DEPARTMENT OF MINES
SOUTH AUSTRALIA

GEOLOGICAL SURVEY

ENVIRONMENT AND RESOURCE DIVISION

CORUNNA BARITE DEPOSIT

Co. HORE - RUTHVEN

by

J.G. OLLIVER
SENIOR GEOLOGIST

&

D. NICHOL
GEOLOGIST
INDUSTRIAL MINERALS SECTION

Rept.Bk.No. 75/49
G.S. No. 5585
D.M. No. 813/74

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ABSTRACT

Quartz-barite veins intrude the Burkitt Granite and the overlying Corunna Conglomerate, 11.6 km northwest of Corunna Homestead. Several hundred tonnes of barite, inferred around two pits, is too high in silica to be suitable for oil drilling purposes.

The Gawler Range Volcanics, the probable source of the barite, offer an extensive exploration target.

INTRODUCTION

The Corunna Barite Deposit was inspected by the authors on 14th November, 1974, during a survey of barite resources in upper Eyre Peninsula.

Appendix A contains the petrographic description of one sample of country rock. Three samples of barite were submitted to the Australian Mineral Development Laboratories for determination of specific gravity and chemical analysis. These results are tabulated in Appendix B.

There are no current mineral claims or leases over the deposit, which lies within Exploration Licence 146, held by the Director of Mines for uranium until 18th July, 1975.

LOCATION

The deposit is located 15 km northwest of Iron Knob and 11.6 km by road north west of Corunna Homestead, within the Eyre Planning Area. Access is westwards from the Homestead for 10 km along a good quality gravel road to Six Mile Dam, thence northerly along the fence for 1.6 km. The prospecting pits are about 100 metres east of the fence (see fig.1).

A sparsely timbered low ridge (see plate IBJA002) flanked by salt bush covered flats extends eastwards from low rounded hills formed by the Burkitt Granite.

GEOLOGICAL SETTING

The accompanying geological enlargement (fig.1) is adapted from Corunna (Johns, Johnson & Miles, 1952) part of PORT AUGUSTA (Dalgano, Johnson & Forbes, 1968).

Dark red coarse grained Burkitt Granite of Charlestonian age is overlain by arenaceous sediments of the Corunna Conglomerate of Late Carpentarian age. The granite contains up to 5% hematite as grains and in cracks and is intruded by small basic dykes and plugs (Jones, 1970).

A series of east-west trending quartz veins, cut both the Burkitt Granite and the Corunna Conglomerate. To the east, an elongated outcrop of Gawler Range Volcanics referred to as the "Dyke Structure" (Turner, 1975) extends south easterly from the main extensive outcrop.

An anomaly at Six Mile Dam, located by stream sediment sampling, is due to minor sulphide mineralisation in

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Plate IBJA002 Corunna Barite Deposit, 14 November, 1974

View northwesterly of two prospecting pits and stockpiled barite.

the quartz-barite veins. Galena, chalcopyrite, covellite, neodigenite and malachite (Jones, op cit) and fluorite (Reid, 1969) have been recognised.

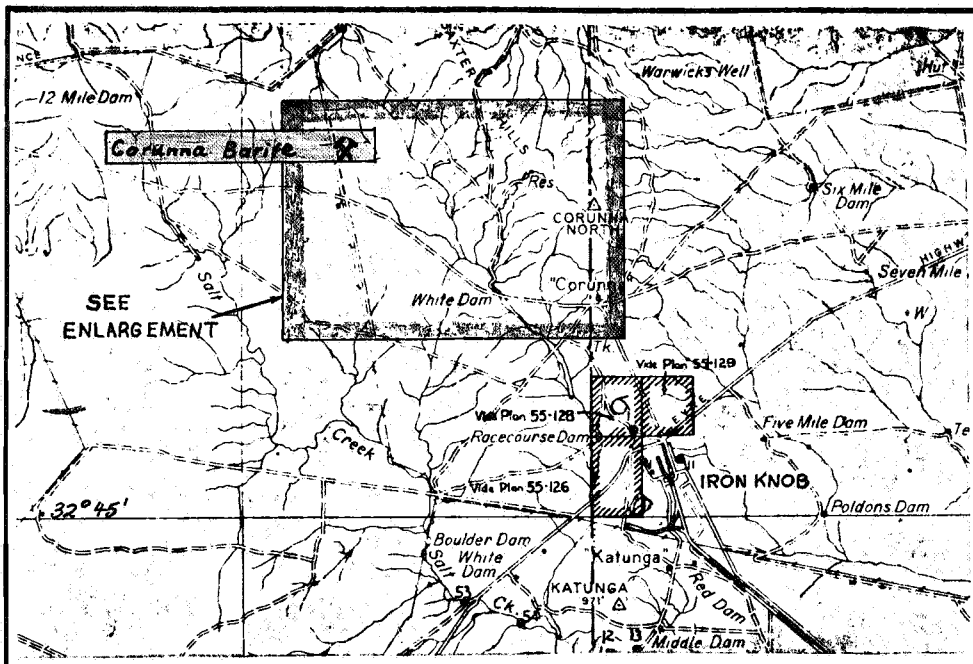
The Gawler Range Volcanics are regarded as the source of barium at this deposit and the extensive lodes in the Flinders Ranges. Small veins of barite have been noted in the volcanics and feldspar phenocrysts contain 3 000 ppm Ba compared to 2 000 ppm Ba in the rock (sample COR 13 Reid, op cit and Turner op cit).

SITE GEOLOGY

The only significant barite is confined to the eastern vein in the Corunna Conglomerate. Intermittent low outcrop with quartz-barite veins and float of quartz and barite extend in a zone east-west for about 800 metres. Maximum width of this zone is 10 metres at the western end. Lenses of relatively pure barite occur within this vein system. The largest, 20 metres long and up to 1.5 metres wide has been tested by two prospecting pits to a depth of about 1 metre . Several tonnes of barite have been stockpiled by the western pit (5 metres by 2 metres) and a smaller quantity remains at the eastern pit (2 metres by 1 metre) (see plate IBJA 002).

The barite varies from colourless through white to pink and pale brown. Small vughs contain pockets of goethite-limonite. Narrow quartz veins are common.

Beyond the pit area, the barite content decreases in both directions until quartz predominates.



LOCALITY PLAN

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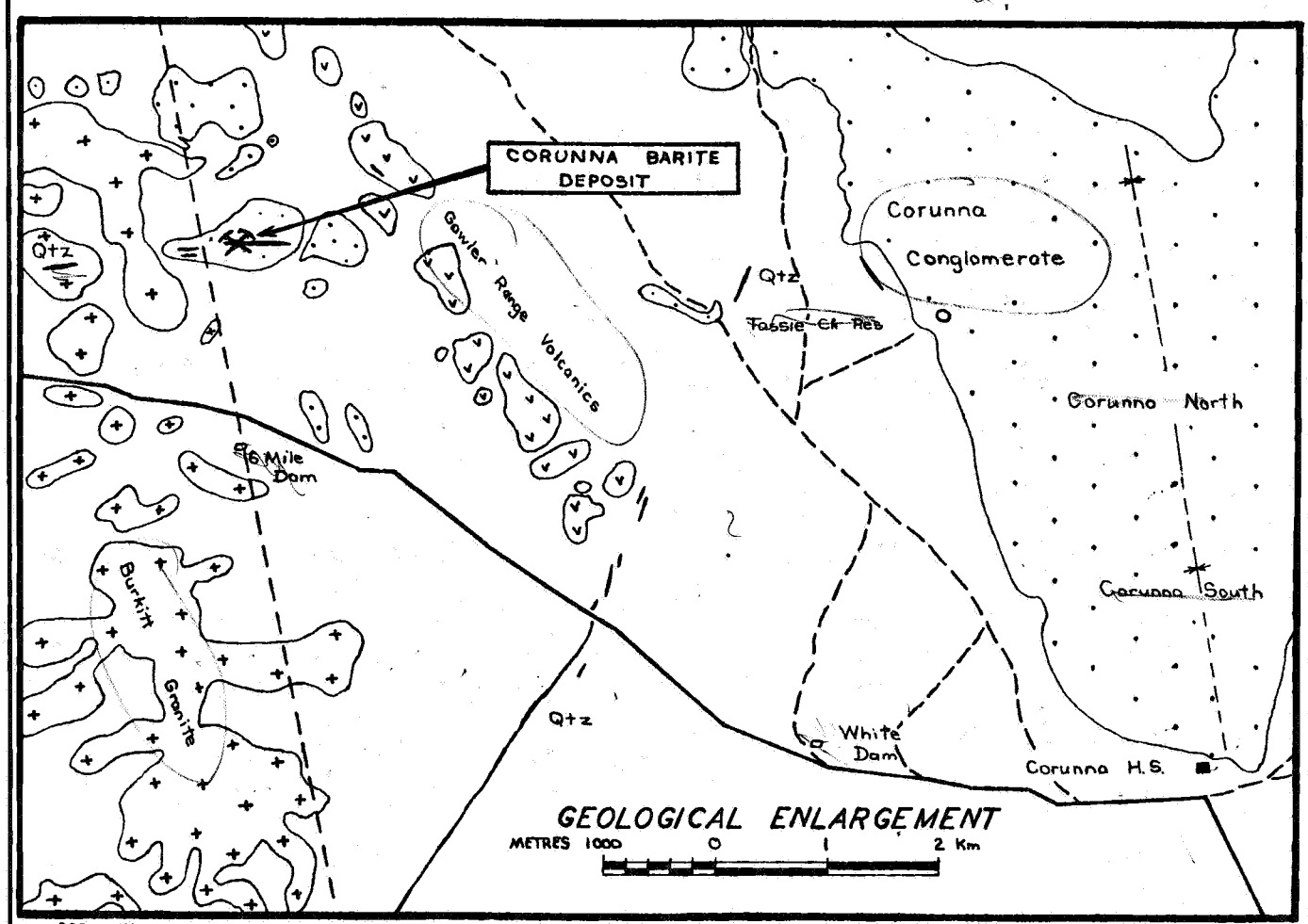

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	DEPARTMENT OF MINES — SOUTH AUSTRALIA	Scale : 1: 250,000 1: 63,360
Compiled : J.G.O.	CORUNNA BARITE DEPOSIT	Date : 4-2-75
Drn. R.J.H. Ckd.	LOCALITY PLAN & REGIONAL GEOLOGY	Drg. No. S-113084

IM—270 A1810

Country rock is a dark red fine grained and faintly bedded sandstone of the Corunna Conglomerate, which has been silicified and ferruginised and intruded by quartz veinlets (see Appendix A). Patches of barite up to several mms within the sandstone have been partially replaced by quartz.

QUALITY OF BARITE

Three samples submitted for laboratory testing are described in Table 1, and the results summarised in Table 2, from the data presented in Appendix B.

TABLE 1

Description of Samples

Sample No.	Description
A446/74	Grab sample representing stockpile at western pit. White to pale pink and pale brown crystalline barite with minor narrow quartz veins.
A447/74	Grab sample representing stockpile at eastern pit. Similar to A446/74.
A448/74	Selected sample from stockpile at western pit. Pale pink crystalline barite, cavitous in places with yellow limonite powder.

TABLE 2

Summary of Test Results

Sample No.	A446/74	A447/74	A448/74
S.G.	4.16	4.16	4.05
$BaSO_4$ percent	88.5	88.2	84.3
$(Ba + Sr)SO_4$ per cent	90.19	90.05	85.77
SiO_2 percent	9.5	9.3	13.6

$SrSO_4$ content varies from 1.47 to 1.85 percent which is consistent with the earlier results of six samples (COR 20 to 25, Reid, 1969) ranging from 1.61 to 1.90 percent and averaging 1.75 percent $SrSO_4$.

The barite falls well outside the requirements for use in pigments and other high quality applications. Also specification DFCP-3 of the Oil Companies Materials Association (U.K.) is not satisfied. Barite for oil drilling purposes is required to

- contain at least 92% $Baso_4$
- have a specific gravity of at least 4.2
- contain less than 250 ppm soluble alkaline earths expressed as caluim.

CONCLUSIONS

Barite is contained within quartz veins intruding both the Burkitt Granite and the overlying sediments of the

Corunna Conglomerate. Quartz content of the barite zone tested by pitting is too high for oil drilling purposes.

The barite is probably derived from the nearby Gawler Range Volcanics.

Although several hundred tonnes of barite could be obtained by open cutting, either beneficiation is required to lower the quartz content or the material should be blended with a higher grade barite.

Detailed mapping followed by exploratory trenching or drilling is necessary to prove reserves and quality of sub-surface barite.

Quartz veins elsewhere on Upper Eyre Peninsula warrant inspection. Exploration of the Gawler Ranges Volcanics for barite is also worthy of consideration.

J.G. OLLIVER
SENIOR GEOLOGIST

Douglas Nichol
D. NICHOL
GEOLOGIST

INDUSTRIAL MINERALS SECTION

25th March, 1975
JGO & DN:JG

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APPENDIX A

Petrographic Description

AMDEL Report MP 2242/75

by

R. COOPER

PETROGRAPHIC DESCRIPTION OF ONE SAMPLE OF COUNTRY ROCK FROM THE CORUNNA BARITE DEPOSIT

Sample: P472/74; TS33267

Location:

County of Hore-Ruthven, 10 km W. of Corunna H.S. (Out of hundreds).

Rock Name:

Ferruginized, silicified and quartz-veined sandstone.

Hand Specimen:

The bulk of this sample is dark red, fine-grained and faintly bedded. It is cut by a number of quartz veins, the largest 5 mm wide, which are vuggy in places and also contain trace amounts of sulphide. In addition within the dark red host rock there are a number of vugs lined with quartz, which are up to 5 mm across and numerous smaller lighter and darker coloured patches some of which are idiomorphic in shape.

Thin Section:

An optical estimate of the constituents gives the following:

	%
Quartz (in host rock)	65-75
Quartz (in veins)	3-8
Iron Oxides/hydroxides	15-25
Barite	1-5
Carbonate	trace
?Jarosite	trace
Fine-grained phyllosilicate-like minerals	trace-4

This sample has been heavily altered/recrystallized by processes such as silicification and ferruginization, but its former clastic sedimentary texture is still visible in many places. The rock was composed of angular to subrounded quartz grains which ranged in size up to 0.2 mm. These grains were seated in a matrix composed of clay/sericite. Now the rock consists of subidiomorphic and xenomorphic crystals of quartz which range in size up to 0.3 mm, with most crystals being 0.1 mm across. Throughout the quartz there are patches of finely dispersed iron oxides/hydroxides. In places the recrystallized areas of quartz in the body of the rock merge with the quartz present in veins and segregations.

The largest veins are several millimetres across and contain crystals of quartz up to 0.6 mm long. Barite does not occur in any of the veins, but it was detected in patches within the body of the rock. The largest patch of barite is several millimetres across and has idiomorphic (square) outlines. This patch/large crystal of barite had been marginally replaced by quartz. Smaller patches of barite within the body of the rock have a similar habit but usually the replacement of the barite by quartz is more extensive. Few of these patches of barite would exceed 0.5 mm in diameter. There are a few patches of carbonate, the largest about 0.3 mm across, and one such patch has a distinctive rhombic shape. Within the body of the rock there are areas with a similar shape which now contain quartz and iron oxides/hydroxides. It is thought that these may have once contained carbonate, most likely rhombs of dolomite. Within one of the quartz veins there is a patch of a yellow mineral, approximately 0.2 mm across, which in habit resembles the iron oxides/hydroxides but is more likely to be one of the jarosite-like minerals.

This sample has been silicified, ferruginized and veined by quartz. Despite this it is evident that the rock was originally a ?sediment, probably a sandstone, which contained crystals of barite and rhombs of ?dolomite. This rock could easily be a more heavily altered version of sample P212/74 (A), a sericitic quartzite with barite from near Whyalla which was described in report MP 1178/75.

APPENDIX B

Specific Gravity Tests and Chemical Analyses

extracted from

AMDEL Report AN 2243/75

Sample No.	A446/74	A447/74	A448/74
Specific Gravity	4.16	4.16	4.05
Chemical Content (%)			
$BaSO_4$	88.5	88.2	84.3
$SrSO_4$	1.69	1.85	1.49
Fe_2O_3	0.06	0.06	0.06
SiO_2	9.5	9.3	13.6
Al_2O_3	< 0.05	0.05	0.05
Ig Loss	0.18	0.17	0.24
TOTAL	99.9	99.6	99.7
Soluble Alkaline Earths as Ca (ppm)	10	10	15