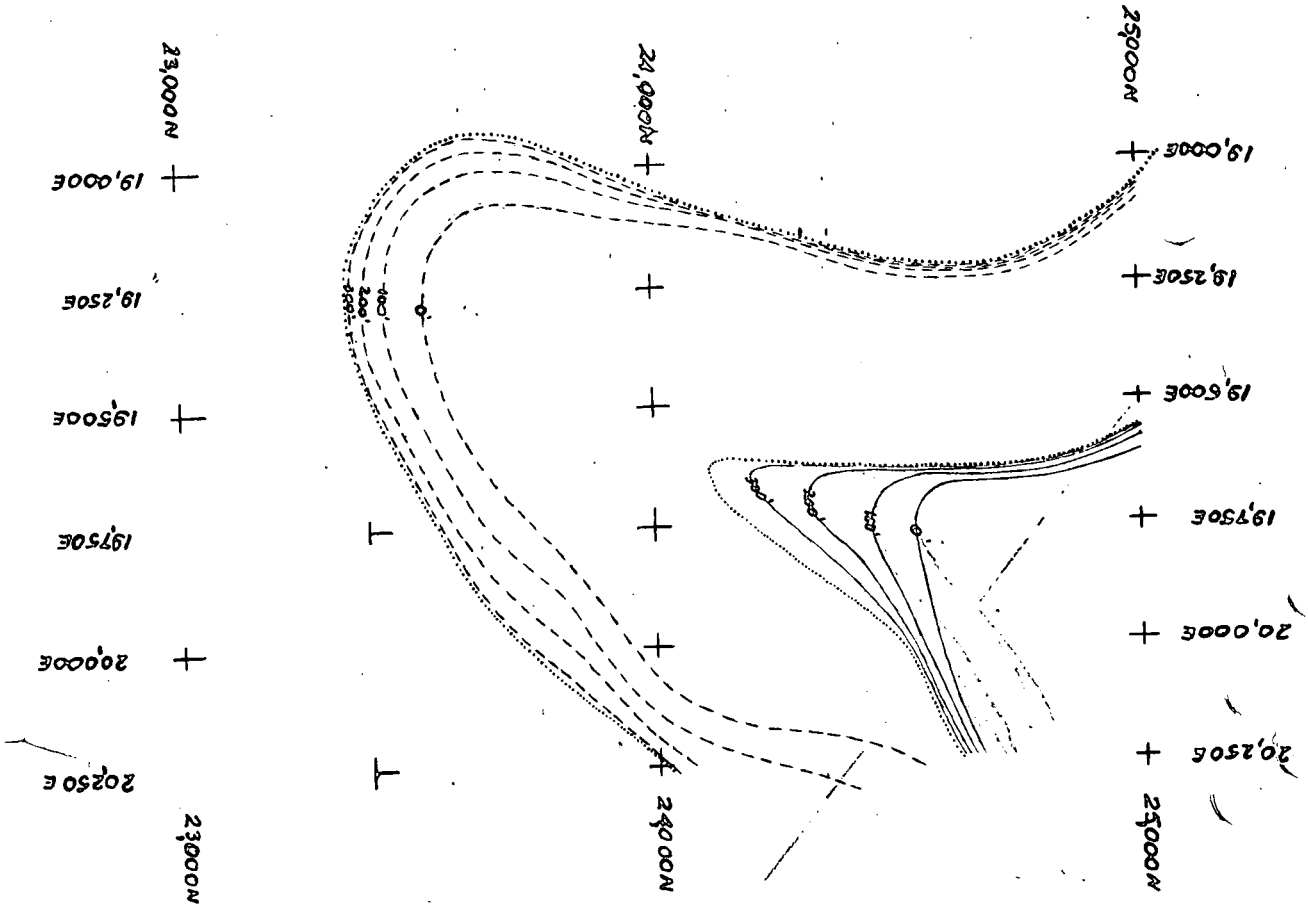
20500E
24200N

Structure at 19750E 24500N. One hole 500' + ~~inclined~~ depressed at ~~50°~~ 4 in a direction 15° W. of Lyrd South collared at 24600N well test bed, magnetic & gravity anomalies. Direction follows axial plane.

Out

Considered for GD3 - rejected

Greenpatch Anomaly, Southern Eyre Peninsula.
Structural contours of minor syncline.



W Shackleton 4.10.63

GD3

SECTION ALONG 19750E Greenpatch Anomaly

220 Gu
210 Gu
400' 200 Gu
190 Gu
300' 180 Gu 2000γ
T (±) 200
15,000γ
100 10000γ
0 5000γ
-100 0000γ
-200
-300

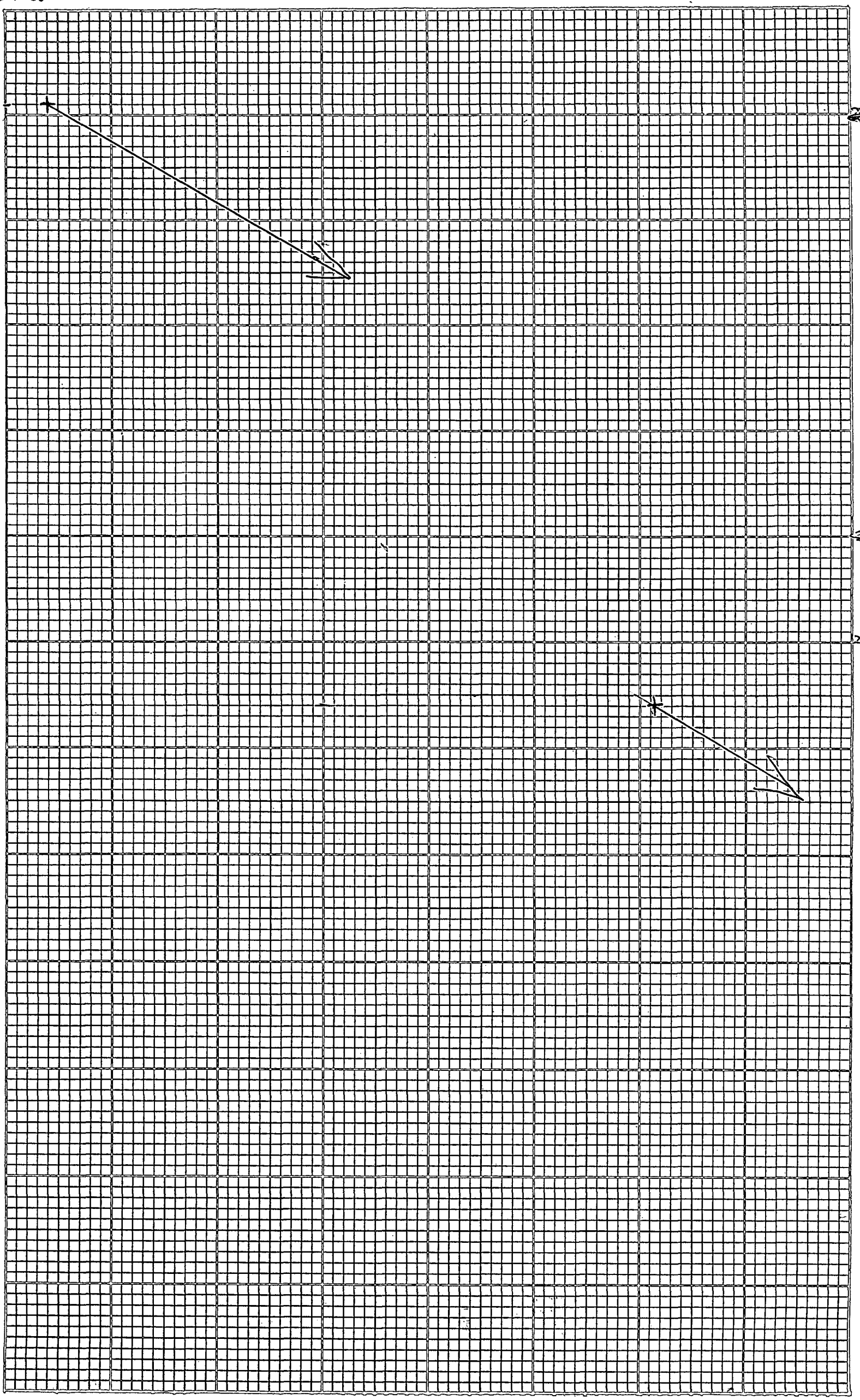
Gravity
Ground
Magnetics
BED
BED
Direction of Traverse 50° x 1" = 10 chains grid south.
Conclusion for G.D.3 & rejected.

23500 23600 23700 23800 23900 24000 24100 24200 24300 24400 24500 24600 24700 24800

Scale: 100' to 1"

W Shackleton 4.10.63

21000E



TO THE CHIEF GEOLOGIST:

Drilling - Greenpatch

With the increased drilling activity at Greenpatch and the necessity to indicate large tonnages it is desirable to test as many different structures as possible.

The current programme of 3 holes (G.D.2,3, & 4) will test 3 minor synclines on the western limb, one hole in each structure. Two zones on the overturned east limb also require drilling. These should be drilled by holes G.D. 5 & G.D.6 immediately following holes G.D.2, 3 and 4 so that the ore potential of the 5 structures can be compared. Should any of these 5 holes be encouraging further targets in the relevant structures can be suggested at short notice.

At present the following holes are proposed:

Hole No.	Coordinates	Direction	Angle	Length
G.D. 5	21940 N 21615 E	120° Grid	- 45°	400'-600'
G.D. 6	22510 N 21040 E	120° Grid	- 45°	400'

Mr. Shackleton has been instructed to lay out these holes on Tuesday 3.12.63.

Initial approval has been obtained for £3,5000 It is suggested that another £5,000 be sought as an interim approval pending clarification of the Special Mining Lease.

GW:PAL
2/12/63

GRAHAM WHITTEN
Senior Geologist
Iron Exploration
Section

Woolshed hill

Only a 200' foot hole depressed 45° along 17000E to South with test bed, and both the gravity & magnetic anomalies - holes at 25500N.

Reminis

DH - 200 - 300'

GD2

Section along 17000E Greenpatch Anomaly

230 Gu
220 Gu
210 Gu
200 Gu
400'
300'
200'
20,000 γ 190 Gu
15,000 γ
10,000 γ
5000 γ
0000 γ
Gravity
Ground
Magnetics
GD2 /-45°
21
83
59
103
213
241
328
403
430
Clay etc Quartzite
JASPILITE
Jaspilite intersected
Iron Formation
Carbonate Iron Formation
Sulphide intersected
BED
GD2 as drilled.
24700N
24800N
24900N
25000N
25100N
25200N
25300N
25400N
25500N
25600N
25700N
25800N
25900N
26000N

Scale: 100' to 1"

W Shackleton 4·10·63

I Possibility of two holes on line 16250E

(A) The first, on 24900N, is depressed ~~60°~~ 50° to ~~50~~ south & would be approx ~~4500'~~ 3500' long. This assumes plunge of the structure to be 50°. This first hole would test (i) bed position
(ii) Magnetic peak
(iii) small gravity anomaly on flanks of larger.

(B) The second would test a vertical hole on 25200N
(i) Bed position
(ii) Main gravity peak
(iii) small magnetic anomally on flanks of larger.
This hole would be approx. 4900' deep.

Refer planning worksheet Hill.

Section along line 16250E Greenpatch Anomaly

220 Gu
210 Gu
200 Gu
Gravity
400'
Ground Surface
300'
15000 Y
200'
100000 Y
50000 Y
Magnetics
00000 Y
ASPHALTITE
DEAD
30° 60°
1500'
1900'
24300N
24400N
24500N
24600N
24700N
24800N
24900N
25000N
25100N
25200N
25300N
25400N
25600N
25700N

Scale: 100' to 1"

W Shackleton 4·10·63

Structure at 24500N 20500E. One hole depressed at 60° in a ~~direct~~ southerly direction 26° E of Grid South. The hole would be at least 500 long to test the pegmatite formation, main gravity and magnetic peaks.

Hole collared at 25000N 20250E

Decision

Defer!

4.10.63.

500'
400'
300'
200'

220 Gu
210 Gu
200 Gu
190 Gu
20,000γ
15,000γ
10,000γ
5000γ
0000γ

Gravity
Ground
Magnetics

LIMESTONE

FORMATION

60°

600'

24000N
20750E

24500N
20500E

25000N
20250E

Scale: 100' to 1"

W. Shackleton
4-10-63

N

SEE ENLARGEMENT

REFERENCE TO SIGNS

Float	f
Ferruginous	F
Breccia	b
Observed geological boundary	
Approx. geological boundary	
Sample lines	②
Jaspilite body	H

Note:
Bedding shown in areas of Canga is of outcropping jaspilite

LEGEND

Clays to sands of drainage systems	Qal
Canga - Tertiary (?)	Tc
Sandy Laterites - Tertiary	Tsl
Nodular Laterites - Tertiary	Tnl
Conglomerates - Tertiary	Tg
Hematite &/or limonite sandstones - Tertiary	Ts
Limonite - Tertiary (?)	TL
Conglomerate Proterozoic (?)	P
Jaspilites - Archaean	AJ
Quartzites - Archaean	Aq
Hutchison Schists - Archaean	As
High Grade Iron Ore	

SCALE

FEET 1000 500 0 1000 2000 3000 4000 FEET

Del. F.B. 63·620

W. G. Shackleton - Geologist

S. A. Department of Mines

Clays to sands of drainage systems – Quaternary . Qal
Canga Tertiary ? . . . . . Tc
Sandy Laterites – Tertiary. . . . . Tsl
Nodular Laterites – Tertiary . . . . . Tnl
Conglomerates – Tertiary. . . . . Tg
Hematite and/or Limonite Sandstones – Tertiary. . . . Ts
Limonite – Tertiary ? . . . . . Tf

Jaspilites – Archean . . . . . AJ
Quartzites – Archean . . . . . Aq
Hutchison Schists – Archean . . . . . As
Manganiferous ore – Archean . . . . . AMn

SCALE
FEET 400 0 400 800 1200 1600 FEET

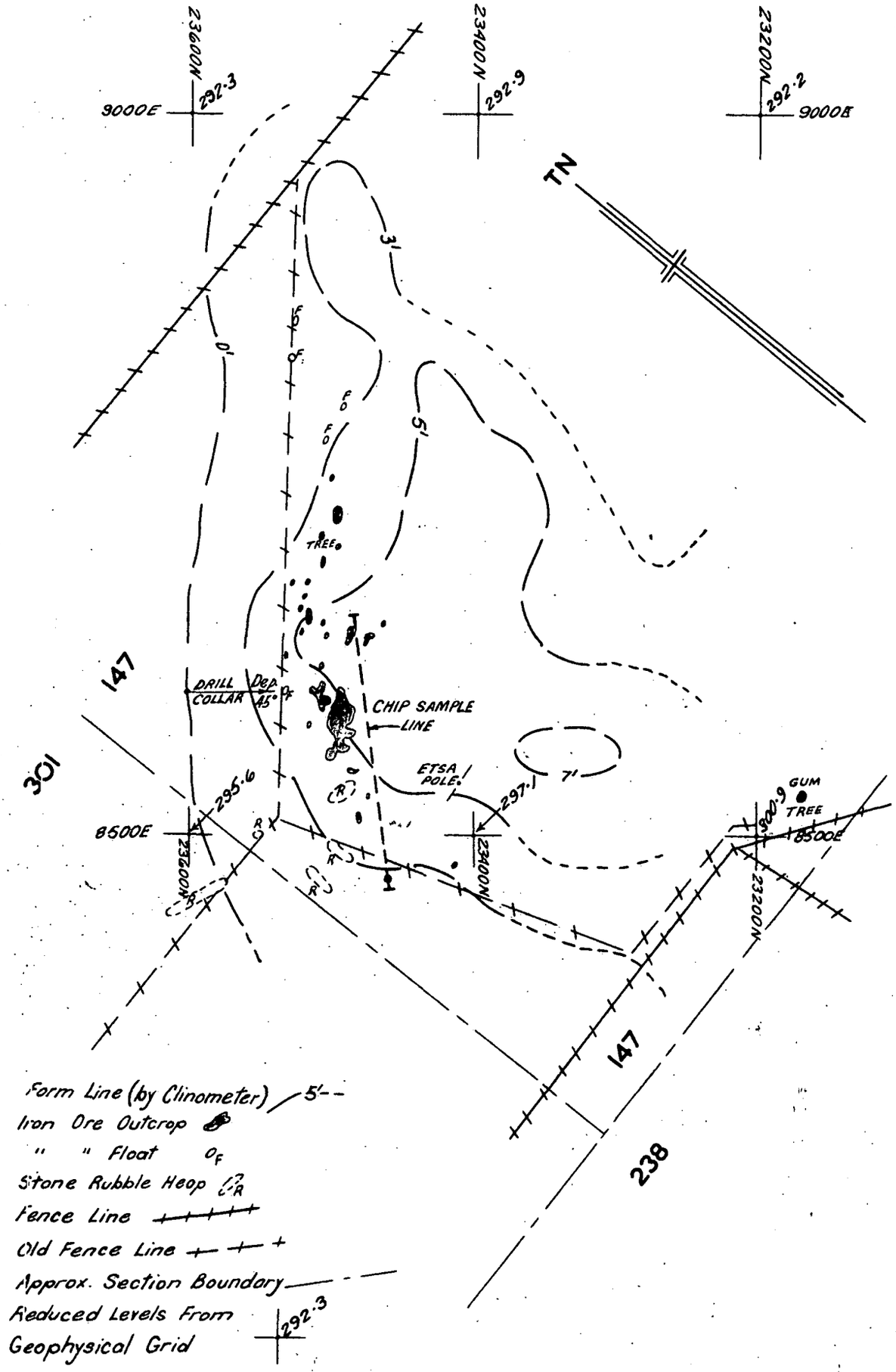
Float . . . . . f
Ferruginous . . . . . ⌐
Breccia . . . . . ▲▲ or b
Observed Geological boundary . . . . . ⌒
Approximate Geological boundary . . . . – – –

Note: Bedding shown in areas of Canga is of outcropping jaspilite

Del. F.B. 63·621/1

W. G. Shackleton – Geologist

S. A. Department of Mines

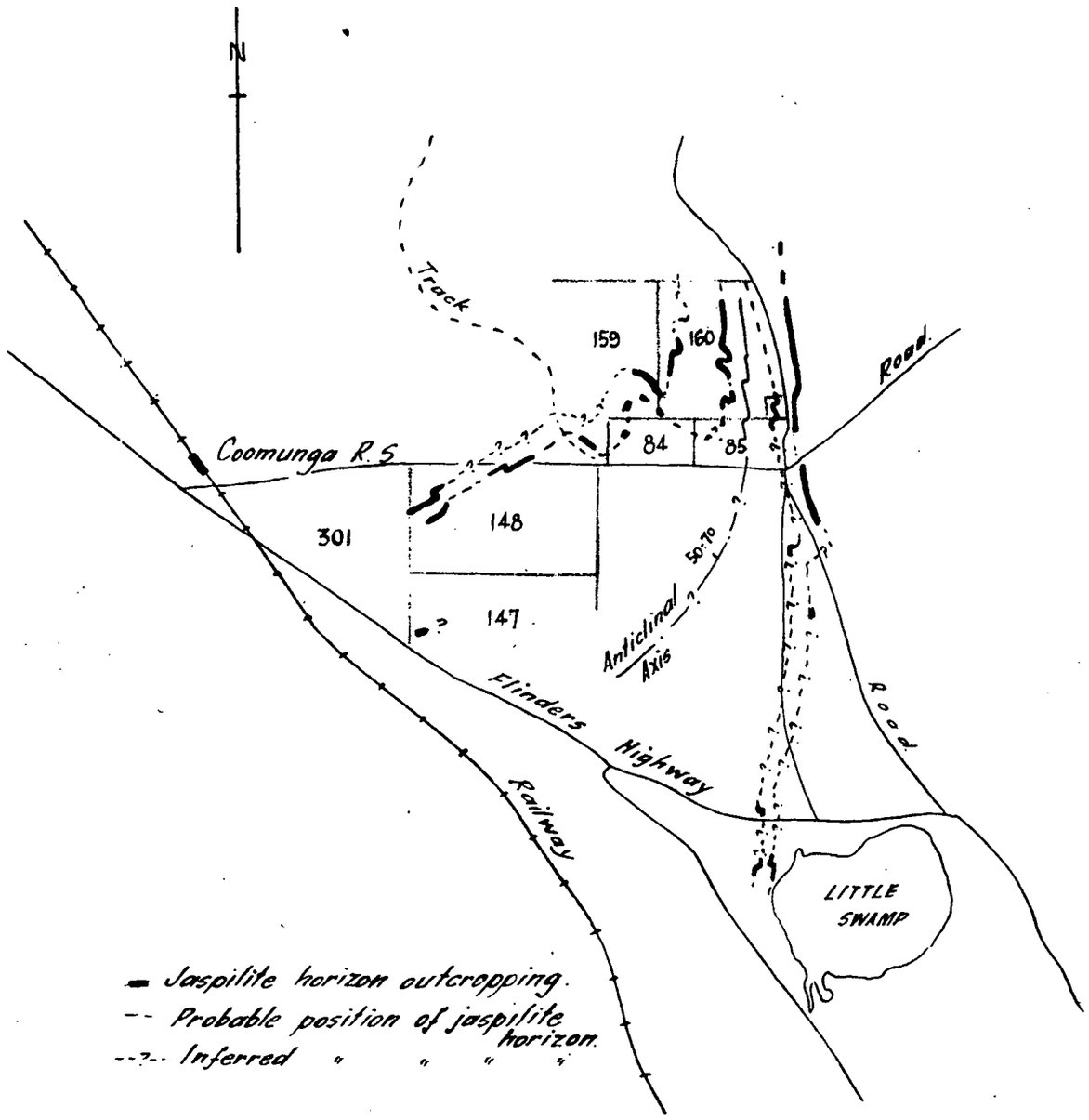


To accompany report by W.G. Shackleton

S.A. DEPARTMENT OF MINES

Approved	Passed	Drn.	GREENPATCH DISTRICT IRON DEPOSIT	D.M.	Scale 100' to 1"
		Tcd. B.G.	Sec. 147, Hd. Lincoln	Req.	S3440
		Ckd.	750 yds. NNW of Wattleton Homestead		Dn 13.
Director		Exd.	GEOLOGICAL SKETCH PLAN		Date 2-7-63.

200—2-61 3805



Scale :- 1 mile to 1 inch.

S. A. DEPT. OF MINES

GREEN · PATCH DISTRICT - Hd LINCOLN

JASPILITE STRUCTURE

To accompany report by W. G. Shackleton.

S 3445

Dn. 13

11. 7. 63

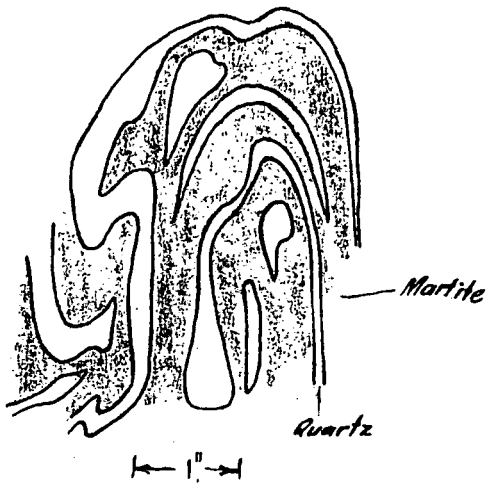


FIG. 1

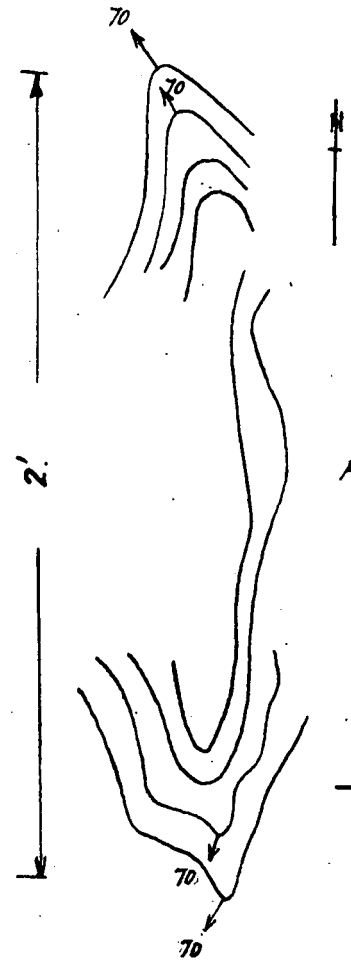


FIG. 2

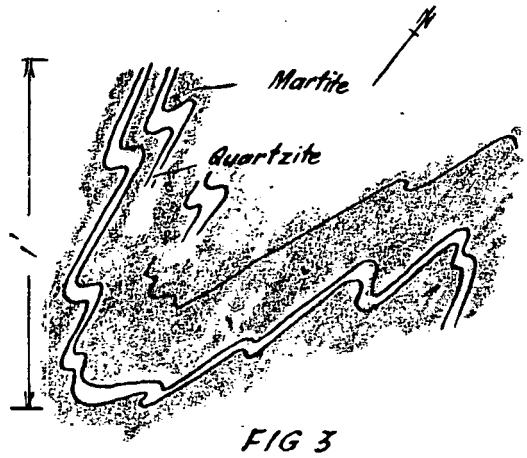


FIG 3

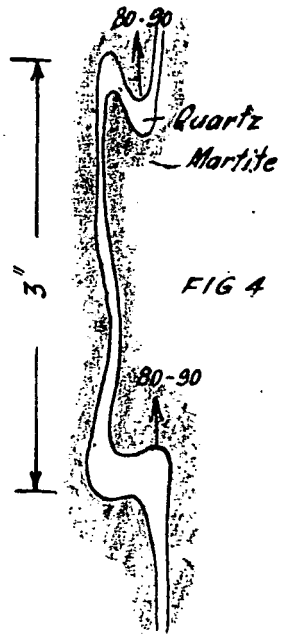


FIG 4

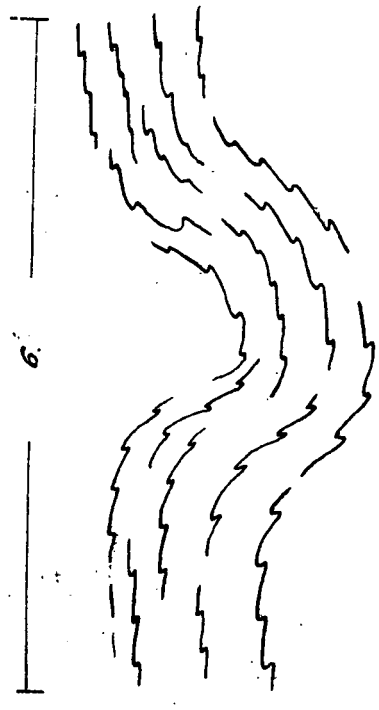


FIG. 5

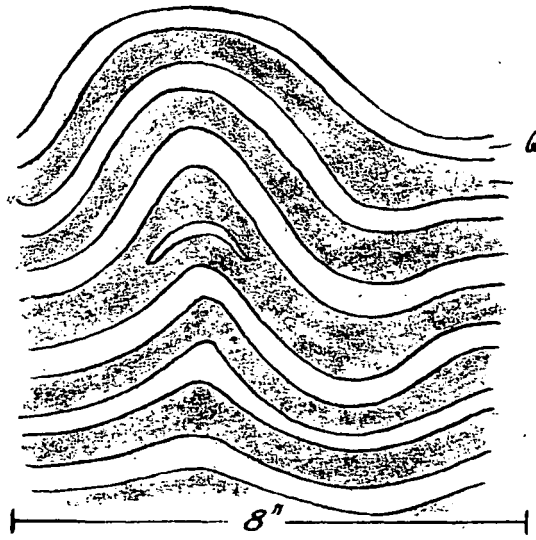


FIG. 6.

S. A. DEPT. OF MINES

GREEN PATCH DISTRICT · Hd LINCOLN

FOLD TYPES IN THE JASPILITES

To accompany report by W. G. Shackleton.

11. 7. 63

S. 3446

Dn 13

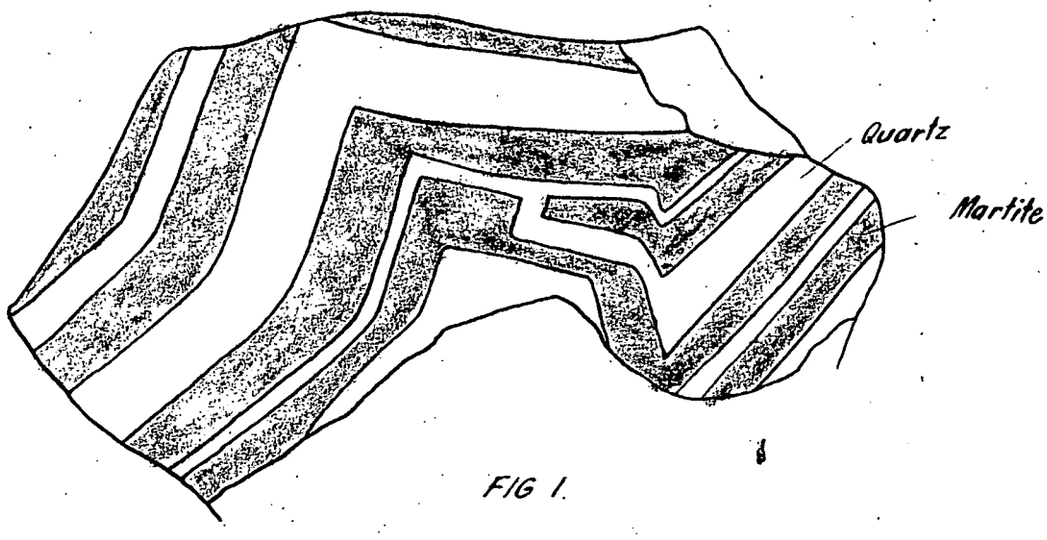


FIG 1.

9"

Specimen from body E

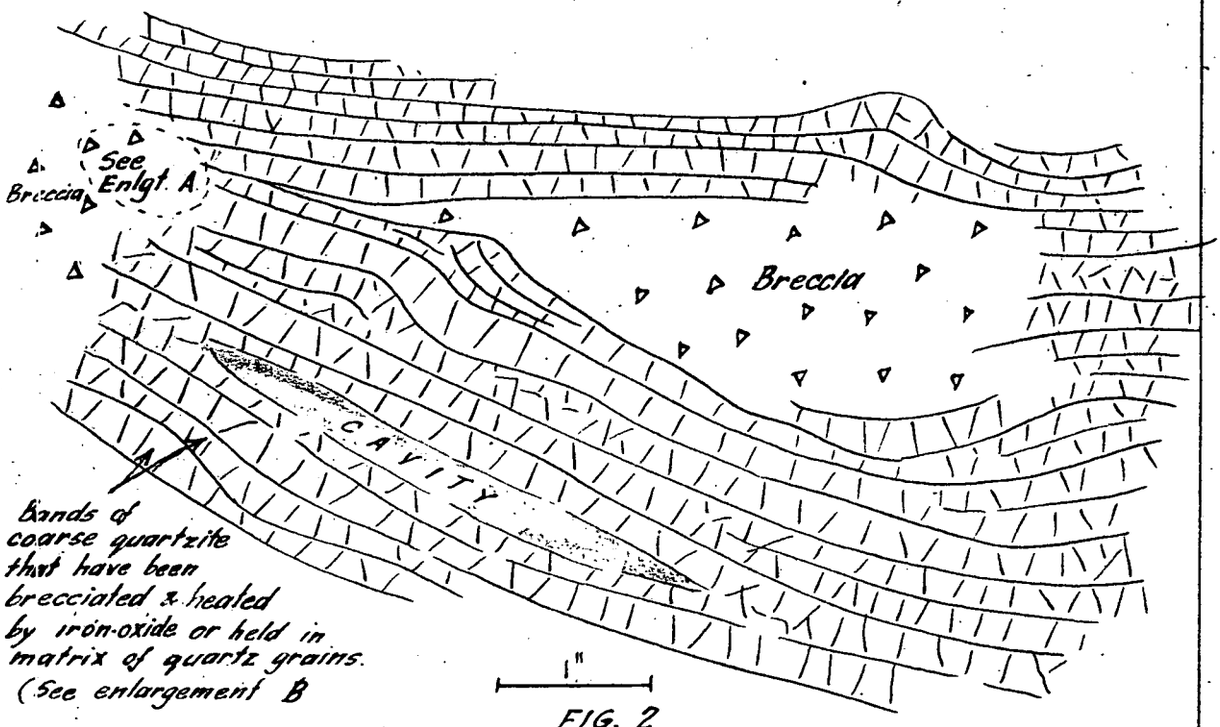
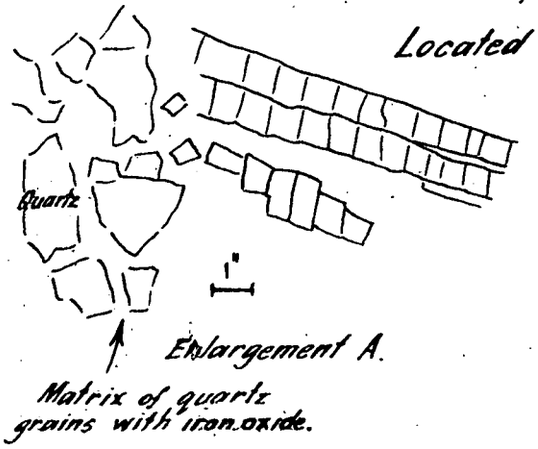
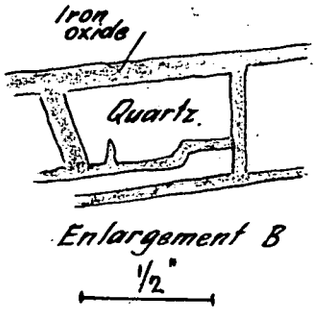


FIG. 2

Located at southern tip of body D.





S. A. DEPT. OF MINES

GREENPATCH DISTRICT · Hd LINCOLN

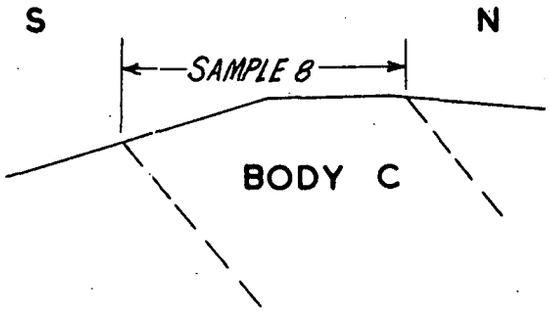
TECTONIC & SEDIMENTARY STRUCTURES IN THE JASPILITES

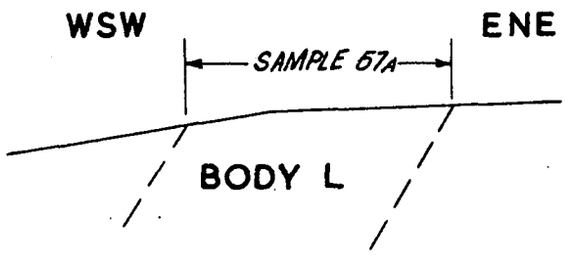
To accompany report by W. G. Shackleton.

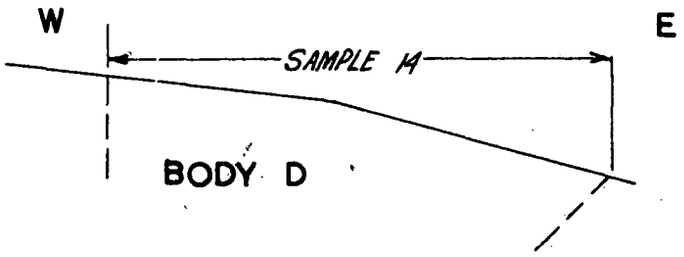
S 3447

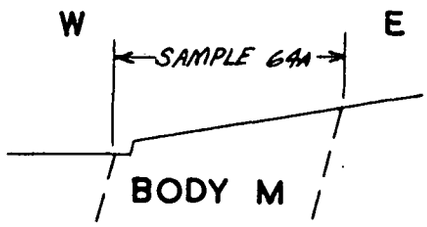
Dn. 13

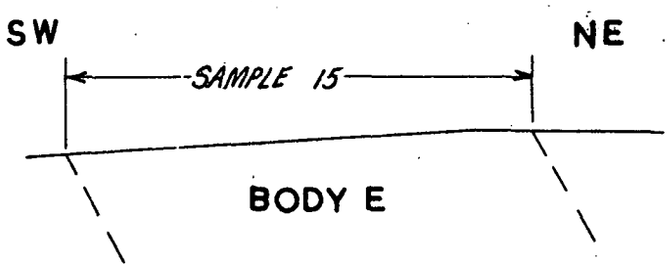
11. 7. 63

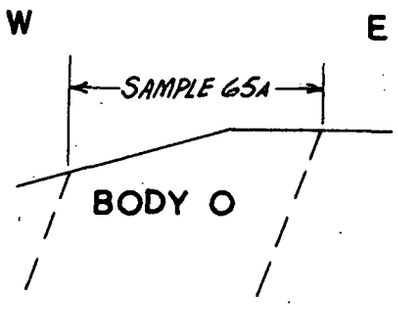


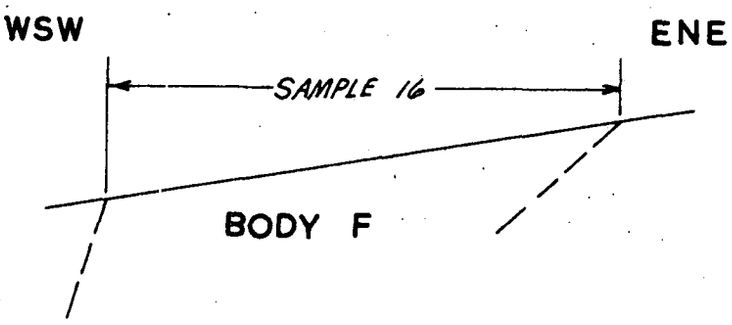


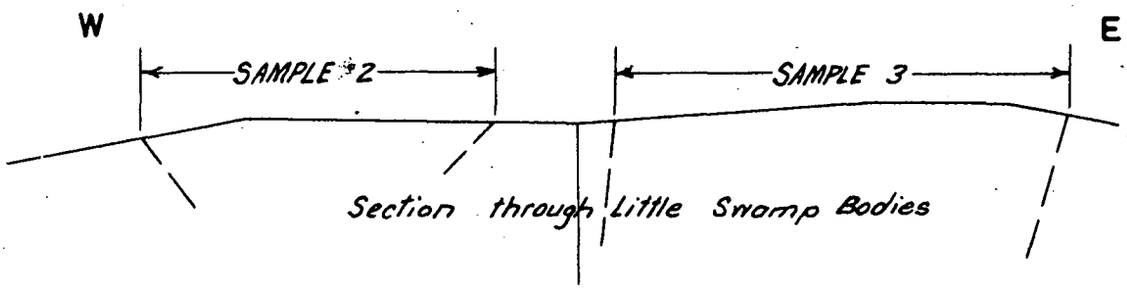












To accompany a report by W.G. Shackleton.

S.A. DEPARTMENT OF MINES

Approved	Passed	Drn.	GREENPATCH JASPILITE STRUCTURE	D.M.	Scale 100Ft to 1inch
		Tcd. B.L.G.	HD. LINCOLN	Req.	S3448
		Ckd.	CHIP SAMPLE LOCATIONS		Dn 13
Director		Exd.			Date 12-7-63.

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