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ANNUAL REPORT

EXPLORATION LICENCE 2193

COX PENINSULA

NORTHERN TERRITORY GEOLOGICAL SURVEY

CR 86/160A

Distribution :
Department of Mines and Energy
Darwin Office
Perth Office

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April 1986
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1) **Introduction**

This report documents the work carried out on Exploration Licence 2193 during the period 27th March 1985 to 26th March 1986. It is submitted to the Northern Territory Department of Mines and Energy to document exploration activity and in support of a renewal of the exploration licence.

The exploration was carried out by Greenex, a subsidiary of Greenbushes Ltd and its joint venture partner, Barbara Mining Corporation, a subsidiary of Bayer A.G. of West Germany. The joint venture is known as the Bynoe Joint Venture.

2) **Location, Climate and Topography**

The tin, tantalum and niobium resources of the Cox Peninsula south west of Darwin (figure 1) covers an area 55 km x 9 km. The nine square kilometres within EL 2193 is part of a larger area being investigated by the Joint Venture Partners.

The area's climate is tropical, monsoonal with 2 seasons, the wet extending from October to April and the dry, May to September. Annual rainfall is 1,600 mm with approx. 97% falling in the wet season. The humidity varies from 50% to 80% in the wet and 45% to 70% in the dry.

The land system comprises 3 main land forms:

2.1 the upland plains consist of gently undulating plains with gravel ridges often associated with quartz veining or ironstone lateritic crust.

2.2 the alluvial flats are 200 m to 300 m wide and several kilometres long. The accumulation of organic material in the drainage means they are
commonly known as black soil plains.

2.3 the lower slopes separate the upland plains from the alluvial flats. In most cases the slopes are scree covered and outcrop is poor.

3) Licence Details

Exploration Licence 2193 was approved by the Secretary on the 27th March 1981 and application was made on the 19th February 1986 for renewal of the licence and deferral of the reduction of the licence area.

The licence area is approximately nine square kilometres in area and is covered by graticular blocks 2652, 2653 and 2654 (part). Figure 2 shows the location of the licence area.

The Bynoe Joint Venture undertook an exploration expenditure of $25,000 for the fifth year of the tenement.

4) Regional Exploration Context

Exploration Licence 2193 is one of a number of licences held by the Joint Venture Partners in the Finnis River Pegmatite Belt. The exploration plan has been to prove ore reserves for a number of pegmatites and associated alluvial deposits centred on a suitable plant site and water storage area. The satellite mining operations would supply ore to the central plant, which on completion of mining in one area would be moved progressively to other locations.

The joint venture has transported a pilot gravity concentration plant with a nominal 30 to 40 cubic metre per hour capacity to the project area and processed
approximately 80,000 tonnes of ore during 1985-86.

5) Work Completed 1985-86

During the 1985-86 season the exploration grid was extended to include Bush Bull, Roadside, Roadside North and Two Sisters prospects (figure 3) which have been mapped at a scale of 1:500 (figure 4 to 6). Shallow trenching over the Bush Bull and Two Sisters prospects augmented surface mapping.

Samples were processed and assayed using techniques identical to those adopted in previous years.

5.1 Roadside Prospect

Location:
The Roadside prospect is located immediately west of the dozer-cut line leading south from the Mandorah Road. It lies 5.25 km south of the Mandorah Road and 3.9 km west-south-west of the Observation Hill plantsite.

Topography:
The prospect is located on a flat laterite plateau.

History:
There is no history of production from the prospect.

1985 Work:
The exploration grid was extended north and west to include the prospect. Mapping of surface excavations was completed at a scale of 1:500 (figure 4).

General Geology:
The pegmatite has been exposed in old workings over a strike length of approximately 70 m. The pegmatite
strikes north-east and attains an apparent maximum width of about 7 m. Contacts are rarely exposed and within old excavations the pegmatite is extremely weathered, however the major lithology is kaolin-quartz-muscovite with zones of quartz-muscovite indicated by the composition of material on the dumps.

A parallel massive quartz vein outcrops 30 m west of the workings.

It is possible that the full width of this pegmatite has not been exposed as the thickness of laterite caprock would have been a major impediment to excavation.

5.2 Roadside North Prospect

Location:
This prospect is located 350 m north-west of the Roadside prospect.

Topography:
The prospect is situated on the western margin of a flat laterite plateau.

History:
There is no record of production from this prospect.

1985 Work:
The exploration grid was extended north to include the prospect and mapping of surface excavations was completed at a scale of 1:500 (figure 4).

General Geology:
Old workings are limited to three small pits dug into highly lateritized quartz eluvium. The workings extend north-north-east over a distance of approximately 50 m. The lithology is kaolin-quartz-muscovite. No reliable information is available on the width of the pegmatite although a possible minimum width of 20 m may be assumed.
from the location of the two northern pits.

5.3 Bush Bull Prospect

Location:
Access to the prospect can be gained by the dozer-cut line leading south from the Mandorah Road west of Grants pegmatite and the Far West pegmatite swarm. A track leads east to the prospect about 6.6 km south of the Mandorah Road turnoff. The prospect lies 4.1 km south-west of the Observation Hill plantsite.

Topography:
The pegmatite is exposed on the eastern margins and upper slopes of an extensively lateritized plateau. Outcrops of massive quartz with muscovite are found to the north and south of the main workings which are dug into highly indurated laterite caprock.

History:
There is no known history of production from this prospect.

1985 Work:
A total of 207 m of costeaming was completed, however mapping and sampling of the prospect was interrupted by flooding. The exploration grid was extended to the west to include the prospect.

General Geology:
Workings have been dug into highly indurated laterite caprock to expose a narrow (5m) predominantly kaolin-quartz-muscovite pegmatite. In one exposure there is evidence of a lateral zonation to quartz-muscovite. The workings are scattered over 400 m along the strike of the vein and to the north and south of the main working the pegmatite becomes narrower and changes in composition to quartz-muscovite and ultimately to massive
quartz containing traces of muscovite (figure 5).

It is probable that the area contains two or more narrow pegmatite/quartz veins arranged en echelon and parallel to the local, steeply dipping north-north-east foliation.

Ore Reserve Potential:
The Bush Bull trenches will be sampled as part of the 1986 programme. After this work is completed an assessment of the ore reserve potential will be possible.

5.4 Two Sisters Prospect

Location:
The Two Sisters prospect can be reached via the main track leading south from the Mandorah Road near Hendersons prospect. Following the track west at Vickmans prospect, the workings are 700m north of the point at which the track crosses the tributary of the Charlotte River.

Topography:
The prospect is located on the western slopes of a laterite ridge which parallels a south flowing drainage feeding the Charlotte River. The ridge is more pronounced to the south where it is covered with abundant quartz float.

History:
Old workings are shallow and located on a narrow quartz-rich vein system which outcrops above the drainage channel. There is no record of production from the area.

1985 Work:
A total of 177 m of costeining was completed and 8 samples were processed and analysed. The exploration grid was extended south from a surveyed line (26000N) to include the prospect.
General Geology:
Costeaneing has exposed a steeply inclined quartz-rich pegmatite which varies in composition from predominantly quartz to quartz-muscovite and quartz-kaolin-muscovite from south to north. The vein has a maximum width of about 4m and has intruded ferruginised shales parallel to the foliation (figure 6).

The quartz proved resistant during costeaneing and therefore the orientation of many contacts have not been noted. The vein strikes about 035° in the northern section while to the south it is aligned closer to north. It is likely that the vein system is continuous between Two Sisters and Two Sisters South prospects although this has not been proven. If so, the exposed strike length is about 275m.

Cassiterite and Tantalite Mineralisation:
Mineralisation tends to be tantalite-rich. The average SnO\textsubscript{2}/Ta\textsubscript{2}O\textsubscript{5} ratio of five samples being 0.037. The average grade of the samples is 0.003/0.082 kg/tonne SnO\textsubscript{2}/Ta\textsubscript{2}O\textsubscript{5} (Density 1.5 tonnes/LCM).

Ore Reserve Potential:
Although the tantalum grades are significant (figure 5) the volume potential of this deposit is small. There is potential for eluvial reserves associated with the pegmatite.

6) 1985 Expenditure Estimates

<table>
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<tr>
<th>Item</th>
<th>Estimated Expenditure</th>
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<tr>
<td>Surveying from baseline</td>
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<tr>
<td>Road construction 4kms of road</td>
<td>4,500</td>
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<tr>
<td>Accomodation and messing</td>
<td>1,200</td>
</tr>
<tr>
<td>Geological</td>
<td>2,800</td>
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Technical Material 280  
Communications 250  
Tenement Administration 450  
Trenching 3,800  
Vehicles 1,200  
Fuel Oil Maintenance Tyres 800  
Sample Analysis 450  
Sample Preparation 850  
Transport 50  
Travel (Perth-Darwin) 1,000  
Clerical and Secretarial 350  
Staff Amenities 400  
Drafting 450  
Field and Office Supplies 250  
Line Clearing 550  
Wages - Field Hands 1,000  
Project Management 1,200  
Office Overheads Perth 3,000

$ 27,830

7) 1986 Programme

Exploration during the 1986 season is aimed at determining the surface extent of Roadside and Roadside North prospects and continued reconnaissance. Reserves within the eastern segment of Lees drainage have now been established and additional deep trenching is planned for the western continuation of the drainage within exploration licence 2193.  

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THE FINNISS RIVER PEGMATITE BELT

Figure 1
Figure 2: LOCALITY PLAN EL 2193
LEGEND

ALL WEATHER DIRT ROAD.
SEASONAL BUSH TRACK.
1 CAMP SITE TURN OFF.
2 OBSERVATION HILL TURN OFF.
3 HANG GONG TURN OFF.
4 FAR WEST TURN OFF.

REGIONAL LOCALITY MAP

FIGURE 3