NORTHERN TERRITORY GEOLOGICAL SURVEY REPORT GS 74/1

ALLIGATOR RIVERS AGGREGATE INVESTIGATION

[redacted]

by

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PLATE 1: Location of outcrops under investigation - Scale 1:100 000 G73/46C

PLATE 2: Geological Sketch Map - Area 1 - Scale 1: 1 500 - G74/7D

PLATE 3: Geological Sketch map - Area 2 - Scale 1: 1 500 - G74/8C

PLATE 4: Geological Sketch map - Area 3 - Scale 1: 2 000 - G74/9C

PLATE 5: Geological Sketch map - Area 4 - Scale 1: 2 000 - G74/10C

SUMMARY

Four outcrops of metadolerite have been mapped and three have been drilled in a search for raw material for production of crushed rock. Reserves of 100 000 - 150 000 m^3 may exist in Area 1, 20 000 - 25 000 m^3 with possible extension in Area 2 and 30 000 m^3 in Area 3.

INTRODUCTION

Mines Branch is investigating sources of raw material for crushed rock in the Alligator Rivers area. The Commonwealth Department of Works has estimated that 500 000 m^3 of crushed rock may be required for building construction and road sealing.

The aim of the investigation was to find, by examination and a limited amount of drilling, areas in which initial supplies of 100 000 - 200 000 m^3 of rock are available.

A number of potentially suitable rock outcrops are shown on Bureau of Mineral Resources preliminary geological maps for the area (Needham and Smart, 1972). Metadolerite and quartzite are available but metadolerite is considered more suitable for crushed rock. Four areas of metadolerite outcrop have been examined; they are shown on Plate 1 as Areas 1-4.

This report supersedes the first progress report GS73/10, which was written in July 1973 and described the results of drilling in Area 1.

AREA 1
(geological sketch map - Plate 2)

Area 1 is situated at G.R. Cahill 449047. Scattered metadolerite and amphibolite crop out over a large area. The investigation was centred on a small, 10 m high hill with more abundant outcrop. Traversing with a magnetometer failed to define the margins of the rock body, probably because it contains few magnetic minerals.

Two inclined holes were drilled from the sides of the hill, and one vertical hole was drilled on top of the hill. The weathered zone is 2.4 - 5.0 m thick, and contains fresh 'floaters' embedded in completely weathered rock. Below this zone, each hole cored continuous metadolerite and amphibolite, both of which are considered suitable for use as crushed rock. Hole 3 had a standing water level of 10.2 m below ground (14.7 m downhole) in July 1973.

In the area of the hill, reserves of about 16 000 m^3/m depth appear to exist beneath a mantle of weathered material. If mined to about 10 m depth the area might provide 100 000 - 150 000 m^3 of rock suitable for aggregate.

ALLIGATOR RIVERS AGGREGATE AREA 1 DDH 1.

GR Cahill 449047 (Australian Map Grid)
Inclined hole, depression 45° at collar, azimuth 042° TN.
Total depth 65 m
Drilled 23 November 1972 to 9 December 1972 by A. Pincott, Mines Branch
Rig Mindrill E1000

LOG

2.8 - 65.0 amphibolite: dark green grey, medium grained, slightly weathered 2.8 - 5.2 m, fresh 5.2 - 65.0 m, moderately hard throughout, strong 2.8 - 5.2 m, very strong 5.2 - 65.0 m; 40% felspar (white to colourless, fine subidiomorphs and xenomorphs, may include some quartz) 60% amphibole (green-black, medium subidiomorphs to idiomorphs); minor sphene (up to 1% in places); amphibole lineation 20° to core normal, some chalcopyrite and pyrite in scattered ?quartz - felspar veins

Whole interval is considered suitable for aggregate.

RECOVERY (BQ core except where shown)

Depth	Recovery	Depth	Recovery
0.6 - 2.8	0%	17.3 - 20.2	100%
2.8 - 3.2	90% (NQ core)	20.2 - 23.3	100%
3.2 - 3.7	60%	23.3 - 26.4	100%
3.7 - 4.1	85%	26.4 - 29.5	100%
4.1 - 4.6	70%	29.5 - 32.5	100%
4.6 - 5.2	100%	32.5 - 35.5	95%
5.2 - 8.2	90%	35.5 - 38.6	90%
8.2 - 11.3	95%	38.6 - 41.7	95%
11.3 - 12.1	95%	41.7 - 44.1	100%
12.1 - 12.5	100%	44.1 - 47.6	100%
12.5 - 13.1	100%	47.6 - 50.8	90%
13.1 - 13.6	95%	50.8 - 53.9	100%
13.6 - 14.3	100%	53.9 - 56.9	100%
14.3 - 15.4	95%	56.9 - 60.0	95%
15.4 - 17.3	90%	60.0 - 63.1	100%
		63.1 - 65.0	80%

ALLIGATOR RIVERS AGGREGATE AREA 1 DDH 2.

GR Cahill 449047 (Australian Map Grid)
Vertical hole
Total depth 15 m
Drilled 18 December 1972 to 20 December 1972 by L. Blackmore, Mines Branch
Rig Mindrill E1000

LOG

0.6 - 1.2	metadolerite: brown and grey, weathered, medium grained
1.2 - 4.0	no recovery
4.0 - 5.0	metadolerite sand: grey (no core)
5.0 - 9.8	metadolerite: grey, medium grained
9.8 - 10.2	amphibolite: grey; thin section from 9.9 m is amphibolite containing 10% sericite, 25% plagioclase, 60% actinolite, minor chlorite, clinozoisite, sphene, ilmenite/leucoxene-heterogeneous part-igneous, part-metamorphic texture
10.2 - 15.0	metadolerite: grey, medium grained, thin section from 14.7 m contains metadolerite with 10% actinolite, 20-30% clinopyroxene, 30-40% bastite (serpentine), 40% plagioclase - texture is medium grained, subidiomorphic granular and subophitic igneous, partially modified by metamorphism, with several thin subparallel shears

Fractures throughout, most are almost normal to core axis. Isotropic fabric (no lineation or foliation).

Whole core should be suitable for aggregate.

RECOVERY (BQ core except where shown)

Depth	Recovery	Depth	Recovery
0.6 - 1.2	15% (NQ core)	7.2 - 7.4	50%
1.2 - 2.7	-	7.4 - 7.7	20%
2.7 - 4.0	-	7.7 - 8.1	65%
4.0 - 4.2	30%	8.1 - 8.4	30%
4.2 - 5.0	15%	8.4 - 9.5	70%
5.0 - 6.7	10%	9.5 - 10.0	75%
6.7 - 6.8	100%	10.0 - 10.6	95%
6.8 - 7.2	20%	10.6 - 11.5	100%
		11.5 - 14.5	100%
		14.5 - 15.0	100%

ALLIGATOR RIVERS AGGREGATE AREA 1 DDH 3.

GR Cahill 449047 (Australian Map Grid)
Inclined hole, depression 45° at collar, azimuth 222°TN
Total depth 44.5 m
Drilled 8 January to 18 January 1973 by L. Blackmore, Mines Branch.
Rig Mindrill E1000

LOG

0.0 - 0.6	clay: red brown, plastic, with lumps of grey, apparently fresh amphibolite; evidently the surface weathered zone contains fresh, usable boulders embedded in completely weathered rock
0.6 - 1.2	no recovery
1.2 - 1.8	clay, as 0.0 - 0.6
1.8 - 2.4	no recovery
2.4 - 10.0	metadolerite: dark grey with some lighter grey patches, medium grained, thin section from 3.9 m contains metadolerite with 20-30% actinolite, 30-40% ?hornblende, 40% plagioclase, minor sericite, clinozoisite, garnet, opaques-texture is medium grained subidiomorphic granular and subophitic igneous partially altered by metamorphism
10.0 - 22.0	metadolerite: dark grey, medium grained,; thin section from 17.6 m contains metadolerite with 5% quartz, 5% muscovite, 5-10% bastite, 10% albite, 10% actinolite, 30% clinopyroxene, ?40% calcic plagioclase, minor chlorite, calcite, clinozoisite, sphene, opaques - texture is fine grained porphyritic and subophitic igneous, altered by metamorphism
22.0 - 23.2	amphibolite: some sphalerite in a felspar vein
23.2 - 24.0	metadolerite
24.0 - 26.0	amphibolite: dark grey, about 50% ?quartz and felspar, 50% amphibole, no apparent lineation
26.0 - 41.4	quartz amphibolite: dark grey; alignment of amphiboles in lineation (30° - 40° to core normal) lineation wavy and apparently folded below 35.3 m; thin section from 36.9 m contains quartz-felspar-actinolite amphibolite; 10% quartz, 10% plagioclase, 80% actinolite, minor sphene, calcite, pyrite, clinozoisite - amphibole texture is granuloblastic, with interstitial xenoblastic quartz and felspar, several thin shears

41.4 - 44.5 quartz amphibolite: grey, medium grained, finer than above but with stronger lineation 30° to core normal; thin section from 44.0 m contains quartz-felspar-actinolite amphibolite; 5% sericite, ?10% quartz, 40-50% actinolite, 50% plagioclase, minor clinozoisite, ?chlorite, sphene, calcite, pyrite - large actinolite subidioblasts in a matrix of fine quartz and felspar, several thin shears and albitized zones

Fractures throughout, generally 0° - 40° to core normal and 60° - 70° to core normal; both groups have thin films of ? talc and calcite; 60° - 70° group has more obvious slickenside type grooving.

Whole core probably suitable for aggregate.

Lineation may control fracturing to produce a flaky aggregate. Free quartz content is undesirable. Shape of aggregate should be tested by crushing.

RECOVERY (BQ core except where shown)

0.0 - 0.6	15%		13.4 - 13.7	95%
0.6 - 1.2	0%		13.7 - 15.2	90%
1.2 - 1.8	15%		15.2 - 17.1	100%
1.8 - 2.4	0%		17.1 - 19.2	95%
2.4 - 3.1	30%	(NQ core)	19.2 - 20.1	95%
3.1 - 4.0	70%		20.1 - 22.5	100%
4.0 - 4.4	65%		22.5 - 23.2	90%
4.4 - 4.6	65%		23.2 - 26.2	100%
4.6 - 6.1	75%		26.2 - 29.3	95%
6.1 - 7.6	100%		29.3 - 32.1	100%
7.6 - 8.1	100%	(part NQ core)	32.1 - 32.3	100%
8.1 - 9.7	70%		32.3 - 35.4	95%
9.7 - 10.1	40%		35.4 - 38.4	95%
10.1 - 10.9	20%		38.4 - 39.9	95%
10.9 - 11.5	60%		39.9 - 41.5	100%
11.5 - 12.5	35%		41.5 - 44.5	100%
12.5 - 13.4	0%			

AREA 2
(geological sketch map - Plate 3)

This area lies 2 km south-south-east of Area 1, at G.R. Cahill 455030. The Arnhem Highway passes about 300 m to the south. Dolerite of the Zamu Complex (Needham and Smart, 1972) crops out in three hills 5-6 m high and in surrounding scattered exposures.

As at Area 1, traverses with a magnetometer failed to detect the expected anomaly over the dolerite. However the transition from nonmagnetic dolerite to magnetic metasedimentary rocks on the eastern side is well defined, and coincides with a change from moderately dense, tall trees to scattered, stunted trees and shrubs. This transition is marked as an inferred, concealed geological boundary on Plate 3.

The three hills are steep with some boulder scree; two inclined diamond drill holes were drilled into the hills from the base of the scree. DDH 1 cored fresh, strong metadolerite and amphibolite below 3.9 m (vertical depth) in the northern hill. This hill has an area of 2 600 m^2, and with nearby outcrops might provide 20 000-25 000 m^3 of rock for crushing. DDH 3 was drilled into the southern hill, on which foliated amphibolite crops out. The foliation dips at 30° in a 250°-260° MN direction. DDH 3 cored amphibolite with a weak foliation at the same attitude (15° to core normal). Most of the core is slightly to moderately weathered, and only the rock 8.3-12.2 m downhole (5.9-8.6 m vertical depth) is suitable for crushing. Foliated amphibolite therefore appears more susceptible to deep weathering than more isotropic metadolerite and amphibolite. Some outcrops on the central hill are also foliated. More work on the central and southern hills will be necessary to determine whether fresh rock exists at reasonable depth.

DDH 2 was drilled between the central and southern hills to test the quality and continuity of rock in the subsurface. Moderately to completely weathered amphibolite with a weak foliation about 40° to core normal was cored to 10 m. Gaps between hills are probably all sites of deep weathering, possibly controlled by cross-joints.

The scattered outcrops of metadolerite and amphibolite are situated north- north-west and west of the hills. A series of holes were drilled at 50 m spacing to check the subsurface continuity of rock and to measure the depth of weathering. Each hole was drilled down to hard rock using a roller bit, then a metre or so of rock was cored. All holes cored metadolerite or amphibolite. DDH 4,8,9 and 12 failed to core rock suitable for crushing; the other five holes cored suitable rock at various depths between 2.4 m and 12.7 m. In most holes, usable rock was 4 m or more deep, which is probably too deep to mine at reasonable cost. The area of scattered outcrop is therefore considered unsuitable as an aggregate source.

ALLIGATOR RIVERS AGGREGATE AREA 2 DDH 1. (230S-1130E)

GR Cahill 455030 (Australian Map Grid)
Inclined hole, depression 45° at collar, azimuth 084°TN
Total depth 30 m
Drilled August, 1973
Rig Longyear 44. Hole continuously cored in B size

LOG

0 - 2.8	brown soil with 10% fine to medium, subangular quartz sand, 10% buckshot ironstone and some decomposed dolerite overlying brick red clay with some coarse quartz grains and buckshot ironstone
2.8 - 3.05	boulder of metadolerite: dark greenish grey, medium grained; fresh but slightly to moderately weathered along fractures; moderately hard, strong to very strong; contains approx 20% pyroxene (pinkish medium subidiomorphs, altering to very fine green amphibole), 40% amphibole (green to black medium subidiomorphs) 40% felspar (white, may include some quartz)
3.05- 3.1	brownish orange clay with some fragments of moderately to highly weathered metadolerite
3.1 - 4.9	metadolerite: pale greyish green; highly weathered; felspar is completely altered to white clay, amphibole is mostly altered
4.9 - 8.3	metadolerite: dark greenish grey, medium grained, granuloblastic texture; fresh, but slightly to moderately weathered along fractures; strong to very strong, moderately hard; approx. 10-30% pyroxene and bastite (pink medium subidiomorphs altering to very fine amphibole), 20-40% amphibole (green to black, medium subidiomorphs, in discrete aggregates after original mafic minerals), 50% felspar (white, fine to medium ?xenomorphs and subidiomorphs, may include some quartz)

8.3 - approximate position of boundary, no expression in core surface

8.3 - 10.0	amphibolite: dark greenish grey, fine to medium grained granuloblastic texture; fresh but slightly to moderately weathered along fractures; moderately hard, strong to very strong; 40-50% amphibole (green to black, fine to medium subidiomorphs in groups after original mafics), 50-60% felspar (white, fine to medium ?xenomorphs to subidiomorphs, may include some quartz)

10.0 - approximate position of boundary, no expression in core surface

10.0 - 20.5 metadolerite: dark green to dark grey; fresh throughout but slightly weathered along fractures; moderately hard, strong to very strong; 10-25% pyroxene-bastite (pink medium subidiomorphs altering to amphibole), 25-50% amphibole (green to black, mostly fine to medium subidiomorphs, some aggregates of very fine subidiomorphs), 40-50% felspar (white), minor pyrite

20.5 - approximate position of boundary, no expression in core surface

20.5 - 30.0 amphibolite: dark green; fine to medium grained granuloblastic texture; fresh throughout but slightly to moderately weathered along fractures, especially the 50° to core normal set, moderately hard, strong to very strong; 40-50% amphibole (green to black, fine to medium subidiomorphs, exceptionally up to 15 mm long), 50-60% felspar (white, fine to medium, ?xenomorphs to subidiomorphs, may include some quartz), minor pyrite and sphene; foliation 15° to core normal below 29.5 m

RECOVERY AND FRACTURE LOG

Depth	Recovery	Fracture spacing (average/minimum/maximum) in cms
0 - 4.8	not measured	not measured
4.8 - 6.71	20%	6.2/2/11
6.71- 6.75	100%	4
6.75- 7.9	100%	8.8/2/26
7.9 - 8.0	100%	9
8.0 - 8.3	100%	4/1/8
8.3 - 9.0	85%	3.5/1/11
9.0 - 11.0	25%	4.7/1/11
11.0 - 11.7	75%	17/13/25
11.7 - 11.8	100%	3.7/2/5
11.8 - 14.1	70%	13/3/32
14.1 - 17.2	90%	12/3/50
17.2 - 19.7	80%	22/5/47
19.7 - 20.0	65%	)
20.0 - 20.4	100%	) 23/2/74
20.4 - 20.7	100%	)
20.7 - 20.8	100%	)
20.8 - 23.8	80%	28/2/78
23.8 - 26.9	100%	13/1/80
26.9 - 29.9	100%	28/9/71
29.9 - 30.0	100%	8

ALLIGATOR RIVERS AGGREGATE AREA 2 DDH 2. (317S-1214E)

GR Cahill 455030 (Australian Map Grid)
Vertical hole
Total depth 10 m
Drilled August 1973
Rig Longyear 44. Hole cored continuously in N size

LOG

0.0 - 2.1	soil: dark red brown, ferruginous, clayey; some granules of quartz-ironstone, clear quartz, and rare fragments of completely weathered rock
2.1 - 2.3	amphibolite: mostly orange clay with scattered fresh amphibole crystals, completely weathered; porous due to fine (1 mm or smaller) tubes and vughs
2.3 - 3.3	amphibolite: light grey, completely weathered, felspars completely altered to clay, amphiboles mostly fresh, green ? actinolite, medium grained
3.3 - 4.4	amphibolite: light brown, completely weathered, as 2.3-3.3 above but iron stained
4.4 - 4.8	amphibolite: light grey, completely weathered, felspar completely altered to white clay, amphibole and some mica mostly fresh, medium grained granuloblastic texture preserved
4.8 - 5.3	amphibolite: mottled white/dark green, highly weathered, felspars mostly altered to white clay, amphiboles mostly fresh, medium grained granuloblastic texture, weak foliation 40°-50° to core normal; rock strength - very weak
5.3 - 7.0	no recovery
7.0 - 10.0	amphibolite: mottled white/dark green, highly to moderately weathered; about 50% felspar mostly altered to white clay, about 50% amphibole mostly fresh; medium grained granuloblastic texture, foliation 40° to core normal; rock strength weak, some clay coated fractures 50°-60° to core normal

Whole interval 0-10 m is unsuitable for aggregate

RECOVERY

0 - 0.05	not measured	2.29 - 2.52	not measured
0.05 - 0.30	" "	2.52 - 2.64	" "
0.30 - 0.46	" "	2.64 - 2.87	" "
0.46 - 0.61	" "	2.87 - 3.11	" "
0.61 - 0.76	" "	3.11 - 3.34	" "
0.76 - 0.85	" "	3.34 - 4.43	" "
0.85 - 0.93	" "	4.43 - 4.51	" "
0.93 - 1.09	" "	4.51 - 4.66	" "
1.09 - 1.11	" "	4.66 - 4.81	" "
1.11 - 1.20	" "	4.81 - 5.31	" "
1.20 - 1.40	" "	5.31 - 7.00	" "
1.40 - 1.85	" "	7.00 - 7.78	45%
1.85 - 2.00	" "	7.78 - 8.08	85%
2.00 - 2.15	" "	8.08 -10.00	65%
2.15 - 2.29	" "		

ALLIGATOR RIVERS AGGREGATE AREA 2 DDH 3. (358S-1209E)

GR Cahill 455030 (Australian Map Grid)
Inclined hole, depression 45° at collar, azimuth 084°TN
Total depth 30.0 m
Drilled September 1973
Rig Longyear 44. Hole cored continuously in N size

LOG

0 -? 0.40	soil: light grey brown, with one 5 cm pebble of fresh amphibolite
?0.40- 2.64	clay: red brown, with buckshot ironstone at top and amphibole crystals near bottom
2.64- 3.20	amphibolite: light brown, completely weathered, 0.2-1.0 mm idiomorphic green amphibole crystals in clay matrix
3.20-? 4.10	amphibolite: light grey, highly weathered; 50% green, medium grained amphibole in a white clay matrix; some 0.1-0.5 mm ?solution holes
?4.10- 5.45	amphibolite: light grey to brown, completely weathered; about 50% fine grained green idiomorphic amphibole in porous clay matrix
5.45- 7.90	amphibolite sand: dark grey; about 20% felspar (white, fine grained) and 80% amphibole grains (green to brown, fine grained idiomorphs)
7.90- 8.26	amphibolite: light grey, highly weathered; 50% amphibole (green, fine grained idiomorphs), 50% weathered felspar (white, fine grained)
8.26- 12.20	amphibolite: dark grey; moderately weathered to 8.30 m, fresh 8.30-12.20 m but moderately weathered along some fractures, medium strong to strong, moderately hard, contains $<1\%$ pyrite, 1-2% sphene (pink xenomorphs with adamantine lustre), 40-50% felspar (fine to medium white subidiomorphs and xenomorphs, may include some quartz), 50-60% amphibole (fine to medium green to brown subidiomorphs and xenomorphs); most amphibole and felspar is grouped into mono-mineralic patches - may be relict texture;
12.20- 30.0	amphibolite: grey to dark grey; moderately weathered 12.20-23.3 m, moderately weathered/highly weathered 23.3-25.7 m, moderately weathered 25.7-28.16 m, moderately weathered 28.3-29.15 m, slightly weathered 28.16-28.3 m, moderately weathered 29.4-29.6 m, slightly weathered 29.6-30.0 m; generally highly weathered and clayey on fractures; weak, soft; contains about

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(12.20- 30.0) 1-2% sphene (not seen in moderately weathered and highly weathered rocks), 40% felspar (colourless, subidiomorphic to xenomorphic and white, partly weathered, fine to medium grained), 60% amphibole (green brown, subidiomorphic to idiomorphic medium grained, usually with preferred orientation of crystals, individual grains weather to clay along fine fractures, having fresh mineral between); fractures often coated with pale yellow clay; weak foliation 15° to core normal is defined by grouping of amphibole and felspar, and accentuated by weathering

Only core in interval 8.3-12.2 m appears suitable for aggregate

RECOVERY

Depth	Recovery
0 - 8.26 m	not measured
8.26 - 8.89	100%
8.89 - 10.00	95%
10.00 - 11.30	90%
11.30 - 12.45	90%
12.45 - 15.50	15%
15.50 - 18.70	55%
18.70 - 21.70	45%
21.70 - 23.30	90%
23.30 - 24.37	85%
24.37 - 25.40	20%
25.40 - 27.50	70%
27.50 - 30.00	100%

ALLIGATOR RIVERS AGGREGATE AREA 2 DDH 4. (150S-1200E)

GR Cahill 455030 (Australian Map Grid)
Vertical hole
Total depth 24.25 m
Drilled September 1973
Rig Longyear 44. Hole cored 17.00-24.25 in N Size (cored at start of harder rock)

LOG

17.00 - 24.25	amphibolite: green grey, highly weathered 17.00-17.80 m, moderately weathered 17.80-24.25 m, but highly weathered along some fractures; weak; composition roughly 40% felspar (white or weathered and brown stained, fine subidiomorphic to xenomorphic grains) 60% amphibole - ?actinolite (fresh or slightly weathered, green to black, 0.5-2.0 mm subidiomorphs); texture fine to medium granuloblastic, weak foliation at 40° to core normal

Whole interval 0-24.25 m is unsuitable for aggregate

RECOVERY

Depth	Recovery
17.00 - 20.29 m	25%
20.29 - 21.47	50%
21.47 - 23.25	60%
23.25 - 24.25	10%

ALLIGATOR RIVERS AGGREGATE AREA 2 DDH 5. (150S-1150E)

GR Cahill 455030 (Australian Map Grid)
Vertical hole
Total depth 13.65 m
Drilled September 1973
Rig Longyear 44. Hole cored in N size at start of harder rock, 11.50-13.65 m

LOG

11.50 - 13.65	amphibolite: speckled dark green and white to 12.65 m, dark grey 12.65-13.65 m; contains about 50% felspar and quartz (0.2-1.0 mm xenomorphs with few cleavage faces and no twinning seen, and therefore difficult to distinguish), about 50% actinolite amphibole (dark green or brown, 0.5-3.0 mm subidiomorphic to idiomorphic crystals); weak foliation 50° to core normal above 12.65 m; fractures very closely spaced, i.e. less than 50 mm spacing; moderately strong 11.5-12.65 m, strong 12.65-13.65 m.

Core below 12.65 m is probably suitable for aggregate

RECOVERY

Depth	Recovery
11.50 - 12.65 m	50%
12.65 - 13.65	65%

ALLIGATOR RIVERS AGGREGATE AREA 2 DDH 6. (150S-1100E)

GR Cahill 455030 (Australian Map Grid)
Vertical hole
Total depth 7.80 m
Drilled September 1973
Rig Longyear 44. Hole cored in N size from start of harder rock, 3.80-7.80 m

LOG

3.80 - 4.00	boulder of metadolerite: fresh dark grey core with orange brown highly weathered surface; contains about 5-10% pyroxene partly altered to amphibole (as 2-5 mm idiomorphs), 50% quartz and felspar (white, colourless xenomorphs) 50% amphibole (black xenomorphs and subidiomorphs up to 3 mm size)
4.00 - 7.80	metadolerite: dark grey, fresh, moderately hard, strong; contains about 1% pyrite, 20% bastite after pyroxene (subidiomorphs to idiomorphs up to 10 mm long, pink to green submetallic lustre, 90° cleavage pseudomorphed), 35% quartz and felspar (colourless subidiomorphs and xenomorphs up to 3 mm size, a few felspar cleavages visible), 40% amphibole (black subidiomorphs and xenomorphs, size range from very fine grains rimming bastite, up to 2 mm porphyroblasts; fractures spaced 50-300 mm apart

Core recovered below 4.00 m is suitable for aggregate, but poor recovery indicates that weathered zones occur.

RECOVERY AND FRACTURE LOG

Depth	Recovery	Fracture spacing (average/ minimum/ maximum) in cms
? - 4.00 m	15 cm	
4.00 - 7.80	20%	22/13/33

ALLIGATOR RIVERS AGGREGATE AREA 2 DDH 7. (150S-1050E)

GR Cahill 455030 (Australian Map Grid)
Vertical hole
Total depth 7 m
Drilled September 1973
Rig Longyear 44. Hole cored in N size from start of harder rock, 3.8-7.0 m.

LOG

3.8 - 7.0	amphibolite: dark green to dark grey, fine to medium grained, granuloblastic texture, slightly weathered with moderately weathered fractures 3.8-6.5 m, fresh 6.5-7.0 m, moderately hard, medium strong to strong 3.8-6.5 m, strong to very strong 6.5-7.0 m; 50% amphibole (green to black, fine to medium subidiomorphs to idiomorphs), 50% felspar (white, fine to medium subidiomorphs, a few porphyroblasts up to 5 mm size, may include some quartz), minor sphene; thin 75° calcite veins 6.8-7.0 m

RECOVERY AND FRACTURE LOG

Depth	Recovery	Fracture spacing in cms (average/minimum/maximum)
4.0 - 6.45	10%	2/1/10
6.45- 7.0	100%	14/9/16

Whole interval 3.8-7.0 is probably suitable for aggregate.

ALLIGATOR RIVERS AGGREGATE AREA 2 DDH 8. (150S-1000E)

GR Cahill 455030 (Australian Map Grid)
Vertical hole
Total depth 15.8 m
Drilled September-October 1973.
Rig Longyear 44. Hole cored in N size from start of harder rock, 13.25-15.8 m.

LOG

13.25 - 15.8	amphibolite: dark green, fine grained, moderately weathered, moderately hard, weak except for 110 mm of fresh, strong rock; contains about 50% amphibole (brown to black, fine subidiomorphs to idiomorphs), 50% felspar (grey to white fine subidiomorphs, may include some quartz); thin discontinuous very close to close calcite-quartz veins throughout.

Most of the core is unsuitable for aggregate.

RECOVERY

Depth	Recovery
13.25 - 15.8	15%

ALLIGATOR RIVERS AGGREGATE AREA 2 DDH 9. (200S-1050E)

GR Cahill 455030 (Australian Map Grid)
Vertical hole
Total depth 9.25 m
Drilled October 1973
Rig Longyear 44. Hole cored in N size from start of harder rock, 8.3-9.25 m

LOG

8.3 - 9.25	amphibolite: dull green, fine grained, slightly to moderately weathered, moderately hard, moderately strong; contains about 50% amphibole (green to black, fine to medium subidiomorphs), 50% felspar (white, fine subidiomorphs, may include some quartz); common quartz veins, up to 20 mm thick, minor pyrite

Whole interval is unsuitable for aggregate

RECOVERY

Depth	Recovery
8.3 - 9.0	20%
9.0 - 9.25	70%

ALLIGATOR RIVERS AGGREGATE AREA 2 DDH 10. (200S-1100E)

GR Cahill 455030 (Australian Map Grid)
Vertical hole
Total depth 8.5 m
Drilled October 1973
Rig Longyear 44. Hole cored in N size from start of harder rock, 7.0-8.5 m

LOG

7.0 - 8.5	metadolerite: greenish grey to dark grey, medium grained, slightly weathered, moderately hard, strong; 25% serpentine (pseudomorphs of pyroxene, light brown, very fine fibres at top; soft, green to blue, micaceous below about 8.0 m; brown, oxidized on fractures), 25% amphibole (light brown above 8.0 m, black below 8.0 m, medium subidiomorphs), 50% plagioclase (white, medium subidiomorphs with some pale green ?chlorite alteration), minor pyrite, sphene; white calcite - quartz veins up to 3 cm thick, 30°-45°, often discontinuous

Whole interval 7.0-8.5 m is probably suitable for aggregate

RECOVERY AND FRACTURE LOG

Depth	Recovery	Fracture spacing (average/minimum/maximum) in cms
7.0 - 8.5	40%	7.8/3/13

Fractures rough, 50°-60° to core normal

ALLIGATOR RIVERS AGGREGATE AREA 2 DDH 11. (250S-1100E)

GR Cahill 455030 (Australian Map Grid)
Vertical hole
Total depth 3.0 m
Drilled October 1973
Rig Longyear 44. Hole cored in N size from start of harder rock, 2.4-3.0 m

LOG

2.4 - 3.0	amphibolite: dark green, fine to medium grained, granuloblastic texture, fresh to slightly weathered but moderately weathered along some fractures, moderately hard, strong to very strong; 50% amphibole (green to black, fine to medium, subidiomorphs to idiomorphs) 50% felspar (white, fine to medium subidiomorphs, may include some quartz), minor sphene; some thin, 0.5 mm quartz veins

Interval 2.4-3.0 m is suitable for aggregate

RECOVERY AND FRACTURE LOG

Depth	Recovery	Fracture log in cms (average/minimum/maximum)
?2.4 - 2.7	25 cm	2.5/2/4
2.7 - 3.0	60%	3.6/2/9

Core is broken and ground, but some rough 80°-90° to core normal fractures are visible.

ALLIGATOR RIVERS AGGREGATE AREA 2 DDH 12. (100S-1000E)

GR Cahill 455030 (Australian Map Grid)
Vertical hole
Total depth ?15.3 m
Drilled October 1973
Rig Longyear 44. Hole cored in N size from start of harder rock

LOG

?15.0 - ?15.3	amphibolite: dull green, fine grained, moderately weathered, soft, weak; about 50% amphibole (green, fine subidiomorphs), 50% felspar (white, fine subidiomorphs); very closely spaced, white, 0.5-2.0 mm thick quartz veins

Interval cored is unsuitable for aggregate

RECOVERY

Depth	Recovery
?15.0 - ?15.3	30 cm pebbles

AREA 3
(geological sketch map - Plate 4)

The third area investigated is an outcrop of dolerite of the Zamu Complex (Needham and Smart, 1972). It lies 3 km west of the Munmarlary road at GR Cahill 400025 and extends northwards for about 1000 m from the 119¾ mile on the Arnhem Highway.

Plate 4 shows a geological sketch map of the area. As in the other areas investigated, the outcrops are scattered and are less extensive than the dolerite photo-pattern shown on the Cahill NW preliminary geological map. Outcrop totals about 5% in the southern part of the area and about 10-20% over a low rise in the northern part. Only very scattered outcrops and boulders occur in the central part.

Outcrops in the southern part of the area are up to 1 m high and consist of metadolerite and some amphibolite, both of which are suitable for crushing. Micaceous greenstone, which is unsuitable for crushing, occurs only as rare boulders on the western side. Because the outcrops are scattered, two east-west costeans were bulldozed to test the extent and quality of subsurface rock. Each costean bottomed in completely weathered rock, with a recognizable metadolerite-amphibolite texture below about 2 m depth. Fresh rock suitable for crushing was observed only as "floaters" amounting to about 10% of the material costeaned.

Unless the surface outcrops of fresh rock can be scraped up and crushed, the southern end of Area 3 cannot be considered as an aggregate source area.

The low rise in the northern part of the area is 2-3 m above the surrounding ground level and contains 10-20% outcrop of amphibolite. Low scattered outcrops of metadolerite and amphibolite occur nearby. Three vertical diamond drill holes (DDH 1,2 and 4) were drilled into the main rise. The weathered zone is 0.5-4 m thick, and probably contains some fresh, usable 'floaters'. Below this zone, cores of fresh, moderately hard, strong to very strong amphibolite and metadolerite were recovered in unbroken lengths of up to 5 m. A fourth diamond drill hole (DDH 3) was drilled in a metadolerite ourcrop north of the main rise. Drilling was difficult and the recovery was poor, but the recovered core was fresh to slightly weathered, moderately hard, strong metadolerite and amphibolite, suitable for aggregate. This hole probably penetrated fresh 'floaters' embedded in highly weathered or completely weathered rock.

The standing water level in two holes measured in late October was 3.3 m below ground level, but these levels may be atypically high due to the heavy June rain in 1973. A drainage line with black, cracking clayey soil and swamp-type vegetation lies on the northern side of the rise and indicates a shallow water table. The occurrence of shallow groundwater and the absence of a convenient disposal point may hinder mining in this area.

The main rise covers 5000-6000 m^2. If groundwater can be controlled, the drilling results indicate that at least 30 000 m^3 of good quality rock could be quarried here. Some additional rock is available from adjacent, more weathered outcrops.

ALLIGATOR RIVERS AGGREGATE AREA 3 DDH 1. (825S-4110W)

GR Cahill 400025 (Australian Map Grid)
Vertical hole
Total depth 15.0 m
Drilled October 1973. Standing water level on 25 October was 3.3 m
Rig Longyear 44. Hole continuously cored in N size.

LOG

0.5 - 15.0	amphibolite: dark greenish grey, fine to medium grained, fresh to slightly weathered, moderately hard, very strong; 30-40% felspar and quartz (white, fine xenomorphs and subidiomorphs), 60-70% amphibole (greenish brown to black, fine to medium subidiomorphs to idiomorphs, random orientation), minor sphene, pyrite, chalcopyrite; scattered thin 0.5 mm quartz veins; at 9.5 m a calcite-quartz vein, greenish white, 10 mm thick, quartz along sides with calcite in centre, trend 75°, with associated small blebs of galena, sphalerite, and chalcopyrite.

Whole interval is suitable for aggregate

RECOVERY AND FRACTURE LOG

Depth	Recovery	Fracture spacing in cms (average/minimum/maximum)	
?0.5 - 1.3	82 cm		
1.3 - 3.78	100%	?0.5 - 3.5	33/3/88
3.78 - 6.5	100%	3.5 - 6.5	52/10/108
6.5 - 9.55	100%	6.5 - 9.9	344 (one piece)
9.55 -12.7	95%	9.9 -15.0	502 (one piece)
12.7 -13.7	100%		
13.7 -15.0	100%		

Fractures ?0.5 - 3.5 m, smooth - rough, 30°-50° to core normal
3.5 - 9.9 m, smooth-rough, 70°-80°
and smooth, 30°

ALLIGATOR RIVERS AGGREGATE AREA 3 DDH 2. (850S-4150W)

GR Cahill 400025 (Australian Map Grid)
Vertical hole
Total depth 15 m
Drilled October 1973. Standing water level on 25 October was 3.2 m
Rig Longyear 44. Hole continuously cored in N size.

LOG

3.94 - 15.0 amphibolite: dark green, medium grained at top becoming fine to medium at bottom; fresh, moderately hard, very strong; 30-40% felspar (grey to white, fine to medium, subidiomorphs and xenomorphs), 60-70% amphibole (brownish green to black, fine to medium, subidiomorphs to idiomorphs, randomly oriented), minor pyrite, sphene, pink ?mica; some felspar-quartz veins 0.5-15 mm, 60°-80°, usually with minor sphalerite, rarely with minor galena; some ?pre-metamorphism veins have diffuse margins and include minor amphibole .

Whole interval is suitable for aggregate

RECOVERY AND FRACTURE LOG

Depth	Recovery	Fracture spacing (average/minimum/maximum) in cms	
3.94 - 4.80	75%	3.94 - 5.1	18/9/28
4.80 - 7.84	100%	5.1 - 6.5	34/8/53
7.84 - 9.80	95%	6.5 - 11.8	510 (one piece)
9.80 - 12.90	95%	11.8 - 15.0	366 (one piece)
12.90 - 15.00			

Fractures 3.9 - 6.5 m, smooth-rough, irregular, 0°-65° to core normal
11.8 m smooth, 60°

ALLIGATOR RIVERS AGGREGATE AREA 3 DDH 3. (760S-4150W)

GR Cahill 400025 (Australian Map Grid)
Vertical hole
Total depth 12.2 m
Drilled October 1973. Standing water level on 25 October was below 2.8 m
Rig Longyear 44. Hole continuously cored in N size

LOG

1.5 - ?9.5	metadolerite: dark greenish grey, fine to medium grained; fresh to slightly weathered, but moderately weathered along some fractures; moderately hard, strong; 25-40% pyroxene (pink, fine to medium subidiomorphs, altering to very fine amphibole around margins, relict subophitic texture), 15-25% amphibole (green to black, very fine to medium subidiomorphs), 50-60% felspar (colourless to white, fine to medium, ?subidiomorphs and xenomorphs, may include some quartz)
?9.5 -?10.5	amphibolite: dark grey, fine to medium grained, fresh, moderately hard, strong; 50% amphibole (green to black, fine to medium subidiomorphs), 50% felspar (white, fine subidiomorphs to xenomorphs)
?10.5 - 12.2	metadolerite: as 1.5-?9.5 above

Recovered core is suitable for aggregate, but poor recovery indicates presence of fresh to slightly weathered 'floaters' embedded in highly to completely weathered rock.

RECOVERY AND FRACTURE LOG

?1.5 - 2.0	45 cm		?1.5 - 2.0	5/1/25
2.0 - 2.1	100%			
2.1 - 2.39	75%		2.0 - 3.05	4.3/1/7
2.39 - 3.05	65%			
3.05 - 3.51	100%		3.05 - 4.7	10/2/19
3.51 - 4.7	25%			
4.7 - 5.08	10%		4.7 - 7.5	pebbles 103 cm diameter, with occasional core lengths 5-10 cm
5.08 - 5.25	100%			
5.25 - 5.45	95%		7.5 - 12.2	3.8/2/11
5.45 - 7.15	20%			
7.15 - 7.5	35%			
7.5 - 10.0	25%			
10.0 - 11.3	35%			
11.3 - 12.0	20%			
12.0 - 12.2	10%			

Fractures: smooth-rough, moderately weathered with thin clay coatings, 50°-70° to core normal
and smooth-rough, slightly weathered, 45°

ALLIGATOR RIVERS AGGREGATE AREA 3 DDH4. (810S-4150W)

GR Cahill 400025 (Australian Map Grid)
Vertical hole
Total depth 15 m
Drilled October 1973
Rig Longyear 44. Hole continuously cored in N size

LOG

?4.3 - 15.0 amphibolite: dark greenish grey, mostly fine grained, fresh; moderately hard but soft in monomineralic amphibole sections, generally very strong but weak in amphibole sections; 20-50% felspar and quartz (white to pale green, fine subidiomorphs and xenomorphs), 50-80% amphibole (green to black, mostly fine, subidiomorphs to idiomorphs); some separation into felsic-rich and felsic-poor areas on 10-20 mm scale, some bands of pure amphibole, minor sphene, pyrite; some felspar-quartz veins 2-10 mm thick at 50°-75°, contain minor sphalerite; some short, broken lengths of chloritic and/or talcose sheared amphibolite core

The recovered core is suitable for aggregate

RECOVERY

The sequence of this core was completely destroyed during transport from the drill site. Three sections of core of 5.7, 2.5 and 3.1 m were reconstructed, but their orientations and depths are unknown. These sections of core, taken together, have a fracture spacing of 94/4/277 (av./min./max. in cms). In addition to these sections, there is 50 cm of broken core containing sheared amphibolite.

AREA 4
(geological sketch map - Plate 5)

Area 4 is situated 2.5 km north-east of Yourmill Waterhole, at G.R. Cahill 515038. Rock outcrops with boulder scree occur in a west-south-west to east-north-east trending belt, 1100 m long and about 50 m wide. Scattered biotite gneiss outcrops lie north and south of the amphibolite.

The area was traversed at a number of places with a magnetometer, but the method failed to detect boundaries between the amphibolite and gneiss.

To date there has been no drilling or costeaning in this area. From the drilling results in the other areas, deeply weathered amphibolite can be expected in the gaps between outcrops; fresh amphibolite suitable for crushing can be expected beneath most of the outcrops, whose surface area totals about 3600 m^2.

REFERENCE

Needham, R.S. and Smart, P.G. 1972 Progress report, Alligator River party N.T., 1971. Bur. Miner. Resour. Aust. Rec. 1972/1.

Plate 4

4300 W

4200 W

4100 W

700S

800S

900S

1000S

1100S

1200S

1300S

1400S

1500S

amphibolite

GRID LINE PEGGED BY GEOPEKO

drainage line

outcrop of metadolerite

DDH3 12·2 m

DDH4 15m

DDH1 15m

DDH2 15m

low rise with good outcrops of metadolerite

BASE LINE PEGGED BY N.T.G.S.

scattered boulders and outcrops of metadolerite and amphibolite

Black – soil swamp

Very

DENSE TREE CANOPY

COSTEAN 2

COSTEAN 1

Micaceous greenstone boulders

Area containing scattered outcrops of metadolerite with some amphibolite

ARNHEM HIGHWAY

119 mile 3900 feet

C/L

True North

SECTION EXPOSED BY COSTEANS

SCALE 1:100

$\frac{V}{H} = 1$

700 S

800 S

900 S

1000 S

1100 S

1200 S

1300 S

1400 S

1500 S

EAST

EAST

10–40% fresh usable rock ? dip 45° westward

30–40% fresh rock

5–10% fresh usable rock

2–5% fresh usable rock

COSTEAN 1

COSTEAN 2

WEST

Surface of C W rock with relict metadolerite texture

1–2% boulders

Surface of C W rock with relict metadolerite texture

-1 -2 -3 -4 metres

WEST

-1 -2 -3 -4 metres

Geological Sketch Map Area 3

(Australian Map Grid Reference Cahill 400025)

Scale 1: 2000

50 0 50 100 metres

REFERENCE

Metadolerite and amphibolite, dark grey, fine to medium grained

Outcrop boundary, position approximate

DDH2 15m — Diamond drill hole, vertical, with depth

400S — Metric grid extended from lines pegged by Geopeko

NORTHERN TERRITORY GEOLOGICAL SURVEY

DEPARTMENT OF THE NORTHERN TERRITORY

ALLIGATOR RIVERS AGGREGATE INVESTIGATION

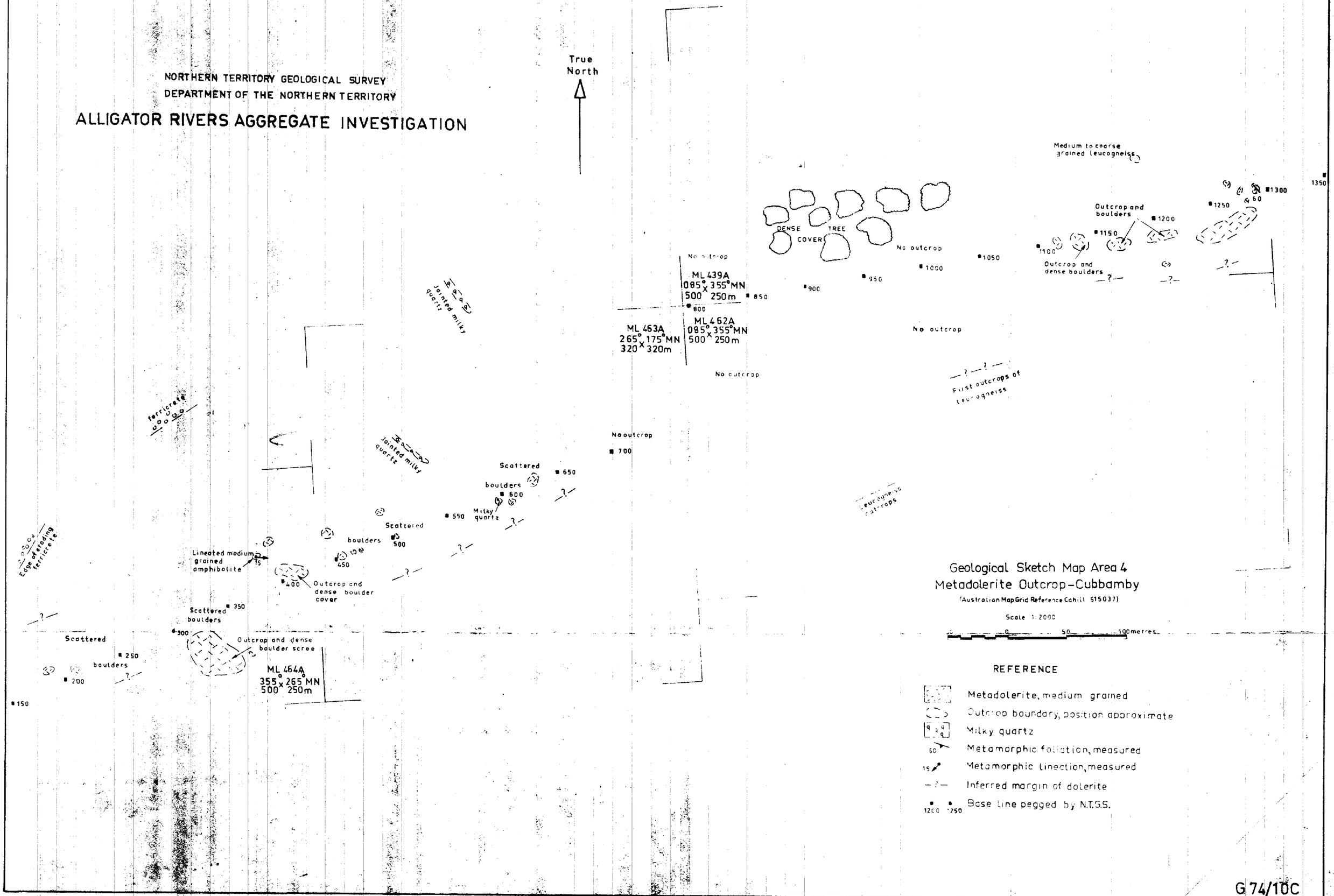
4300 W 4200W 4100W

G74/9 C

Plate 5

NORTHERN TERRITORY GEOLOGICAL SURVEY
DEPARTMENT OF THE NORTHERN TERRITORY

ALLIGATOR RIVERS AGGREGATE INVESTIGATION



Geological Sketch Map Area 4
Metadolerite Outcrop – Cubbamby

(Australian Map Grid Reference Cahill 515037)

Scale 1:2000

50 0 50 100 metres

REFERENCE

- Metadolerite, medium grained
- Outcrop boundary, position approximate
- Milky quartz
- 60 Metamorphic foliation, measured
- 15 Metamorphic lineation, measured
- –?– Inferred margin of dolerite
- 1200 1250 Base line pegged by N.T.G.S.

G 74/10C

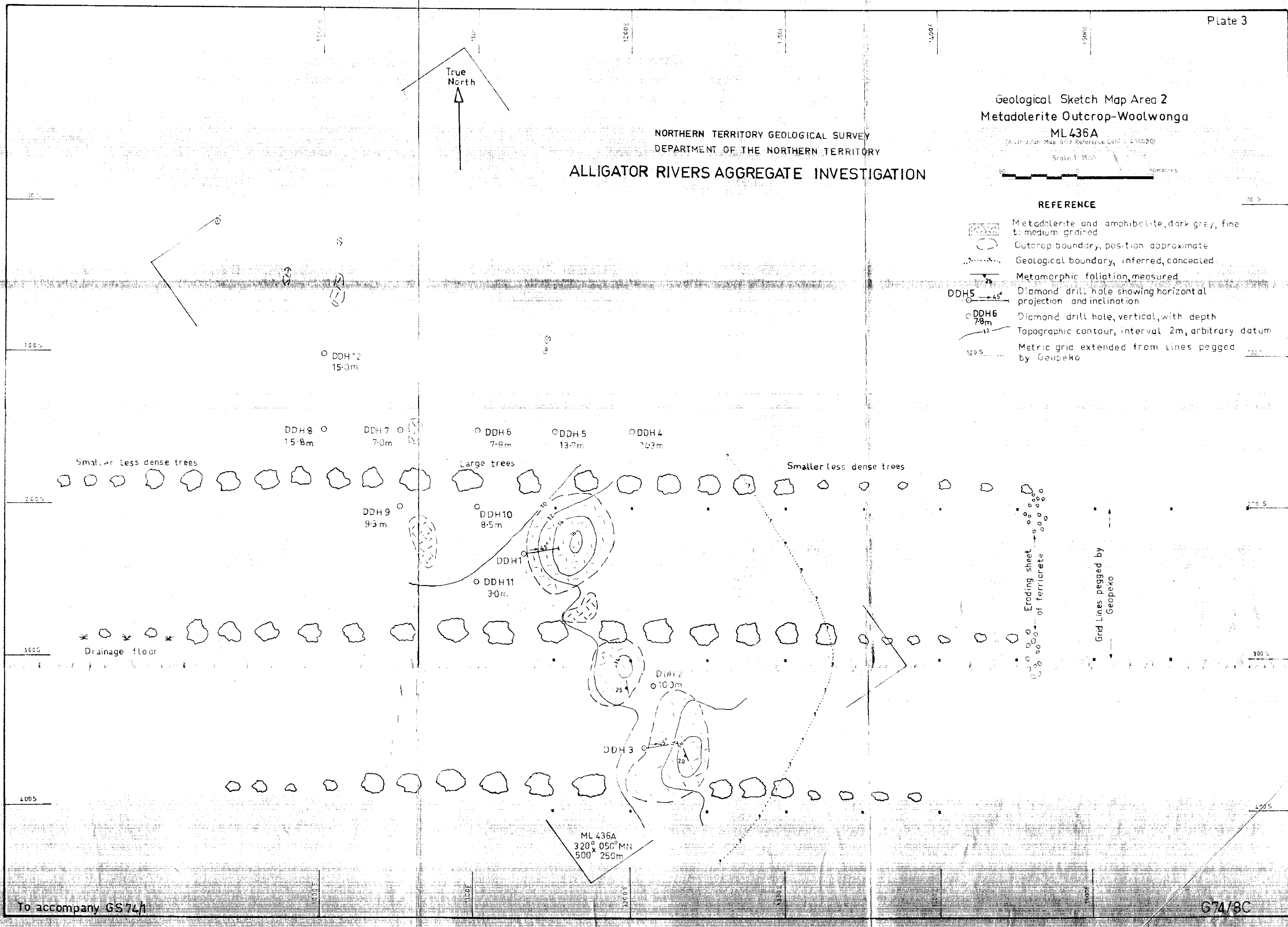
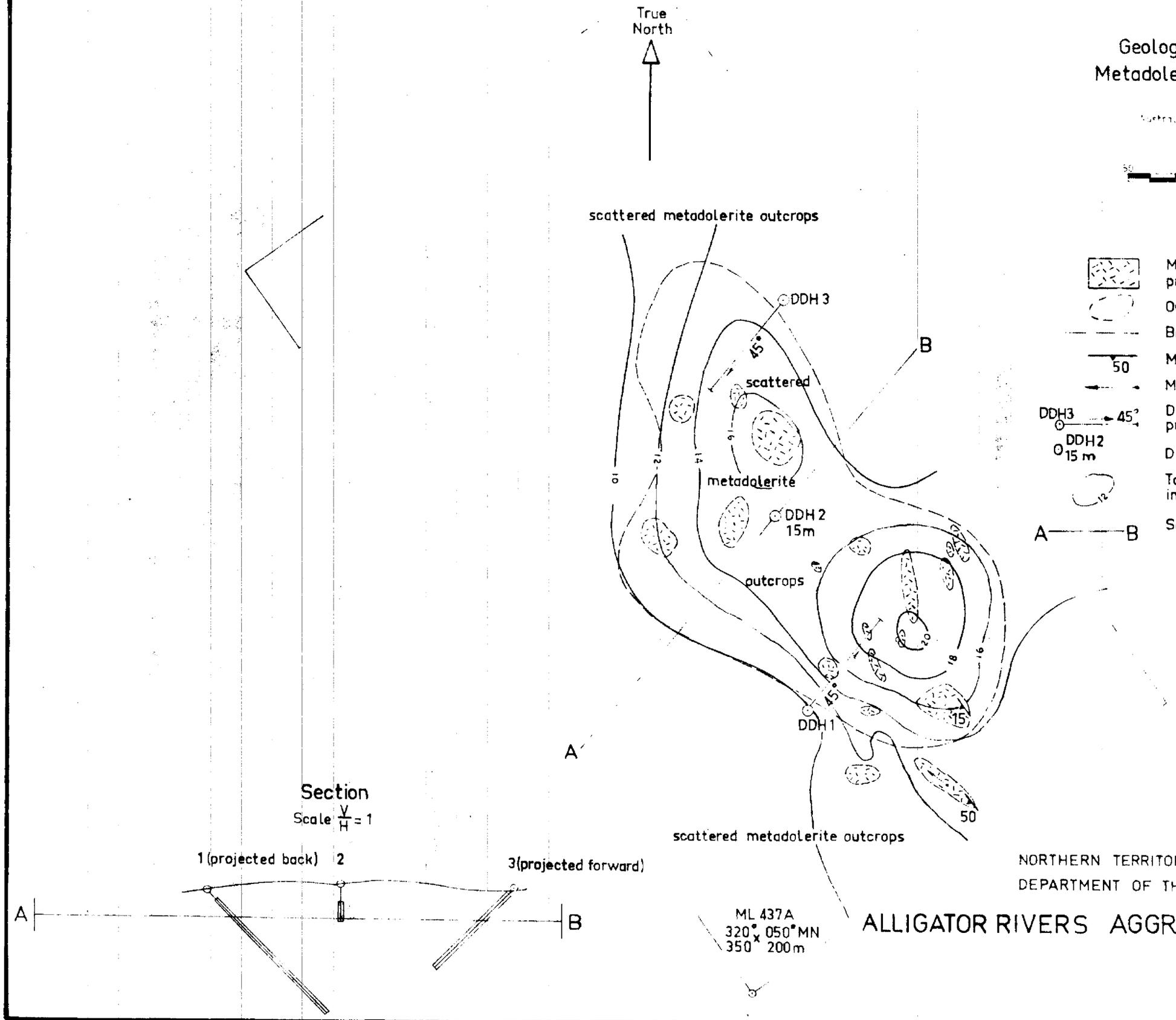


Plate 3
True North
NORTHERN TERRITORY GEOLOGICAL SURVEY
DEPARTMENT OF THE NORTHERN TERRITORY
ALLIGATOR RIVERS AGGREGATE INVESTIGATION
Geological Sketch Map Area 2
Metadolerite Outcrop-Woolwonga
ML 436A
Scale 1:1500
REFERENCE
Metadolerite and amphibolite, dark grey, fine to medium grained
Outcrop boundary, position approximate
Geological boundary, inferred, concealed
Metamorphic foliation, measured
DDH5 45°
Diamond drill hole showing horizontal projection and inclination
DDH6 7·8m
Diamond drill hole, vertical, with depth
Topographic contour, interval 2m, arbitrary datum
Metric grid extended from lines pegged by Geopeko
DDH 8 15·8m
DDH 7 7·0m
DDH 6 7·8m
DDH 5 13·7m
DDH 4
Smaller less dense trees
Large trees
Smaller less dense trees
DDH 9 9·3 m
DDH10 8·5 m
DDH 1
DDH 11 3·0m
Drainage floor
DDH 2 10·0m
DDH 3
Eroding sheet of ferricrete
Grid Lines pegged by Geopeko
ML 436A 320° x 050° MN 500 x 250m
To accompany GS 74/1
G74/8C

Geological Sketch Map Area 1
Metadolerite Outcrop - Woolwonga
ML 437A

REFERENCE

- Metadolerite, medium and coarse grained, probably suitable for aggregate.
- Outcrop boundary, position approximate.
- Boundary of main outcrop.
- 50 — Metamorphic foliation, measured.
- Metamorphic Lineation.
- DDH3 → 45° — Diamond drill hole, showing horizontal projection and inclination.
- DDH2 15 m — Diamond drill hole, vertical, with depth.
- Topographic contour, position approximate, in metres above an arbitrary datum.
- A——B — Section line



Section

Scale $\frac{V}{H} = 1$

ML 437A
320° x 050° MN
350 x 200 m

NORTHERN TERRITORY GEOLOGICAL SURVEY
DEPARTMENT OF THE NORTHERN TERRITORY

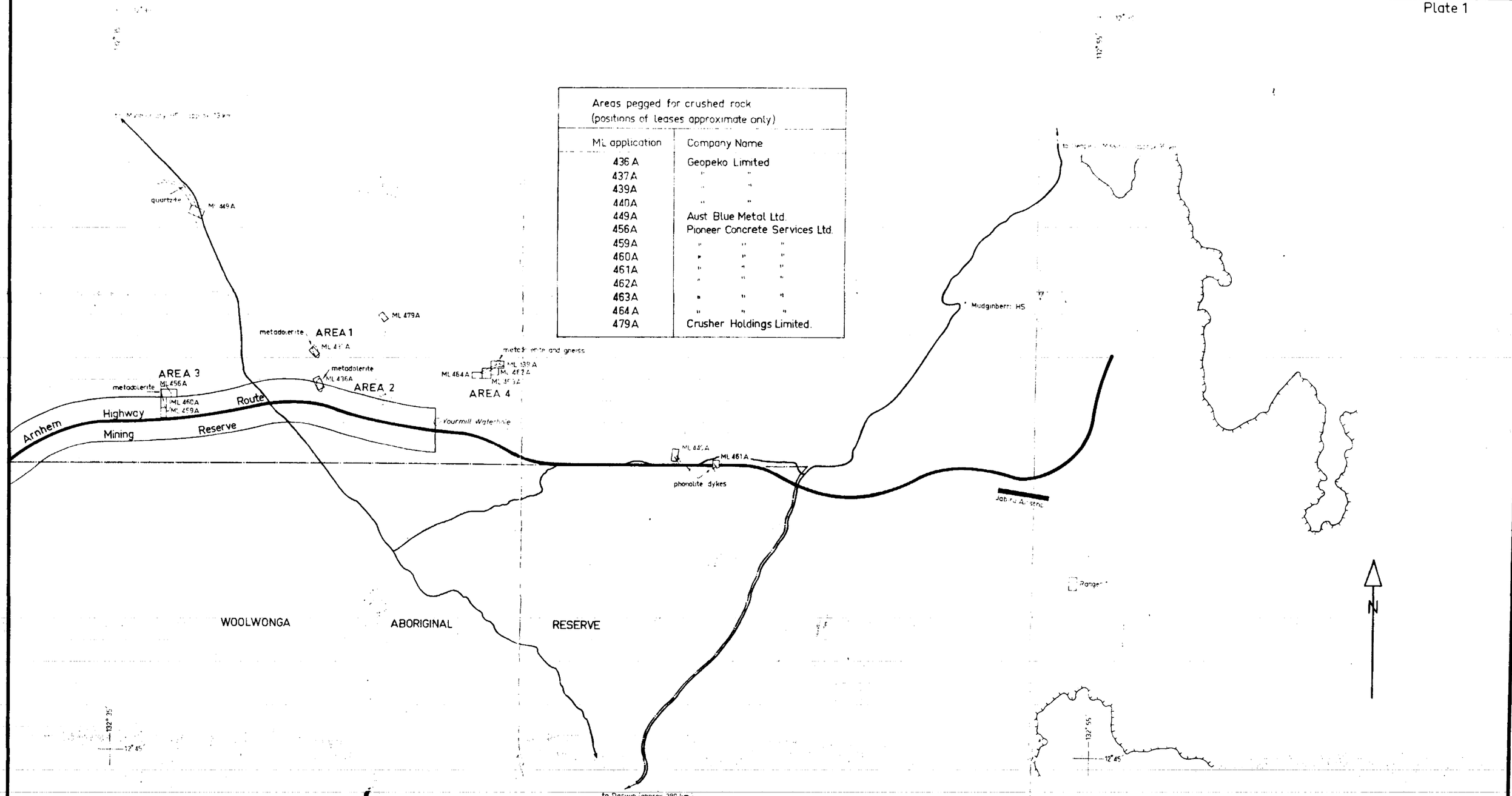
ALLIGATOR RIVERS AGGREGATE INVESTIGATION

G 74/7D

Plate 1

Areas pegged for crushed rock
(positions of leases approximate only)

ML application	Company Name
436A	Geopeko Limited
437A	" "
439A	" "
440A	" "
449A	Aust Blue Metal Ltd.
456A	Pioneer Concrete Services Ltd.
459A	" " "
460A	" " "
461A	" " "
462A	" " "
463A	" " "
464A	" " "
479A	Crusher Holdings Limited.



Reference

- Geological boundary, position approximate (after Needham and Smart 1972)
- Dyke
- Road
- Escarpment

NORTHERN TERRITORY GEOLOGICAL SURVEY
DEPARTMENT OF THE NORTHERN TERRITORY

ALLIGATOR RIVERS AGGREGATE INVESTIGATION

Location of Outcrops Under Investigation

Scale 1 100,000

1 0 1 2 3 4 5 kilometres

Compiled by N.T. Geological Survey (Reference No. G.S. 71 1)
Drawn by Mines Branch Draughting Office Darwin December, 1974

G73/46C

Areas pegged for crushed rock. (positions of leases approximate only)	
ML application	Company Name
436 A	Geopeko Limited
437 A	" "
439A	" "
440A	" "
449A	Aust. Blue Metal Ltd.
456A	Pioneer Concrete Services Ltd.
459A	" " "
460A	" " "
461A	" " "
462A	" " "
463A	" " "
464 A	" " "
479A	Crusher Holdings Limited.

12° 30'
132° 35'
to Munmarlary HS (approx 13 km)
quartzite
ML 449 A
ML 479A
metadolerite
AREA 1
ML 437A
metadolerite and gneiss
ML 439 A
ML 462 A
ML 463A
ML 454A
AREA 4
metadolerite
ML 436A
AREA 2
AREA 3
metadolerite
ML 456A
ML 460A
ML 459A
Arnhem Highway Mining Route Reserve
Yourmill Waterhole
ML 440A
ML 461 A
phonolite dykes
WOOLWONGA ABORIGINAL RESERVE
132° 35'
12° 45'
to Darwin (approx 280 km.)

12° 30'
132° 55'
to Oenpelli Mission (approx 35 km.)
Mudginberri HS
Jabiru Airstrip
Ranger 1
N
132° 55'
12° 45'

Reference

Geological boundary, position approximate (after Needham and Smart 1972)
Dyke
Road
Escarpment

NORTHERN TERRITORY GEOLOGICAL SURVEY
DEPARTMENT OF THE NORTHERN TERRITORY

ALLIGATOR RIVERS AGGREGATE INVESTIGATION

Location of Outcrops Under Investigation

Scale 1:100,000

1 0 1 2 3 4 5 kilometres

Compiled by N.T. Geological Survey (Reference No. G.S. 71/1)
Drawn by Mines Branch Draughting Office, Darwin, December, 1974

G73/46C

Plate 3

NORTHERN TERRITORY GEOLOGICAL SURVEY
DEPARTMENT OF THE NORTHERN TERRITORY

ALLIGATOR RIVERS AGGREGATE INVESTIGATION

Geological Sketch Map Area 2
Metadolerite Outcrop-Woolwonga
ML 436A

(Australian Map Grid Reference Cahill 4 55030)

Scale 1: 1500

50 0 50 metres

REFERENCE

- Metadolerite and amphibolite, dark grey, fine to medium grained
- Outcrop boundary, position approximate
- Geological boundary, inferred, concealed
- 25 — Metamorphic foliation, measured
- DDH5 → 45° — Diamond drill hole showing horizontal projection and inclination
- DDH6 7·8m — Diamond drill hole, vertical, with depth
- 12 — Topographic contour, interval 2m, arbitrary datum
- 100 S — Metric grid extended from lines pegged by Geopeko

1000 E 1100 E 1200 E 1300 E 1400 E 1500 E

00 S

100 S

200 S

300 S

400 S

True North

DDH 12 15·0m

DDH 8 15·8m

DDH 7 7·0m

DDH 6 7·8m

DDH 5 13·7m

DDH 4 24·3m

Smaller less dense trees

Large trees

Smaller less dense trees

DDH 9 9·3m

DDH 10 8·5m

DDH 1

DDH 11 3·0m

Eroding sheet of ferricrete

Grid Lines pegged by Geopeko

Drainage floor

DDH 2 10·0m

DDH 3

ML 436A
320° x 050° MN
500 250m

To accompany GS74h

G74/8C

11/1159

Plate 4

4300 W

4200 W

4100 W

700 S

800 S

900 S

1000 S

1100 S

1200 S

1300 S

1400 S

1500 S

amphibolite

GRID LINE PEGGED BY GEOPEKO

drainage line

outcrop of metadolerite

DDH3 12·2 m

DDH4 15m

DDH1 15m

DDH2 15m

low rise with good outcrops of metadolerite

BASE LINE PEGGED BY N.T.G.S.

Very scattered boulders and outcrops of metadolerite and amphibolite

Black – soil swamp

DENSE TREE CANOPY

COSTEAN 2

COSTEAN 1

Micaceous greenstone boulders

Area containing scattered outcrops of metadolerite with some amphibolite

True North

ARNHEM HIGHWAY

119 mile 3900 feet

C/L

SECTION EXPOSED BY COSTEANS

SCALE 1:100

$\frac{V}{H} = 1$

COSTEAN 1

EAST

10–40% fresh usable rock ? dip 45° westward

30–40% fresh rock

WEST

Surface of CW rock with relict metadolerite texture

COSTEAN 2

EAST

2-5% fresh usable rock

5–10% fresh usable rock

1-2% boulders

Surface of CW rock with relict metadolerite texture

WEST

-1 -2 -3 -4 metres

Geological Sketch Map Area 3

(Australian Map Grid Reference Cahill 400025)

Scale 1: 2000

50 0 50 100 metres

REFERENCE

Metadolerite and amphibolite, dark grey, fine to medium grained

Outcrop boundary, position approximate

DDH2 15 m — Diamond drill hole, vertical, with depth

400S — Metric grid extended from lines pegged by Geopeko

NORTHERN TERRITORY GEOLOGICAL SURVEY

DEPARTMENT OF THE NORTHERN TERRITORY

ALLIGATOR RIVERS AGGREGATE INVESTIGATION

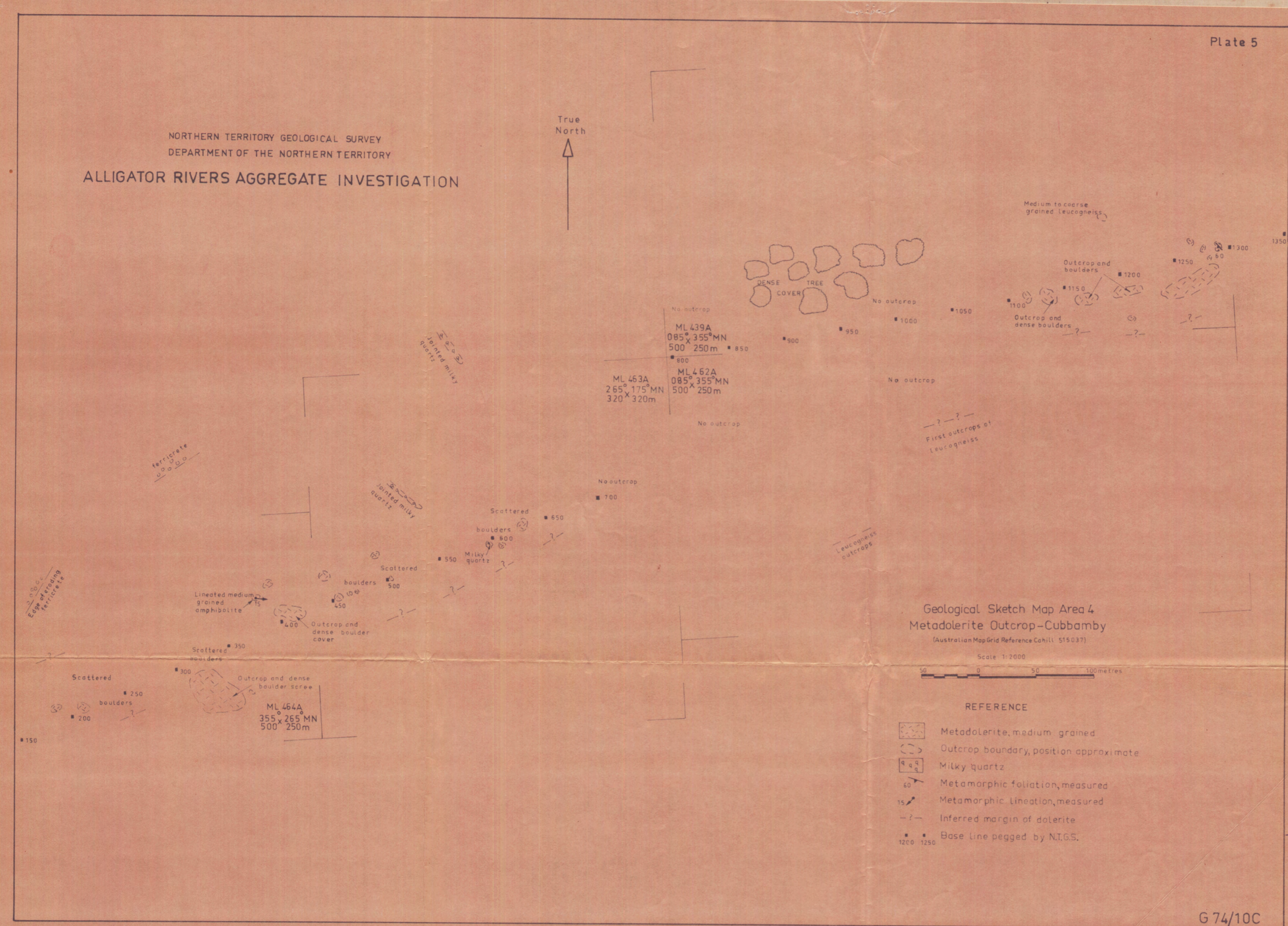
G74/9 C

GS 74/1

Plate 5

NORTHERN TERRITORY GEOLOGICAL SURVEY
DEPARTMENT OF THE NORTHERN TERRITORY

ALLIGATOR RIVERS AGGREGATE INVESTIGATION



Geological Sketch Map Area 4
Metadolerite Outcrop – Cubbamby

(Australian Map Grid Reference Cahill 515037)

Scale 1:2000

50 0 50 100 metres

REFERENCE

- Metadolerite, medium grained
- Outcrop boundary, position approximate
- Milky quartz
- 60 Metamorphic foliation, measured
- 15 Metamorphic lineation, measured
- — ? — Inferred margin of dolerite
- 1200 1250 Base line pegged by N.T.G.S.

G 74/10C

G 5714