DEPARTMENT OF MINES
SOUTH AUSTRALIA

GEOLOGICAL SURVEY
NON METALLIC RESOURCES

DOLOMITE DEPOSITS WITHIN THE PROPOSED BLACK HILL CONSERVATION PARK

Sections 328 to 333, 5536 and 5539 Hd. Onkaparinga

by

J.T. VALENTINE
EXTRACTIVE MINERALS SECTION

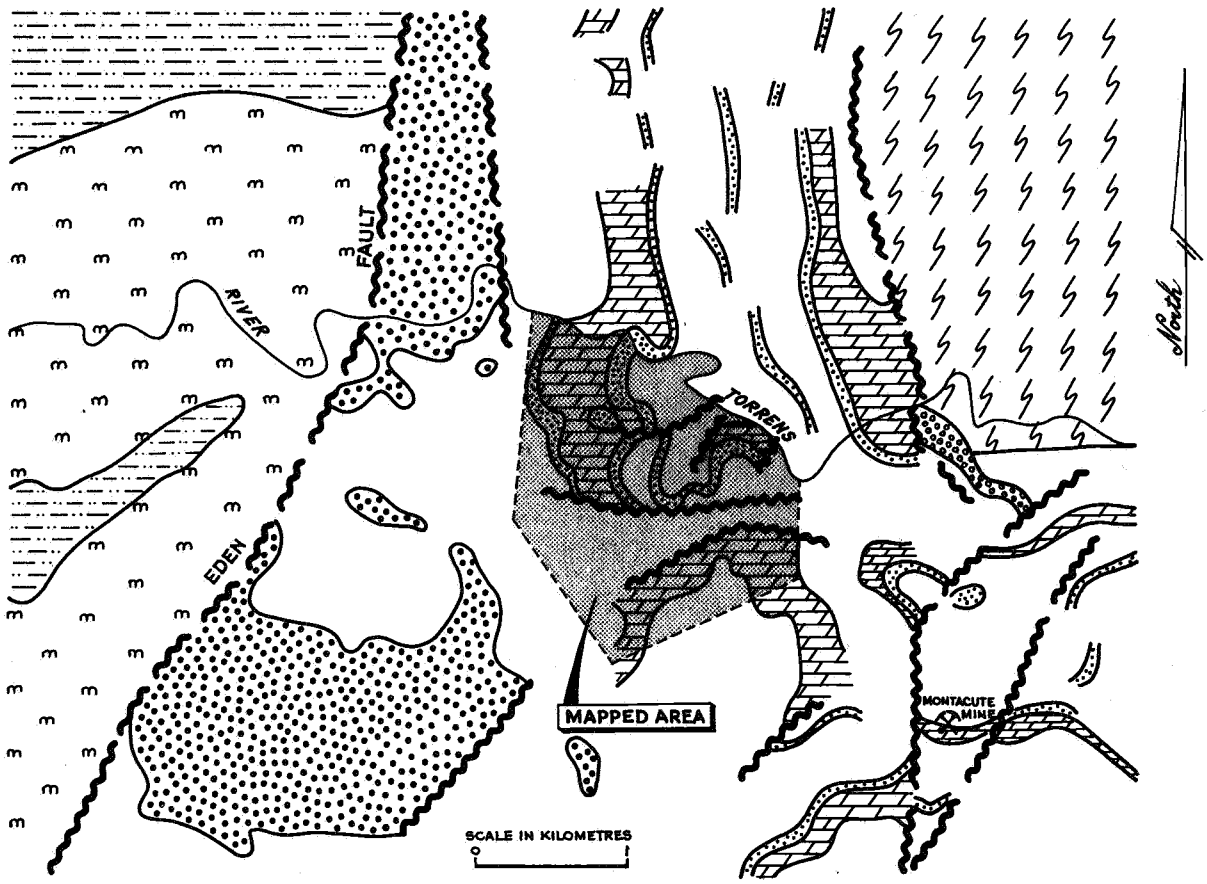
Rept.Bk.No. 77/3
G.S. No. 5832
DM. No. 1174/74

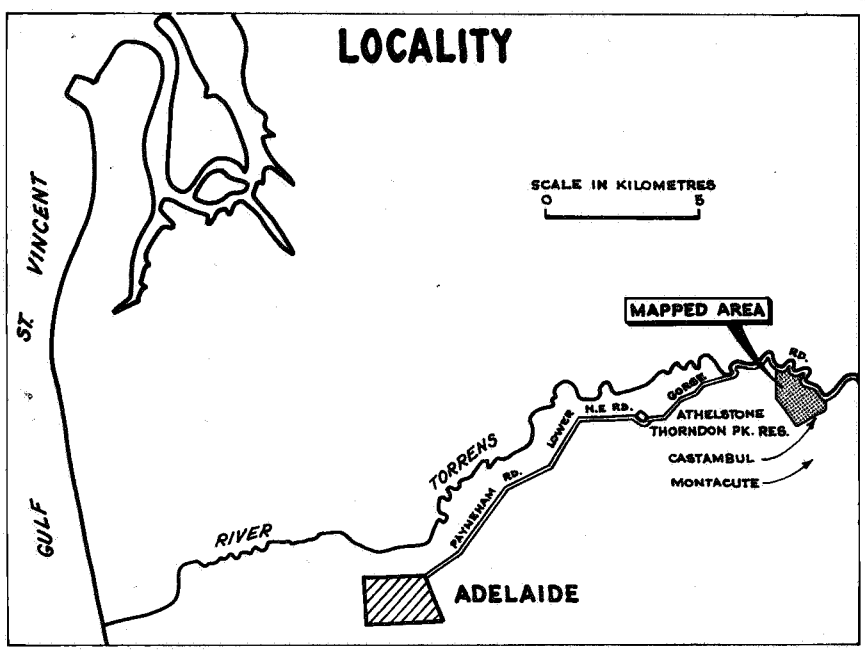
12th January, 1976

CONTENTS

PLANS

Number	Title	Scale
S12522	Black Hill Conservation Park, Dolomite Deposit. REGIONAL GEOLOGY AND LOCALITY PLANS.	1:50 000 1:250 000
76-975	Black Hill Conservation Park, Dolomite Deposit. GEOLOGICAL PLAN	1:5 000
76-976	Black Hill Conservation Park, Dolomite Deposit. QUARRY OUTLINES AND PARK BOUNDARIES	1:5 000
76-977	Black Hill Conservation Park, Dolomite Deposit. GEOLOGICAL CROSS SECTIONS A-J	1:2 500





LEGEND

Tertiary Recent

- m — Sands & clays
- Sands & clays

Torrensian

- UNDALYA QUARTZITE
- Phyllites with minor dolomites & quartzites
- MONTACUTE DOLOMITE
- Phyllites with minor dolomites & quartzites
- CASTAMBUL DOLOMITE
- Phyllite
- ALDGATE SANDSTONE
- Phyllite

Lower Proterozoic

- BAROSSA COMPLEX

FAULT

	DEPARTMENT OF MINES—SOUTH AUSTRALIA	SCALE 1:50 000 (GEOLOGY) 1:250000 (LOCALITY)
COMPILED J. VALENTINE	BLACK HILL CONSERVATION PARK DOLOMITE DEPOSIT REGIONAL GEOLOGY & LOCALITY PLANS	DATE JANUARY 1977
DRN L.C. CKD		PLAN NUMBER S 12522
EXTRACTIVE MINERALS		

DEPARTMENT OF MINES
SOUTH AUSTRALIA

Rept.Bk.No. 77/3
G.S. No. 5832
D.M. No. 1174/74

DOLOMITE DEPOSITS WITHIN THE PROPOSED BLACK HILL CONSERVATION PARK

Sections 328 to 333, 5536 and 5539 Hd. Onkaparinga

ABSTRACT

Deposits of dolomite suitable for use as bitumen chippings are not widely distributed in and near the Adelaide metropolitan area. Proposed extensions to the Black Hill Conservation Park include such a dolomite deposit.

The deposite has been geologically mapped and a possible design for a quarry is proposed. Reserves of 9.0 million cubic metres of dolomite and 1.4 million cubic metres of quartzite have been inferred for this particular method of quarrying.

Diamond drilling will be required to confirm quality and reserves of the material.

INTRODUCTION

A major dolomite resource to the north-east of Adelaide is located in the vicinity of Pinkerton Gully, to the south of the Gorge Road and about 0.8 km west of Castambul (Plan S-12522). Proposed extensions to the Black Hill Conservation Park beyond the open space area designated in the 1962 Metropolitan Development Plan, included an area to the west of Pinterton Gully which Nixon (1958) had shown to be part of this deposit.

Following reconnaissance mapping on sections 328 to 333, 5536 and 5539, hundred of Onkaparinga, the area to the west of Pinkerton Gully was mapped in more detail using an aerial photograph of scale 1:5 000 in order to assess the feasibility of quarrying operations and to estimate extractable dolomite reserves.

Sealed road access to the lower slopes is provided via Pinkerton Gully. The ridges on either side can be reached by two steep winding tracks some parts of which can only be negotiated in four wheel drive.

LAND TENURE AND USE

Four private mines were granted in June, 1973, thereby exempting the land from the provisions of the Mining Act (1971). Private mines 135 (sections 331 and 333), 136 (section 330) and 137 (section 332) are leased by Montacute Blue Metal Quarries Pty. Ltd. Private mine 147 (sections 5536, 5539), leased by Riverview Quarries Pty. Ltd. was purchased by the State Planning Authority in 1975, but has now been excluded from the proposed park following submissions to the Extractive Industries Committee. Plan 76-976 shows the original boundary of the Black Hill Conservation Park as designated in the 1962 Metropolitan Development Plan, the proposed extended boundary and the present boundary.

The present quarry is located on section 330. The rest of the area, including the remainder of section 330, is used for grazing of sheep. Easements for an E.T.S.A. transmission line cross sections 5536 and 331.

PHYSIOGRAPHY

The area is bounded to the north by the River Torrens Gorge, where excellent exposure is provided in the cliffs along the Gorge Road. Deep dissection by tributary watercourses, controlled by lithology and geological structure, has produced a rugged topography of southerly trending ridges and steep sided gullies, Pinkerton Gully being the most prominent. Soil cover is extensive, particularly to the east of Pinkerton Gully, and slips have occurred on some of the steeper slopes. The best exposures occur in the west of the area, although the slopes here are partly covered by quartzite and dolomite talus.

Dense scrub has developed only in the north of section 5536 and in the west of section 5539 and the more sheltered areas carry abundant fern growth and scattered eucalypts. Grass cover is widespread, except in exposed areas.

GEOLOGICAL SETTING

The rocks within the mapped area form part of the Burra Group of early Torrensian age, and unconformably overlie Carpentarian schists and gneisses of the Barossa Complex which are exposed about 1 km to the northeast. The sequence is characterised by two dolomite members , the Castambul Dolomite and the Montacute Dolomite, separated and overlain by thick units of calcareous phyllite and thin, interbedded quartzites.

Both dolomites contain accumulations of sedimentary magnesite, which has been interpreted as being indicative of a periodic lagoonal and shallow marine environment (Forbes, 1961). The discontinuous outcrop pattern of the dolomite is consistent with paralic conditions and is probably an expression of facies changes.

The structural evolution of the area involved metamorphic recrystallisation of the dolomitic sediments and multistage deformation of the argillaceous rocks around the more competent quartzites, accompanied by faulting and associated copper mineralisation.

Regional geology is outlined on Plan S12522.

STRATIGRAPHY

A proposed stratigraphy for the mapped area is presented on geological Plan 76-975 and is described below, beginning with the oldest unit.

Phyllite

Grey and green foliated rock in which small folds are outlined by thin siliceous layers within the schistosity. Capped, in places, by olive green and grey weathered sandstone.

Dolomite (Castambul Dolomite)

Hard, pink, siliceous dolomite interbedded with pale pink and white, very weathered sandy dolomite. Manganese dendrites are common. The unit probably lenses out to the west.

Phyllite

Grey and greyish green weathered phyllite, similar to that which underlies the Castambul Dolomite.

Quartzite

Pale brown and pale pink, heavily quartz veined in part with thin beds of dolomitic phyllites near the top of the unit. Generally hard to the west of Pinkerton Gully, but is thinner and more ferruginised and sugary to the east and north.

Phyllites and Dolomites

Grey and olive green sandy and silty phyllites in which small folds are outlined by thin sandy units, and which contains thin, discontinuous beds of hard, grey, cherty and magnesitic dolomite.

Lower Quartzite

Pale brown, weathered and cross bedded with heavy mineral bands. Harder and silicified near faults.

Dolomite (Montacute Dolomite)

Hard, dark grey, magnesitic and cherty dolomite, interbedded with sandy dolomites, intraformational breccia and minor phyllites. The best exposures are found in gullies in the west of the mapped area, and on the higher slopes to the south of the Gorge Road. The unit is thought to thin towards the south.

Upper Quartzites

Hard light pink to light brown, partly friable quartzite with thin interbeds of dolomite and schist near the base. Caps the two ridges to the west of Pinkerton Gully producing marked breaks in slope.

Upper Phyllites and Dolomites

Grey, green and brown sandy phyllites with small folds in the siliceous beds. A bed of hard grey cherty and magnesitic dolomite of unknown extent and quality has been located in the lower part of the unit. A thin pale brown and pale pink inter-phyllitic quartzite has acted as a topographic control to the west of the quarry office and covers the western slope of Pinkerton Gully on sections 329 and 331. The quartzite contains both hard and friable bands with thin phyllitic beds near the base. The unit is capped by grey phyllite which contains a few thin bands of hard dolomite.

STRUCTURE

Folding

The quartzite units are useful structural markers in the northern part of the area. Folds in these units are predominantly open and concentric and plunge at 10-20° to the south-east, but appear not to persist to the south. Overturning was observed near the western margin of the mapped area. Schistosity in phyllites exhibits approximately the same regional trend, but the orientation of small folds, outlined by sandy bands within the phyllites, is variable.

The trends of bedding in quartzites and schistosity in phyllites suggest that the broad structure may be the result of at least three phases of folding (Offler and Fleming, 1968). The overturning within the upper quartzite in the west of the area is thought to be a remnant of the first deformation.

Outcrop is reduced in the central and southern parts of the area and structural orientation is unclear. Easterly trends are indicated for the central part of the area, and southerly trends reappear in the south.

Faulting

No evidence of major meridional faulting was found and the regional structure is continuous across Pinkerton Gully.

Three major E-W faults are proposed, all dipping at 40-50° south.

a) Northern Fault

The repetition of the lower quartzite in the diamond drillhole, together with the occurrence of copper mineralisation, the discontinuity of the Montacute Dolomite and the local hardening of the quartzite provide evidence for reverse faulting. The fault is not traceable along strike to the west, and may have been absorbed by continuous deformation in incompetent dolomite beds.

b) Central Fault

A normal fault, which brings the upper phyllites and dolomites into contact with the Montacute Dolomite is indicated by the termination and local hardening of the lower quartzite, and the sporadic occurrence of copper mineralisation.

c) Southern Fault (Castambul Fault)

The apparent termination of the Montacute Dolomite to the north of the existing quarry is consistent with east-west faulting. Other evidence is lacking in the mapped area, but termination of quartzite beds to the east is reported by Nixon (1961).

DRILLING

In 1972, at the request of Readymix Concrete Pty. Ltd., diamond drillhole DDH-1 (Serial number 660/72) was drilled vertically to a depth of 157 metres on the ridge to the west of Pinkerton Gully. Appendix A contains an amended version of the company's log.

Results of tests for Los Angeles Abrasion Loss, performed on drillhole samples by Readymix's raw materials laboratory appear as Appendix B. The L.A. results indicate that the material contained beneath the proposed park extension would be suitable for use in the construction and surfacing of roads and in concrete.

RESERVES AND QUARRY DESIGN

The surface mapping has indicated that the greatest development of the Montacute Dolomite within the proposed park extension occurs to the west of Pinkerton Gully, to the north of the central fault. The Montacute Dolomite being presently quarried at the head of Pinkerton Gully appears to extend to the south and west of the quarry, but the quartzite marker units are not in evidence and the full thickness of the dolomite is not exposed. Following confirmatory drilling, the present quarry could probably be extended to the south and west into sections without a significantly increased visual impact. Two thin quartzite beds were located to the east of Pinkerton Gully to the north of the central fault but no surface indications of economic thickness of hard, grey dolomite were found here.

Although the area to the west of Pinkerton Gully on sections 331, 5536 and 5539 offers the greatest potential for future supplies of dolomite, it is also the area where greatest visual impact could be produced by quarrying. In order to reduce and, ideally, remove the visual effects, calculation of reserves must assume a particular method of quarrying which would not open faces to full view from the plains to the west. One such method, which may be carried out in three stages, is outlined on Plan 76-976 and on geological cross sections. C-J.

The first stage involves removal of the top of the ridge in the south of section 5539 and in section 331, down to a reduced level of 345 metres, and benching from natural surface in the east of section 331. Stage two extends benching inwards from the east and west and reduces the natural surface into

the Pinkerton and western gullies to an R.L. of 310 metres. Further internal benching during stage three ultimately results in a wedge-shaped cut trending north-northwest with a base at R.L. 260 metres. In situ reserves available during each of the stages are tabulated below (in cubic metres).

	STAGE I	STAGE II	STAGE III	TOTAL
Phyllite	920 000	540 000	550 000	2 010 000
Dolomite	1 340 000	3 080 000	4 530 000	8 950 000
Quartzite	230 000	495 000	635 000	1 360 000

The quoted reserves are minimum available quantities for what is considered to be a reasonable compromise between potential visibility and total available reserves. An attempt has been made to minimise visibility by internal development (i.e. benching towards the centre of the quarry). Extension to the west would allow the extraction of substantially larger quantities of dolomite (see geological sections F, G, H, J). These have not been included in the quarry design because of problems associated with local visibility. However, further reserves of Montacute Dolomite and quartzite would be available by deepening of the quarry in the area to the north of section G-G down to an R.L. of about 225 metres.

The total dolomite reserve includes some 2.6 million cubic metres of the upper dolomite. The extent of the dolomite is tentative and based on scant outcrop. The upper part of the mapped sequence should therefore be checked by drilling. Suggested sites for three diamond drillholes each approximately 175 metres deep on an azimuth of 060° (true) are indicated on plan 76-975. These holes would also provide information concerning the attitude of the central fault. Drilling on the eastern side of Pinkerton Gully to the north of the central fault, to check the thickness of the scant occurrences of hard dolomite, should also be considered.

Actual available reserves will be affected by the final quarry design which in turn will depend upon structure and stratigraphy. Additional diamond drilling should be carried out between the central fault and the Gorge Road to check for variability in quality of the dolomite and quartzite and for departures from the proposed geological structure.

CONCLUSIONS AND RECOMMENDATIONS

1. The proposed extension to the Black Hill Conservation Park contains substantial reserves of dolomite and quartzite.
2. One of the methods of quarrying the deposit would allow the removal of a possible 6.3 million cubic metre of dolomite and 1.4 million cubic metres of quartzite down to an R.L. of 260 metres. Reserves will be significantly affected should stringent limitations be imposed on local visibility of future quarrying.
3. It is recommended that the geological structure be verified by drilling, particularly to the south of the central fault where a further 2.6 million cubic metres of dolomite are possible. Scout drilling should also be carried out to the east of Pinkerton Gully to the north of the central fault. The thickness and quality of the Montacute Dolomite within the proposed park extension should be confirmed by drilling.

J. T. Valentine

JTV:FdeA
12/1/77

J.T. VALENTINE

REFERENCES

Forbes, B.G., 1960. Magnesite of the Adelaide System: Petrography and Description Stratigraphy. Trans. Roy. Soc. S. Aust., Vol. 83, pp. 1-9.

_____1961. Magnesite of the Adelaide System: Discussion of its Origin. Trans. Roy. Soc. S. Aust., Vol. 85: pp. 217-222.

Nixon, L.G., 1958. Blue Dolomite Deposit - Torrens Gorge. Min. Dev., Adelaide, 108, pp. 116-123.

_____1961. Blue Dolomite Deposit - Pinkerton Gully. Min. Rev., Adelaide, 115 pp. 142-159.

Offler, R. and Fleming, P.D., 1968. A Synthesis of Folding and Metamorphism in the Mount Lofty Ranges, South Australia. J. geol. Soc. Aust., 15(2): pp. 245-266.

Sprigg, R.C., 1946. Reconnaissance Geological Survey of Portion of the Western Escarpment of the Mount Lofty Ranges. Trans. Roy. Soc. S. Aust., 70(2): pp. 313-347.

Talbot, J.L., 1964. The Structural Geometry of Rocks of the Torrens Group near Adelaide, South Australia. J. geol. Soc. Aust., 11(1): pp. 33-48.

APPENDIX A

LITHOLOGICAL LOG OF DIAMOND DRILLHOLE DDH1

Details of Drillhole

Client:	R.M.C. Ltd.
Drill Hole No.:	DDH-1 (Pinkerton's Gully)
Hole Serial No.:	D/D 660/72 (Mines Dept. Ref. No.)
Drill Type:	Mindrill F-20/E-1000
Drill Operators:	K. Kalmar and J. Martin
Drilled Interval:	Surface to 157 metres
Core Recovery:	153.1 metres
Core Dimensions:	(a) 6.35 cm dia. - surface to 3.30 m
	(b) 4.75 cm dia. - 3.30 m to 52.30 m
	(c) 3.70 cm dia. - 52.30 m to 157 m
Logged:	P. Gray (R.M.C.) August, 1972

Drill Hole No. DDH-1 Pinkerton Gully

Depth (metres)	Description
0 - 0.8	Soil
0.8 - 1.0	Sandstone with kaolinitic inclusions.
1.0 - 3.3	Grey-white quartzite with minor inclusions of crystalline calcite along bedding.
3.3 - 3.65	White quartzite.
3.65 - 5.0	Weathered quartzite, some schist along bedding.
5.0 - 6.0	White quartzite with quartz and calcite along bedding planes and infilling of sheared sections, disseminated pyrite inclusions.
6.0 - 10.8	White quartzite random pyrite and disseminated pyrite granules.
10.8 - 11.7	Coarse grained, weathered quartzite, some disseminated pyrite.
11.7 - 30.5	White quartzite, some schist and quartz present along bedding, random horizons of calcite (to 3 cm thickness) and minor occurrences of pyrite.
30.5 - 31.0	Brown laminated silty quartzite, pyrolusite dendrites associated with schist common along bedding planes.
31.0 - 31.9	White-blue quartzite with interbedded schist, limonite and calcite commonly infilling sheared zone and bedding planes.
31.9 - 32.5	Blue-grey dolomitic slates, parallel bedding, with schist and dendrites.
32.5 - 33.6	Blue-grey slaty schist, moderately folded with siliceous inclusions.
33.6 - 34.5	Grey-brown silty slates, parallel bedding.
34.5 - 37.70	Blue-grey schistose slates with some quartz horizons (to 4 cm thickness), moderately folded.
37.70 - 38.1	Brown grey siliceous schist.
38.1 - 38.3	Quartz.
38.3 - 38.4	Brown laminated slate.
38.4 - 38.8	Quartz.

38.8 - 40.5	Grey-blue finely laminated slates with schist present along bedding.
40.5 - 40.6	Grey-white schistose slates.
40.6 - 47.2	Grey-blue finely laminated dolomite with random horizons of quartz.
47.2 - 48.1	Dolomitic schist, numerous quartz horizons containing some pyrite.
48.1 - 49.2	White quartzite and quartz with inclusions of calcite, vughs and cavities common, abundance of pyrite and disseminated pyrite. Possible fault zone.
49.2 - 51.1	White-grey quartz and multi coloured schists, finely laminated, vughs carrying pyrite and disseminated pyrite common, malachite associated with calcite.Possible fault zone.
51.1 - 51.3	White quartz. Possible fault zone.
51.3 - 53.4	Blue-grey massive dolomite with calcareous and quartz horizons, some disseminated pyrite.
53.4 - 53.6	White-brown siliceous dolomite.
53.6 - 54.0	Black dolomite.
54.0 - 54.3	Grey-white siliceous schists.
54.3 - 55.2	Blue-grey dolomitic schist.
55.2 - 56.3	Blue-grey siliceous dolomite, with schistose bedding.
56.3 - 59.8	Blue-white quartzite with calcareous infilling of sheared portion.
59.8 - 63.3	Blue-grey dolomite, some schistose and siliceous horizons.
63.3 - 64.5	Black graphitic dolomite, pyritic in parts, quartz horizons.
64.5 - 71.5	Black-blue massive dolomite, minor graphitic and siliceous horizons, random grains of pyrite.
71.5 - 72.7	Blue siliceous dolomite.
72.7 - 76.6	Black-blue dolomite, numerous graphitic horizons (rippled), pyrite associated with quartz.
76.6 - 80.6	Black dolomite, graphitic bedding, minor pyrite occurring within quartz horizons.
80.6 - 81.9	Black graphitic dolomite.
81.9 - 90.8	Black massive dolomite, random quartz horizons (to 10 cm thick), graphitic in places, non-pyritic.

90.8 - 96.6	Blue dolomite, occasional quartz occurrence containing pyrite, graphitic bedding plane.
96.6 - 99.0	Black dolomite, partially laminated, with thin graphitic sequence, quartz abundant (to 15 cm thick), non-pyritic.
99.0 - 107.4	Blue-grey dolomite, chlorite schist along bedding planes.
107.4 - 107.8	Quartz, inclusions of graphitic schist and disseminated pyrite.
107.8 - 108.8	Blue-grey dolomite, laminated, containing graphitic and chloritic schists.
108.8 - 110.1	Blue-grey dolomite
110.1 - 113.3	Blue-grey and brown laminated dolomitic schist, some quartz and schist containing pyrite on contact. Dolomite enriched in parts.
113.3 - 116.7	Blue-glack dolomite, few quartz horizons, schist distributed along bedding.
116.7 - 117.3	Blue dolomite, fine grained of pyrite distributed throughout.
117.3 - 118.5	Blue-grey dolomite, numerous quartz inclusions, pyritic in places.
118.5 - 122.3	Blue dolomite, some graphitic schist, non-pyritic.
122.3 - 123.3	Black graphitic dolomite, numerous quartz inclusions containing pyrite.
123.3 - 124.5	Black graphitic dolomite.
124.5 - 126.5	Black-blue dolomite, inclusions of quartz, chlorite schist along bedding.
126.5 - 130.6	Blue-grey dolomite, minor inclusions of quartz, cubic pyrite at 128 m, elsewhere non-pyritic.
130.6 - 131.0	Dolomitic schist and quartz, pyrite abundant, malachite occurring with disseminated pyrite.
131.0 - 132.0	Siliceous dolomite, abundance of granular pyrite.
132.0 - 133.7	Blue-white quartzite, minor granular pyrite throughout.
133.7 - 136.3	Brown-white quartzite, soft, coarse and gritty, calcareous and non-pyritic.
136.3 - 140.8	White-blue calcareous quartzite (minor pyrite).
140.8 - 141.2	White-brown quartzite, calcareous, coarse and gritty non-pyritic.

141.2 - 148.7	Blue-white quartzite, fine grained, calcareous, random grains pyrite.
148.7 - 149.1	White quartzite, calcareous, coarse and gritty, non pyritic.
149.1 - 150.9	Blue calcareous quartzite.
150.9 - 157.0	White-green quartzite, calcareous, chloritic schist occurring along bedding.

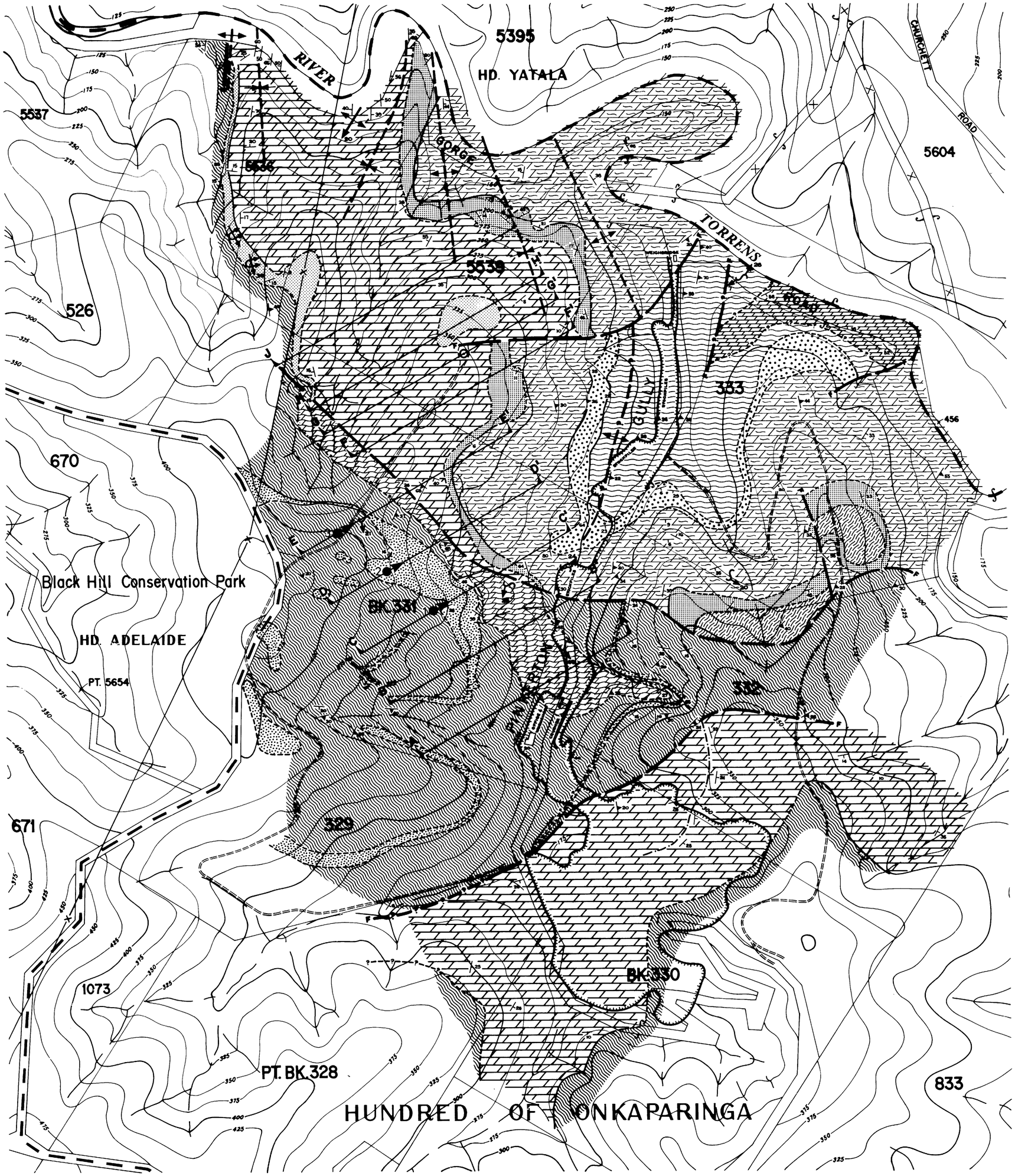
APPENDIX B

LOS ANGELES ABRASION LOSS TESTS ON DIAMOND DRILL CORE FROM DDH1

by

RAW MATERIALS LABORATORY
READYMIX CONCRETE PTY.LTD.

Interval Sampled (metres)	Rock Type	Size (inches)	Weight (gms)	L.A. Loss
3.3-30.5	Quartzite	$-\frac{3}{4}+\frac{1}{2}$ $-\frac{1}{2}+\frac{3}{8}$	2 500 2 500	19%
43.5-65.0	Schistose and siliceous dolomite	$-\frac{3}{4}+\frac{1}{2}$ $-\frac{1}{2}+\frac{3}{8}$	2 500 2 500	26%
65-124	Hard grey dolomite	$-\frac{3}{4}+\frac{1}{2}$ $-\frac{1}{2}+\frac{3}{8}$	2 500 2 500	24%
124-142	Dolomite and quartzite	$-\frac{3}{4}+\frac{1}{2}$ $-\frac{1}{2}+\frac{3}{8}$	2 500 2 500	26%
142-157	Quartzite	$-\frac{3}{4}+\frac{1}{2}$ $-\frac{1}{2}+\frac{3}{8}$	2 500 2 500	19%



LEGEND

True North
Magnetic North

- Phyllite
- Quartzite
- Dolomite & interbedded dolomitic phyllite.
- Quartzite
- Montacute Dolomite, phyllite at base in places.
- Quartzite
- Phyllite, thin dolomitic interbeds.
- Quartzite
- Phyllite
- Castambul Dolomite

- Lithological boundary, accurate
- Lithological boundary, approximate
- Lithological boundary, inferred
- Fault, accurate
- Fault, inferred
- Syncline, approximate
- Anticline, accurate & plunge
- Anticline, approximate
- Anticline, overturned & plunge
- Plunge of small fold
- Trend of bedding
- Strike & dip of bedding
- Strike & dip of foliation
- Diamond drill hole
- Proposed diamond drill hole inclined at 70°
- Track
- E.T.S.A. transmission line
- Quarry
- Geological section line
- Contour value in metres (A.H.D)
- Section Number
- Hundred boundary

SCALE 1:5000

METRES 100 0 100 200 300 400 500 METRES

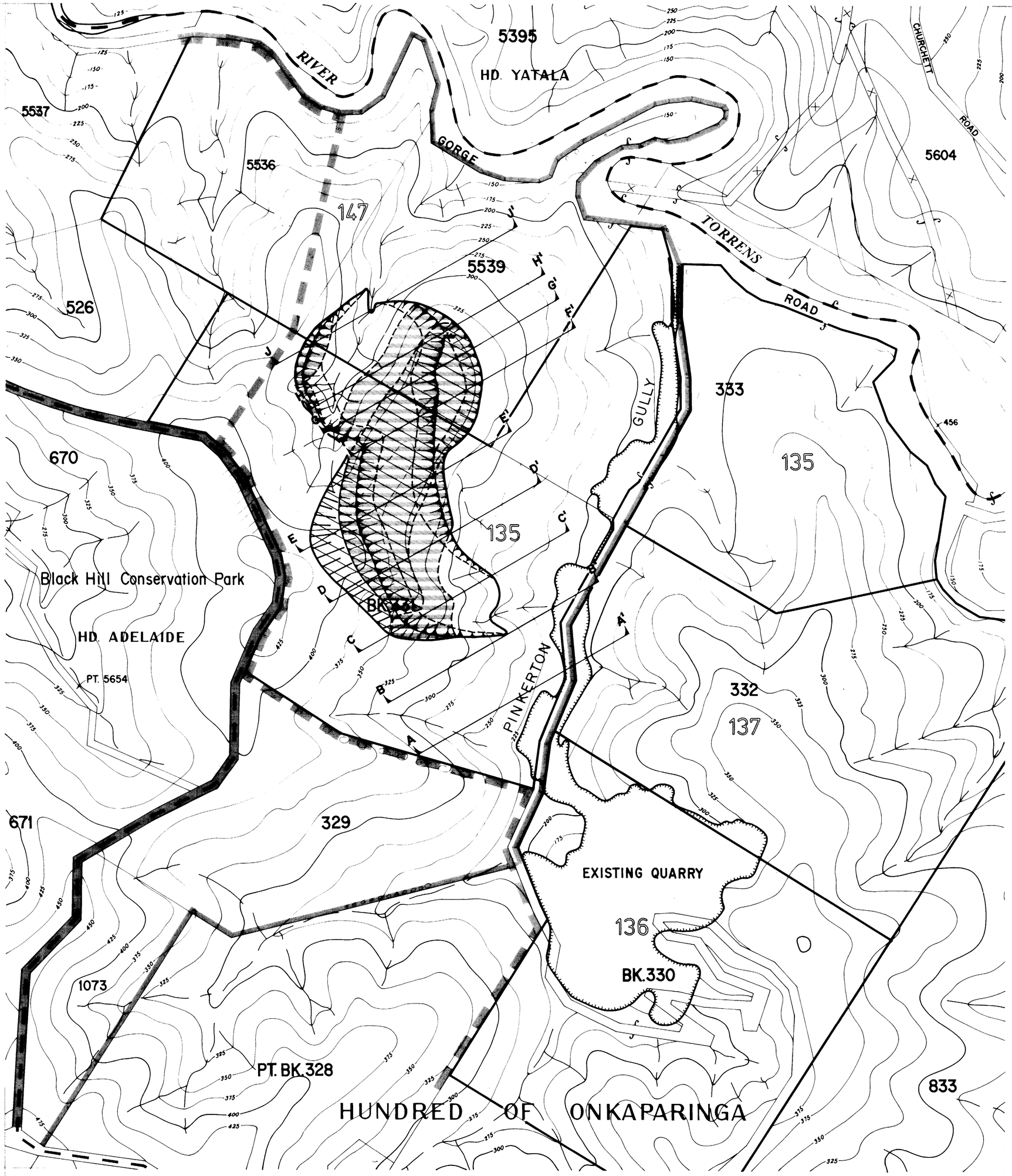
Note for geological cross sections A-J see plan No 76-977

DEPARTMENT OF MINES—SOUTH AUSTRALIA

BLACK HILL CONSERVATION PARK DOLOMITE DEPOSIT
GEOLOGICAL PLAN

EXTRACTIVE MINERALS	COMPILED J.VALENTINE	DRN L.C.	SCALE 1:5000	PLAN NUMBER 76-975
DIRECTOR OF MINES		CKD	DATE DECEMBER '76	

G628-3



True North
Magnetic North

LEGEND

Private Mine Boundary

Private Mine Number — 135

Eastern boundary of open space area as designated in the authorized Metropolitan Adelaide Development Plan.

Extended eastern boundary of Black Hill Conservation Park as originally recommended by Black Hill Steering Committee.

Present extended eastern boundary of Park as ammended following recommendations of Extractive Industries Committee.

Proposed Quarry

Stage 1 R.L. = 345m

Stage 2 R.L. = 310m

Stage 3 R.L. = 260m

Outline of present quarry.

Cross section line. — A A'

Contour value in metres (A.H.D.) — 425

Section Number. — 333

Hundred boundary.

SCALE 1:5000

METRES 100 0 100 200 300 400 500 METRES

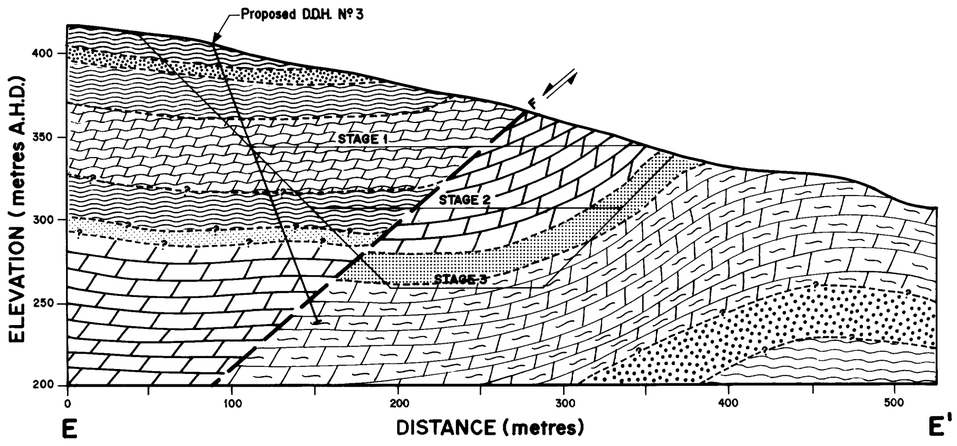
Note for geological cross sections A-J see plan Nº 76-977

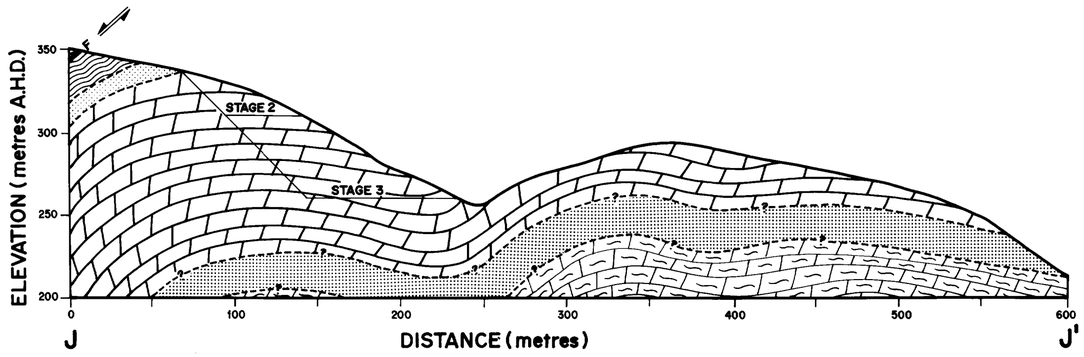
DEPARTMENT OF MINES - SOUTH AUSTRALIA

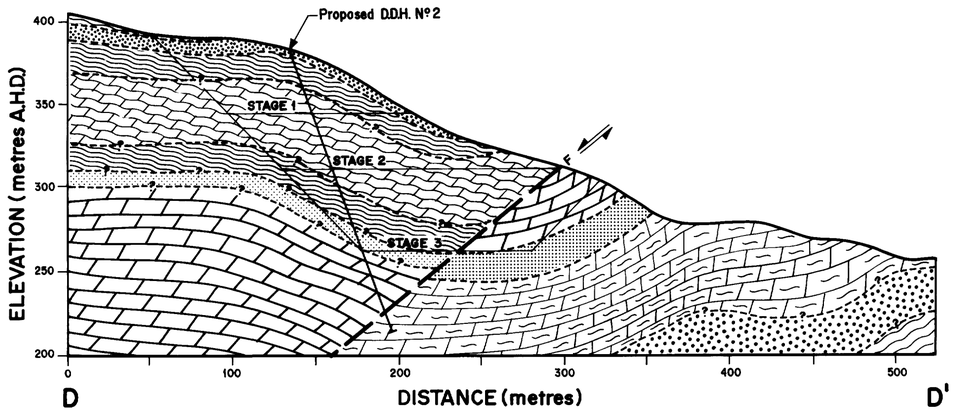
BLACK HILL CONSERVATION PARK DOLOMITE DEPOSIT
QUARRY OUTLINES & PARK BOUNDARIES

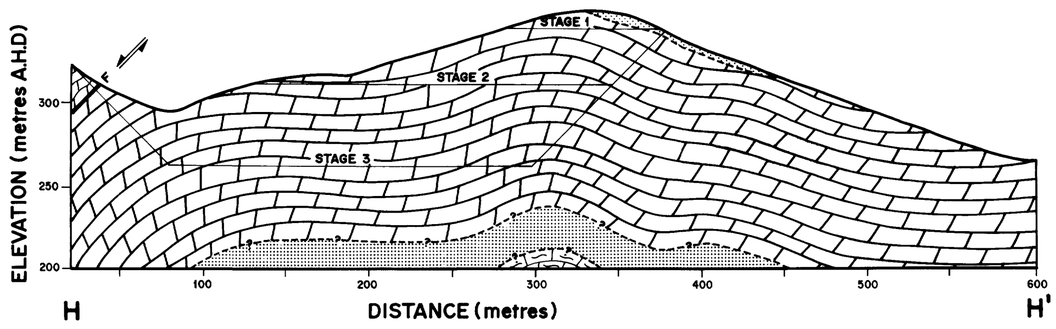
EXTRACTIVE MINERALS	COMPILED J. VALENTINE	DRN L.C.	SCALE 1:5000	PLAN NUMBER
DIRECTOR OF MINES		CKD	DATE DECEMBER '76	76-976

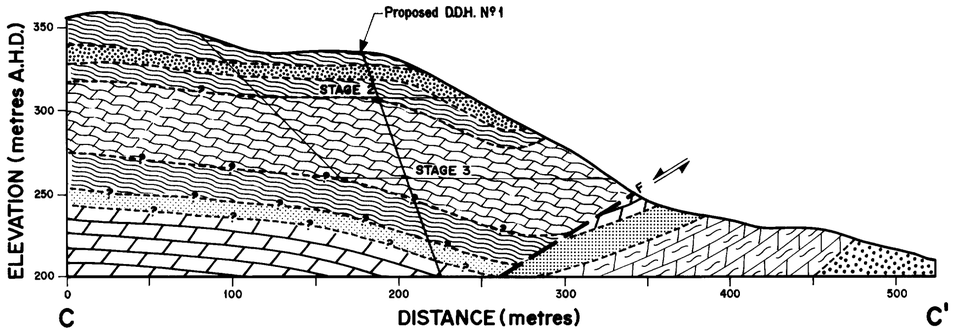
6928-3

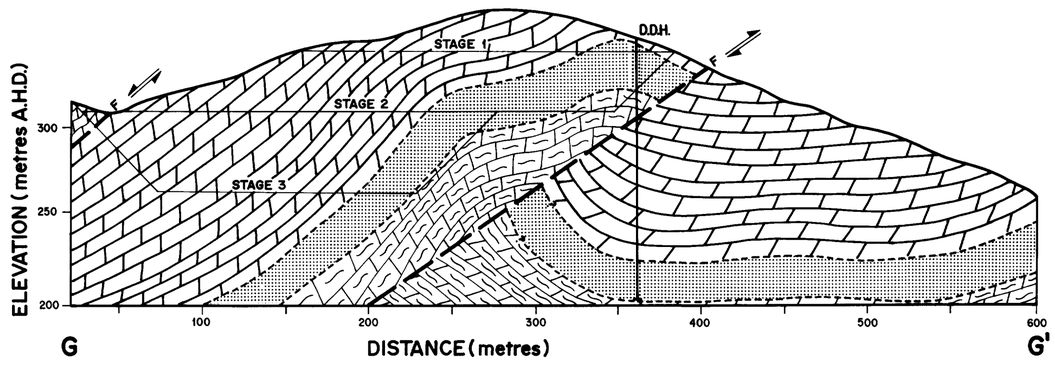


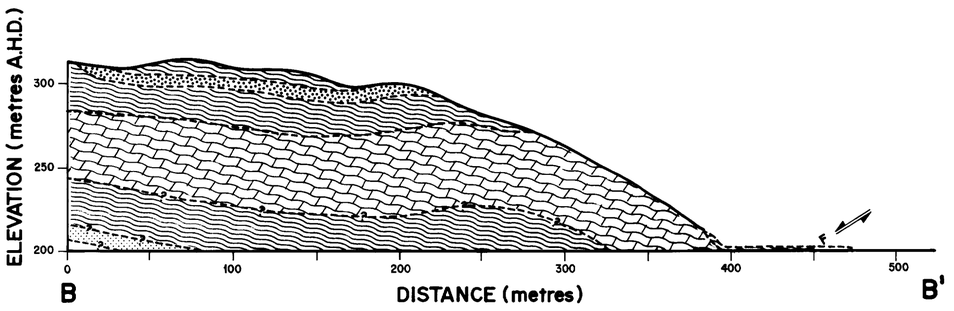


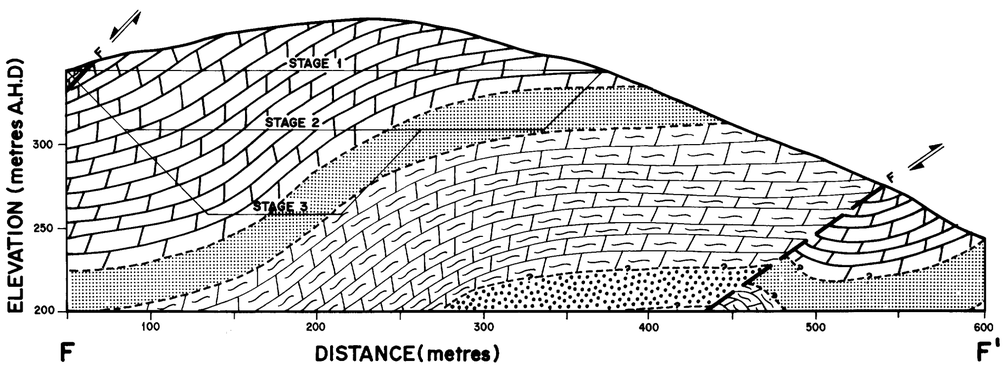


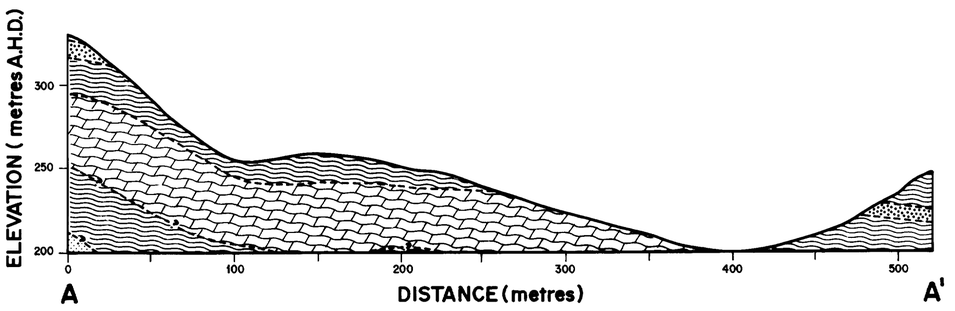












Note for section location & legend see plan Nº 76-975

DEPARTMENT OF MINES - SOUTH AUSTRALIA

BLACK HILL CONSERVATION PARK DOLOMITE DEPOSIT

GEOLOGICAL CROSS SECTIONS A - J

EXTRACTIVE MINERALS	COMPILED J. VALENTINE	DRN L.C.	SCALE 1:2500	PLAN NUMBER
DIRECTOR OF MINES		CKD	DATE DECEMBER '76	76-977

G826-3