NORTHERN TERRITORY GEOLOGICAL SURVEY

GS 72/25

TECHNICAL REPORT

THE STOKES YARD BASE METAL PROSPECT

HERMANNSBURG 1:250 000 SHEET AREA SF 53-13

NORTHERN TERRITORY

BY

O FRUZZETTI

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epartment of Mines and Energy

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OPENFILE

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1. SUMMARY

A diamond drilling programme was undertaken by Mines Branch between November 1971 and March 1972 at the Stokes Yard Prospect in the Glen Helen-Haast Bluff locality, on the western margin of the Hermannsburg 4-mile Sheet area, Northern Territory.

The prospect is located in metamorphic rocks of the Precambrian Arunta Complex.

The aim of the investigation was to test the downward extent of a zone of lead-zinc-copper-silver mineralisation occurring at the surface and exposed in a number of shallow trenches and pits.

Drilling was carried out at the request of Mr. S. Griffiths of Alice Springs, holder of a number of Mineral Leases in the area, and was undertaken by the Northern Territory Administration as part of the policy of the Commonwealth Government to assist in the exploration of mineral resources.

Five drill holes totalling 1957.5 feet were put down; mineralisation appeared to be epigenetic and confined to shear zones and their immediate surroundings.

142 samples including surface chip samples, split core and sludge samples from drill holes were assayed; results show that the mineralisation is of economic grade only at the surface and does not persist in depth.

At the surface, the mineralised zone has an average width of 50 feet and a strike length of at least 250 feet. Samples from this zone average 2.82% Pb, 2.81% Zn, 0.27% Cu and 1.26 oz/ton Ag. Shallow pattern drilling on a closely spaced grid is therefore recommended to assess tonnage and grade available to a vertical depth of at least 30 feet.

2. INTRODUCTION

The Stokes Yard Base Metal Prospect is situated 131 road miles west-north-west of Alice Springs with access through the Glen Helen Tourist Camp (plate 1). The prospect area, covered by Mineral Leases 473H, 514H, 516H, 517H and 683H held by Mr. S. Griffiths of Alice Springs, is about 3½ miles north-north-west of Stokes Yard which is located on the road that links Alice Springs with the Haast Bluff Native Settlement.

Other mineral occurrences are recorded in the area, and Mr. Griffiths holds three Mineral Claims (MC 218H, 219H and 220H) mainly for copper, immediately to the east of the Leases. Minor copper prospects also occur in the vicinity of Glen Helen Homestead as well as Haast Bluff and Papunya Native Settlements within a 22-mile radius.

3. PREVIOUS INVESTIGATIONS

Previous work carried out in the area, mainly on M.L. 473H, includes AAS analyses of surface chip samples as well as an IP survey.

The main mineralised outcrop lying within Lease 473H was extensively sampled by A. Hoskins, geologist of ASARCO (Australia) Pty. Ltd., and the samples were analysed using atomic absorption spectrography by McPhar, of Unley, S.A., and by Geochemical and Mineralogical Laboratories (N.T.) Pty. Ltd. (GEOMIN), of Darwin. Assay results ranged up to 7.5% Pb, 26% Zn, 7.5% Cu and 4.6 oz/ton Ag; the average values being : 1.4% lead (49 samples assayed), 2.1% zinc (50 samples), 0.23% copper (65 samples), 1 oz/ton silver (63 samples).

The Induced Polarization survey was carried out for Mr. Griffiths by the Compagnie Generale de Geophysique, South Brisbane; party chief was T. Crews, geophysicist. The area covered by the survey was included in M.L. 473H and M.L. 516H. Six IP anomalous areas were outlined of which the first (A) coincided with known surface mineralisation with possible extension into another contiguous one (B) (plate 3).

At the request of the leaseholder, who had lodged an application for drilling assistance with the Director of Mines, Darwin, the prospect area was visited a number of times by the writer. Sampling and detailed mapping were carried out and a preliminary report on the prospect was prepared in October 1971, including proposals for an exploratory drilling programme.

4. GENERAL GEOLOGY

Geology of the Glen Helen-Haast Bluff area

All the igneous and metamorphic rocks outcropping in this general area belong to the Precambrian Arunta Complex. They include gneiss, amphibolite, schist and calcsilicate rocks, irregularly intruded by pegmatite and dolerite dykes.

Apart from these basement rocks, Upper Proterozoic sedimentary rocks, comprising Heavitree Quartzite and Bitter Springs Formation, crop out in the southern part of the area between Haast Bluff (the actual landmark on the western edge of the Hermannsburg 4-mile Series Sheet) and Glen Helen Homestead.

Minor Tertiary deposits occur at the foot of the hills and Quaternary Alluvium covers all the flat area between the ranges of crystalline rocks to the north and the ranges composed of the Amadeus Basin sedimentary rocks to the south.

Geology and Geological History of the Prospect Area

The country rocks at the prospect are mainly migmatitic granite-gneiss, amphibolite and calcsilicate rock intruded by pegmatite veins (plate 2).

The geological history of the area is tentatively outlined as follows:

1. Original sediments of calcareous and dolomitic composition were intruded "lit-par-lit" by granitic magma.

2. Limestone and dolomite were contact metamorphosed with the formation of marbles bearing calcium-magnesium silicates.

3. Subsequently, the complex underwent further deep metamorphism which gave rise to magmatitic granite - gneiss with intercalated actinolite - tremolite rich amphibolite (para-amphibolite), partly derived from the olivine-rich calcsilicate rock.*

4. A late phase was the intrusion of pegmatites, which remobilized metal ions, producing a weak mineralisation that extended into the remaining calcsilicate rock and parts of the amphibolite.

5. Finally, alteration of amphiboles locally formed asbestos.

5. ECONOMIC GEOLOGY

At the Stokes Yard Prospect the mineralisation exposed on the surface and in a number of shallow trenches and pits consists of argentiferous galena, pyromorphite, sphalerite, hemimorphite, smithsonite, chalcocite, malachite, chrysocolla plus rhodonite and asbestos (actinolite - tremolite). It occurs mostly in an outcrop within M.L. 473H, which lithologically consists of amphibolite, calcsilicate rock and pegmatite.

From the evidence obtained by drilling, mineralisation seems to be epigenetic, being represented by weak metal concentrations, mainly associated with pegmatites invading shear zones. It is confined to these quartz-pegmatite veins and near-by calcsilicate rock and amphibolite, and does not economically persist in depth.

Previous Development of the Prospect Area

The prospect comprises a number of shallow excavations, namely four trenches, three of which have been dug at right angles to the strike of the rock foliation, and at least six pits. All these trenches and pits were sunk to an average depth of 5 feet in areas of obvious surface mineralisation, and are situated at the foot of the main outcrop lying within M.L.473H. Other shallow prospecting pits have also been dug in the flat area surrounding this outcrop, especially on its northern and north-western sides.

According to Mr. Griffiths, no production of base metal ores has taken place to date, apart from a small amount (about 1 ton ?) of rhodonite sold in Alice Springs for ornamental purposes.

Diamond Drilling

Five diamond drill holes, totalling 1597.5 feet, were drilled by Mines Branch, Northern Territory Administration, at the Stokes Yard Prospect (see Appendix I and plates 2 to 5 inclusive).

* Olivine is always the Mg-rich variety, i.e. forsterite. No calcsilicate rock was intersected at depth in the drill holes.

Drill holes 1, 2 and 3 were drilled from the same collar, located 240 feet west-south-west of the centre of the main outcrop, all with a depression of 45°, but on bearings of 40°, 60° and 77° magnetic. This was thought to be advisable in consideration of the almost boomerang-shaped outcrop to be tested, in which rock foliation dips towards the concave part of the "boomerang". The main aim of these holes was to test IP anomalies A and B and determine the downward extent of rich surface mineralisation. Very minor disseminated sulphides were encountered (mainly pyrite and pyrrhotite) and the only intersection of possible interest occurs in D.D.H.3 between 144 and 147 feet (downhole depths) where weak copper and zinc mineralisation was penetrated.

Drill hole 4, situated at peg 1.5 W on line 3N of the CGG's grid, was drilled at a depression of 45° and on a bearing of 140° magnetic. Minor copper and zinc were encountered between the down-hole depth of 59 and 60 feet.

D.D.H.5, located at peg 2.0 E on line 1N of the CGG's grid, was put down at a 45° depression and 70° magnetic bearing to investigate IP anomaly C, but no mineralisation was intersected.

In conclusion, the sensitivity of the I.P. method is shown by anomalies produced by only minor amounts of disseminated sulphides.

Assay Results

One hundred and fortytwo samples, including eight surface chip samples and 134 samples from drill holes (131 split core and three sludge samples), were assayed (Appendix II).

The chip samples were assayed for lead, zinc, silver and in part for copper and nickel. Results ranged up to 35.8% Pb, 18.5% Zn, 3.5% Cu, 9.1 oz/ton Ag and $<$ 0.01% Ni with the following average values : 12.8% lead, 7.9% zinc, 1.8% copper and 3.6 oz/ton silver.

The split core and sludge samples (mainly in two-foot lengths) were spectrographically analysed for copper, lead, zinc, bismuth, arsenic, nickel, silver and cobalt (D.D.H's 1 and 2) and for copper, lead, zinc and silver (D.D.H's 3, 4 and 5).

No economic grade mineralisation was found in samples from drill holes 1 and 2, where only zinc gave generally low anomalous values.

In D.D.H.3, copper values up to 8500 p.p.m. and zinc up to 2200 p.p.m., were recorded between 144 and 145 feet downhole depths. In the same drill hole, copper averaged more than 0.5% between 144 and 147 feet (downhole depths). Zinc averaged 0.17% in this section.

In D.D.H.4, from 59 to 60 feet downhole depths, assays of 2000 p.p.m. copper, 1000 p.p.m. zinc and 800 p.p.m. lead were recorded.

Drill hole 5 did not show any significant results, apart from very low anomalous zinc values.

Ore Reserves

No ore zones have been intersected at depth. Economic grade mineralisation appears to be confined to the surface and to shallow

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depth, and its extent could only be determined by vertical pattern drilling on the main mineralised outcrop.

However, the following dimensions for the mineralised zone appear to be reasonably well established by the work done to date:

Average height of mineralised outcrop ..... 5 feet

Average depth of mineralisation shown in trenches and pits (at foot of ourcrop) ..... 5 feet

Average width of mineralised outcrop .....50 feet

Minimum length of mineralised outcrop ..... 250 feet.

Average assays for all samples collected from this mineralised zone are as follows:

Lead 2.82%	(56 samples assayed)
Zinc 2.81%	(57 samples assayed)
Copper 0.27%	(67 samples assayed)
Silver 1.26 oz/ton	(70 samples assayed)

6. CONCLUSIONS AND RECOMMENDATIONS

Mineralisation at the Stokes Yard Prospect appears to be epigenetic, is very localized and has little extent in depth.

A near-surface zone of mineralisation extends over an area of about 50 by 200 feet; samples from this zone averaged 2.82% lead, 2.81% zinc, 0.27% copper and 1.26 oz/ton silver.

Vertical pattern drilling to a depth of 30 feet on a closely spaced grid, is recommended in order to assess possible ore reserves within this zone, at the main mineralised outcrop within M.L. 473H. This could be carried out using a wagon drill.

No further diamond drilling is recommended at this stage.

7. ACKNOWLEDGEMENTS

The core was logged by J.S. Morlock and split by W. Sargood.

The writer is also obliged to Mr. S. Griffiths for making available all the results of previous investigations carried out at the prospect.

8. REFERENCES

Compagnie Generale de Geophysique, 1971 Induced Polarization tests on Dreamtime Lease, Glen Helen area, Northern Territory.

Fruzzetti, O., 1971 Preliminary Report on the Stokes Yard Base Metal Prospect, Hermannsburg, N.T. N.T. Geol. Surv. G.S. 270.

APPENDIX I

GEOLOGICAL LOGS FOR DIAMOND DRILL HOLES 1-5,

STOKES YARD BASE METAL PROSPECT

D.D.H.1

Location : 240 ft. WSW from the centre of the main outcrop.

Bearing : 40° magnetic.

Depression : 45°.

Logged by : J. Morlock.

Note : All angles measured relative to core axis (0°).

DEPTH	CORE SIZE
0' - 20'	Nx Casing
20' - 30'	Nx
30' - 167'	Bx
167' - 360'	Ex

Depth	Core Recovered	Remarks
0' - 33'	22'	Granite Gneiss: Minor inclusions of dark minerals including amphiboles and biotite. Fine grained. Gneissosity approximately 50°.
33' - 34½'	1½'	Amphibolite: Sheared, medium-grained. Somewhat gneissic. Dark green; equant grains.
34½' - 57'	22'	Granite Gneiss: As for 0' - 33'.
57' - 62'	5'	Granite Gneiss: As above but with increasing percentage of dark mineral bands, containing fine grained biotite, hornblende and possibly other amphiboles.
62' - 64½'	2½'	Amphibolite: Dark green. Fine to medium-grained. Contacts contorted but approximately 30°.
64½' - 65½'	1'	Granite Gneiss: As for 57'-62'.
65½' - 68'	2½'	Amphibolite: As for 62' - 64½'. Contacts approximately 30°.
68' - 78'	10'	Granite: Pegmatitic. Little gneissosity. Somewhat altered with development of epidote.
78' - 97'	19'	Granite Gneiss: As for 0'-33'. Gneissosity approximately 35°.
97' - 99'	1½'	Amphibolite: Sheared. Highly altered to chlorite. Contacts obscured due to ground core.
99' - 131'	32'	Granite Gneiss: As for 0'-33'. Gneissosity 30-40° but locally contorted.
131' - 157'	23'	Granite Gneiss: Sheared. Highly altered to clay.

Depth	Core Recovered	Remarks
157' - 162½'	5½'	Granite Gneiss: Gneissosity 40-50°. Minor bands of dark minerals.
162½' - 164'	1½'	Amphibolite: Medium green. Fine to medium-grained. Equant grains. Sharp contacts at 45°.
164' - 174'	10'	Granite - Amphibolite Gneiss: Alternating bands of quartz gradational to granite and amphibolite which is increasingly biotite-rich with depth.
174' - 183'	9'	Granite Gneiss: Initially amphibolite-rich, but amphibolite bands decrease with depth.
183' - 184'	1'	Amphibolite: Fine-grained. Sharp contacts at approximately 45°.
184' - 204½'	20'	Granite Gneiss: Minor dark minerals in bands at 45°. Rare sulphide specks within dark bands.
204½' - 211½'	7'	Amphibolite: Rich in asbestiform tremolite and actinolite.
211½' - 239'	27'	Granite Gneiss: Gneissosity approximately 40°.
239' - 243'	4'	Amphibolite - Granite Gneiss: Mainly amphibolite (fine-grained) with granite gradational to pure quartz bands at about 40°.
243' - 245'	2'	Granite Gneiss: Contains bands of amphibolite.
245' - 249½'	4½'	Amphibolite - Granite Gneiss: As for 239'-243'.
249½' - 251'	1½'	Granite Gneiss: As for 243'-245'.
251' - 262½'	11'	Amphibolite - Granite Gneiss: Alternating bands of amphibolite and granite gradational to quartz at 45-50°. Rock is mainly amphibolite.
262½' - 267½'	5'	Granite - Amphibolite Gneiss: As above but decreased amount of amphibolite. Minor epidote.
267½' - 275'	7½'	Amphibolite - Granite Gneiss: As for 251'-262½'.
275' - 306'	30'	Granite Gneiss: As for 243'-245'.
306' - 340'	33'	Amphibolite - Granite Gneiss: As for 251'-262½'.
340' - 360'	19'	Granite Gneiss: As for 243'-245'.
360' --	--	END OF HOLE.

D.D.H.2.

Location : 240 ft WSW from the centre of the main outcrop.
Bearing : 60° magnetic.
Depression : 45°.
Logged by : J. Morlock.
Note : All angles measured relative to core axis (0°).

DEPTH	CORE SIZE
0' - 15'	Nx Casing
15' - 32'	Bx
32' - 184'	Ax
184' - 405'	Ex

Depth	Core Recovered	Remarks
0' - 16'	10'	Granite Gneiss: Highly weathered. Random attitude of gneissosity.
16' - 18'	2'	Amphibolite - Granite Gneiss: Core somewhat ground.
18' - 21½'	3½'	Granite Gneiss: Highly quartzose.
21½' - 22½'	1'	Amphibolite: Dark green. Medium to fine-grained. Equant grains.
22½' - 33'	9'	Granite Gneiss: Fresh rock. Gneissosity approx. 40°.
33' - 55½'	22½'	Granite - Amphibolite Gneiss: Alternating bands of granite gradational to quartz and amphibolite. Gneissosity approximately 45-50°. Rock is fine-grained overall.
55½' - 57'	1½'	Amphibolite: Fine-grained. Equant grains. Dark green. Fine to medium-grained. Sharp contacts at 50°.
57' - 63½'	6½'	Amphibolite - Granite Gneiss: As for 33'-55½' but more abundant amphibolite.
63½' - 69½'	6'	Granite - Amphibolite Gneiss: As for 33'-55½'. Variable angle of gneissosity.
69½' - 70½'	1'	Amphibolite: As for 55½'-57'.
70½' - 94½'	24'	Granite Gneiss: Bands of minor amphibolite gradational to biotite rock at approximately 45°.

Depth	Core Recovered	Remarks
94½' - 96½'	2'	Amphibolite: Gneissic; minor bands of quartz gradational to granite gneiss at approximately 50°. Rare sulphide specks. Sharp contacts.
96½' - 144'	46'	Granite Gneiss: As for 70½'-94½'. Sheared from 127'-131' at approximately 5°. Gneissosity variable but approximately 40° overall.
144' - 147'	3'	Quartz - Epidote Rock: Contacts obscure.
147' - 154'	7'	Granite Gneiss: As for 70½'-94½'.
154' - 183'	28½'	Granite - Amphibolite Gneiss: Some fracturing of granite with partial re-crystallization of amphibolite minerals to biotite.
183' - 297'	114'	Granite Gneiss: Gneissosity approximately 45°. Approximately 30% amphibolite in bands. Grades from above.
297' - 298'	1'	Quartz - Epidote Rock: As for 144'-147'.
298' - 405'	106'	Granite Gneiss: As for 183'-297'. About 20% dark minerals (amphibolite gradational to biotite rock).
405'	---	END OF HOLE.

D.D.H.3

Location : 240 ft WSW from the centre of the main outcrop.

Bearing : 77° magnetic.

Depression : 45°.

Logged by : J. Morlock.

Note : All angles measured relative to core axis (0°).

DEPTH	CORE SIZE
0' - 10'	Nx Casing
10' - 35'	Nx
35' - 39'	Bx
39' - 228½'	Ax
228½' - 310'	Ex

Depth	Core Recovered	Remarks
0' - 57½'	57'	Amphibolite - Granite Gneiss: Some shearing at 35½'-36'.
57½' - 58½'	1'	Amphibolite: Medium to dark green. Fine-grained.
58½' - 94'	35'	Granite Gneiss: Minor amphibolite bands at various angles, but approximately 50° overall.
94' - 95'	1'	Amphibolite: Highly biotitic. Sharp contacts, but at variable angles.
95' - 130'	35'	Granite Gneiss: As for 58½'-94'.
130' - 133'	3'	Amphibolite: Medium to dark green. Fine-grained. Contacts approximately 55°.
133' - 141'	8'	Amphibolite - Granite Gneiss: Bands variable, approximately 40-50° overall.
141' - 150'	9'	Amphibolite: Minor granite gradational to fine quartz bands. From 145'-146½', minor sulphides associated with quartz.
150' - 151'	1'	Quartz- Epidote Rock: Contacts approximately 40°.
151' - 170½'	19½'	Amphibolite: As for 141'-150'.
170½' - 171½'	1'	Granite Gneiss: Minor amphibolite bands.
171½' - 178'	6½'	Amphibolite: As for 141'-150'.
178' - 181'	3'	Granite Gneiss: Gneissosity approximately 35-40°.
181' - 310'	129'	Amphibolite - Granite Gneiss: Alternating bands of quartz gradational to granite and amphibolite. From 210 to 310 ft. the core is fractured into subrounded fragments of granite gradational to quartz surrounded by amphibolite (highly biotitic).
310' --	--	END OF HOLE.

D.D.H.4

Location : Co-ordinates 1.5 W 3N (CGG grid).
Bearing : 140° magnetic.
Depression : 45°.
Logged by : J. Morlock.
Note : All angles measured relative to core axis (0°).

DEPTH	CORE SIZE
0' - 52'	Nx
52' - 239'	Bx
239' - 415½'	Ex

Depth	Core Recovered	Remarks
0' - 26'	9'	Granite Gneiss: Highly quartzose.
26' - 60'	28'	Granite - Amphibolite Gneiss: Granite gradational to quartz, highly fractured and filled by biotitic amphibolite. Minor sulphides from 59'-60'.
60' - 94'	34'	Granite - Amphibolite Gneiss: Much less fractured than above. Biotite-rich medium grained amphibolite at 81'-81½', 83½'-84' and 87'-87½' at 40-50°.
94' - 149'	54'	Granite Gneiss: Minor amphibolite bands at approximately 50°.
149' - 159'	9½'	Granite - Amphibolite Gneiss: Grades from above. Increasing proportion of amphibolite with depth. Granite becoming more fractured, surrounded by biotitic amphibolite and biotite rock.
159' - 213½'	54½'	Amphibolite: Minor granite gneiss bands. Evidence of fracturing and subsequent healing. Gneissosity highly variable.
213½' - 224'	10'	Granite - Amphibolite Gneiss: As for 149-159 feet.
224' - 236½'	12½'	Amphibolite: As for 159'-213½' but less evidence of fracturing.
236½' - 240'	3½'	Granite Gneiss: Somewhat fractured.
240' - 415½'	174'	Amphibolite - Granite Gneiss: Gneissosity somewhat contorted but overall approximately 50°. No evidence of fracturing. Rare sulphide specks.
415½' --	--	END OF HOLE.

D.D.H.5

Location : Co-ordinates 2.0 E 1N (CGG grid).
Bearing : 70° magnetic.
Depression : 45°.
Logged by : J. Morlock.
Note : All angles measured relative to core axis (0°).

DEPTH	CORE SIZE
0' - 22'	Nx
22' - 107'	Bx

Depth	Core Recovered	Remarks
0' - 21'	10'	Granite Gneiss: Very minor dark minerals. Gneissosity approximately 45°.
21' - 41'	20'	Granite - Amphibolite Gneiss: Approximately 30-40% dark minerals, mainly biotite with rare amphibole, probably hornblende. Rock has variable composition from granite to monzonite. Fine-grained. Gneissosity approximately 45°.
41' - 49'	8'	Granite Gneiss: As for 0-21 feet.
49' - 107'	57'	Granite - Amphibolite Gneiss: As for 21-41 feet.
107' --	--	END OF HOLE.

APPENDIX II

ANALYTICAL RESULTS

STOKES YARD BASE METAL PROSPECT

CHIP SAMPLES:

	Pb%	Zn%	Cu%	Ni%	Ag oz/ton
71/AS/7063	7.4	1.5	*	*	2.0
7064	*	*	*	-0.01	*
7065	4.5	18.5	3.5	*	9.1
7066	5.6	15.0	*	*	1.3
7067	0.7	0.9	*	*	0.2
7068	1.2	12.0	*	*	0.1
7069	34.2	5.5	0.11	*	6.7
7070	35.8	1.8	*	*	6.1

* Analysis not requested.

D.D.H.1 (Split Core)

		Parts per Million							
	INTERVAL	Cu	Pb	Zn	Bi	As	Ni	Ag	Co
71/AS/7123	62' - 64'6"	50	50	190	-20	-10	40	-2	30
7124	65'6"- 68'	40	30	210	20	-10	40	-2	40
7125	97' - 99'	40	20	120	20	-10	50	-2	40
7126	162'6"-164'	60	20	270	40	-10	90	-2	50
7127	172'6"-174'	50	30	350	20	-10	70	-2	40
7128	183' -184'	20	20	210	20	-10	70	-2	50
7129	204'6"-206'6"	-10	20	70	20	-10	220	-2	50
7130	206'6"-208'6"	10	10	60	20	-10	180	-2	50
7131	208'6"-211'6"	10	10	60	20	-10	150	-2	30
7132	239' -241'	90	30	280	20	-10	60	-2	40
7133	241' -242'	40	30	270	20	-10	50	-2	40
7134	242' -243'	10	30	200	20	-10	40	-2	40
7135	245' -247'	20	30	230	20	-10	40	-2	40
7136	247' -249'6"	60	30	300	20	-10	20	-2	20
7137	251' -253'	60	30	170	20	-10	20	-2	10
7138	253' -255'	20	40	270	20	-10	40	-2	30
7139	255' -257'	50	30	310	20	-10	50	-2	50
7140	257' -259'	30	30	250	20	-10	30	-2	20
7141	259' -262'6"	20	20	100	20	-10	30	-2	20
7142	267'6"-269'6"	30	30	230	20	-10	80	-2	30
7143	269'6"-271'6"	180	30	250	20	-10	110	-2	40
7144	271'6"-273'6"	30	30	210	20	-10	70	-2	40
7145	273'6"-275'	10	20	170	20	-10	40	-2	30
7146	306' -308'6"	10	20	150	20	-10	30	-2	20
7147	308'6"-310'6"	-10	20	170	20	-10	40	-2	30
7148	310'6"-312'6"	40	30	140	20	-10	30	-2	30
7149	312'6"-314'6"	10	70	90	20	-10	20	-2	20
7150	314'6"-316'6"	10	30	120	20	-10	30	-2	30
7151	316'6"-319'	10	30	140	20	-10	60	-2	40
7152	319' -321'	90	30	110	20	-10	40	-2	30
7153	321' -323'	10	30	130	20	10	30	-2	30
7154	323' -325'	10	20	110	20	-10	40	-2	40
7155	325' -327'	10	30	140	20	20	40	-2	30
7156	327' -329'	10	30	180	20	-10	40	-2	30

	INTERVAL	Parts per Million Cu	Pb	Zn	Bi	As	Ni	Ag	Co
71/AS/7157	329' -331'	30	30	190	20	-10	20	-2	20
7158	331' -334'	30	20	180	20	-10	30	-2	20
7159	334' -336'	-10	30	130	20	-10	40	-2	20
7160	336' -338'	20	30	110	-20	-10	20	-2	10
7161	338' -340'6"	10	20	80	-20	-10	20	-2	10
7162	340'6"-342'6"	-10	30	130	-20	-10	20	-2	20
7163	342'6"-344'6"	-10	30	130	-20	-10	20	-2	20
7164	344'6"-346'6"	20	20	160	-20	-10	20	-2	20
7165	346'6"-348'6"	20	20	150	-20	-10	20	-2	20
7166	348'6"-350'6"	10	20	120	-20	-10	20	-2	20
7167	350'6"-353'	30	10	40	-20	-10	20	-2	10
7168	353' -355'6"	10	10	30	-20	-10	20	-2	10
7169	355'6"-357'6"	10	20	110	-20	-10	30	-2	20
7170	357'6"-360'	10	10	20	-20	-10	20	-2	10

D.D.H.S. (Split Core)

	INTERVAL	Parts per Million Cu	Pb	Zn	Bi	As	Ni	Ag	Co
71/AS/7171	7' - 8'6"	10	30	80	-20	-10	10	-2	10
7172	9' - 11'	20	30	160	-20	-10	80	-2	40
7173	49'6"- 51'	30	30	90	-20	-10	20	-2	10
7174	55'6"- 58'	10	30	230	-20	-10	50	-2	40
7175	64'2"- 65'1"	20	30	170	20	-10	50	-2	40
7176	69'6"- 70'6"	50	30	250	20	-10	50	-2	40
7177	94' - 96'	10	30	190	20	-10	30	-2	30
7178	96' - 97'6"	20	30	270	20	-10	30	-2	30
7179	114' -116'	-10	10	120	20	-10	20	-2	20
7180	117' -119'6"	40	30	100	-20	-10	20	-2	20
7181	119'6"-122'	20	10	40	-20	-10	10	-2	10
7182	122' -124'	-10	20	50	-20	-10	10	-2	10
7183	129' -131'	220	20	110	-20	10	20	-2	20
7184	140' -142'8"	40	30	160	-20	-10	40	-2	20
7185	146' -148'	20	20	250	-20	-10	40	-2	40
7186	148' -150'	-10	20	140	-20	-10	30	-2	20
7187	154' -156'	10	30	180	-20	-10	40	-2	40
7188	156' -158'	10	30	160	-20	-10	40	-2	40
7189	158' -160'	30	30	120	-20	-10	30	-2	20
7190	160' -162'	10	20	240	-20	-10	40	-2	40
7191	162' -164'	20	20	150	-20	-10	40	-2	20
7192	164' -166'	40	30	80	-20	-10	20	-2	10
7193	166' -168'	10	30	140	-20	-10	40	-2	20
7194	168' -170'	10	30	120	20	-10	30	-2	20
7195	170' -172'	10	20	170	20	-10	40	-2	20
7196	172' -174'	10	20	170	20	-10	30	-2	30
7197	174' -176'	10	20	160	20	-10	30	-2	30
7198	176' -178'	10	20	120	-20	-10	30	-2	20
7199	178' -180'	10	20	110	-20	-10	20	-2	20
7200	180' -182'	-10	20	90	20	-10	20	-2	20
7201	182' -184'	-10	10	50	20	-10	20	-2	10
7202	195'6"-197'6"	10	20	90	-20	-10	20	-2	10
7203	197'6"-199'6"	30	20	150	-20	-10	50	-2	20
7204	199'6"-202'6"	30	20	170	20	-10	50	-2	20
7205	202'6"-204'6"	40	20	230	20	-10	50	-2	20
7206	204'6"-206'6"	170	50	250	20	-10	50	-2	20
7207	250' -252'6"	10	30	230	20	-10	40	-2	30
7208	252'6"-254'6"	20	30	120	20	-10	40	-2	30

	INTERVAL	Parts per Million Cu	Pb	Zn	Bi	As	Ni	Ag	Co
71/AS/7209(a)	254'6"-256'6"	310	30	190	20	-10	50	-2	50
7209(b)	256'6"-258'6"	10	30	120	20	-10	20	-2	20
7210	284' -287'	10	30	270	20	-10	20	-2	20
7211	287' -289'	10	20	90	20	-10	20	-2	20
7212	289' -290'	-10	30	160	20	-10	20	-2	30
7213	290' -292'	-10	20	140	20	-10	30	-2	30
7214	292' -294'	-10	20	110	20	-10	40	-2	30
7215	294' -296'	30	30	210	20	-10	40	-2	40
7216	296' -298'	10	30	230	20	-10	40	-2	40
7217	298' -300'	10	30	190	20	-10	40	-2	40
7218	300' -303'	-10	20	260	20	-10	60	-2	40
7219	303' -305'	60	20	270	20	-10	40	-2	30
7220	315'10"-317'	20	30	360	20	-10	30	-2	30
7221	317' -320'	10	30	330	20	-10	30	-2	30

D.D.H.3

	INTERVAL	Parts per Million Cu	Pb	Zn	Ag
72/AS/7222	144' - 145'	4000	50	2000	3
7223	145' - 146'	8500	50	2200	5
7224	146' - 147'	2600	20	1000	3
7225	183' - 184'	700	30	200	3
7226	184' - 185'	130	40	180	3
7227	185' - 186'	15	15	125	2
7228	228' - 230'	35	10	280	3
7229	283' - 291'	130	-10	280	8
7230	291' - 300'	50	-10	140	4

All split cores apart from 72/AS/7228 to 7230 inclusive (sludge samples).

D.D.H.4 (Split Core)

	INTERVAL	Parts per Million Cu	Pb	Zn	Ag
72/AS/7231	59' - 60'	2000	800	1000	3
7232	99' - 100'	40	60	120	-2
7233	280' - 281'	15	30	66	-2
7234	290' - 291'	20	20	140	-2
7235	300' - 301'	15	15	68	-2
7236	310' - 311'	15	10	41	-2
7237	320' - 321'	45	20	34	-2
7238	330' - 331'	30	-10	55	-2
7239	340' - 341'	90	10	57	-2
7240	350' - 351'	95	10	68	-2
7241	360' - 361'	30	10	42	-2
7242	320' - 321'	35	10	55	-2
7243	380' - 381'	30	10	62	-2

D.D.H.5 (Split Core)

	INTERVAL	Parts per Million Cu	Pb	Zn	Ag
72/AS/7244	60' - 62'	20	-10	61	-2
7245	62' - 64'	15	20	93	-2
7246	64' - 66'	25	10	90	-2
7247	66' - 68'	15	-10	63	-2
7248	68' - 70'	10	-10	140	2
7249	70' - 72'	15	10	210	-2
7250	72' - 74'	25	20	250	-2
7251	74' - 76'	35	20	270	-2
7252	76' - 78'	20	20	295	-2
7253	78' - 80'	25	40	180	-2
7254	80' - 82'	10	30	170	-2
7255	82' - 85'	45	30	210	-2

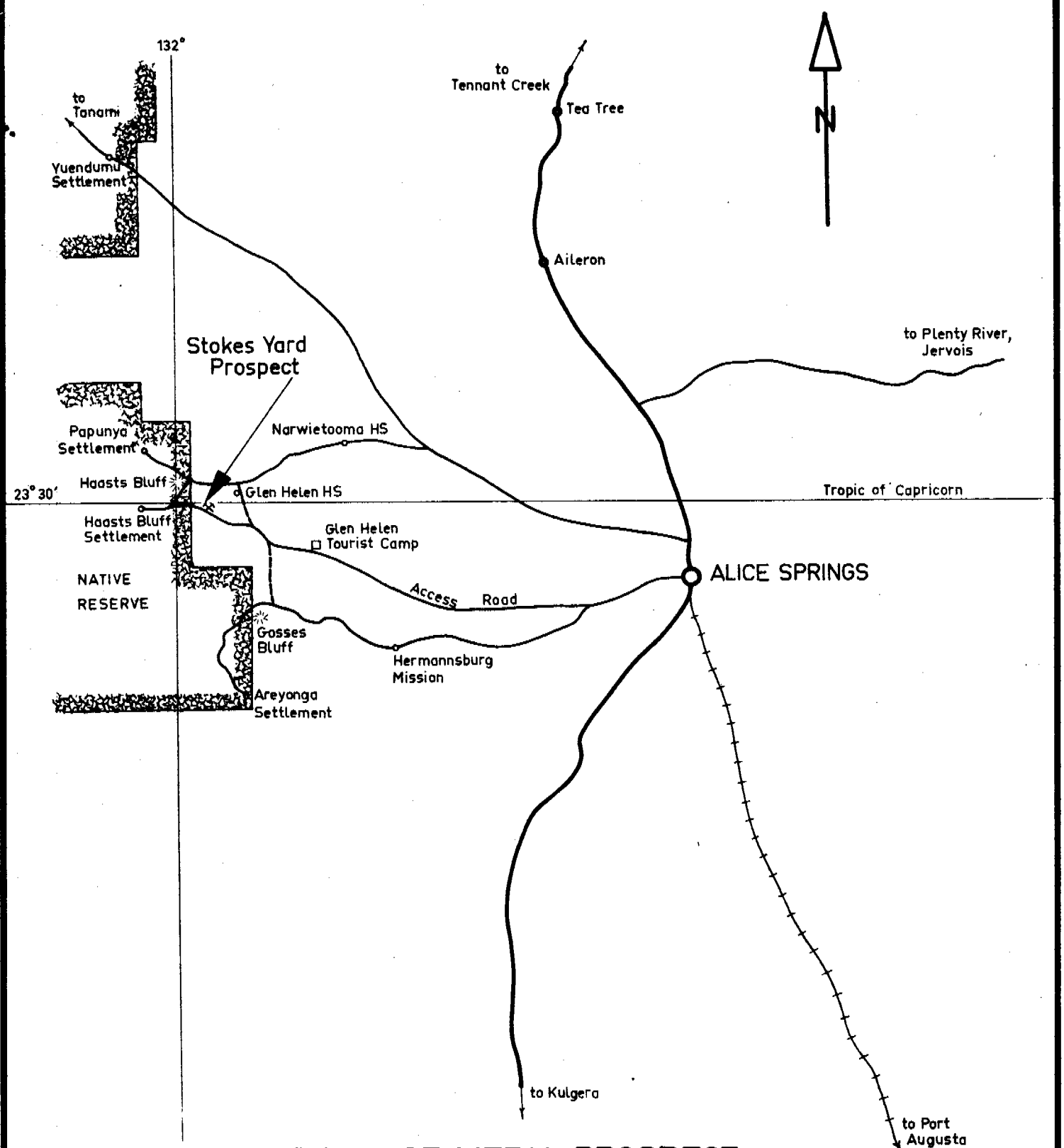
DETECTION LIMITS :

Cu	5 ppm
Pb	10 ppm
Zn	2 ppm
Bi	20 ppm
As	10 ppm
Ni	10 ppm
Ag	2 ppm
Co	10 ppm

- Denotes values less than detection limits.

Assays carried out at East Point Laboratory, Northern Territory Administration, Darwin.

Plate 1



THE STOKES YARD BASE METAL PROSPECT
LOCALITY MAP

Scale 1:2,000,000

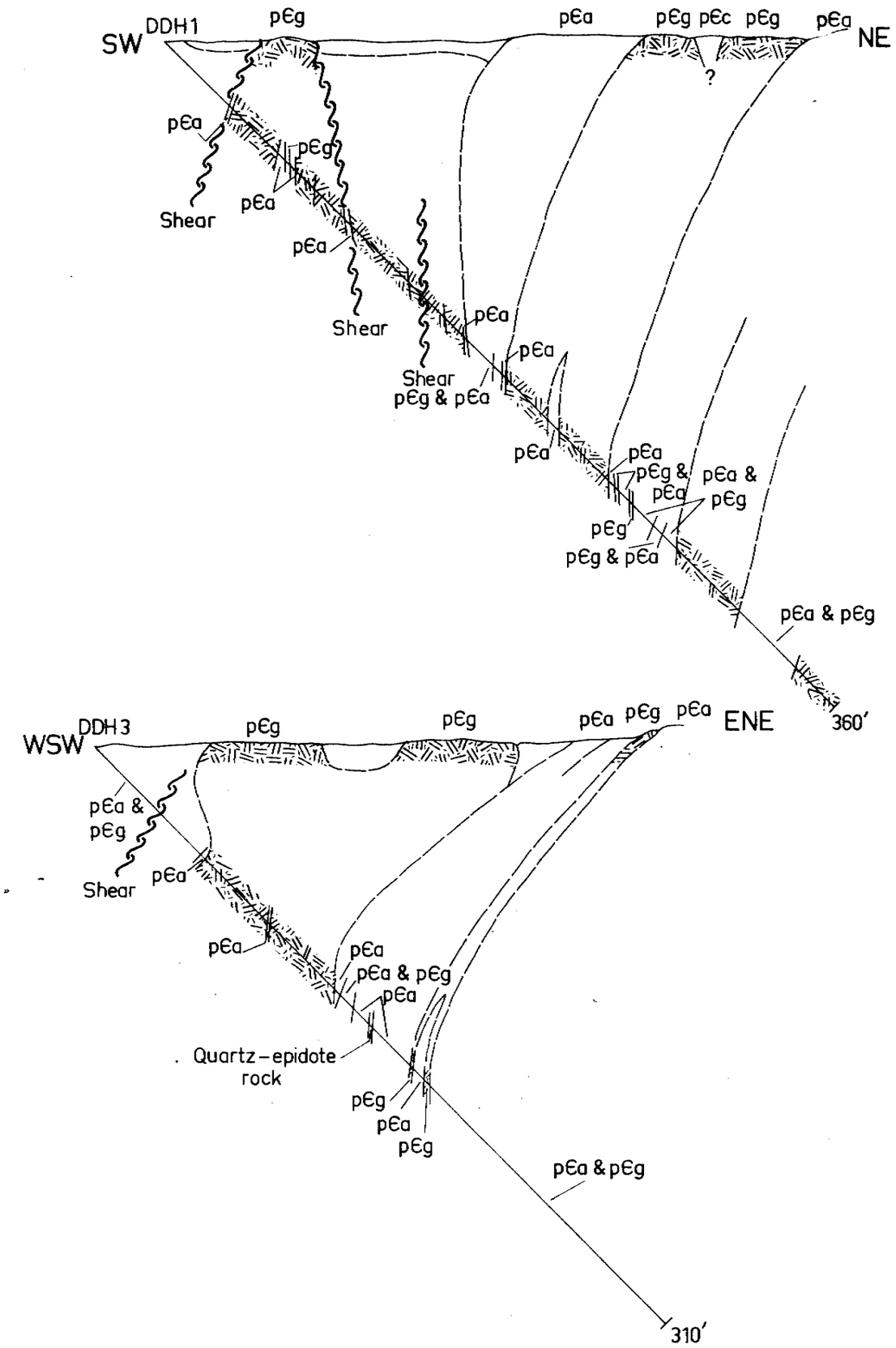
10 0 50 100 miles

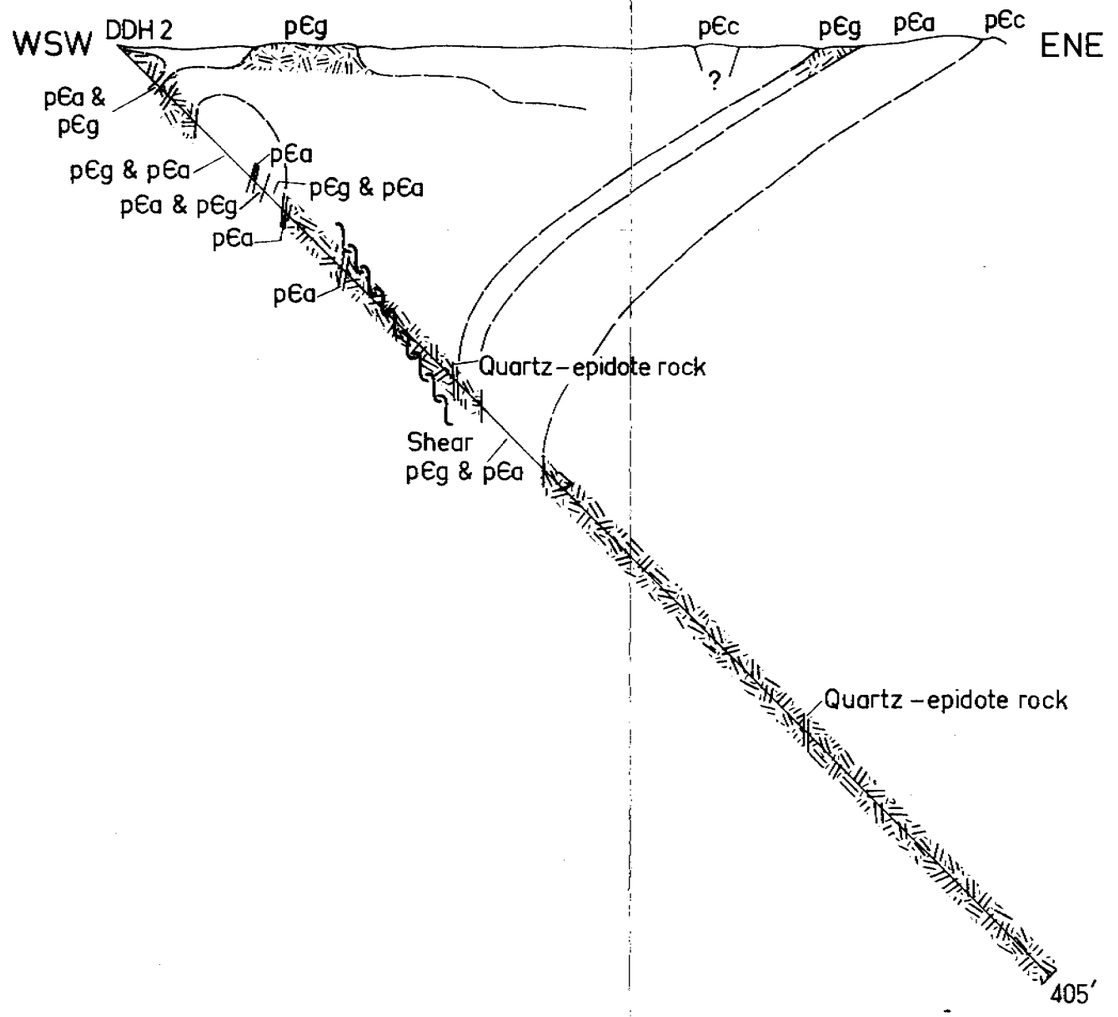
Compiled by N.T. Geological Survey (Reference No. G.S.343)
Drawn by Mines Branch Draughting Office, Darwin, January, 1973.

G73/4E

GS 72/25

Plate 4





THE STOKES YARD BASE METAL PROSPECT
SECTIONS FOR DIAMOND DRILL HOLES 1, 2 AND 3

Scale 1:600

50 0 50 100 feet

REFERENCE

pEg Granite-gneiss

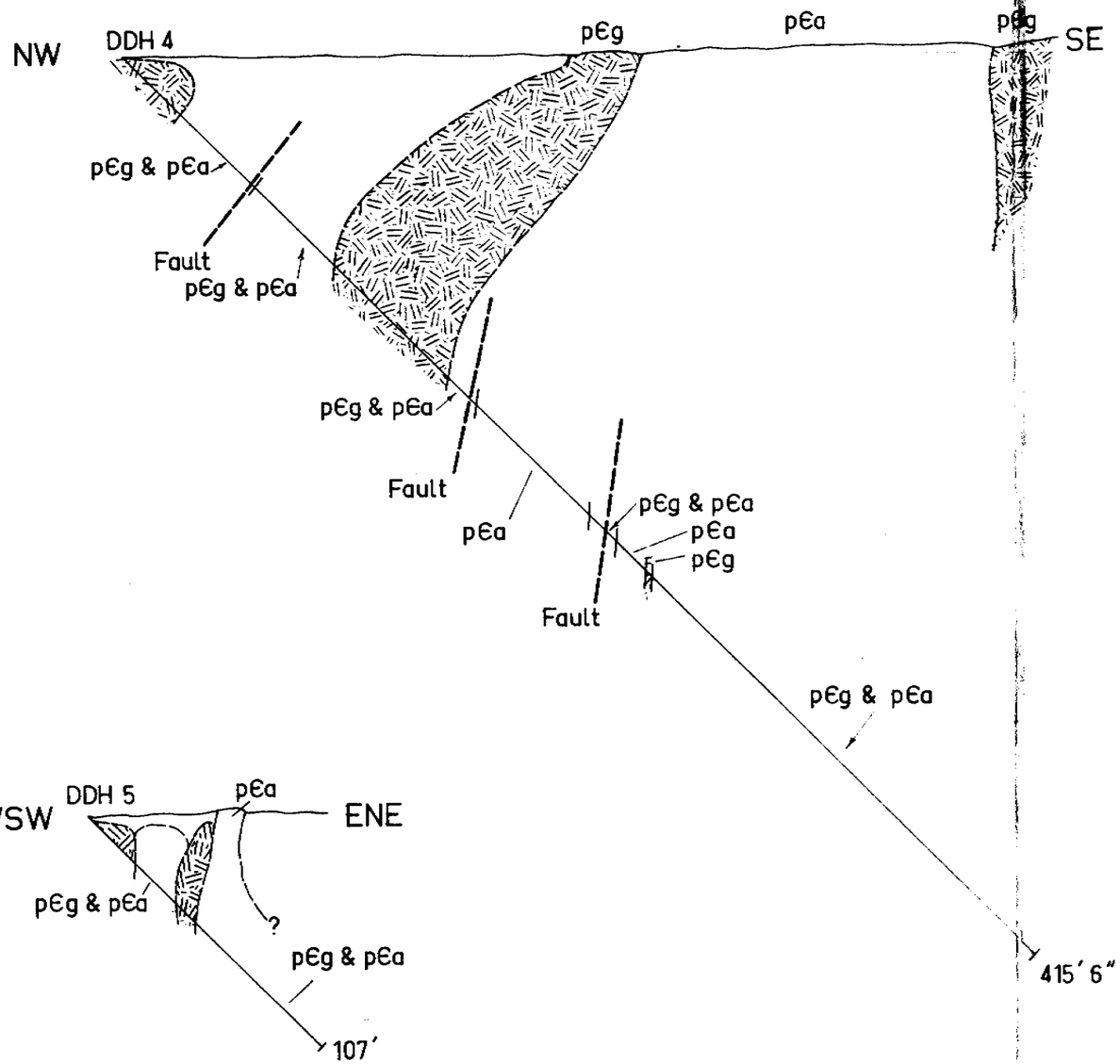
pEa Amphibolite

pEc Calsilicate rock

Compiled by N.T. Geological Survey (Reference No. G.S. 343)
Drawn by Mines Branch Drafting Office, Darwin, February, 1973

G73/7D

GS 72/25



THE STOKES YARD BASE METAL PROSPECT
SECTIONS FOR DIAMOND DRILL HOLES 4 AND 5

Scale 1:600

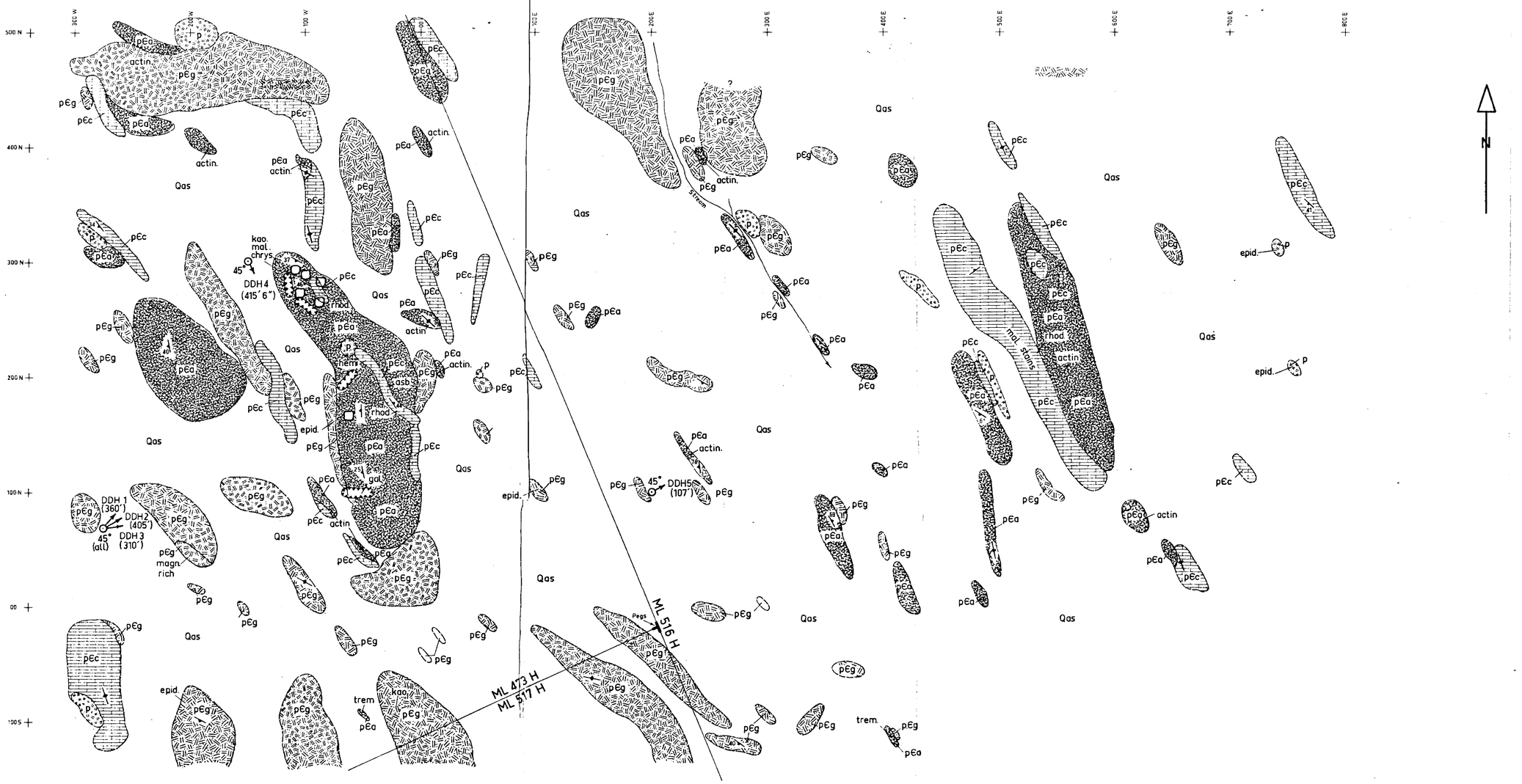
0 50 100 150 feet

REFERENCE

pEg Granite - gneiss

pEa Amphibolite

Compiled by N.T.Geological Survey (Reference N°·G.S.343)
Drawn by Mines Branch Drafting Office, Darwin, February, 1973



THE STOKES YARD BASE METAL PROSPECT
SURFACE GEOLOGY

Scale 1:600

50 0 50 100 200 feet

Reference.

Pre-Cambrian
- pEg — Migmatitic granite-gneiss, Banded gneiss
- pEc — Calcsilicate rock, Olivine-Marble
- pEa — Amphibolite, Actinolite-Tremolite schist
- P — Pegmatite

Quaternary
- Qas — Alluvium, windblown sand

- 40 — Strike and dip of foliation
- Foliation, vertical
- Approximate geological boundary
- Trench; pit
- ML 473 H — Lease boundary
- DDH 5, 45° (107') — Diamond drill-hole location, showing direction, inclination and total depth.

actin. actinolite
asb. asbestos
chrys. chrysocolla
epid. epidote
gal. galena
hemi. hemimorphite
kao. kaolinite
mal. malachite
magn. magnetite
rhod. rhodonite
trem. tremolite

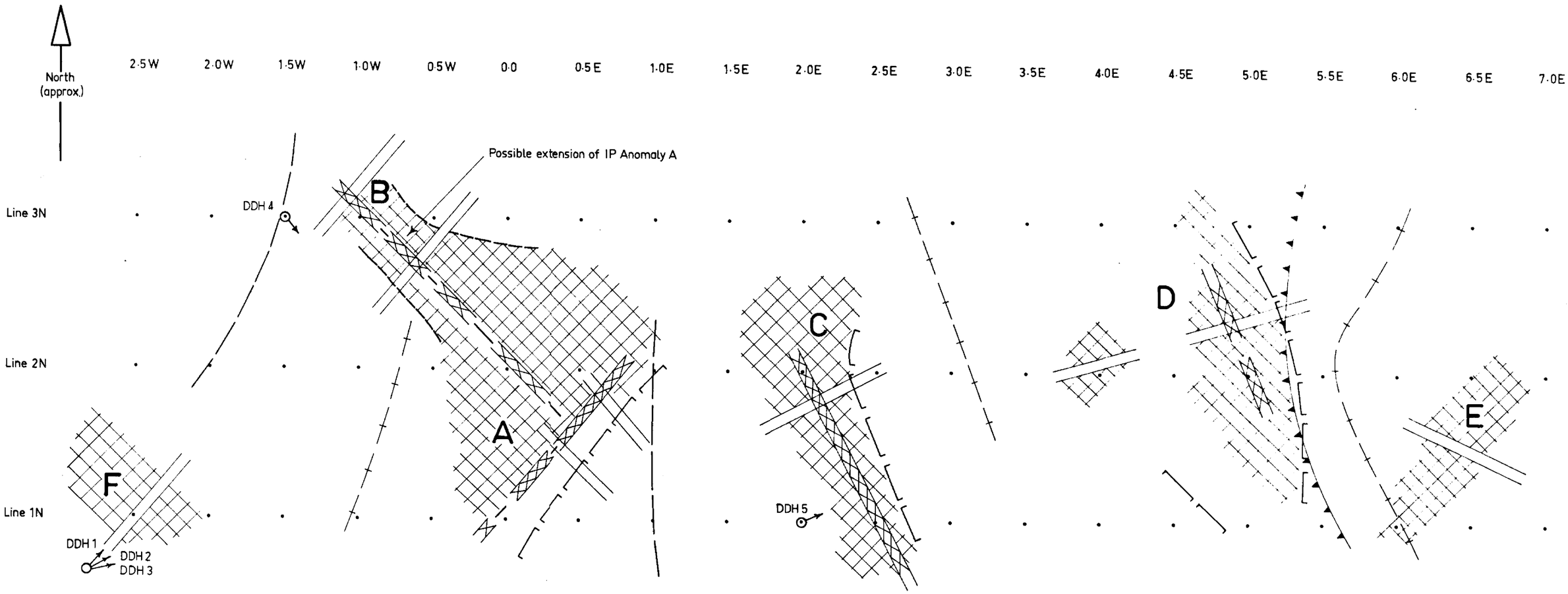
Note: Survey carried out using tape and compass with reference made to existing C.G.G.'s grid

Acknowledgement: Data provided by Mr. S. Griffiths, leaseholder, is included in this map.

Compiled by N.T. Geological Survey (Reference N°: G-S 343)
Drawn by Mines Branch Drafting Office, Darwin. February, 1973.

G73/5B

G572/28



THE STOKES YARD BASE METAL PROSPECT
INDUCED POLARIZATION SURVEY

Scale 1:600

50 0 50 100 feet

REFERENCE

A IP Anomalous area	Apparent polarizability gradient
Plotting point	Area of higher values of apparent polarizability
Resistant axis	Positive IP axis
Conductive axis	Recommended costean (C.G.G)
Apparent resistivity gradient	DDH5 Drillhole (Mines Branch)

Note: Redrawn after Compagnie Générale de Géophysique, Brisbane, 1971, with addition of drillhole locations

Reference No. G.S.343
Drawn by Mines Branch Drafting Office, Darwin, February, 1973