DEPARTMENT OF MINES
SOUTH AUSTRALIA

RIB 51/134

Report on

ORAPARINNA BARYTES MINE

ML. NOS. 2933-2936, 2996, OUTSIDE HUNDREDS, CO. TAUNTON

(South Australian Barytes Limited)

by

L. G. Nixon
Geologist

MINERAL RESOURCES SECTION

GEOLOGICAL SURVEY

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G.S. 1873
D.M. 1428/59

1st December, 1960

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ORAPARINNA BARYTES MINE

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(S. A. Barytes Limited)

1. ABSTRACT

Lower Cambrian, Marinoan and Sturtian Series sediments are folded into a north easterly pitching syncline contained in a composite faulted wedge, with its apex directed towards the south west.

Barytes occurs in veins occupying steeply dipping tension fractures in the Purple Shale formation immediately beneath the A.B.C. Quartzite. The main vein mapped on No. 3 level averages 8 feet in width over a length of 340 feet. Near the south end of the drive on this level the bottom of the vein was mapped pitching 52 degrees towards 50 degrees. Reserves are estimated at 430 tons per vertical foot. Available reserves would be dependent on mining methods.

2. INTRODUCTION

Following a visit to the mine in July 1959, L. L. Mansfield (Inspector of Mines & Quarries) recommended a geological survey of the No. 3 level and winzes to guide future development and stoping.

Because of water shortage during February 1960, the walls could not be washed till the water bore at the mine had been deepened, and the water supply position improved, consequently the proposed survey was postponed.

Between 31st May - 2nd June 1960 adequate water was available for hosing down the walls, and geological mapping of the cross cut and drive on No. 3 level and Nos. 1 and 3 winzes, and the stope was completed; at the same time a stadia survey of the workings below No. 2 level was carried out by M. B. Langsford and M. Orian (Surveyors).

3. REFERENCES

Mining Review 73, p. 69 1941 (H. S. Cornelius)

Mining Review 75, p. 68 1942 (H. S. Cornelius)

Mining Review 76, p. 97 1943 (H. S. Cornelius)

Mining Review 82, pp. 82-89 1946 (E. Broadhurst)

Mining Review 82, pp. 121-127 1946 (L. L. Mansfield)

Mining Review 86, pp. 112-114 1948 (L. L. Mansfield)

Mining Review 87, pp. 203-204 1949 (L. L. Mansfield)

Mining Review 91, pp. 200-201 1951 (L. L. Mansfield)

Mining Review 102, pp. 84-100 1955 (A. A. Gibson)

Structural Geology, De Sitter

Transactions of the Roy. Soc. of S. Aust. Vol. 72, (2) 1948, pp. 276-280. MAWSON, D and SEGNIT.

4. TOPOGRAPHY AND ACCESS

The Oraparinna Barytes Mine is approximately 66 miles NNE of Hawker and 10 miles ENE of Oraparinna Head Station, on the steep southern slope of a low range of rugged hills known as the Bunkers. Barytes is trucked from the mine to Hawker where it is transhipped and railed to the crushing plant at Quorn 42 miles to the south.

The main Hawker-Blinman road is kept graded and in good repair, but tends to get damaged by heavy transport when wet. The access road from Oraparinna head station to the mine is well marked but rough in places.

Rainfall is low, (approximately 9 inches per annum) and surface water scarce. The mine is dependent on a bore for its water supplies.

5. GEOLOGY

The general geology of the area is outlined on the Oraparinna photomosaic sheet No. 670, zone 6, and comprises Cambrian, Marinoan and possibly Sturtian sediments, folded into a north easterly pitching syncline and faulted in a composite wedge against Marinoan and Sturtian sediments to

the north west and south east. The apex of the wedge points to the south east.

The fault along the north west of the wedge strikes 020° and has a relative movement of north block up and north, the apparent shove and throw being of the order of 2 miles.

The fault along the south east of the wedge strikes 052° and has a relative movement of north block down and south, the apparent shove and throw being about 4 miles.

The two smaller faults within the wedge strike parallel to the south eastern fault, but the relative movement is similar to the north western fault, i.e. north block up and north, the shove and throw being between ½ and ¾ of a mile each.

Barytes occur in veins in the Purple Slates formation in the Marinoan series of the Adelaide System. The occurrence of barytes in this part of the stratigraphic column is common throughout the State and has been commented on by Mawson and Segnit (op. cit). These workers found "that these shales in some areas at least have a notable content of barium and even copper". At the mine the barytes veins occur in the purple shales in tension fractures without apparent alteration of the country rock in a region isolated from igneous activity. These factors would allow the possibility of a lateral secretion type process for the formation of the deposit.

Sediments in the mine are predominantly grey or greenish-grey laminated and flaggy slates with purple staining in parts of the drive and adit. Beds strike 293° and dip 15° to 50° to the north east. Small folds and minor drags pitch between 15° and 25° towards the north east. In the south face of the drive on No. 3 level the beds are schistose, striking 075° and dipping 50°-55° northerly.

Strongly developed shear faults strike 056° and dip vertically or steeply north or south. A complimentary set of fractures mapped as joints may represent poorly developed conjugate shears striking 325° dip 80°N.

Previous mapping in the workings above No. 3 level shows a well developed system of conjugate shears striking

ESE and WNW approximately and dipping northerly between 40 - 50°.

Tension fractures strike 026°, dip 50-85° east, cutting across the bedding and shear planes. The open zig zag pattern of the vein in the southern portion of the No. 3 level drive shows the influence of the conjugate shear pattern on the tension fracturing. The veins on all levels show a change in strike direction from 026° in the southern part of the workings, to 050° in the northern part. On No. 3 level this change is due to new veins striking across the drive parallel to a well developed zone of shear faults. Of these new veins the northern most one is the most important, having an average width of 5 feet striking 060°, dip 76° northerly. This vein has been driven on for 30 feet, showing fault gauge (a few inches wide) just east of the centre of the vein running parallel to the hanging wall along the length of the back of the drive.

A second important vein with an average width of 3 feet, was intersected in the cross cut immediately east of station 303. This vein may be the northerly extension of a vein branching off the main vein immediately east of station 302. A northerly trending drive along this vein may make connection with No. 4 winze sunk from No. 2 level.

The main barytes vein on No. 3 level at the time of this investigation averaged a width of 8 feet over a length of 345 feet striking 016°, dip 50-85°E. Taking the average composition of the vein as 97.3 $BaSO_4$, 1.6% SiO_2, 0.13% Fe_2O_3, 0.21% H_2O (see M.R. 102, p. 88) and the S.G. of barytes as 4.5, the tonnage factor is 8.2 feet per ton. This gives reserves of 340 tons per vertical foot for the main vein.

Copper staining was noted in places along the drive and in the lower portion of No. 4 winze, showing up as green copper carbonates. The locations of these stainings are marked on map No. 60-600 accompanying this report.

6. WORKINGS

Workings on No. 3 level include an adit-cross cut 580 feet long, a drive along the vein 540 feet long and two cross cuts off the drive. Three winzes sunk from the No. 2 level connect directly or indirectly with No. 3 level (as mapped) and some stoping on the main vein and on what may be a branch of the main vein completes the present workings below No. 2 level.

A cross cut put into the west of the drive immediately west of Station 301 is 90 feet long and was designed to intersect a southerly projection of what may be the No. 1B lode, worked in the No. 2 level and which is being driven on at present at the north end of the No. 3 level. No lode was intersected in this cross cut, which may be because the lode does not extend as far south as the cross cut, or because the cross cut has been swung southerly to parallel the drive on No. 3 level. It is suggested that the cross cut be swung northerly at Station 304 (see level plan) or the lode be driven on in a southerly direction to the vicinity of the cross cut.

The second cross cut off the drive is located 200 feet further north, immediately east of Station 303, extended for 60 feet along a bearing of 075°. It was designed to intersect the northern extension of a branch lode exposed in the east wall of the drive immediately east of station 302. A strong vein was intersected at 55 feet along the cross cut and stoped back to No. 3 winze a distance of approximately 70 feet in a southerly direction to a height of 15 feet above the level. (It may have saved some dead work if the cross cut had been directed at right angles to the main drive.)

At the time of the survey no driving was in progress. One miner was employed in stoping and the others in trucking.

7. CONCLUSIONS

Sediments of Cambrian, Marinoan and possibly Sturtian age are folded into a north easterly pitching syncline and

faulted into a composite wedge with its apex directed towards the south west. The beds dip towards the north and north east at an average angle of 45°. There are no igneous rocks in the area.

Barytes occurs in veins in the Purple Slate formation in the Marinoan Series immediately beneath the A.B.C. Quartzite, and is of common occurrence in this stratigraphic position in the State.

At the southern end of the mine the barytes veins strike 026° and dip from steeply east to steeply west. Towards the northern end of the workings there is a general change of strike to 050°. The veins occupy tension fractures and vary in width from a foot to about fourteen feet and frequently contain horsts of country rock. The country rock is grey or greenish grey laminated and flaggy slates in places showing purple colouration and occasionally patches of copper staining near the vein. There appears to be an absence of wall rock alteration.

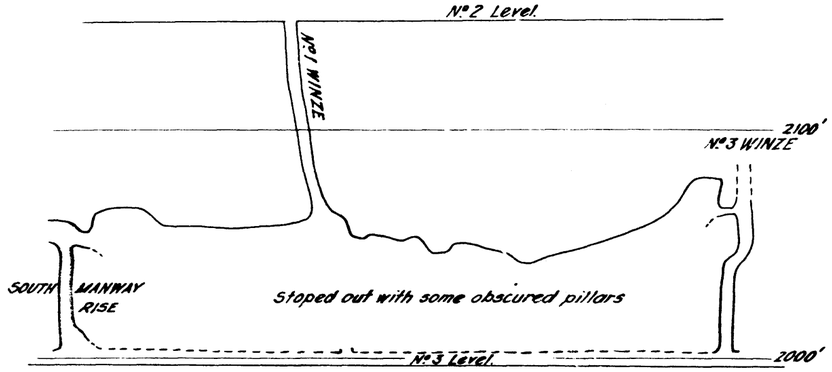
Conjugate shears fault the lode in the upper levels but only one shear direction is well developed on No. 3 level.

Reserves on the main vein are estimated at 430 tons per vertical foot. Available reserves will be dependent on mining methods used.

The high barium content in places in the chocolate slates, the frequent location of barytes veins in these sediments in this portion of the stratigraphic column, the lack of wall rock alteration at the mine and the absence of igneous activity in the area permits presumption that some lateral secretion process was involved in the formation of the barytes veins investigated.

L. G. NIXON
GEOLOGIST

LGN:CERF
1/12/60



PROJECTED SECTION THROUGH STOPE

Legend

- Lode
- Pitch of Minor Folds.
- Strike & Dip of Bedding 40°
- " " " Jointing 40°
- Shear Fault
- Schistose Zone
- Survey Station.

SOUTH MANWAY RISE

No 1 WINZE
Looking S.

No 3 WINZE, N Face
Looking N.

Survey by M.B. Langsford & M. Orian, Dept. of Mines & Geosurveys (Aust) Ltd.

To accompany report by L.G. Nixon.

S.A. DEPT. OF MINES

Associated Drawing	No.	No.	Amendment	Exd.	Date

Req. No.
D.M.
Compiled from

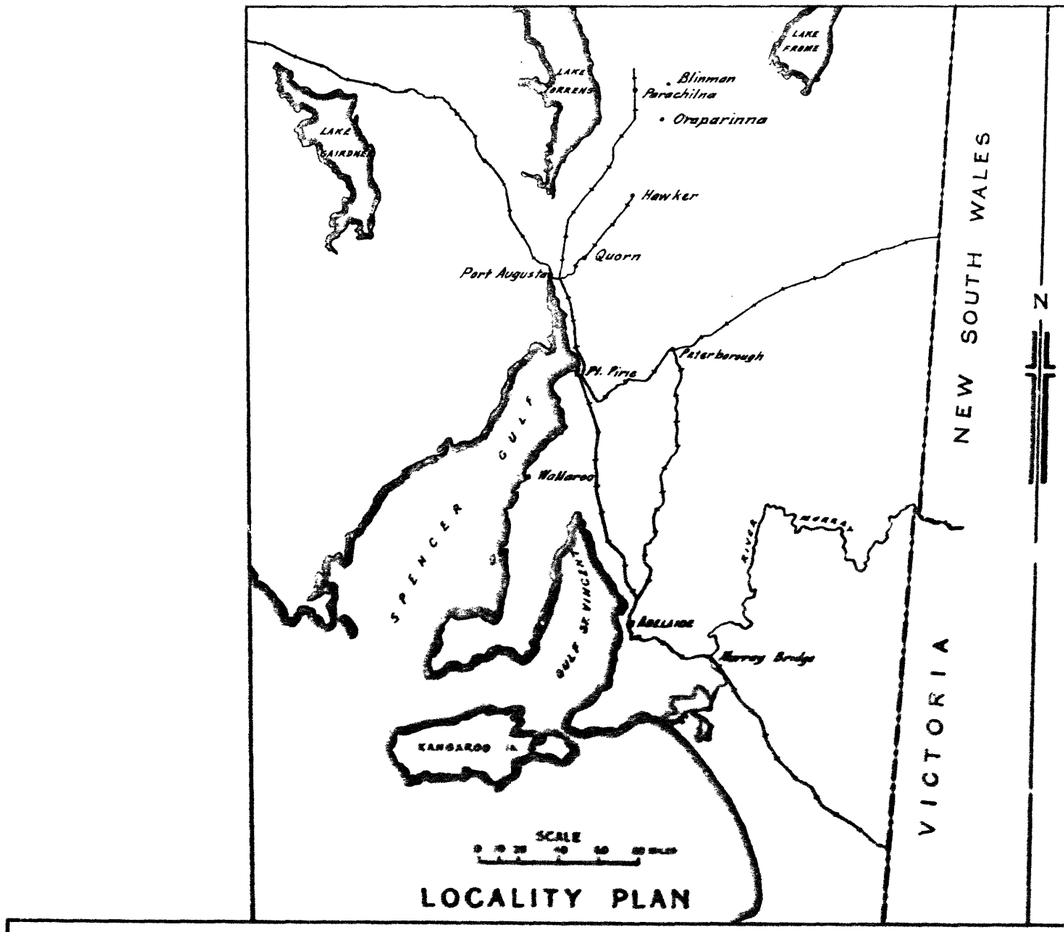
ORAPARINNA BARYTES MINE
(S.A. BARYTES)
No 3 LEVEL
GEOLOGICAL PLAN AND SECTIONS

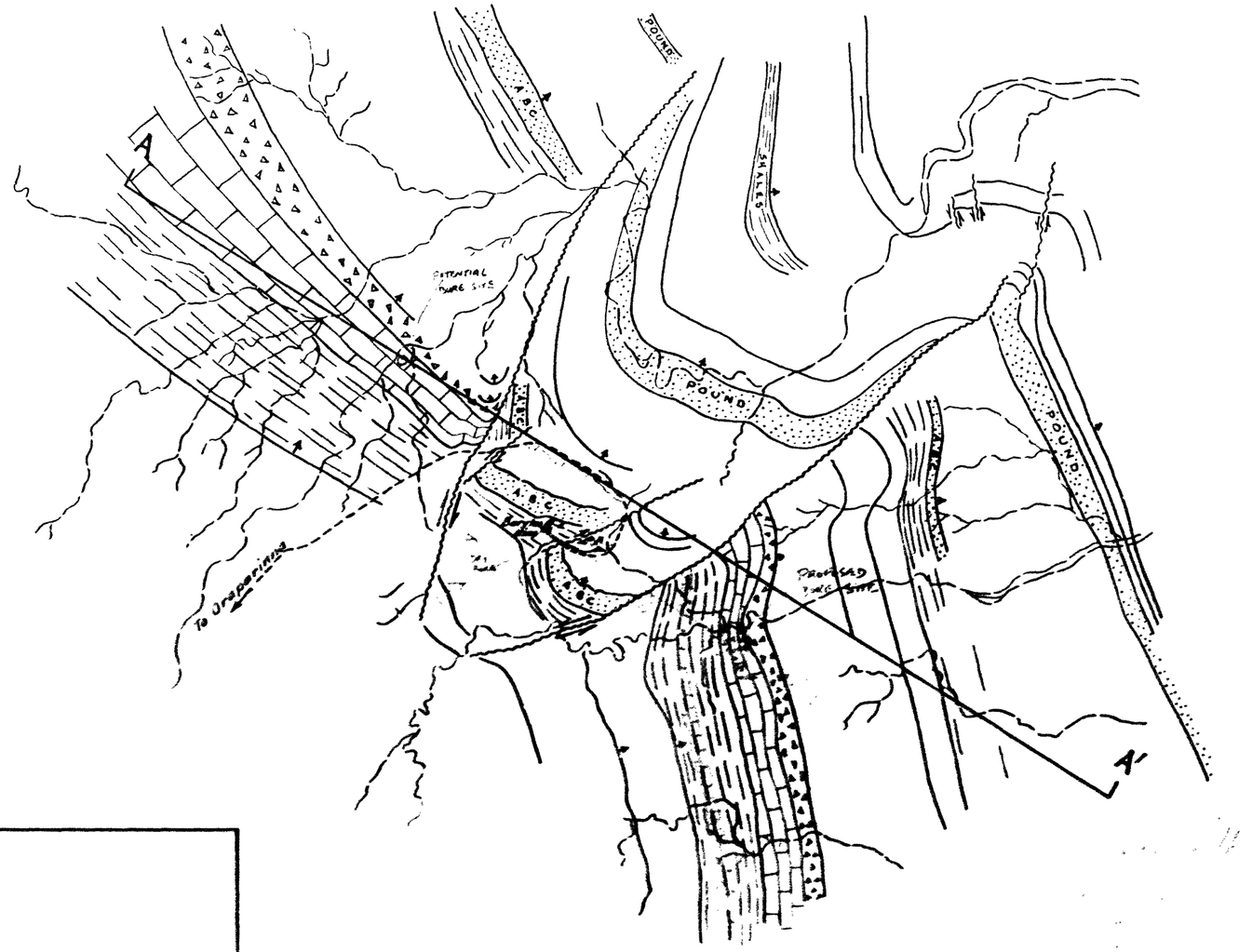
Approved	Passed
Director of Mines	

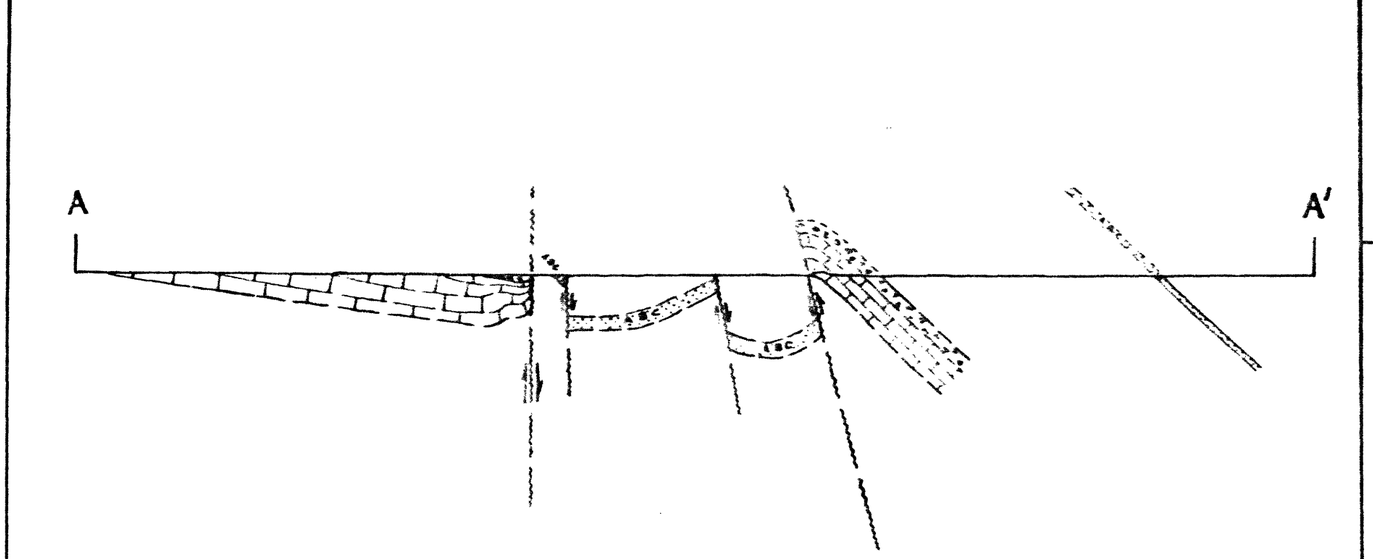
S.P.B. 134 & 5.12.
Drn. M.B.L. & L.G.N.
Tcd. M.B.L.
Ckd.
Exd.

Scale: Hor. & Vert. 40 ft. to 1 in.
60 - 600
Fa
Date 15-11-60.

600—7.58 2917







LEGEND

Pound Quartzite	POUND	Bedding Strike and dip	
ABC Quartzite	A B C	Fault showing relative movement	
Upper Tillite			
Hieroglyphic Limestone			
Shales and slates			
Barytes veins			

To accompany report by L. G. Nixon.

S.A. DEPT. OF MINES

100—7.58 2917

ORAPARINNA BARYTES MINE
(S. A. BARYTES)

REGIONAL GEOLOGICAL MAP AND SECTION

Associated Drawing No.	No. Amendment Exd. Date	Req. No. D.M. Compiled from	Approved Director of Mines	Passed	Drn. L.G.N. Tcd. R.R. Ckd. Exd.

Scale: 1 Mile to 1 inch.

60-601
Fa

Date 22-11-60