REPORT ON
CURRENT RESOURCE STATUS
MT FINNISS AND LEVIA THAN CREEK PEGMATITES
BYNOE AREA
NORTHERN TERRITORY

C.J. ROBINSON

JUNE 1993
CONTENTS

INTRODUCTION page 1

REGIONAL GEOLOGY page 1

EXPLORATION HISTORY page 6

MT FINNIS PEGMATITES page 7

Previous Assessments

LEVIATHAN CREEK PEGMATITES page 10

Mining History

Ore Resource Assessments

1. Greenbushes & Bynoe JV

2. J. Crago Sampling

CONCLUSIONS AND RECOMMENDATIONS page 16

BIBLIOGRAPHY page 17

Reports
Maps

MAPS AND FIGURES

Figure 1. Bynoe District

Figure 2. Geology and Structure. Bynoe Area.

Figure 3. Location of Sn/Ta Pegmatites, Bynoe.

Figure 4. Pegmatite Locations. Leviathan Creek Group. Greenbushes. 1988.

Figure 5. Prospect Locations. Mt Finnis Area.
INTRODUCTION

This report summarises the exploration work carried out on the Bynoe rare metal pegmatites located within the present E.L.s 7079, 7439, and 8015 in the Finniss River and Leviathan Creek areas.

Information has been drawn from Open File Reports and maps, NTGS publications, and from personal communications with workers in the field. The author has twice visited the area in 1987 and 1993.

The locations of all known pegmatites have been plotted on 1:25,000 BYNOE geological compilation sheets. While the locations of the Leviathan Group have been well documented by Greenbushes Ltd, those at Finniss River have had very little regional work conducted on them and have undergone several name changes in recent times.

Similarly, the Leviathan Group have remained unmined since the early 1920's while the Finniss Group have seen several attempts at exploitation since 1984, all of which have failed.

Limited soft rock reserves on the Leviathan Group and estimations of the resource potential of the Finniss Group indicate the areas have the potential for a medium-scale mining operation. However, more exploration work is required, particularly in the latter area, to make a final determination.

REGIONAL GEOLOGY

The Bynoe rare-metal pegmatites form an extensive but little-known 'tin-belt' extending from 20 km (Kings Table Sn) to 100 km (Mt Tolmer Sn) south southwest of Darwin. The mineralised pegmatites form a linear trending zone 5-6 km wide and 70-80 km long. Over 100 pegmatites have been recognized.

The main concentration of pegmatites is in the northern half of the zone - some 40 km, which can be subdivided for the purposes of geographical location into the West Arm Group (greatest concentration), the Leviathan Creek Group, the Mount Finniss Group, and a fourth and southernmost group south of Bamboo Creek.

The Sn-Ta-Nb mineralised pegmatites intrude the early Proterozoic Burrell Creek Formation of the Finniss River Group which forms the western margin of the Pine Creek Geosyncline. The Burrell Creek Formation consists of an interbedded, pelitic, aranaceous to rudaceous turbidite sequence deposited from the west in a submarine fan environment, (Pietsch, 1986).

The sub- to mid-greenschist grade metasediments of the Burrell Creek Formation grade to the west into, or are faulted against, the amphibolite grade Welltree Metamorphics. Metamorphism was contemporaneous with deformation which produced north north-west trending tight to isoclinal, doubly plunging macroscopic and megascopics folds. A second generation of folding has produced a regional north north-west striking, steeply dipping cleavage.
Figure 1 Bynoe district.
To the south and west of Bynoe Harbour, the Burrell Creek Formation and the Welltree Metamorphics are intruded by the Two Sisters Granite which underlies much of the Cox Peninsula.

In the Bynoe Area, there is a progression from west to east, with decreasing metamorphic grades, from barren pegmatoidal granite to mineralised pegmatites, and thence to quartz veining, reflecting the general relationship of rare-element pegmatites to low-pressure metamorphic sequences of the upper greenschist to lower amphibolite facies. The local increase in pegmatite abundance is attributed to the presence of near-surface granitic stocks. While it is easy to attribute the mineralisation to the visible granite, it is more likely there are several more localised intrusions responsible.

Investigations to date have not found a regular distribution of predominantly Sn- or Ta-rich pegmatite type on a regional scale. Indeed, both Sn-enriched and Ta-enriched pegmatites are frequently found in close proximity, (Clayton, 1987).

Two styles of pegmatite intrusion occur throughout the belt. The first and most common is as vein- or dyke-like intrusions, lenticular in surface outcrop and sometimes having pronounced pinch and swell characteristics. Dimensions of the dykes and veins show large variations in scale, from narrow fracture fillings several millimetres in width to massive bodies up to 50m in width and over 200m in length. The second category are sill-like bodies in which sub-horizontal jointing is thought to be the main control. They are less common than the vein-type but are usually of greater average dimensions.

The pegmatites display evidence of both displacement and non-displacement intrusive mechanisms. Different emplacement mechanisms have operated at various stages of pegmatite development, the later mechanisms progressively overprinting the earlier stages.

Mineralisation is associated with mineralogical assemblages within 'zoned' pegmatites. Cassiterite and tantalite is associated with the muscovite-quartz unit surrounding the quartz 'core' and where this unit occurs on the contact margins. Enrichment of cassiterite and columbo-tantalite occurs also in the kaolin-muscovite-quartz unit which was probably an albite-muscovite-quartz assemblage prior to weathering. Rarely does mineralisation occur in the quartz core. The Ta content of the columbo-tantalite varies between pegmatites and within individual pegmatites. Bulk sampling and mining has indicated a range of 35 to 55 wt% contained Ta O.

Pegmatite outcrop is generally poor, in many cases visible only by a gentle rise in the surrounding country. Shallow auger drilling by Greenbushes Ltd has shown severe weathering to extend to 25m. Mineralisation is enriched in the near-surface eluvium.
Fig. 2. Geology and Structure Bynoe Area

TIMOR SEA

- Geologic boundary
- Fault
- Fault interpreted from magnetic data
- Magnetic lineament
- Shale; silstone; sandstone; greywacke; schist and gneiss
- Carbonaceous and ferrognous shale with chert bands; carbonate rocks; tuff; banded iron formation
- Sandstone; silstone; shale; marble; quartzite; conglomerate
- Slate; schist; phyllite; phyllitic schist; psammite; argillite; chlorite schist
- Granite; gneiss; schist; metasediments
- Granite; gneiss; amphibolite; metasediments
- Granite

CRETACEOUS
- Sandstone; claystone; siltstone
- Sandstone; silstone

PERMIAN
- Limestone; silstone; sandstone; conglomerate

CAMBRIAN-ORDOVICIAN

MIDDLE PROTEROZOIC
- Murenja Group
- Talmer Group
- Fitzmaurice Group
- EARLY PROTEROZOIC
- Granite — undifferentiated
- Wangi Basalt
- Zuma Dolerite
- Wellers Metamorphics

Unnamed unit
- Finnis River Group
- South Alligator Group
- Mount Partridge Group
- Namoona Group
- EARLY PROTEROZOIC
- DIRTY WATER METAMORPHICS
- ARCHAEOAN
- Rum Jungle Complex
- Waterhouse Complex
- Woolner Granite

Biotite gneiss; metabasalts; amphibolite; calc-silicate gneiss

Bedding trend
- Syncline, showing trend and plunge of axis
- Anticline, showing trend and plunge of axis

Prevailing strike and dip

- Protruding strike and dip

- Concealed geologic boundary
Fig 3. Location of Sn/Ta Pegmatites, Bynoe

- Regional metamorphic isograd
- Contact metamorphic isograd
- Gravity contour (milligal)
- Tin or tin-tantalum occurrence
- Early Proterozoic granite

0 5 10 15 20 km
EXPLORATION HISTORY

Tin was discovered in the Bynoe area in 1886. Chinese prospectors are responsible for the discovery of many of the outcropping pegmatites throughout the 'tin belt'. Small mining operations were established on the larger pegmatites, mainly treating weathered pegmatitic ore from shallow open cuts, although on some pegmatites, underground workings extend to depths of up to 20m. Most of the operations were short lived, and revivals have accompanied tin price rises. Past production is largely unrecorded.

The increase in tantalum prices in the late 1970's saw the establishment of several small gravity plants on the Hang Gong, Picketts, Saffums, and Mt Finniss pegmatites. Major exploration work was conducted by Greenbushes Ltd (Greenex) who entered the area in 1977, and later became the operator of a Joint Venture with Barbera Mining Corporation - a subsidiary of Bayer A.G. of West Germany. Their exploration concentrated on the northern West Arm Group and the Leviathan Group over the period 1977-1985, culminating in the construction of a 70 tph gravity concentration plant at Observation Hill processing 80,000 tonnes of pegmatite, eluvial and alluvial ore.

The syndicate that became Talmina Trading carried out extensive costeasting and drilling over pegmatites in the Mt Finniss Group. Unfortunately, no systematic testing and evaluation of reserves was undertaken, and a premature attempt at mining caused the syndicate to cease operations. North Queensland Resources N.L. entered the scene in 1989-90, accepting the tenuous reserve situation at Talmina and repeated the mining history of their predecessor. No firm details of their production is available, though it appears some 20,000 to 30,000 m³ of eluvium were treated. S. Hamilton (pers. comm.) states that 45 of 200 litre drums of concentrate were sent away for a return of 5,000 kg tantalite and 10,000 kg cassiterite. Tantalite grades ranged from 32-38% Ta, while cassiterite grades ranged from 46-73% Sn.

Prospecting work is currently being conducted by Corporate Developments Pty Ltd.
**MT FINNISS PEGMATITES**

Some 17 pegmatites have been identified within E.L.'s 7439 and 7079 as part of the Mt Finniss Group.

In the time of Talmina Trading, a process of re-naming took place, which has led to a problem in identifying individual pegmatites in the area. Several maps are available by various authors reflecting this problem in nomenclature. Titles ascribed to pegmatites in this report are those currently used, though this situation will change with the production of the report by NTGS staff (in prep.).

Several of these pegmatites have been part mined (so-called 'trial mined'), by Wigg, Talmina Trading Pty Ltd and NQR at Saffums 1, Saffums 2, Martins, Sandra's, Turner's, and the Northern Pegmatites. The Bilato pegmatite was mined by Dino Bilato within MLN 813, and outside that tenement by NQR. Total production figures are unavailable.

Identified pegmatites are:

- Saffums 1
- Saffums 2
- Bilato (Picketts)
- Picketts (Witherden's)
- Chiastolite
- Northern Group Pegmatites
- Sean's
- Chinese (Sabine, Chinaman)
- Freds 1
- Freds 2
- TW 4
- TW 5
- Sandra's
- Turners
- Martins
- Goodluck
- Lucy

**Previous Assessments**

(a) Wallen-Teluk (1988) quotes from previous work by Terence Willsteed and Associates, Ross Fardon, and Greg Kater and Associates (all 1984). The resource figures are derived from Fardon and Kater, and are quoted as:

- **Pegmatite Lodes**: 5 - 11 Mt to 20m depth at a cut-off grade of 0.4 kg/t of 'tantalite concentrate'.

- **Eluvial Deposits**: 4M m³ at a cut-off grade of 0.4 kg/m³ of 'tantalite concentrate'.

- **Alluvial Deposits**: 50M m³ at a cut-off grade of 0.15 kg/m³ of 'tantalite concentrate'.
Teluk notes that the first two categories are from Fardon, and based on widespread trenching over 20 km of strike length of an overall estimated total of 80 km length of pegmatite zones. Exposed widths were from over 20m, while others were from 2-6m. Alluvial reserves were largely speculative.

He further quotes reserves based on detailed trenching and sampling as well as 'trial mining' of Saffums 1 and the Turners-Martins-Sandras pegmatite line. Widths are quoted at 15-32m and Ta concentrate values ranging from 0.5 kg/t to 75 kg/t. Measured reserves are based on a high degree of confidence in average grade, and accurate measurement of size, including stockpiles. Indicated reserves are defined by a good accuracy in measurement of real size projected to 10m depths, and where estimation of average grades is based on detailed trenching.

Reserves are quoted as:-

**Measured**  
149,000 tonnes at 1.48 kg/t tantalite concentrate

**Indicated**  
905,000 tonnes at 1.30 kg/t tantalite concentrate.

These figures pre-date the mining by NQR N.L.

No details of these ore resource estimates were sighted. From the author's observations on ground, the estimates are not to be regarded seriously, and reflect the earlier statements regarding geological input.

(b) Crago (1991) reported on 11 pegmatites in the Mt Finnis area and assessed them according to their Ta or Sn dominance. 8 of the pegmatites are regarded as Ta-rich, and 3 as Sn-rich. The Lucy is Sn dominant, and the other pegmatites are similarly Sn-rich or too small.

This assessment was made post-mining by NQR, and estimated the potential volumes of eluvial material of suitable grade for mining.

- **Ta Pegmatites**  
  45,000 m³ at 0.09 kg/m³ Ta₂O₅; 0.3 kg/m³ SnO₂

- **Sn Pegmatites**  
  15,000 m³ at 0.03 kg/m³ Ta₂O₅; 0.5 kg/m³ SnO₂

- **Total**  
  60,000 m³ at 0.07 kg/m³ Ta₂O₅; 0.35 kg/m³ SnO₂

This evaluation is the lowest for the area and would be an indicated resource. Crago infers a further 550,000 m³ of eluvium at similar grades from the same group of pegmatites.

Recent sampling has disclosed an inferred 30,000 m³ of alluvials adjacent to Bilato's pegmatite between Bilato and Saffums 2.

Evaluation methods used by Crago included channel sampling from excavator costeans, surface samples on grid, and samples from spoil heaps. The samples were panned, and the concentrated heavy minerals tested in a zinc dish with 10% HCl. A visual estimate was made of the ratio of tin to tantalite. This method has been found to be rapid and, on check assay, sufficiently accurate for reserve estimates.
Table 1. Mt Finiss Pegmatites - Crago Sampling

1. Ta Pegmatites

<table>
<thead>
<tr>
<th>Pegmatite</th>
<th>Volume</th>
<th>Grade $\text{Ta}_2\text{O}_5$</th>
<th>Grade $\text{SnO}_2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saffums 1</td>
<td>10,000</td>
<td>0.08</td>
<td>0.30</td>
</tr>
<tr>
<td>Saffums 2</td>
<td>7,000</td>
<td>0.10</td>
<td>0.02</td>
</tr>
<tr>
<td>Bilato</td>
<td>10,000</td>
<td>0.08</td>
<td>0.40</td>
</tr>
<tr>
<td>Freeds 1</td>
<td>5,000</td>
<td>0.06</td>
<td>0.20</td>
</tr>
<tr>
<td>Freeds 2</td>
<td>5,000</td>
<td>0.10</td>
<td>0.30</td>
</tr>
<tr>
<td>Tw 5</td>
<td>2,000</td>
<td>0.05</td>
<td>0.10</td>
</tr>
<tr>
<td>Martins</td>
<td>5,000</td>
<td>0.08</td>
<td>0.60</td>
</tr>
<tr>
<td>Turners</td>
<td>1,000</td>
<td>0.10</td>
<td>0.10</td>
</tr>
</tbody>
</table>

2. Sn Pegmatites

<table>
<thead>
<tr>
<th>Pegmatite</th>
<th>Volume</th>
<th>Grade $\text{Ta}_2\text{O}_5$</th>
<th>Grade $\text{SnO}_2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sandras</td>
<td>5,000</td>
<td>0.03</td>
<td>0.40</td>
</tr>
<tr>
<td>Chinaman</td>
<td>5,000</td>
<td>0.02</td>
<td>0.70</td>
</tr>
<tr>
<td>Tw 4</td>
<td>5,000</td>
<td>0.03</td>
<td>0.50</td>
</tr>
</tbody>
</table>
LEVIATHAN CREEK PEGMATITES

This group of pegmatites has been examined in some detail by Greenbushes Ltd under their own exploration programme, and later under the Bynoe Joint Venture in the period 1979–1985.

Initial exploration involved systematic mapping and sampling of recorded pegmatite prospects. Should the grades from trench sampling be encouraging, or the pegmatite was of potentially large volume, it was drilled on a 5m x 25m grid. Drilling was carried out using an auger drill, sampling every 1.5m in eluvium.

Ore reserve calculations were computed on the average sectional area method, with grades based on volume and expressed as kg/1cm. A conversion factor of 1.8 was used to express the grade in kg/tonne (except where noted).

Due to different values for tin and tantalum, the grade was converted to a tin equivalent grade where:

\[ \text{tin equivalent grade} = \text{SnO}_2 \text{ grade} + 10(\text{Ta}_2\text{O}_5 \text{ grade}) \]

The ratio of 1:10 between \( \text{SnO}_2 \) and \( \text{Ta}_2\text{O}_5 \) was loosely based on commodity values. A cut-off grade of 0.5 kg/1cm (tin equivalent) was used for ore reserve calculations.

In all, Greenbushes spent $4.9M in the area. Within the Leviathan Group, some 30 pegmatites were discovered or re-discovered and evaluated.

More recently, John Crago has reported on his work on the Leviathan Group which involved follow-up of Greenbushes evaluation, with sampling and estimations of grades and volumes as discussed previously.

Mining History

The first found pegmatite in the field was the Leviathan discovered by C. Clarke in 1886. This is the only mine in the field on which production details are available. By 1890, the mine had produced 406.4 tonnes for a recovery of 2.03 tonnes of cassiterite. By 1909, the mine was abandoned.
Table 2. Pegmatites - Leviathan Creek Group

Leviathan North
   Central
   South
   East
Old Bucks (Ford's Claim)
Megabucks (Old Bucks West)
Bunbury
Enterprise
Phoenix
North Phoenix
Kristies
Kristies South
Centaur
Welcome Surprise
Frilled Lizard
Jim Jim
Trojan
Burnetts Find North
   South
McBurns
Northern Reward
Mackas Reward
Pandanus
Sarah's
Hackett & Parsons
Angers
Beatas
Hatchers
Riverside West
   East
Melissas
Jennas
FIGURE 5.

PROSPECT LOCATIONS. MC FINNIS AREA.
Ore Resource Assessments

1. Greenbushes & Bynoe JV

Greenbushes Ltd report ore reserves on 4 of the pegmatites only, and report on an alluvial resource for Leviathan Creek.

NORTH PHOENIX

The North Phoenix pegmatite consists of one prominent intrusion striking 350°. Deep eluvium cover obscures the contacts. The vein may be 40m long and from 2-20m wide. Evaluation consisted of 133m of trenching for 14 samples and 4 auger holes totalling 49m for 31 samples. Drilled to 15m and open at depth.

Resource:
Two separate zones of mineralization:
- near surface Sn-rich zone - SnO₂:Ta₂O₅ 14:1
- deeper zone SnO₂:Ta₂O₅ 2.6:1

Surface Zone to 1.5m 1160t 0.405 kg/t SnO₂; 0.031 kg/t Ta₂O₅
Deeper Zone 4440t 0.033 kg/t SnO₂; 0.017 kg/t Ta₂O₅

WELCOME SURPRISE

Welcome Surprise is a segregated pegmatite with a core up to 4m wide. Length 300m striking NNE with widths 1.25-9m. 340m of trenching for 40 samples, and 126m auger drilling for 79 samples.

Resource:
Near surface zone weathered pegmatite;
12,000t grading 0.02 kg/t SnO₂; 0.07 kg/t Ta₂O₅
+ Several thousand tonnes of associated alluvium.

McBURNS

Small pegmatite vein 10m long, from 2-3m wide, and lateritised in the west. SnO₂:Ta₂O₅ 6:1.

Resource:
Small; put at 1-200 tonnes of 0.548 kg/1cm SnO₂; 0.09 kg/1cm Ta₂O₅.

NORTH REWARD

Single unconformable vein exposed over 225m and widths of 3-17.5m. The pegmatite has an en echelon relationship with Mackas Reward and Welcome Surprise.

Resource:
Proven reserve of 24,010 tonnes at 0.025 kg/t SnO₂; 0.124 kg/t Ta₂O₅.
PANDANUS

Complex unconformable pegmatite up to 160m long and 1.5-28.5m wide. Cassiterite grades uniformly poor. SnO₂:Ta₂O₅ = 1:5.5.

Resource:

2 pods delineated. To 10m - 22,830 tonnes at 0.006 kg/t SnO₂; and 0.055 kg/t Ta₂O₅. Eluvium likely to be of the order of 3-5000 tonnes.

SUMMARY

<table>
<thead>
<tr>
<th>Pegmatite</th>
<th>Volume</th>
<th>SnO₂</th>
<th>Ta₂O₅</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>North Phoenix</td>
<td>1,160t</td>
<td>0.405</td>
<td>0.031</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4,440t</td>
<td>0.033</td>
<td>0.017</td>
<td>to 1.5m</td>
</tr>
<tr>
<td>Welcome Surprise</td>
<td>12,000t</td>
<td>0.020</td>
<td>0.070</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Alluvium</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>North Reward</td>
<td>21,010t</td>
<td>0.025</td>
<td>0.124</td>
<td></td>
</tr>
<tr>
<td>Ore:Waste 8.7:1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pandanus</td>
<td>22,830t</td>
<td>0.006</td>
<td>0.055</td>
<td>to 10m</td>
</tr>
<tr>
<td></td>
<td>3-5,000 Alluvium</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>McBURNS</td>
<td>1-200t</td>
<td>0.548</td>
<td>0.09</td>
<td>0.09 kg/1cm</td>
</tr>
</tbody>
</table>

Of the others examined, the following had small or limited unquoted reserve. Kristies - small reserve of eluvium near surface Megabucks - limited potential

Leviathan Creek Alluvials - 120,000 tonnes.
2. J. Crago Sampling

<table>
<thead>
<tr>
<th>Pegmatite</th>
<th>Indicated V</th>
<th>Potential V</th>
<th>SnO₂</th>
<th>Ta₂O₅</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leviathan</td>
<td>1,000m³</td>
<td>3,000m³</td>
<td>1.0</td>
<td>0.04</td>
</tr>
<tr>
<td>Beatas</td>
<td>1,500m³</td>
<td>3,000m³</td>
<td>0.5</td>
<td>0.03</td>
</tr>
<tr>
<td>Hatchers</td>
<td>2,000m³</td>
<td>5,000m³</td>
<td>1.0</td>
<td>0.15</td>
</tr>
<tr>
<td>Angers</td>
<td>3,000m³</td>
<td>10,000m³</td>
<td>0.6</td>
<td>0.06</td>
</tr>
<tr>
<td>Megabucks</td>
<td>2,000m³</td>
<td>20,000m³</td>
<td>0.4</td>
<td>0.03</td>
</tr>
<tr>
<td>Old Bucks</td>
<td>4,000m³</td>
<td>10,000m³</td>
<td>0.4</td>
<td>0.10</td>
</tr>
<tr>
<td>Sarah's</td>
<td>500m³</td>
<td>1,500m³</td>
<td>0.4</td>
<td>0.02</td>
</tr>
<tr>
<td>McBurns</td>
<td>200m³</td>
<td>1,000m³</td>
<td>1.0</td>
<td>0.06</td>
</tr>
<tr>
<td>Hacket &amp; Parsons</td>
<td>1,500m³</td>
<td>3,000m³</td>
<td>0.4</td>
<td>0.20</td>
</tr>
<tr>
<td>Frilled Lizard</td>
<td>200m³</td>
<td>1,500m³</td>
<td>0.4</td>
<td>0.30</td>
</tr>
<tr>
<td>Jim Jim</td>
<td>500m³</td>
<td>2,000m³</td>
<td>0.25</td>
<td>0.03</td>
</tr>
<tr>
<td>Pandanus</td>
<td>10,000m³</td>
<td>25,000m³</td>
<td>0.1</td>
<td>0.15</td>
</tr>
<tr>
<td>North Phoenix</td>
<td>3,000m³</td>
<td>5,000m³</td>
<td>0.6</td>
<td>0.04</td>
</tr>
<tr>
<td>Centaur</td>
<td>2,000m³</td>
<td>10,000m³</td>
<td>0.4</td>
<td>0.02</td>
</tr>
<tr>
<td>Welcome Surprise</td>
<td>15,000m³</td>
<td>25,000m³</td>
<td>0.2</td>
<td>0.30</td>
</tr>
<tr>
<td>North Reward</td>
<td>12,000m³</td>
<td>18,000m³</td>
<td>0.2</td>
<td>0.14</td>
</tr>
<tr>
<td>Mackas Reward</td>
<td>20,000m³</td>
<td>35,000m³</td>
<td>0.7</td>
<td>0.10</td>
</tr>
<tr>
<td>Trojan-Burnetts</td>
<td>2,000m³</td>
<td>3,000m³</td>
<td>0.4</td>
<td>0.03</td>
</tr>
<tr>
<td>Kristies</td>
<td>1,500m³</td>
<td>3,000m³</td>
<td>0.6</td>
<td>0.02</td>
</tr>
</tbody>
</table>

Leviathan Creek alluvials are estimated at 150,000 m³, and with limited sampling indicate a grade of 0.3 kg/m³ SnO₂, and 0.04 kg/m³ Ta₂O₅.

Sampling confirmed that Riverside, and Jennas and Melissas are low grade.

Crago recommends further work on the Welcome Surprise – Pandanus Group, and on evaluating the alluvial potential of Leviathan Creek.
CONCLUSIONS AND RECOMMENDATIONS

Evaluation of rare-metal pegmatite resources in the Mt Finniss and Leviathan Creek areas in the Bynoe 'tin belt' by the two main workers - Greenbushes Ltd and John Crago, has revealed the following:

<table>
<thead>
<tr>
<th></th>
<th>Indicated V</th>
<th>Potential V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mt Finniss Group</td>
<td>(C) 60,000 m$^3$</td>
<td>550,000 m$^3$</td>
</tr>
<tr>
<td>Alluvials</td>
<td>30,000 m$^3$</td>
<td></td>
</tr>
<tr>
<td>Leviathan Group</td>
<td>(C) 81,900 m$^3$</td>
<td>183,500 m$^3$</td>
</tr>
<tr>
<td>(G) 61,640 m$^3$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leviathan Creek</td>
<td>(C) 150,000 m$^3$</td>
<td></td>
</tr>
<tr>
<td>(G) 120,000 m$^3$</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Of those figures, the following should be noted:
(1) Not all the volumes will make grade for mining at current Ta metal prices.
(2) The shortfall in Leviathan Group pegmatite volumes would be accounted for by the Mackas Reward resource. The Greenbushes report is currently not available, and volumes are expected to be of the order of +20,000 m$^3$ of eluvium.

Therefore, on the basis of all current information available, some 250,000 m$^3$ of eluvium and alluvium has been identified at the two locations, with the potential for a further 700,000 m$^3$ of eluvium.

These identified resources obviously require firming up, as proposed in the next exploration stage involving on-ground mapping, costeasting and drilling. More work is required in the Mt Finniss Group than the Leviathan Group due to the mining at that location. The Welcome Surprise - Mackas Reward - Northern Reward - Pandanus swarm, and associated alluvials in Leviathan Creek is regarded as the most immediately exploitable area.
1. REPORTS

Bynoe JV. 1989: Annual Report E.L. 3490, Cox Peninsula, N.T.

Bynoe JV. 1990: Final Report E.L. 2088, Cox Peninsula, N.T.


Clayton, W., 1987: Sn-Ta-Nb Bearing Pegmatites, Bynoe, N.T. Setting, Exploration and Development. MSc Seminar, JCUNQ.


Freidrich, G., & Jutz, D., 1984: Sn-Nb-Ta bearing Pegmatites, Finnis River, Northern Territories, Australia. (Unpubl.)


2. MAPS

Greenbushes: Figure 3  Centaur Geological (2)
4  Centaur Grade Plan (2)
5  Centaur Cross Sections (2)
6  Welcome Surprise Geological (2)
7  Welcome Surprise Grade Plan (2)
8  Welcome Surprise Cross Sections (2)
9  Burnettts Find Geological (2)
10 Burnettts Find Grade Plan (2)
GTL
5  Leviathan Geological (2)
6  Leviathan Grade Plan (2)
Greenex
29  Leviathan Alluvial Trenching (2)

NTGS
1:250,000 Magnetics Darwin
1:100,000 Magnetics Bynoe
Talmina Trading Saffums 1 & 2

Talmina
Costeans Sandras
Turners
Martins
Freds 2
Freds 1
Geology
Freds 1
Freds 2
Turners
Martins
Chiastolite
Saffums 1
Sandra Hill

Greg Kater  E.L. 2613

3. UNSIGHTED REPORTS


4. NTGS REPORTS


Eupene Exploration Enterprises Pty Ltd, 1989: Tin, Tantalum & Tungsten Deposits Of The Northern Territory. NTGS.