Rept. Bk. No 38-34
G.S. 138
DM 1194/54

U N C L A S S I F I E D

DEPARTMENT OF MINES

SOUTH AUSTRALIA

PRELIMINARY SURVEY OF ROAD METAL DEPOSITS

TUMBY BAY DISTRICT

Part Hd. of Hutchison

INTRODUCTION

Following a request from the Highways and Local Government Department for geological advice on road metal deposits in the north-west portion of the Hundred of Hutchison, Tumby Bay District (H. & L.G.D. 840/50), a preliminary survey of rock outcrops in the area was carried out on 12- 13th August, in the company of the Assistant District Engineer (Mr. D.E. Roberts).

REQUIREMENTS

The initial request was for an examination of "ferruginous gravel and reefs" in Sections 134, 143, 140, 105, 100, 27, 135, 136, 808 and 138, Hundred of Hutchison, and quartzite in Sections 143 and 140 - adjacent to ironstone reefs. In a subsequent memo (3/8/54) to the Assistant Engineer, a special attention was directed to a white quartzite forming a high ridge on Sections 105 and 110.

Meyal requirements for the planned road-making in the district will be of a very large order, but immediate needs are detailed as follows:-

(a) 50,000 cubic yards of crushed rock for base course work, Ironstone or ferruginous quartzite occuring in thedistrict has been suggested as suitable for this purpose.

(b) Not less than 25,000 cubic yards of clean quartzite for use in bituminous aggregate for road surfacing

Advice on the best material available of these specifications is urgently required as it will be necessary to commence quarrying operations within a few weeks to meet the present road construction programme.

Information has also been sought on alternate sources of supply of road metal in the ranges to the west of the Lincoln Highway between Pt. Lincoln and Tumby Bay, and will be treated in a subsequent report.

GEOLOGY

The area investigated is hilly comprising Archean metasedimentary rocks, in places capped by superficial lateritic iron formations. This area was selected by Highways Department officials as offering best prospects as a source ofcheaply quarried stone for road construction work, in comparison to surrounding areas in which granitic rocks predominate.

A general sub-division of the Archean metasediments in the north-west portion of the Hundred of Hutchison is shown in the accompanying reconnaissance geological plan, and comprises four distinctive horizons, trending in a north-easterly direction, as detailed hereunder:-

1. The lowest or most westerly succession of schistose rocks (memamorphosed slates etc) with minor quartzite beds, and the higher outcrops capped by lateritic ironstone, These include exposures in the western portion of Sections 105, 100 and 96 and in Section 134, and are regarded as unsuitable for any road-making work. The lateritic capping found

in places (e.g. Section 134) could not be expected to extend for more than a few feet in depth and would only provide widely distributed small tonnages of material for foundation use (by bulldozing.)

2. A white bedded quartzite measuring from 30 - 40 feet in thickness. It outcrops prominently along the crest of a high ridge extending north-easterly through Sections 105 and 100, and on geological evidence could be expected to underlie soil covered areas in Sections 27 and 135 etc. The dip is at a steep angle (70°) to the east.

This bed offers best possibilities as a source of high quality road metal in the area examined, and suitable quarry sites along the outcrop are further discussed under the heading of Site A below.

3. Overlying the quartzite are several hundred feet of poorly outcropping Schistose metasediments.

4. Bedded ferruginious quartzite formation, interbedded with thin layers of schistose rock. The surface outcrops of these rocks are featured by a heavy limonitic staining, and pockets of hematite, cementing fragments of finely laminated quartzite At a depth of a few feet they probably consist mainly of quartzite with thin ironstone partings.

Ferruginious quartzites outcrop prominently in the central portion of Section 109, and can be traced through Sections 105, 101 and 96. The same formation is also exposed along a high ridge in Sections 143 and 140.

There are beds of ferruginious quartzite of sufficient thickness to warrant consideration as a quarrying proposition, and which should provide good bonding material for base course work - but unsuitable for bituminous aggregate. Two readily accessible deposits of this type are described as Site B and Site C.

SUGGESTED QUARRY SITES

Three localities are recommended as being the best available sources of stone requirements. The positions of these deposits are shown on the accompanying plan and details observed during the preliminary survey are as follows:.

SITE A - Clean quartzite for best grade road metal

A white quartzite bed of approximately 30-40 feet thickness forming the crest pf a high ridge extending through Sections 105 and 100. Assuming that this bed is solid quartzite - which appears probable but cannot be definitly be determined from the surface outcrops - the immediate requirements of 25,000 cubic yards of metal for bituminous aggregate would be readily available by normal quarrying methods at each of several positions along the ourcrops w ere a face is exposed by creek dissection.

Any proposed quarrying should be designed to follow the north-easterly strike of the formation. The dip is steep to the aset (70^{o}).

Access to the best quarry sites may be difficult due to steep grades. A poor track passes down a steep gully on the east side of the most northerly outcrop and joins the Koppio road one half mile south of the Yallunda Flat turn off, but the remainder of the area is at present in- accessible to motor vehicles.

SITE B - Ferruginious quartzite for base courses only

An outcrop of ferruginious quartzite in Section 109 which measures approximately 40 feet in width and is readily accessible by means of a track leading off the Koppio road in Section 120, Hundred of Koppio. Here the ferruginious quartzite could be quarried in large quantities, and can be expected to increase in quality (or quartzite content) beneath the gosany capping.

SITE C - Ferruginious quartzite for base work only:

Outcrops im Sections 143 and 140, on both sides of a made road. Ferruginious quartzites are present as three or four disticnt beds each of the order of 20feet wide and seperated by similar widths of poorly outcropping softer schistose rocks. There are several good faces in the quartzite suitable for quarrying but it is doubtful whether there is sufficient thickness to any of the beds for successful and cheap operation.

The strike of the succession at this place is ENE with the dip at 70° to the north.

RECOMMENDATIONS

The preliminary survey has shown that the potentially best deposits of all-purpose road metal is provided by white quartzite on Sections 105 and 100. The outcrop extends as a high ridge for about ¾ mile in length and would require further detailed examination in regard to true width and access before a decision can be made on its suitability.

The following programme of exploration on the quartzite is recommended:-

1. Inspection of the deposit by Highways Dept. officers to determine best sites for quarrying along strike of the bed.

2. Testing of the true width and quality of the deposit in the selected areas by daimond drilling or open costeaning at right angles to the bedding. This would be important in supplying information on the possible presence of interbedded slatey or schistose material which could render the deposit unsuitable for best grade road metal.

Alternatice deposits of ferruginiois quartzite at Sites B and C may be useful source of rock suitable for road foundation work. Further detailed mapping of these two areas would be necessary before an opinion could be given on the yardage available.

D. KING
GEOLOGIST

DK:BK
18.8.54

for ENGINEERING GEOLOGY & MINERAL RESOURCES SECTION.