POSEIDON GOLD LIMITED

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A PosGold Company

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FIRST RELINQUISHMENT REPORT

FOR EXPLORATION LICENCE 7821

FOR THE PERIOD 14/8/92 TO 13/8/94

TENNANT CREEK DISTRICT, NORTHERN TERRITORY

BARKLY SOUTH PROSPECT

TENNANT CREEK 1:250,000 SHEET SE 53-14

VOLUME 1 OF 1

AUTHOR: R WORLAND
EXPLORATION GEOLOGIST

DATE: NOVEMBER 1994

AUTHORISED BY:

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REPORT NO: 12010
TITLE: FIRST RELINQUISHMENT REPORT FOR EXPLORATION LICENCE 7821, FOR THE PERIOD 14/8/92 TO 13/8/94, TENNANT CREEK DISTRICT, NORTHERN TERRITORY, BARKLY SOUTH PROSPECT
AUTHOR: R WORLAND
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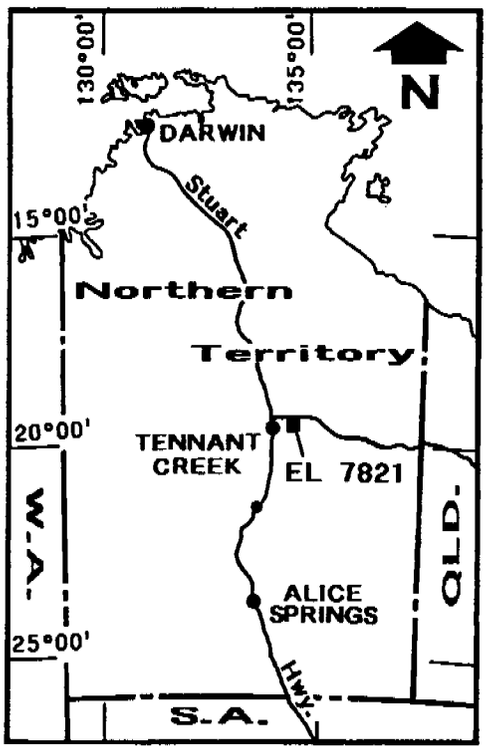


1. SUMMARY

Exploration Licence 7821 (Barkly South Prospect) was granted to Poseidon Gold Limited on 14 August 1992 for a period of six years. The licence comprised 18 graticular blocks of which nine graticular blocks were relinquished at the end of the second year of tenure, in accordance with Section 26 of the Mining Act. This report details the work conducted on the nine graticular blocks relinquished for the period from 14/8/92 to 13/8/94.

EL 7821 is located approximately 19km ENE of Tennant Creek township. Exploration completed by PosGold on the relinquished portion of the licence focused on identifying Tennant Creek style Au-Cu-Bi mineralisation using:

- general field reconnaissance;
- an airborne magnetic survey;
- photogeological mapping; and
- geomorphological mapping.

2. INTRODUCTION

2.1 Location and Access

Exploration Licence 7821 (Barkly South Prospect) is located approximately 19km ENE of Tennant Creek township (refer Figure 1). Access to the licence area from Tennant Creek township is ENE by winding station tracks via Lone Star Mine to Gigantic Mine and then north for approximately two kilometres.

2.2 Climate and Physiography

The climate of the Tennant Creek area is mild to warm and dry throughout autumn, winter and spring. The summers are hot (often in excess of 35°C) with associated seasonal rainfall between December and March (338 mm rainfall December 1993 to March 1994) which frequently impedes field work programmes.

The majority of EL 7821 covers a flat lying area comprising an extensive clay pan devoid of vegetation to the south. The central and northern portion of the licence consists of dense eucalyptic bushland associated with the discharge of Tennant Creek after heavy rainfall. Access to this area is difficult and best traversed via a fenceline trending east-west through the centre of the licence area. The eastern margin of the licence area hosts low lying hills which drain along their western margin where several waterholes exist along a seasonal creek bed.

2.3 Tenure

Exploration Licence 7821 (EL 7821) was granted to Poseidon Gold Limited (PosGold) on 14 August 1992, for a period of six years. The licence originally consisted of 18 graticular blocks and at the end of the second year of tenure was reduced to 9 graticular blocks, in accordance with Section 26 of the Mining Act. The covenant for the first and second years of tenure totalled $7,500 and $7,000 respectively.

2.4 Previous Exploration

Prior to PosGold acquiring EL 7821 no known exploration had been conducted within the Barkly South prospect.

3. REGIONAL GEOLOGY

The Tennant Creek Inlier comprises gneissic basement successively overlain by unconformable Proterozoic sediments of the Warramunga Group, Hatches Creek Group and Tomkinson Creek Beds. These sediments have been intruded by Proterozoic aged granites, and subsequently overlain by Cambrian sediments (Le Messurier *et al*, 1990). The Warramunga Group contains all of the economically viable mineral deposits in the Tennant Creek region.

The Warramunga Group has been divided into the Carraman Formation, which hosts the Black Eye Member, the Bernborough Formation and the Whippet Sandstone. The lower and first mentioned two units contain all the mineralised ironstones in the field. These

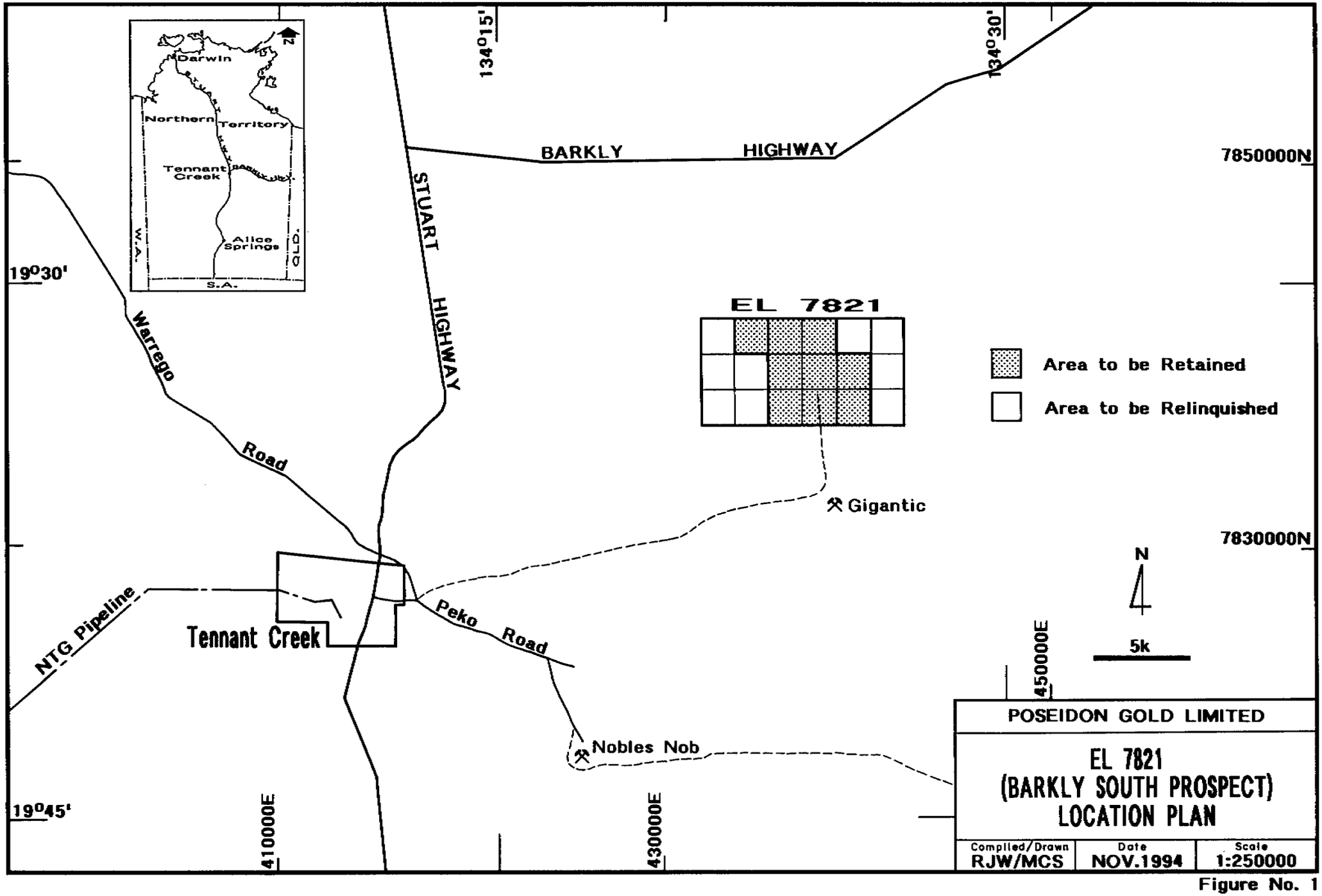

Darwin
Northern Territory
Tennant Creek
Alice Springs
W.A.
QLD.
S.A.
134°15'
134°30'
BARKLY HIGHWAY
7850000N
19°30'
STUART HIGHWAY
Warrego Road
EL 7821
Area to be Retained
Area to be Relinquished
Gigantic
7830000N
N
5k
NTG Pipeline
Tennant Creek
Peko Road
Nobles Nob
450000E
19°45'
410000E
430000E
POSEIDON GOLD LIMITED
EL 7821
(BARKLY SOUTH PROSPECT)
LOCATION PLAN
Compiled/Drawn
RJW/MCS
Date
NOV.1994
Scale
1:250000

Figure No. 1

units are made up of a sequence of argillaceous sediments including siliceous greywacke, siltstone, shale and haematite shale with zones of disseminated haematite-magnetite being common throughout. Quartz feldspar porphyry lenses occur as both cross-cutting and conformable units within the sedimentary sequences.

The Warramunga Group exhibits three deformational phases and is metamorphosed to greenschist facies. The first deformational episode resulted in tight to isoclinal, upright folds with east-west axes. Two later episodes of faulting consist of WNW trending faults and shear zones with south-side-up movement, and NW trending faults often filled with quartz, showing sinistral movement.

4. LOCAL GEOLOGY

Exploration Licence 7821 covers an area mainly consisting of a flat lying alluvial flood plain controlled by the seasonal discharge from Tennant Creek which flows east into the licence area. Aeromagnetic data suggests that beneath cover lies an array of rock types including Warramunga Group sedimentary rocks, Proterozoic granites and Cambrian sedimentary rocks. In the east of the licence area a low-lying range of mostly flat lying Cambrian sedimentary rocks trends north-south and contains small outcrop areas of Warramunga Group rocks.

5. EXPLORATION UNDERTAKEN DURING THE PERIOD 14/8/92 TO 13/8/94

5.1 Aeromagnetics

Aeromagnetic data for EL 7821 was compiled from two aeromagnetic surveys flown in 1989 by Austirex and 1992 by Aerodata. Both data sets were collected by a proton precession 30m SI Scintrex CS-vapour V201 magnetometer, with a sensor height of 60 metres along north-south lines spaced at 200 metres.

Data was compiled and processed by P Smith, Normandy Poseidon Limited Geophysicist, who removed the regional effect of the area from the observed data.

The resulting magnetic contour plan (Plan 1) for the area relinquished from EL 7821 displays broad, low amplitude magnetic features which are suggestive of Proterozoic granites and Cambrian sedimentary rocks.

5.2 Photogeological Mapping

In 1992, PosGold contracted Australian Photogeological Consultants Pty Ltd (APC) to undertake detailed photogeological mapping of the Tennant Creek district. The project was completed using a combination of 1:25,000 scale colour aerial photographs, low-level aerial magnetic survey data and regional field traverses.

The area relinquished from EL 7821, refer Figure 2, is interpreted to consist of various generations of granite, concealed beneath Cambrian sedimentary rocks and recent aeolian cover.

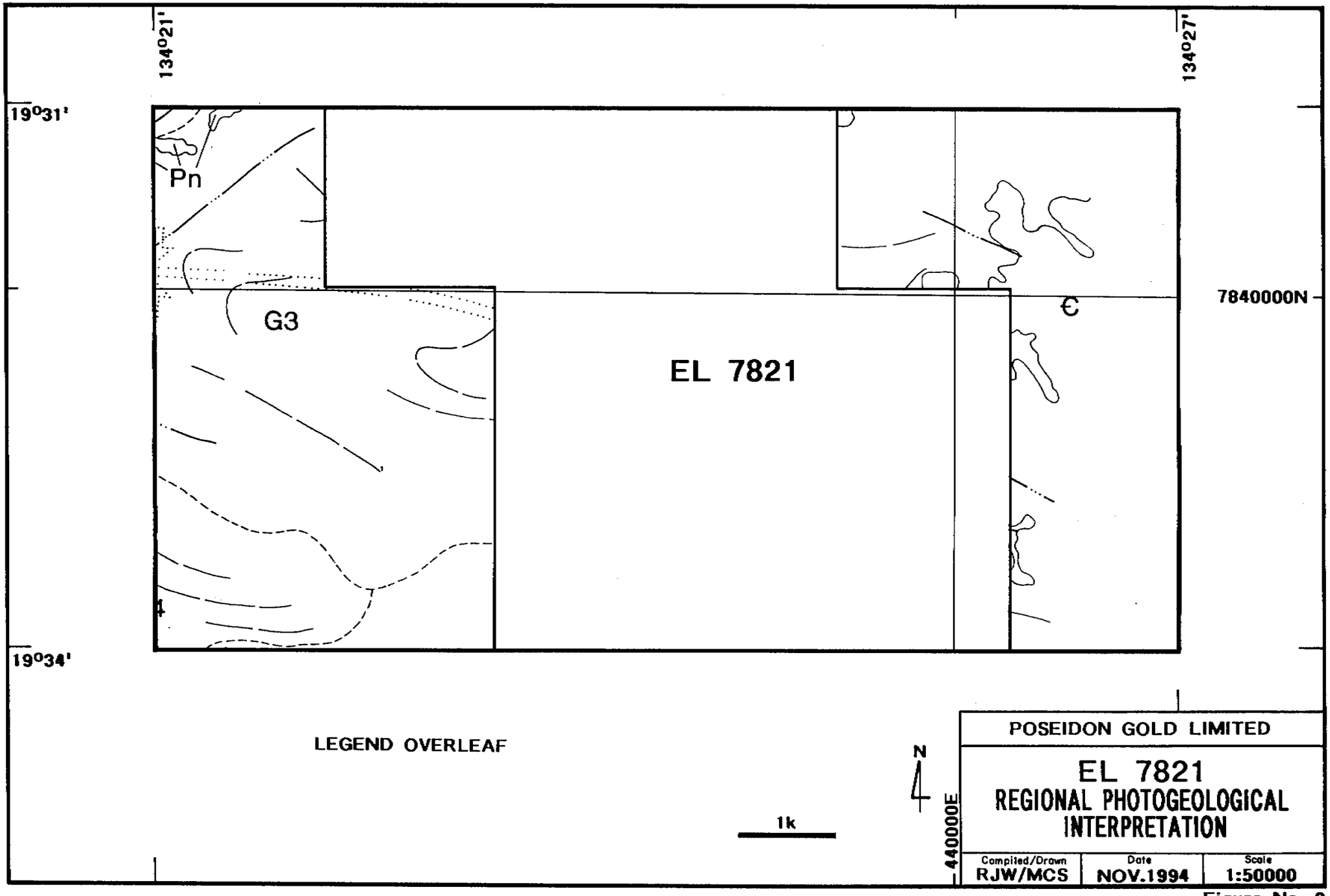

134°21'
134°27'
19°31'
19°34'
7840000N
440000E
Pn
G3
EL 7821
LEGEND OVERLEAF
1k
N
POSEIDON GOLD LIMITED
EL 7821
REGIONAL PHOTOGEOLOGICAL INTERPRETATION
Compiled/Drawn
RJW/MCS
Date
NOV.1994
Scale
1:50000

Figure No. 2

LITHOLOGY

SEDIMENTARY ROCKS

CAMBRIAN	Arthur Creek Formation Helen Springs Volcanics	€	Sandstone, chert, siltstone Weathered and ferruginized basalt
CAMBRIAN TO ADELAIDEAN	Rising Sun Conglomerate	Pur	Polymictic conglomerate, sandstone and quartzite
CARPENTARIAN	Tomkinson Creek Subgroup/Hayward Creek Formation	Pth	Lithic and sublithic arenite, pebbly arenite, quartzite
CARPENTARIAN TO LOWER PROTEROZOIC	Flynn Subgroup	Pn	Lithic and volcanolithic arenite; quartz-magnelite sandstone, siltstone; pebble beds Felsic volcanic and volcanoclastic rock with interbedded sandstone and siltstone (symbol)
	Warramunga Group	Pw	Volcanic arenite, siltstone and terrigenous mudstone including BIF; chert and jasper (hornfelsed shown by symbol)
LOWER PROTEROZOIC TO ? ARCHAEAN	Basement Rocks	A	Gneiss, schist, amphibolite, quartzite

INTRUSIVE ROCKS

Warrego Granite Red Bluff Granite	G1	G1: Weakly magnetically foliated porphyritic adamellite and granophyric granite
	G2	G2: Smooth textured non-magnetic muscovite granite and aplitic phases
		Coarse-grained porphyritic gabbro, diorite, and dolerite
Younger porphyries	Pox	Quartz-feldspar porphyry and sheared equivalents
Older porphyries	Po	Felsic porphyry
Tennant Creek Granite Cabbage Gum Granite Channingum Granite Mumbilla Granodiorite	G3 G4	G3, G4: Strongly magnetically foliated porphyritic biotite granite to granodiorite Several phases outlined by aeromagnetic images

LEGEND

- Photogeologically mapped fault and inferred sense of movement indicated
- Magnetically mapped major dislocation and inferred sense of movement indicated (teeth on overriding plate)
- Magnetically mapped minor break
- Zone of shearing
- Photogeological boundary
- Boundary interpreted from aeromagnetics
- Trends (photogeological and magnetic)
- Generalised dip and strike
- Small mine
- Major mine
- Anticline, syncline (mapped)
- Anticline, syncline (inferred, interpreted)
- Dyke, vein
- Aeromagnetic dipole anomaly
- Fault interpreted from gravity data
- Boundary of granite interpreted from gravity data
- Axis of gravity high
- Axis of gravity low
- Circular gravity high

Adapted from drg by Australian Photogeological Consultants Pty Ltd

POSEIDON GOLD LIMITED

LEGEND FOR REGIONAL PHOTOGEOLOGICAL INTERPRETATION

Compiled/Drawn	Date	Scale
—	—	—

Figure No. 2a

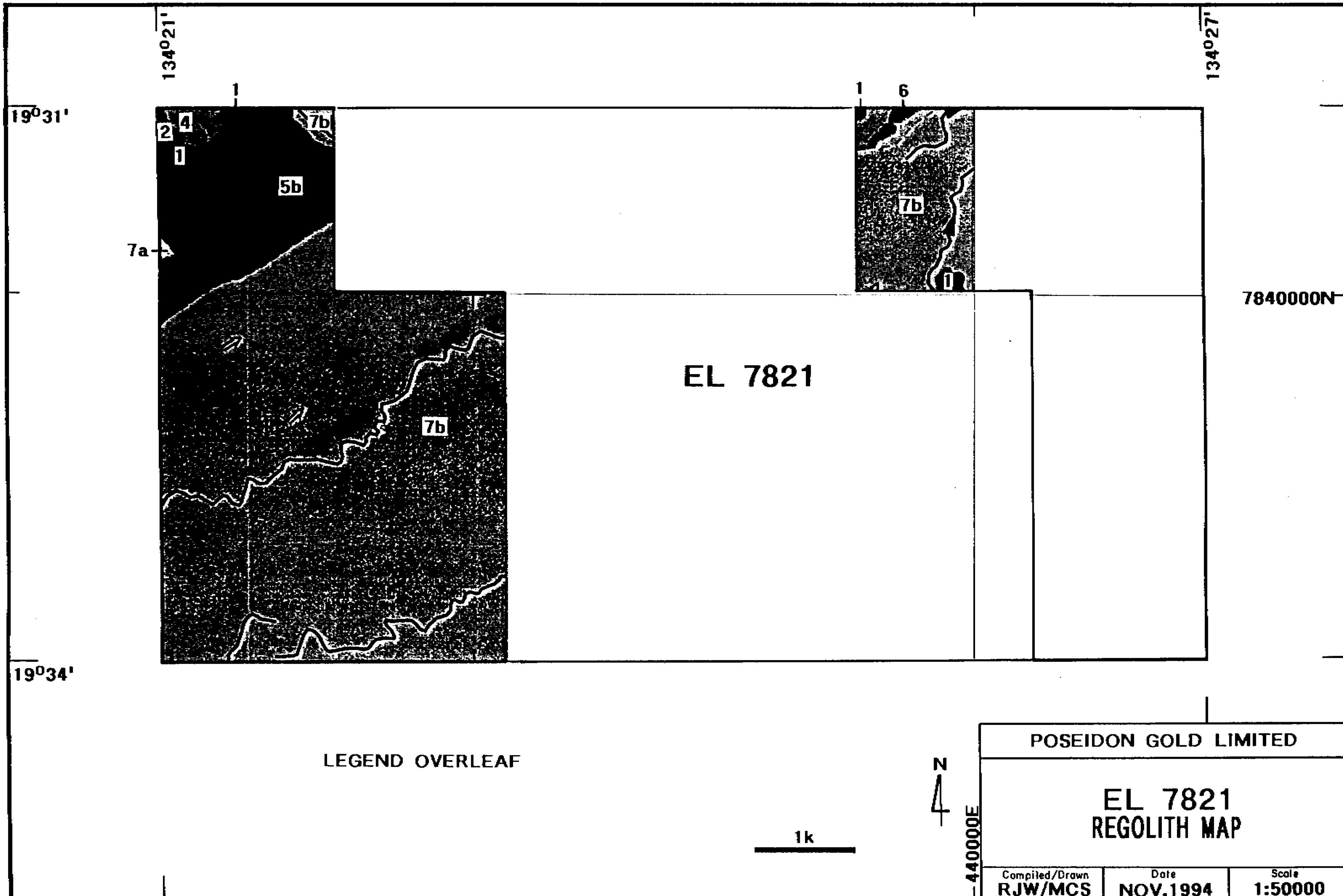
5.3 Geomorphological Mapping

In early 1992 a geomorphological study covering all of Normandy Poseidon Group's tenements in the Tennant Creek area was conducted. The project established a framework of landform units upon which suitable geochemical sampling programmes could be planned. A detailed description of the units and 1:50,000 scale maps were prepared.

The western portion of the relinquished area lies in the active alluvial discharge zone of Tennant Creek and its tributaries, refer Figure 3. The eastern portion of the relinquished area consists of minor Cambrian sedimentary rock outcrop in low lying hills which drain northerly along their western margin where several waterholes exist along a seasonal creek bed.

6. CONCLUSION

Exploration of the relinquished blocks of EL 7821 has been undertaken using a combination of geological and geomorphological mapping and regional geophysics. This work indicates that the majority of the relinquished area consists of granite concealed by alluvial sediments and Cambrian sedimentary rocks, and is not considered to be prospective for Tennant Creek style Au-Cu-Bi mineralisation. Only minor Warramunga Group rocks may be concealed along the margins of the relinquished area. Consequently, further exploration of these blocks is not warranted.



134°21'
134°27'
19°31'
19°34'
7840000N
440000E
1
1
6
2
4
1
7b
5b
7a
7b
7b
1
EL 7821
LEGEND OVERLEAF
1k
N
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EL 7821
REGOLITH MAP
Compiled/Drawn
RJW/MCS
Date
NOV.1994
Scale
1:50000

Figure No. 3

LEGEND

EROSIONAL REGIMES

1 — PROMINENT OUTCROP

UNIT 2 — LOW RELIEF DENUDED OUTCROP WHERE BEDROCK IS FREQENTLY EXPOSED OR BENEATH A VENEER OF SCREES OR STONY SKELETAL SOILS

UNIT 3 — THIN STONY LITHOSOIL (SKELETAL SOIL) WITH PATCHES OF PROXIMAL COLLUVIUM, SUBCROP AND OUTCROP

DEPOSITIONAL REGIMES

UNIT 4 — COLLUVIUM AS SHEETWASH

UNIT 5a — REDDISH YELLOW MIXED ORIGIN SANDY SOILS WITH A LAG OF ANGULAR FELDSPARS, QUARTZ AND IRON GRANULES / PISOLITHS

5b — MIXED ORIGIN COVER (COLLUVIAL/ALLUVIAL/AEOLIAN) TYPIFIED BY VEGETATION COMPRISING EUCALYPT TREES AND SHRUBS (1/2-3m COVER)

6 — BROAD EXPANSES OF SHEETWASH COMPRISING FINE SANDY LOAM SOILS OF VARIABLE DEPTH (2-10m) TYPIFIED BY DENSE VEGETATION AND ABUNDANT TERMITE HILLS- ALLUVIAL & COLLUVIAL IN ORIGIN

UNIT 7a — LOCALLY DERIVED COLLUVIUM AND ALLUVIUM IN UPPER TRIBUTARIES (WHERE SHOWN) AND MIDDLE TRIBUTARIES

UNIT 7b — ALLUVIUM IN BRAIDED WASH VALLEYS AND ACTIVE FLOOD PLAINS

SYMBOLS

- SEALED ROAD
- UNSEALED ROAD
- AMADEUS BASIN- DARWIN GAS PIPELINE
- REGOLITH BOUNDARY, DIFUSE
- REGOLITH BOUNDARY, DISTINCT
- DRAINAGE SHOWING FLOW DIRECTION
- DOWNSLOPE DIRECTION (COLLUVIUM MOVEMENT)
- SHEETWASH FLOW DIRECTION
- RESIDUAL REDDISH- YELLOW SANDS

POSEIDON GOLD LIMITED

LEGEND FOR REGOLITH MAP

Compiled/Drawn	Date	Scale
—	—	—

Figure No. 3a

7. REFERENCES

Le Messurier, P, Williams, B T, and Blake, D H (1990) - *Tennant Creek Inlier - Regional Geology and Mineralisation, in Geology of the Mineral Deposits of Australia and Papua New Guinea (Ed. F E Hughes)*, pp 829-838 (The Australasian Institute of Mining and Metallurgy).

APPENDIX ONE

BIBLIOGRAPHIC DATA SHEET

BIBLIOGRAPHIC DATA-SHEET

REPORT NUMBER	12010
REPORT NAME	FIRST RELINQUISHMENT REPORT FOR EXPLORATION LICENCE 7821 FOR THE PERIOD 14/8/92 TO 13/8/94, TENNANT CREEK DISTRICT, NORTHERN TERRITORY, BARKLY SOUTH PROSPECT
PROSPECT NAME(S)	EL 7821 BARKLY SOUTH PROSPECT
OWNER/JV PARTNERS	POSEIDON GOLD LIMITED
KEYWORDS	AERIAL MAGNETICS RECONNAISSANCE WARRAMUNGA GROUP GEOMORPHOLOGY PHOTOGEOLOGY
COMMODITIES	GOLD
TECTONIC UNIT	TENNANT CREEK INLIER
1:250,000 MAP SHEET	TENNANT CREEK SE 53-14
1:100,000 MAP SHEET	TENNANT CREEK 52/5

134°21' 134°22' 134°23' 134°24' 134°25' 134°26' 134°27'

19°31'

19°32'

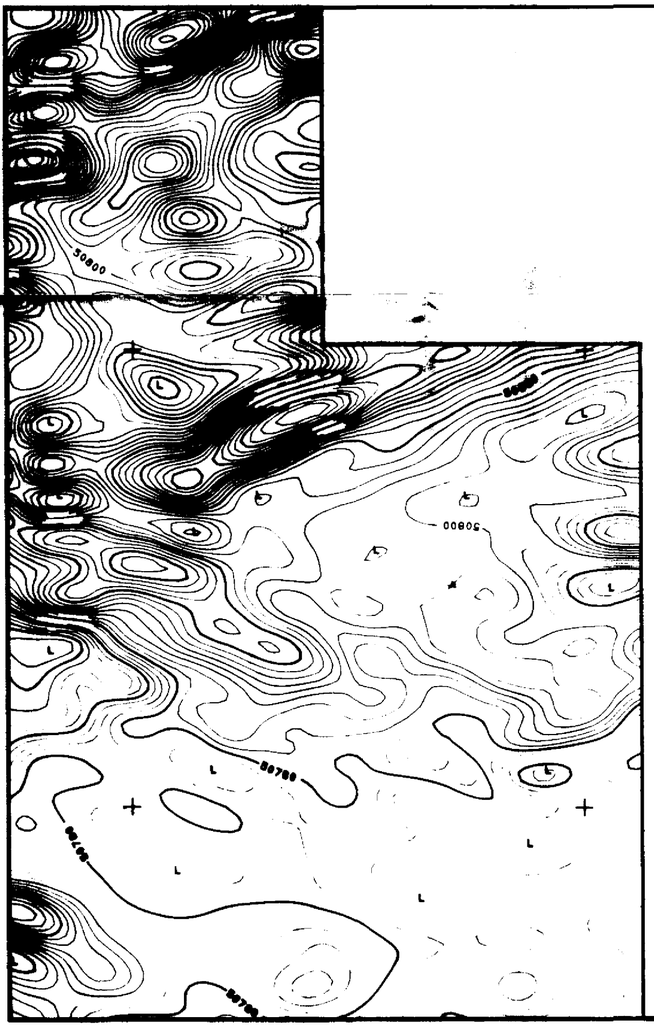
19°33'

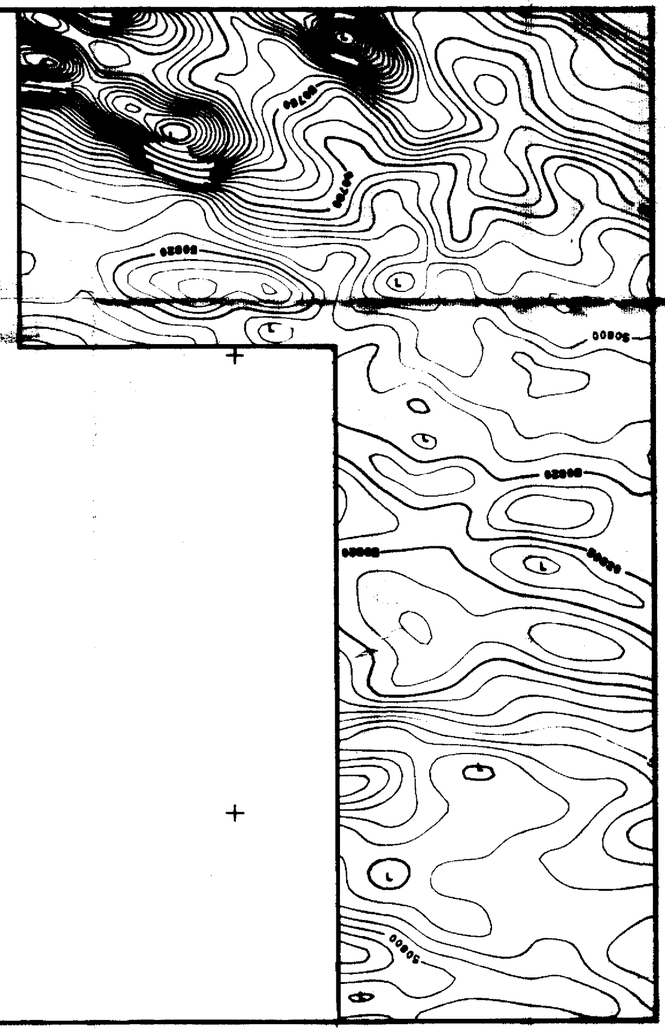
19°34'

7850000N

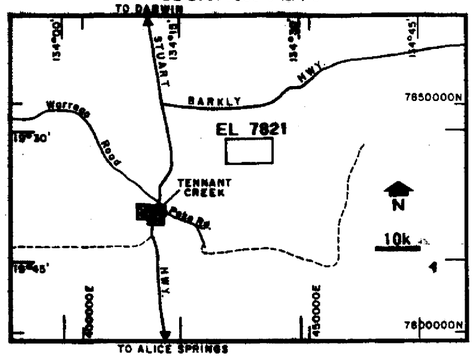
7827500N

EL 7821





LOCATION PLAN



DATA COLLECTION

OPERATOR	:	AUSTIREX-AERODATA 1989-92
MAGNETOMETER	:	PROTON PRECESSION 30m SI
	:	SCINTREX Cs VAPOUR V201
SURVEY HEIGHT	:	60m
LINE DIRECTION	:	NORTH-SOUTH
LINE SPACING	:	200m
TIE LINE SPACING	:	4000m
NAVIGATION	:	RADIO POSITIONING

DATA PROCESSING

CORRECTIONS	:	Tie Line
	:	IGRF
GRIDDING	:	50m
GRIDS MERGED	:	AUSTIREX MULTICLIENT 1989
	:	AERODATA 1990 (SHORT-RANGE)
	:	AERODATA 1992 BARCELONA
	:	AERODATA 1992 PATCH
	:	AERODATA 1992 MOSCOW
	:	AERODATA 1992 STUART
	:	PEKO'S GOSSE RIVER SURVEY

CONTOUR INTERVAL 5nT
REGIONAL VARIATIONS HAVE BEEN REMOVED

ALL DATA HAS BEEN MERGED BY P.SMITH

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EL 7821
AEROMAGNETIC TOTAL MAGNETIC FIELD CONTOURS

Compiled	Date	Scale	Plan No.
PS/MS	NOV.1994	1:25000	1

432500E 435000E 437500E 440000E