DEPARTMENT OF MINES
SOUTH AUSTRALIA

Report on

DOLOMITIC SHALE DEPOSIT - YONGALA

Reserve North of Section 161, Hundred Mannanarie

(Highways & Local Government Department)

by

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Geologist

CONTENTS

Plan No.	Title	Scale
64-772	Dolomitic Shale Deposit - Yongala North of Sec. 161, Hd. Mannanarie (H. & L.G. Dept.) - Geological Plan.	50 ft. to 1 inch

Rept. Bk. No. 59/69
G.S. No. 2968
D.M. 1318/52

18th September, 1964.

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ABSTRACT

Screenings for bituminous surface treatment are sought by the Highways and Local Government Department in the Yongala area. Results of a geological and topographical survey of a previously worked dolomitic shale deposit near Yongala are reported. Diamond drilling indicated that the quarry could not be successfully extended to the east along strike. An investigation of alternative sources of screenings is recommended.

INTRODUCTION

The Highways & Local Government Department is seeking 20,000 cubic yards of screenings for Bituminous Surface Treatment in the Yongala District, and has requested a report on the existing dolomitic shale quarry in the reserve north of Section 161, Hundred of Mannanarie. The quarry is situated about 3 miles west of Yongala just south of the Yongala - Mannanarie road (see Locality Plan, Fig. 64-772). Dolomitic shales and associated beds strike approximately east-west and dip steeply to the south. The country is mainly bare pasture land of low relief.

When the quarry was previously operated, the Highways Department was able to remove considerable quantities of crushed rock for use as base material. This assisted in maintaining the quality of screenings. About 40,000 cubic yards of stone have been removed. As no further supplies of base material are required in this area, successful operation of the quarry would demand a high proportion of sound rock.

The quarry and surrounding area was inspected on 19th May, 1964 with N. Hiern (Geologist), and a stadia survey was carried out on 27th May with the assistance of J. Erkelens

(Surveyor). A diamond drill hole (190 feet in length) was bored to test the dolomitic shales and associated beds at the eastern end of the quarry, but failed to recover a sufficient proportion of satisfactory rock. Subsequently a more detailed examination was carried out at the western end of the quarry.

The areas marked on the locality plan have been previously examined for the Highways Department. (Forbes (1959, 1960)).

Previous Reports

B.G. Forbes (1959) unpublished: Ironstone and Limestone for Road Metal - Section 201 and Reserve, Hundred Mannanarie.

B.G. Forbes (1960) unpublished: Results of Drilling for Road Metal - Sec. 201 and Reserve, Hd. Mannanarie.

GEOLOGY

The rocks in the Yongala district form part of the Sturtian Series of the Proterozoic Adelaide System and are steeply dipping, folded and faulted. In the area surveyed, dolomitic sediments, limestones and shales strike approximately east-west and dip steeply to the south. The country is bare pasture land of low relief, and outcrop is limited. Detailed geological information was only available from the quarry.

The previously quarried dolomitic beds were the subject of the investigation. These beds form part of a sequence consisting dominantly of limestone and shale. The strike of the beds is reasonably constant throughout the quarry and appears to persist to the east. No outcrop of these dolomitic beds occurs beyond the western end of the quarry because of quarry dumps and soil cover. However strike readings obtained in an area of patchy limestone outcrop south-west of the quarry indicate some degree of structural disturbance beyond the western end of the quarry.

Detailed examination of quarry faces showed marked variations in lithology, jointing and strength characteristics.

Detailed sections measured at the eastern and western ends of the quarry are given below. They show that the proportion of massive dark grey and black dolomite is not high. A considerable proportion of other stone which could prove suitable for screenings is interbedded with the black dolomite, together with a high proportion of unsuitable shaly and flaggy sediments, particularly at the eastern end.

Section Measured at Eastern End of Quarry

(from south to north, normal to strike)

30' - Stone of variable quality, consisting of interbedded light grey dolomitic shales, finely bedded dolomites and massive black dolomite. (a)

5' - Massive black dolomite (b).

15' - Similar to (a).

5' - Similar to (b).

15' - Similar to (a).

5' - Mainly massive black dolomite.

10' - Similar to (a).

Section Measured at Western End of Quarry

(from south to north, normal to strike)

12' - Fawn dolomite or limestone.

2' - Fawn shale and siltstone - thinly bedded.

52' - Fawn and grey dolomite or limestone, mainly massive; minor shaly beds. Minor sulphide and siderite mineralisation.

18' - Black dolomite, containing several thin beds of fawn and grey dolomite, and several shaly bands.

22' - Interbedded dark grey dolomite and light grey dolomite or limestone -sound, massive stone.

2' - Dark grey dolomite, somewhat flaggy.

8' - Tough fawn limestone or dolomite.

DIAMOND DRILLING

The dolomitic beds could not be traced beyond the western end of the quarry. Available outcrop information from surrounding areas suggests structural complications in this direction. Although the quality of stone is inferior at the eastern end of the quarry, topography is more favourable for quarrying than at the western end. It was decided to test the dolomitic beds to the east of the quarry to see whether the deterioration in stone quality persisted in this direction. A diamond drill hole 190 feet in length, depressed 30 degrees from the horizontal was bored at right angles to the strike of the bed.

Core loss was heavy during drilling, with only 59% core recovery. This would suggest a high proportion of friable or shaly material unsuitable for ballast. Much of the core recovered consisted of unsuitable shaly and flaggy material. It would appear that stone quality continues to deteriorate beyond the eastern end of the quarry.

Core recovery estimates and a summary of drilling results are appended, together with a detailed drill log.

CONCLUSIONS AND RECOMMENDATIONS

The proportion of stone suitable for screenings at and beyond the eastern end of the quarry is insufficient to justify further quarrying to the east.

Test drilling of the dolomitic beds west of the quarry cannot be recommended because of lack of outcrops and evidences of structural complication.

Regional geological mapping of the Burra and Orroroo 4 mile sheets by the Regional Mapping Section of the Mines Department has located other dolomitic beds in the Yongala District (R. Mirams, personal communication). It is recommended that these possible alternative sources of screenings be examined.

J. N. CRAMSIE
Geologist
NON METALLIC MINERALS SECTION

JNC:AGK
16/9/64

A P P E N D I C E S

APPENDIX I - Summary of Diamond Drilling Results

APPENDIX II - Detailed Diamond Drill Log.

APPENDIX I - SUMMARY OF DIAMOND DRILLING RESULTS

BORE H1 - YONGALA

0 - 62' (42% Recovery) - Core severely fragmented. Core recovered is dark grey dolomite and dolomitic mudstone, with a considerable proportion of weak shaly material. Low core recovery and core fragmentation indicate a high proportion of friable material.

62 - 85' (65% Recovery) - Core recovered is fine grained dark grey dolomite, with an increasing proportion of shaly material towards base.

85 - 100' (50% Recovery) - Core severely fragmented. Core recovered is dark grey to black dolomitic mudstone and shale. Low core recovery indicates a high proportion of friable material.

100 - 170' (71% Recovery) - Core less fragmented. Core recovered mainly dark and light grey dolomitic shale with minor bands of dark grey dolomite or dolomitic mudstone.

170 - 190' (55% Recovery) - Severe core fragmentation. Core recovered is dark grey dolomitic shale, finely bedded, with a strong tendency to fracture along bedding planes.

APPENDIX II - DETAILED DIAMOND DRILL LOG

PROJECT: DOLOMITIC SHALE - HIGHWAYS - YONGALA D.M.: 1318/52

BORE NO.: YONGALA 1 BORE SERIAL NO. DD: H1

HUNDRED: MANNANARIE SEC. Reserve north of 161 PLAN REFERENCE: 64-772

DEPTH: 190 Feet R.L. OF COLLAR: 1703 ft. (arbitrary datum)

BEARING: 355 DEPRESSED: 30° DRILLER: G. Mihaljevic

DATE DRILLING COMMENCED: 2.6.64 DATE DRILLING COMPLETED: 10.6.64

LOG

DEPTH From Ft.	In.	To Ft.	In.	Core Recovered Ft.	In.	
0	0	4	0	2	0	Brown soil with weathered dolomite fragments.
4	0	10	0	4	4	Core badly fragmented. Core recovered is mainly dark grey fine grained massive dolomite with some mid grey shaly dolomite beds. Moderate amount of iron oxide and clay in joints.
10	0	15	0	1	6	Core badly fragmented. Core recovered is dark grey to black dolomite, with minor joint mineralisation as (4'0"-10'0")
15	0	20	0	2	10	Core recovered is mainly massive dark grey dolomite. Core is badly fragmented in upper section.
20	0	25	0	2	0	Core mainly fragmented. Core recovered is coarse bedded (½"-3") dark grey dolomite, with minor solution cavities up to ⅛"
25	0	30	0	2	0	Core badly fragmented. Core recovered as (20'0" - 25'0").
30	0	35	0	1	8	Core mainly fragmented. Core recovered is dark grey dolomitic mudstone minor pyrite impregnation with associated solution cavities and ironstaining.
35	0	40	0	2	2	Dark grey dolomite. Core recovered is shaly and badly fragmented, except for basal 1 foot.
40	0	45	0	1	0	Core fragmented. Core recovered is dark grey dolomite and dolomitic shale.
45	0	47	0	1	5	Core fragmented. Generally medium bedded (¼" - 1") dolomite, with a few shaly lenses and 3" of light grey shale at the base.

LOG

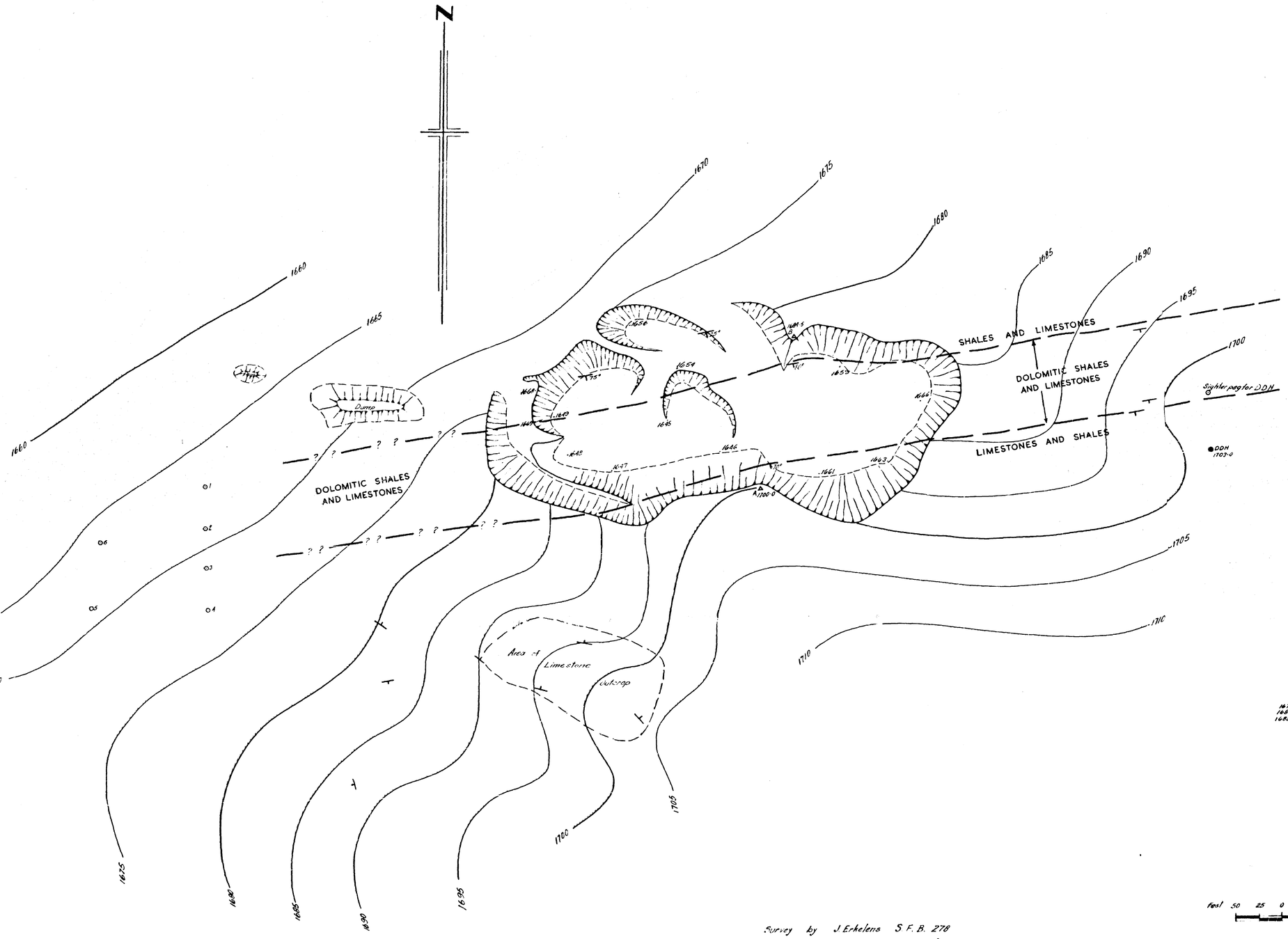
DEPTH From Ft. In.	DEPTH To Ft. In.	Core Recovered Ft. In.	
47 0	52 0	1 8	Core mainly fragmented. Core recovered is coarse bedded dolomiti mudstone impregnated by minor mica(?).
52 0	57 0	1 5	Core mainly badly fragmented. Core recovered is black dolomite with some shaly partings.
57 0	62 0	1 8	Core fragmented. Core recovered is black dolomite, with medium to heavy white clay mineralisation in joints and fractures.
62 0	67 0	3 2	Minor fragmentation of core recovered which is very fine grained black dolomite, generally massive, with medium to heavy white clay mineralisation in joints and fractures.
67 0	70 0	2 0	Core recovered is fine grained dark grey dolomite, with traces of pyrite and mica; medium to coarse bedded (½" - 2").
70 0	75 0	3 2	Some core fragmentation. Core recovered is black dolomite; coarsely bedded; minor mica (?).
75 0	80 0	3 4	Minor core fragmentation. Core recovered is black dolomitic mudstone and shale, with a strong tendency to fracture along the bedding planes.
80 0	85 0	3 0	Core mainly fragmented. Core recovered black dolomite and dolomitic shale.
85 0	90 0	1 6	Core mainly fragmented. Core recovered is black finegrained dolomite.
90 0	95 0	2 10	Core mainly fragmented. Core recovered is interbedded dark and light grey dolomitic shales, with a moderate tendency to fracture along bedding planes.
95 0	100 0	3 1	Some zones of heavy core fragmentation. Core recovered is black dolomitic mudstone and shale, with minor finegrained pyrite.
100 0	110 0	8 2	Minor core fragmentation. 100' - 107' Massive dark grey dolomite. 107' - 110' Banded dark and light grey dolomitic shale, with a strong tendency to fracture along bedding planes.

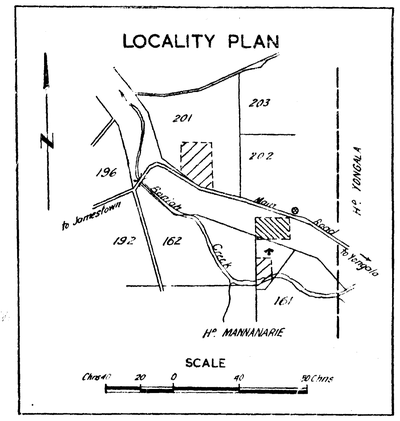
LOG

DEPTH From Ft. In.	DEPTH To Ft. In.	Core Recovered Ft. In.	
110 0	120 0	8 4	Core recovered similar to (107'-110') but with more pronounced bedding development due to the presence of minor amounts of mica parallel to the bedding. Traces of pyrite.
120 0	130 0	5 5	Minor core fragmentation. Core recovered as (110'-120'), but banding is more strongly developed, with a few thin (up to ¼") quartz veins.
130 0	140 0	7 10	Minor core fragmentation. Core recovered is banded dark and light grey dolomitic shale, with strongly developed banding. There is a strong tendency towards fracture along bedding planes, accentuated by the development of mica.
140 0	150 0	7 4	Core recovered (as 130'-140') with a few more massive dolomite bands.
140 0	160 0	9 3	150' - 151'6" (as 140'-150') 151'6" - 153'6" Banded purple and black mudstone, with a tendency to crumble readily. 153'6" - 156' Dark grey dolomitic shale with moderate development of bedding. 156' - 160' Black dolomitic mudstone, with moderate development of white clay in joints and fractures.
160 0	170 0	7 11	Banded dark and light grey dolomitic shale. Bedding is developed only moderately.
170 0	180 0	5 3	Severe core fragmentation at top of run. Core recovered is dark grey dolomitic shale with minor pyrite development. There is a strong tendency to fracture along bedding planes.
180 0	190 0	5 9	Dark grey dolomitic shale; finely bedded. Bedding is well developed, with a strong tendency to fracture along bedding planes. Minor development of pyrite and mica.
			BORE COMPLETED AT 190 ft. NX to 40'. BX to 100' AX to 190'.

Bore logged by J. CRAMSIE

Date 16th July, 1964.





Area surveyed

Areas previously investigated

Corner of fence marked ● is
103' from station A bearing 055
207' " " B " 062

LEGEND

- *1659' Spot heights
- 1675 / 1680 / 1685 Contours (5ft. interval, arbitrary datum)
- 60° Strike and dip of bedding (with angle of dip where known)
- ⊙ 4 Numbered survey pegs
- Probable boundary of useful stone
- ?? Inferred boundary of useful stone

SCALE

Feet 50 25 0 50 100 150 200 250 Feet

Survey by J. Erhelens S.F.B. 278

To accompany a report by J.N. Cousins

S.A. DEPT. OF MINES

DOLOMITIC SHALE DEPOSIT—YONGALA
NORTH OF SEC. 161 HD. MANNANARIE
HIGHWAYS DEPT.
GEOLOGICAL PLAN

Associated Drawing	No.	No.	Amendment	Exd.	Date

Req. No.
D.M.
Compiled from

Approved	Passed	
Director of Mines		Drn. Tcd. B.I.S. Ckd. Exd.

Scale 50 Feet to 1"
64—772
Date 17-9-64