PRELIMINARY
FIRST ANNUAL REPORT
EXPLORATION LICENCE 4806

BYNOE HARBOUR AREA
NORTHERN TERRITORY

for
G. AKED

by J.W. SHIELDS
S.J. BELLETTE
G. SCRIMEGOUR

with a report on literature
research by W.R. Ormsby
Territory Resources N.L.

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INTRODUCTION

Exploration Licence 4806, consisting of 7 one minute blocks in the Bynoe Harbour area, west of Darwin, was granted to Graeme Aked on the fifteenth of October 1987.

The area is low lying and generally flat, with only a very limited scattering of the outcropping prospective Lower Proterozoic rocks.

However, the area would seem to be prospective for tin and tantalum and to a lesser extent gold, uranium, nickel and/or platinoids as well as basemetals.

Literature research, prospectivity studies, exploration strategies and sampling of the outcropping prospective rocks were planned for the first year. All these were completed except for the field sampling which could not be carried out because of the early onset of the wet season.

Repeated attempts are being made to carry out this work and should be successful if the area dries out sufficiently to allow access. Two long mangrove fringed inlets from Bynoe Harbour virtually divide the area into three units as far as access is concerned.

This report sets out the work carried out in the first year of tenure of the Exploration Licence and an attachment is expected shortly (if the area can be accessed) showing the sampling carried out and the results of assays of the sampling.

SUMMARY

Exploration Licence 4806 was applied for because it was considered to be prospective for tin, tantalum, gold, uranium, nickel and/or platinoids.

Literature research was carried out and documented by W.R. Ormsby (attached as Appendice 1). The research bought to light the fact that, although the area has been held as an Exploration Licence by various Companies between 1975 and 1985, no information relating to the exploration activities carried out during this time is available. Although one report:-

> *Porter, D.J. 1985: Annual Report for Exploration Licence 1753, Bynoe Project, Northern Territory. Closed file Company Report for Australian Coal and Gold Holdings (unpublished) CR 85/085.*

does exist, it is closed file and not available to the exploration industry.

However, the area has been geologically mapped recently by the Northern Territory Geological Survey as part of the Bynoe 1:100,000 Sheet with accompanying Explanatory Notes by B.A. Pietsch dated 1986.

The exploration strategy was largely formulated from this work by the Northern Territory Geological Survey as no previous exploration reports are available.

DESCRIPTION OF LICENCE AREA

The area of the Exploration Licence is about 23 square kilometres, some of which is over water.

To the north, the area virtually borders on Bynoe Harbour or Mangrove lined creeks which drain into it.

There are three of these creeks which are tidal. They effectively divide the Exploration Licence into three pieces of land separated by water.

A lot of the Exploration Licence area is below 20 metres A.H.D., and much of the remainder is no higher than 30 metres A.H.D.

Fairly dense timber covers the area, with long sorghum grass growing during the wet season.

LOCATION AND ACCESS

The area is situated about 45 kilometres southwest of Darwin. It is practically on the southern shores of Bynoe Harbour.

Access from Darwin is made by using the following roads:

Stuart Highway
Mandorah Road
Finnis River Station Road
Point Ceylon Road

From the last mentioned road, it is necessary to proceed without the use of bushtracks. This is difficult because of the heavy timber cover and the fact that the area is divided into three segments by tidal creeks.

During the wet season and for some time afterwards, the area cannot be traversed by vehicle at all as the area is low lying and saturated with water.

LITERATURE RESEARCH

A geologist from Territory Resources N.L., W.R. Ormsby compiled a Preliminary Literature Research on Exploration Licence 4806.

This report is presented as Appendice 1.

Briefly, there are no records available from the Northern Territory Geological Survey's library which give any results of exploration within the area, although it is known that the area was included in quite a number of Exploration Licences in the past.

Unfortunately, although it is known that one report exists, there are no reports available which give results of exploration in the area.

However the Northern Territory Geological Survey has recently completed geological mapping of the Bynoe Sheet area at a scale of 1:100,000. This is helpful as a guide to the geology of the Exploration Licence area.

In addition, a detailed aeromagnetic survey was commissioned by the Northern Territory Geological Survey over the Bynoe 1:100,000 Sheet. This is useful for geological interpretation especially when an area has a very limited amount of outcrop.

GENERAL GEOLOGY

The Exploration Licence is situated on the north-western part of the Bynoe 1:100,000 Sheet, and lies in the Litchfield Province. This adjoins the Pine Creek Geosyncline which is located to the east and southeast.

In this Geosyncline, sediments with a thickness of up to 15,000 metres were deposited and greenschist metamorphics were later developed in the central part of the Geosyncline, but towards its edges, amphibolite facies metamorphics were developed.

The Welltree Metamorphics which crop out only twice in the Exploration Area, are amphibolite facies and form part of the Litchfield Province, which in tectonic terms, is the northern extension of the Halls Creek Mobile Zone.

The Early Proterozoic rocks in the Pine Creek Geosyncline are intruded by granite, and rocks of similar age in the Litchfield Province are also intruded by granites which are considered to be synorogenic to postorogenic in both Provinces.

Two small outcrops of granite occur in the Exploration Licence area, and have been given the name Two Sisters Granite. This is made up of granodiorite and adamellite.

GEOLOGY OF THE LICENCE AREA

The surface of the Licence area is covered for the most part by Quaternary and some Cretaceous rocks with several small outcrops of Early Proterozoic age.

As only the Early Proterozoic rocks are considered to be prospective for hard rock mineral deposits, drilling would be necessary to prospect most of the area.

However, the overlying "surficial" rocks may contain detrital minerals which have derived from the underlying "basement" rocks.

The geology of the Licence area has been fairly well discussed under the previous heading as far as the Early Proterozoic rocks are concerned.

The overlying sediments are made up of Cretaceous and Quaternary sediments.

The Cretaceous rocks are represented here by the Darwin Member of the Bathurst Island Formation. Usually a basal polymictic conglomerate is overlain by a ferruginous sandstone, claystone and sandstone.

Cainozoic sediments form an extensive cover over most of the Exploration area. They consist of Tertiary to

Quaternary soil and laterite as well as Quaternary marine and nonmarine sediments.

EXPLORATION TARGETS

There are two main targets for exploration which can be classified as far as the age of the rocks is concerned.

The first target would be the Early Proterozoic metamorphic rocks and pegmatites associated with them. These underlie all the area of the Licence but only outcrop in a few areas. These would be prospective for tin, tantalum, gold, uranium, nickel and/or platinoids and basemetals.

The tin and tantalite could be expected to be found in pegmatites and the other metals could be expected to be found in association with magnetic anomalies.

The magnetic survey commissioned by the Northern Territory Geological Survey shows several magnetic anomalies in the area and these should be followed up by ground magnetic traverses followed by interpretation and geochemical sampling. Drilling would be necessary to follow up encouraging results.

The second target would be the more recent sediments which could be tested by panning in the streams. This would be followed up by auger drilling to basement to determine the extent and depth of the strata containing the minerals.

EXPLORATION BEING CARRIED OUT

As was stated earlier, field exploration had been planned to start some time ago, but the onset of the Wet Season delayed the start.

This work is being carried out at the present time and it is expected that the results will be submitted to the Department of Mines and Energy to append to this report.

The work in progress includes the following:-

Rock chip sampling of all Early Proterozoic outcrops and collection of samples from any other outcrops which appear likely.

Panning of creeks to collect a heavy mineral concentrate.

All samples collected will be assayed at a NATA approved laboratory for the prospective minerals.

This exploration and the laboratory analyses will be written up in a report for attachment to this report, and should take about 1 month to complete.

CONCLUSIONS

The Exploration Area is prospective for tin, tantalum, gold, uranium, nickel and/or platinoids as well as basemetals.

Prospecting for these minerals in the Early Proterozoic rocks is difficult because of the lack of outcrop. However, magnetics published by the Northern Territory Geological Survey, as well as the geological mapping at a scale of 1:100,000 helps to plan the exploration and interpret the results when they become available.

Initial prospecting for detrital minerals should not be so difficult as it will involve panning and producing a heavy mineral concentrate for assaying.

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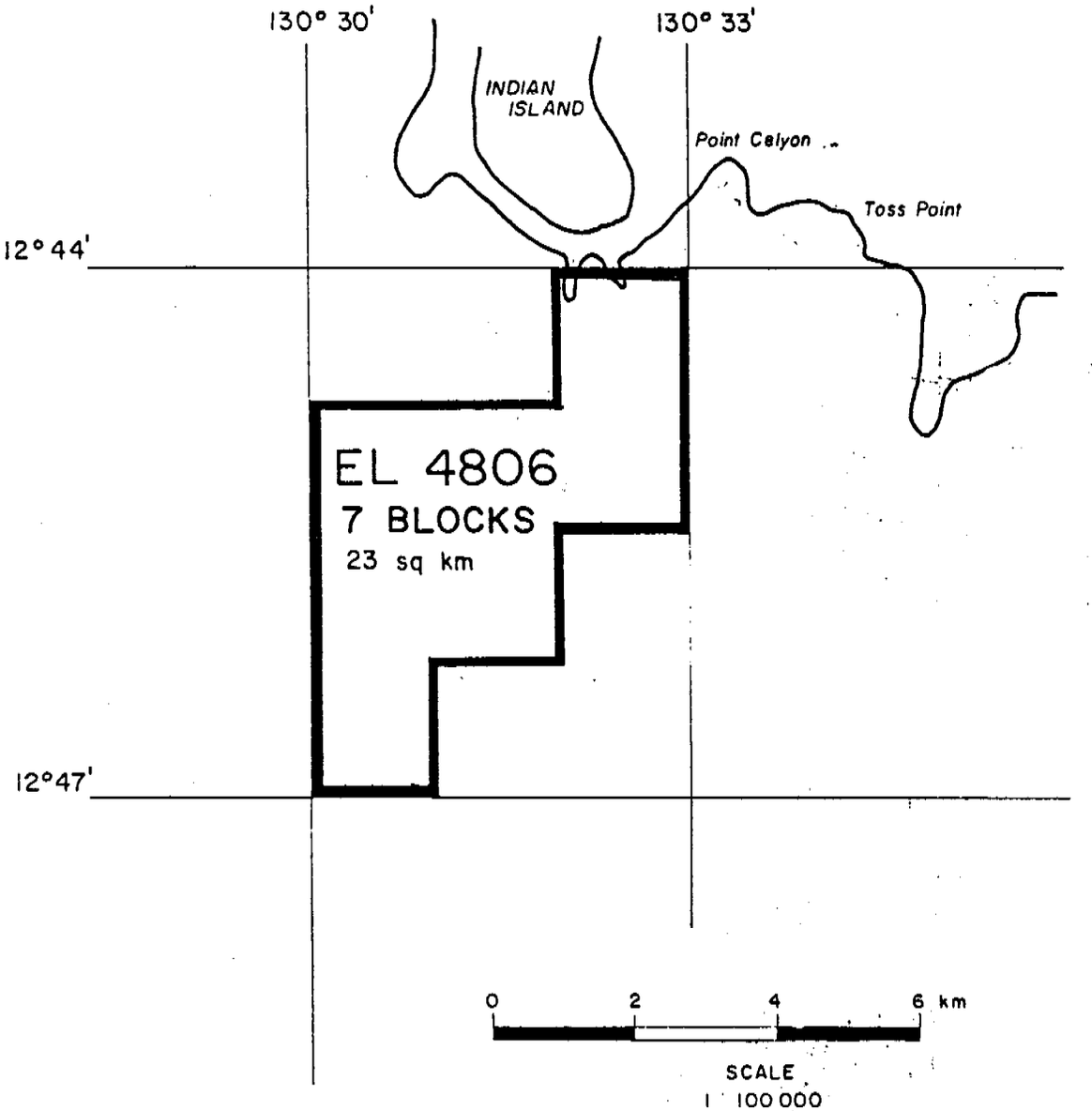
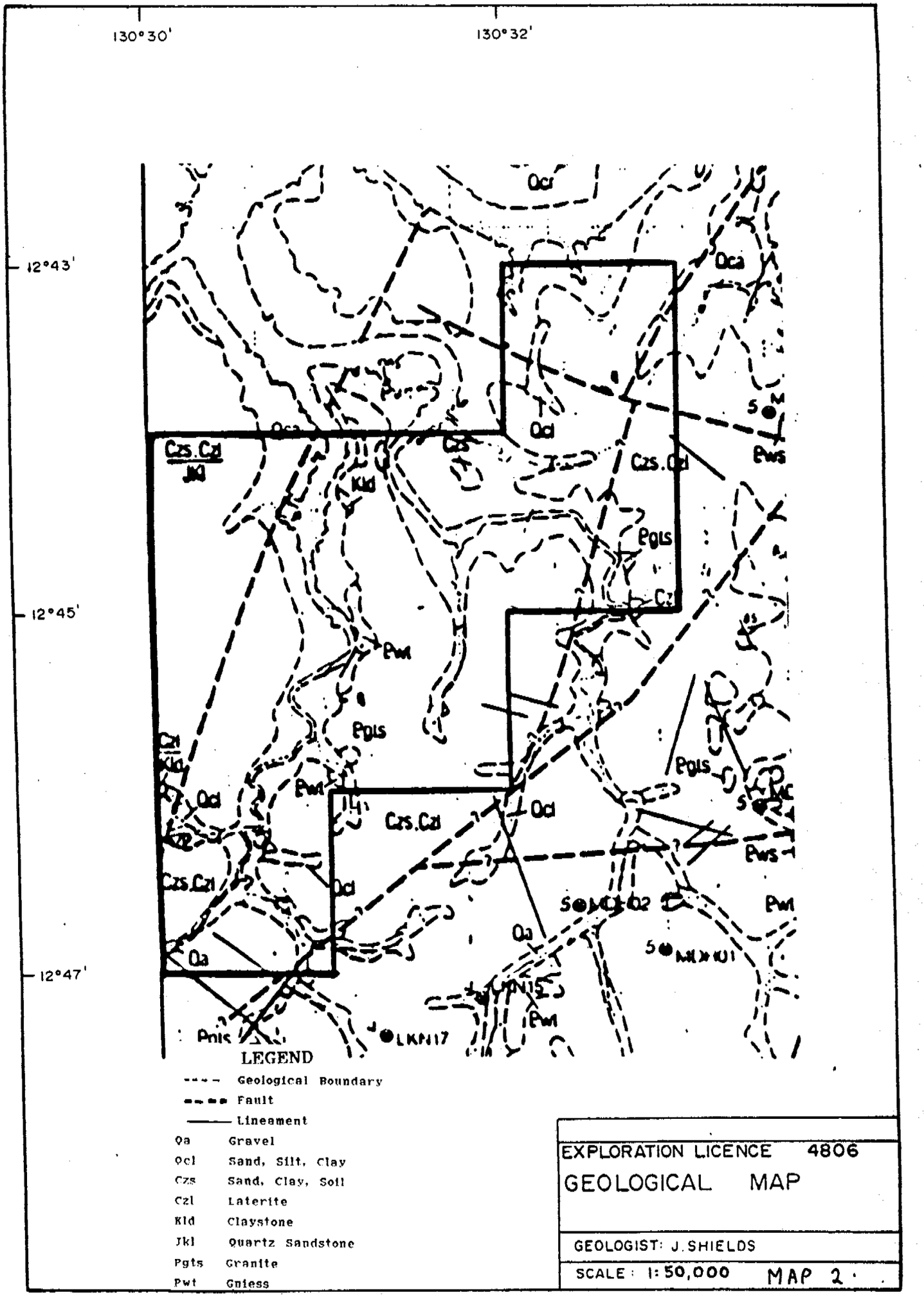
The topography and dense timber make movement within the area quite difficult and exploration during and after heavy rain is impossible.

Early rain this year prevented any exploration on the ground being carried out but exploration is proceeding at the present time and hopefully, will be reported on shortly.

SECOND SCHEDULE
(PLAN OF AREA)



MAP 1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130°32'
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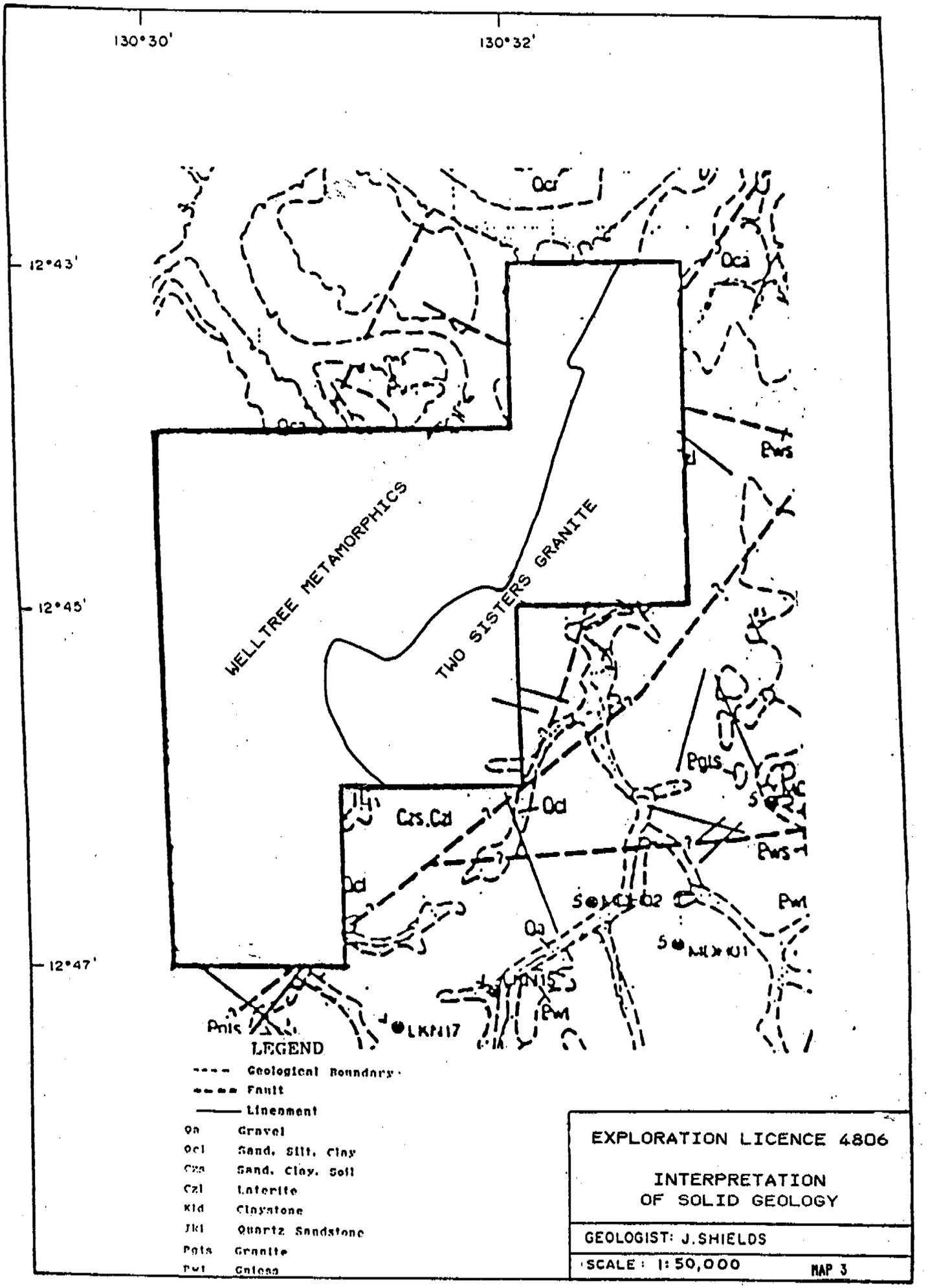
12°45'
12°47'
Qcl
Qca
Czs.Czl
Jkl
Kld
Pgts
Czl
Pwt
Qa
Pwis
LKN17
LEGEND
Geological Boundary
Fault
Lineament
Qa Gravel
Qcl Sand, Silt, Clay
Czs Sand, Clay, Soil
Czl Laterite
Kld Claystone
Jkl Quartz Sandstone
Pgts Granite
Pwt Gniess
EXPLORATION LICENCE 4806
GEOLOGICAL MAP
GEOLOGIST: J.SHIELDS
SCALE : 1:50,000
MAP 2


130°30'
130°32'
12°43'
12°45'
12°47'
Ocr
Oca
Pwv
WELLTREE METAMORPHICS
TWO SISTERS GRANITE
Pgts
Czs.Czl
Od
Qa
Pwt
Pmic
LKP117
LEGEND
Geological Boundary
Fault
Lineament
Qa Gravel
Qcl Sand, Silt, Clay
Czs Sand, Clay, Soil
Czl Laterite
Kld Claystone
Jkl Quartz Sandstone
Pgts Granite
Pwt Gneiss
EXPLORATION LICENCE 4806
INTERPRETATION
OF SOLID GEOLOGY
GEOLOGIST: J.SHIELDS
SCALE: 1:50,000
MAP 3

TERRITORY RESOURCES NL

PRELIMINARY LITERATURE RESEARCH ON EL 4806

BYNOE HARBOUR AREA, NORTHERN TERRITORY

W.R. Ormsby

1.0 Introduction

A search through past tenement maps at the NT Department of Mines and Energy library revealed that the area now covered by EL 4806 has been previously included in the following licence areas:

1975	EL 1075	
1976/77	EL 1178	
1978	EL(A) 1751	
	EL(A) 1753	
1979-85	EL 1753	Australian Coal & Gold Holdings

Unfortunately, no open file reports are listed for these licence areas. A report on Exploration Licence 1753 does exist (Porter,1985), however it is held in closed file, and therefore is not available to the public.

The licence area lies within the NTGS 1:100,000 Bynoe Sheet, and the accompanying notes (Pietsch,1986) appear to be the best available reference on the area.

Other published geological maps of the region include the Darwin 1:250,000 Sheet (1962), the Southport 1:63,360 Sheet (1958), and the Tumbling Waters 1:63,360 Sheet (1959).

An overview of the geology and mineral prospectivity of EL 4806 was compiled by Geonorth (Shields,1987).

The following synopsis of the licence area was derived largely from the NTGS Bynoe Sheet Explanatory Notes.

2.0 Geology

Exploration Licence 4806 is situated in the northwestern portion of the Pine Creek Geosyncline. The underlying geology predominantly comprises the Early Proterozoic Welltree Metamorphics and the accompanying Sweets Member, both of the Litchfield Province.

The Welltree Metamorphics consist of 'quartz-feldspar-biotite gneiss, common garnet and sillimanite; quartzitic gneiss; quartzite, and minor feldspar-muscovite gneiss'.

The Sweets Member is situated near the base of the Welltree Metamorphics, and comprises 'marble (graphitic in places); para-amphibolite, calcsilicate gneiss; quartz-feldspar-biotite gneiss, and minor ultrabasic rocks'. Aeromagnetic data suggests that the Sweets Member underlies much of the eastern section of the exploration licence.

Both the Welltree Metamorphics and the Sweets Member were intruded by the Two Sisters Granite during the Top End Orogeny approximately 1870-1780 million years ago.

Lower Cretaceous sandstones, claystones and conglomerates unconformably overlie basement in the western part of the licence area.

Outcrop is generally poor as the entire area is largely covered by Tertiary sands, gravels and laterites, and surficial Quaternary sediments.

A number of NE-SW trending faults are interpreted from aeromagnetic data to pass through the area, and are shown on the 1:100,000 Bynoe Sheet. A WNW-ESE trending fault is also interpreted to bisect the northernmost block.

3.0 Exploration Activity

Although no previous reports are available for the licence area, some information is available from work carried out in adjacent areas.

The Bynoe 1:100,000 Sheet shows four diamond drill holes situated to the east of exploration licence 4806. The Explanatory Notes indicate that these holes intersected the Welltree Metamorphics, Sweets Member, and the Twin Sisters Granite. They appear to have been targeted on magnetic highs which are probably associated with ultrabasics within the Sweets Member, possibly in search of nickel and/or platinoid minerals.

A further twenty diamond drill holes were drilled by Idemitsu Uranium Exploration Australia in the 'Brooks Area' to the south of the licence. Again, no information is publicly available on the drilling results which were documented by Warren(1982) and Thevissen & Arai(1983). The targets for these holes also appear to have been magnetic anomalies.

Further to the east, tin and tantalite mineralisation occurs in pegmatites associated with the Two Sisters Granite, hosted within the Burrell Creek Formation. Gold and basemetal mineralisation also occurs in the region.

4.0 Exploration Targets

Based upon the limited information available, the following exploration targets are defined in order of priority:

- magnetic anomalies: nickel and/or platinoids, gold and basemetals

- pegmatites: tin and tantalite

The magnetic anomalies are broadly defined on a total magnetic intensity map included in the NTGS Explanatory Notes for the Bynoe Sheet. These can be followed up by ground magnetic surveys and soil geochemical sampling.

Pegmatite outcrops or subcrops can be sampled and assayed, and concealed tin-tantalite mineralisation may be sought by prospecting and/or geochemical sampling along drainages.

5.0 References

PIETSCH, B.A., 1986: Northern Territory Geological Survey, 1:100,000 Geological Map Series Explanatory Notes, Bynoe 5072.

PORTER, D.J., 1985: Annual Report for EL 1753, Bynoe Project, Northern Territory. Closed File Company Report for Australian Coal and Gold Holdings (Unpublished). CR 85/085.

THEVISSEN, J. & ARAI, K., 1983: Annual Report Project 8002, Lookin Area, Northern Territory. Closed File Company Report (Unpublished). CR 84/64.

WARREN, H., 1982: Annual Report, 1981 C.L. 1926, Northern Territory, Lookin Project 824. Closed File Company Report (Unpublished). CR 82/044.

TERRITORY RESOURCES NL

EL 4806 EXPENDITURE STATEMENT

Salaries:

Geologist: Warren Ormsby

Literature research and report preparation

	20 hours @ $60/hour	$1200.00
Overheads:	30% of costs	$ 360.00
	Total	$1560.00