NORMANDY NFM Limited

FINAL REPORT

FINAL REPORT FOR EL 9085 (SPRINGBOK)

for the period
12 November 1996 to **11 October 2001**

Barrow Creek Project
NORTHERN TERRITORY

Volume **1** of **1**

1:250,000 SHEET:	Barrow Creek	SF53-6
1:100,000 SHEET:	Crawford	5655
	Taylor	5755

AUTHOR: Eric J. Whittaker

TENEMENT HOLDERS: Normandy Gold Exploration Pty. Ltd.
Normandy NFM Ltd.
Yuendumu Mining Company

DISTRIBUTION:
- ❑ Northern Territory Department of Mines and Energy
- ❑ Normandy Mining Limited
- ❑ Yuendumu Mining Company

SUMMARY

Report No. 29244

Title: Final Report for EL9085 Springbok, 12 November 1996 to 11 October 2001

Author: E. J. Whittaker

Date: November 2001

This report describes the exploration activity and results obtained from EL9085 over the period of tenure. Exploration within this area included regolith mapping, airborne magnetic and radiometric surveys and vacuum drilling.

Work Summary:

- Regolith mapping
- Airborne magnetic survey
- Airborne radiometric Survey
- Vacuum Drilling, 155 holes for 1433.5m, 155 samples

It was felt that the results of this exploration did not warrant further expenditure, therefore the remaining blocks were relinquished on the 11 October 2001.

TABLE OF CONTENTS

Page Number

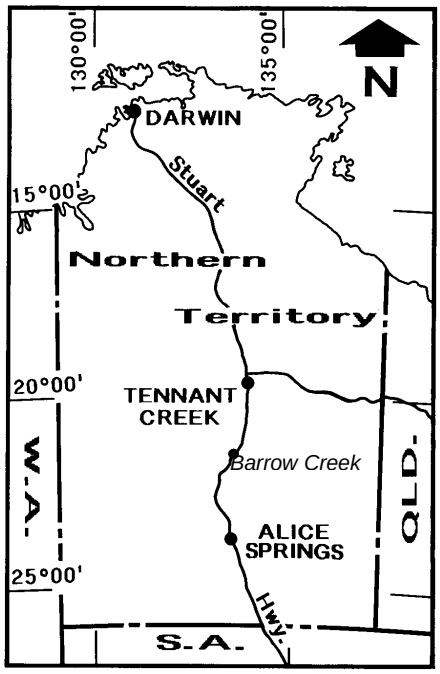
LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

1. INTRODUCTION

Exploration Licence 9085, which forms part of the group of tenements forming the Barrow Creek Joint Venture (BCJV), is located approximately 200 km south of Tennant Creek and was being explored for economic gold mineralisation. Figure 1 shows the licence area and its position in relation to other Normandy NFM tenements.



2. TENEMENT DETAILS

Exploration Licence 9085 originally comprised of 35 graticular blocks and was applied for on 6 February 1995 and subsequently granted to Normandy on 12 November 1996. As part of the licence falls within the BCJV Area of Interest, the licence has been included under the Joint Venture Agreement. Normandy NFM are the operators of the JV and the present breakdown between the JV partners is as follows:

Normandy Gold Exploration Pty Limited	42.5%
Normandy NFM Limited	42.5%
Yuendumu Mining Company	15%

Table 1: Tenement Summary, EL9085 (Springbok)

Action	Date	Blocks Relinquished	Block Holding	Km^2
Application	06/02/95			
Granted	12/11/96		35	113
First Relinquishment	11/10/98	17	18	58
Final Relinquishment	11/10/01	18	-	-

3. LOCATION, ACCESS AND PHYSIOGRAPHY

Exploration Licence 9085 is located approximately 200km south of Tennant Creek and 30km north of the Barrow Creek Hotel (refer Figure 1).

The tenement, located on the Neutral Junction pastoral lease (NT POR. 3375), has the Stuart Highway and associated Travelling Stock Reserve (NT POR. 4338) passing through the centre of the licence. Access is via station tracks from the Stuart Highway.

The Springbok area consists mostly of valley plain colluvial detritus with two channels, associated with the Taylor Creek, running roughly north south through the licence. Isolated subcrop and outcrop occurs in the south of the licence.

4. EXPLORATION OBJECTIVES

The Barrow Creek area has been targeted for the exploration of economic gold mineralisation.

Exploration efforts within the Barrow Creek region have indicated that gold mineralisation has an association with a range of geological environments. Models of the gold occurrences, for which the Barrow Creek area is believed to be most prospective, include:

- Discordant stockwork deposits of gold in relatively late stage quartz veins;
- Gold mineralisation in veins hosted by shear zones with strong alteration characteristics;
- Gold deposits associated with intrusive margins and brittle-ductile deformation;
- Deposits in regolith containing gold concentrated by alluvial, eluvial or alteritic processes.

With these models in mind, the Company's geologists selected prospective target exploration areas based on regional geological, structural, geophysical and geochemical data.

The detailed assessment of these targets was undertaken by a range of exploration techniques, designed to reveal the geology of the target area and the presence of indicator elements.

5. GEOLOGY

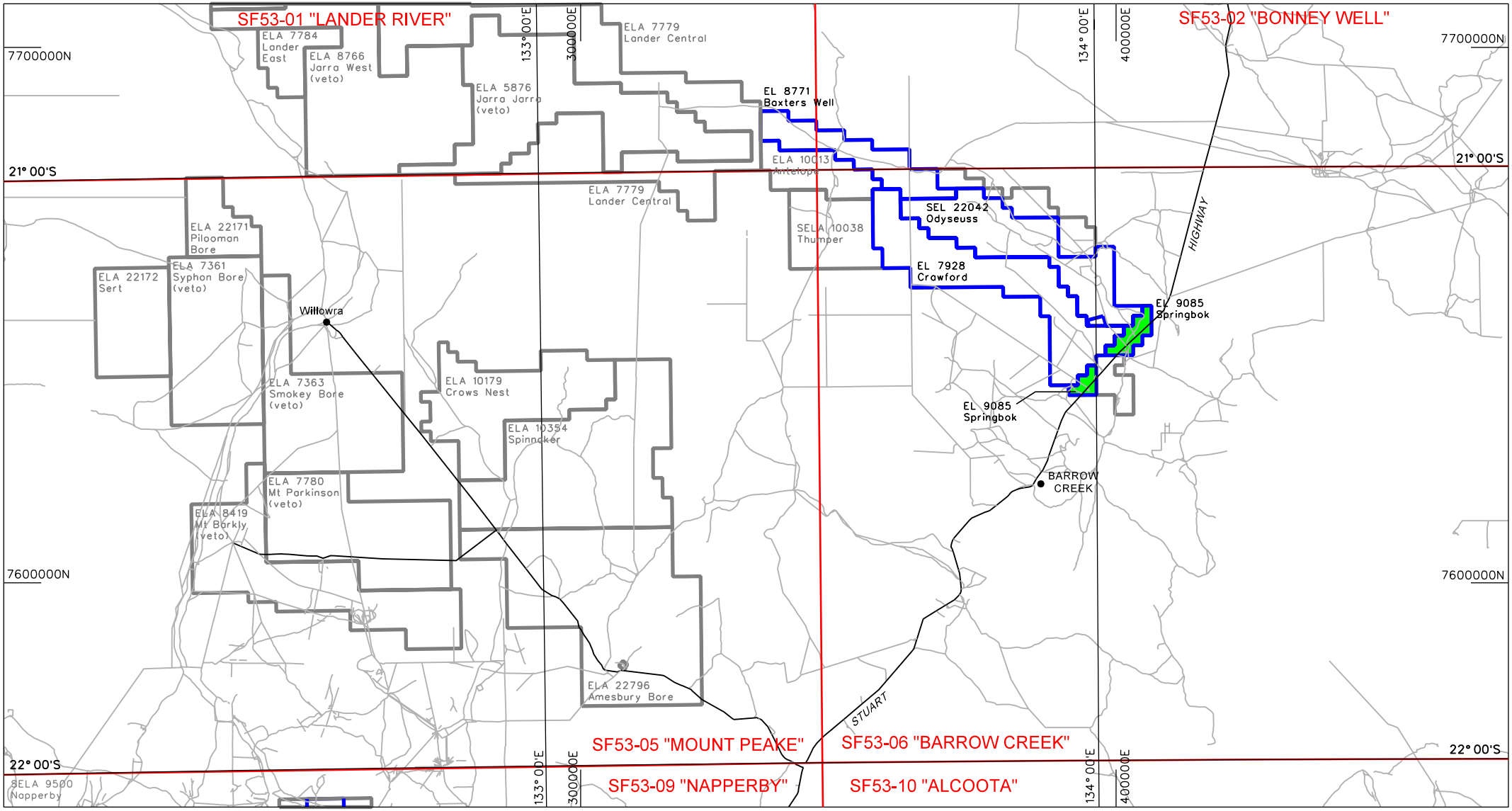
5.1 Barrow Creek Regional Geology

The oldest exposed basement in Central Australia comprises metamorphic and igneous rocks of the Arunta Inlier (Haines et al., 1991). Rocks of the Arunta Inlier are interpreted as being at least partly correlative with sedimentary and volcanic sequences of the adjacent Tennant Creek and Granites-Tanami Inliers.

The Arunta Inlier (Early-Middle Proterozoic) is characterised by metamorphosed sedimentary and igneous rocks of low to medium pressure facies. Deformation and regional metamorphism to upper greenschist facies took place between 1810-1750 Ma (Black, 1981). Shaw and Stewart (1975) established three broad stratigraphic subdivisions based on facies assemblages and lithological correlations. From oldest to youngest, these subdivisions are named Division 1, 2 and 3. Using this model defined by Shaw and Stewart (1975), the orthogneiss east of Osborne Range, the calc-silicate rocks west of Crawford Range and the Bullion Schist would be included in Division 2, and the Ledan Schist in Division 3 of the Arunta Inlier.

Unconformably overlying these rocks are the Hatches Creek Group sediments and volcanics. Blake et al. (1987) formally subdivided the Group into the Ooradidgee, Wauchope and Hanlon Subgroups, comprising a total of 20 Formations and two Members. The Hatches Creek Group is a folded sequence of shallow-water sediments with interbedded volcanic units that reach thicknesses of at least 10,000 metres.

The sediments include ridge-forming quartzites, felspathic, lithic and minor conglomeratic arenites and friable arenite, siltstone, shale and carbonate. The Ooradidgee Subgroup consists mainly of fluvial



N
W E
S

0 50km

SCALE 1:1,000,000

UTM Zone 53 (AGD66)

Normandy NFM Limited

NORMANDY EXPLORATION PTY LTD

EL 9085 - SPRINGBOK

TENEMENT LOCATION PLAN

29/10/2001

Tanami Location

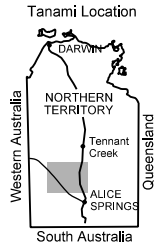
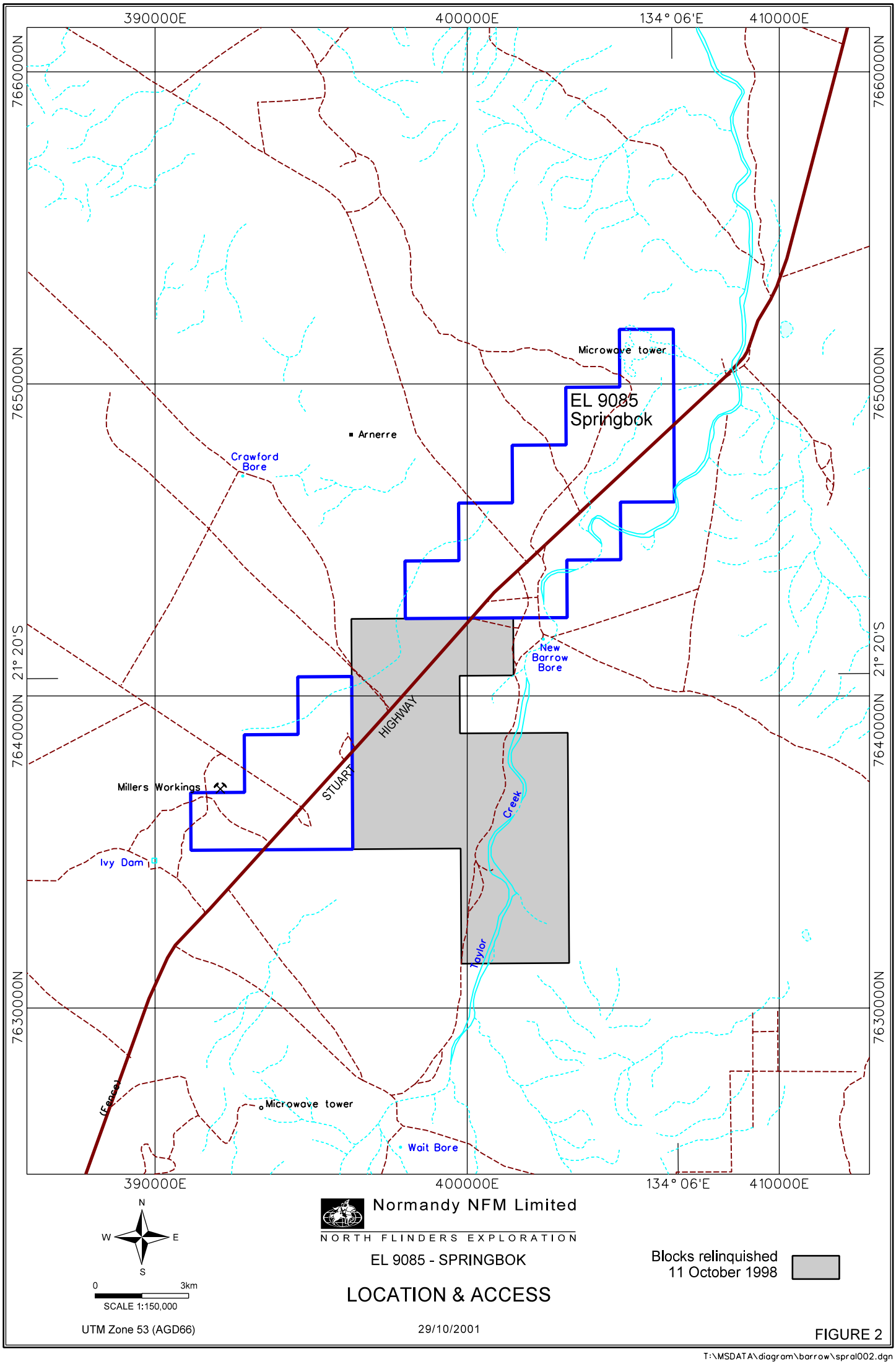


FIGURE 1

T:\MSDATA\diagram\barrow\spral001.dgn


390000E
400000E
134° 06'E
410000E
7660000N
7650000N
7640000N
7630000N
21° 20'S
Microwave tower
EL 9085
Springbok
Arnerre
Crawford
Bore
New
Barrow
Bore
HIGHWAY
STUART
Millers Workings
Creek
Ivy Dam
Taylor
Fence
Microwave tower
Wait Bore
N
W
E
S
0
3km
SCALE 1:150,000
Normandy NFM Limited
NORTH FLINDERS EXPLORATION
EL 9085 - SPRINGBOK
LOCATION & ACCESS
Blocks relinquished
11 October 1998
UTM Zone 53 (AGD66)
29/10/2001
FIGURE 2
T:\MSDATA\diagram\barrow\spral002.dgn

sediments and sub-aerial volcanics which partly interfinger. The Wauchope Subgroup is characterised by large volumes of volcanics and sediments probably both marine and fluvial in origin. The Hanlon Subgroup may be entirely marine and lacks volcanics (Blake et al., 1987).

Deformation and regional metamorphism took place between 1810-1750 Ma (Black, 1981). Folding was about NW trending axes while metamorphism to upper greenschist facies took place. Later intrusion of both the Arunta basement and the Hatches Creek Group by granitoids of the Barrow Creek Granitic Complex took place around 1660 Ma (Blake et al., 1987). Contact metamorphism and metasomatism are often observed.

Sedimentation associated with the Georgina Basin commenced during the Late Proterozoic with the Amesbury Quartzite and was terminated during the Early Devonian after deposition of the Dulcie Sandstone. The Georgina Basin sequence was mildly affected by the Carboniferous Alice Springs Orogeny.

A long erosional period followed with subsequent deep weathering during the Tertiary produced silcrete and ferricrete horizons. A thin veneer of Quaternary sands and soils overlays much of the area, except where recent and active alluvial sedimentation is present.

5.2 Local Geology

Surface geology within the area consists mostly of valley plain colluvial detritus with two colluvial channels running roughly north-south through the relinquished blocks associated with Taylor Creek. Isolated subcrop and outcrop occurs in the south of the area and consists of probable Hatches Creek Group and Ali Curung Granite.

6. PREVIOUS EXPLORATION

Within the Barrow Creek area, Kewanee Australia Pty Ltd undertook a broad exploration programme between 1970-1974 within the Crawford-Osborne Range area. Several targets were delineated by a combination of airborne magnetics, radiometrics and EM survey techniques. Targets generated by this method were followed up with geological mapping, sampling and a combination of percussion, reverse circulation and diamond drilling. This work delineated a sub-economic Cu-Ni resource, Prospect D (approximately 9km NE of the relinquished blocks), but grade was considered too low to warrant further investigation and the ground was relinquished in 1973. Kewanee Australia Pty Ltd also targeted the Millers pegmatite hosted tin/tantalum prospect, within the original EL9085, with rock chipping, soil sampling and geological mapping but with disappointing results.

Limited exploration was conducted by Australis Mining NL, during 1969, for base metal potential in the Crawford Range area. Pegmatites, granites and metadolerites were targeted with disappointing results.

7. WORK UNDERTAKEN ON RELINQUISHED BLOCKS

7.1 Vacuum Drilling

A vacuum drilling programme was carried out on a 500m x 100m spaced east-west grid over the southern half of EL9085. The drilling was completed by Tracey's Drilling of Tennant Creek with a tractor mounted vacuum drill rig. A total of 155 holes were drilled for 1433.5m. All holes were drilled to bedrock. The reader is referred to Figure 3 for the location of drillholes.

Geochemical samples were taken from the bedrock at the base of each hole. The samples were then submitted to Australian Laboratory Services (Townsville) for low level detection gold-arsenic-base metal analysis. The results are provided in Appendix 1 while details of the analysis undertaken can be obtained from Table 2.

The drilling within the license area intersected siltstones, sandstones and suspected volcaniclastics that are thought to represent the Hatches Creek Group. Bedrock assay results from the programme within the suspected Hatches Creek Group rocks were subdued.

Table 2: Springbok Vacuum Drillhole Details

Drillhole ID	Samples	Analysis Code	Elements Analysed (detection in ppm unless otherwise indicated)
SPV0001-0155	546001 – 546061 546063 – 546083 546085 – 546113 546115 – 546146 546148 - 546160	PM225	Au(0.1ppb)
		IC225	Fe(100), Mn(5), Co(1), Ni(1)
		IC588	Cu(1), Pb(1), Zn(1), Ag(0.1), Bi(0.2), As(0.2), Cd(0.1), Mo(0.2)
155 holes for 1433.5m	**155 Samples**		

7.2 Regional Regolith Survey

A regional regolith survey of the Barrow Creek area was carried out by former, in-house geoscientist, Mark Derriman. The survey was compiled from existing aerial photographs and satellite imagery and then checked with field inspections. The dominant regolith types within the relinquished EL9085 are valley plain colluvial detritus, and alluvium from active channels, namely the Taylor Creek.

7.3 Airborne Surveys

A regional aeromagnetic and radiometric survey was flown over the Barrow Creek area, including the relinquished blocks of EL 9085, in 1996. The survey was completed by World Geoscience Corporation for Normandy and was flown at a height of 40m above the ground on north-south lines, 100m apart. The survey was designed to identify lithological boundaries and structures below the cover that could then be targeted by future exploration.

392500E 395000E 397500E

7642500N

EL9085 - SPRINGBOK
Blocks Relinquished Oct 1998

7640000N

SPV0102 SPV0103 SPV0104 SPV0105 SPV0106 SPV0107 SPV0108 SPV0109 SPV0110 SPV0111 SPV0112 SPV0113 SPV0114 SPV0115 SPV0116 SPV0117 SPV0118 SPV0119 SPV0120 SPV0121 SPV0122 SPV0123 SPV0124 SPV0125 SPV0126 SPV0127 SPV0128 SPV0129

SPV0149 SPV0148 SPV0147 SPV0146 SPV0145 SPV0144 SPV0143 SPV0142 SPV0141 SPV0140 SPV0139 SPV0138 SPV0137 SPV0136 SPV0135 SPV0134 SPV0133 SPV0132 SPV0131 SPV0130

SPV0150 SPV0151 SPV0152 SPV0153 SPV0154 SPV0155

SPV0086 SPV0087 SPV0088

7637500N

SPV0030 SPV0031 SPV0032 SPV0033 SPV0034 SPV0035 SPV0036 SPV0037 SPV0038 SPV0039 SPV0040 SPV0041 SPV0042 SPV0043 SPV0044 SPV0045 SPV0046 SPV0047 SPV0048 SPV0049 SPV0101 SPV0100 SPV0099 SPV0098 SPV0097 SPV0096 SPV0095 SPV0094 SPV0093 SPV0092 SPV0091 SPV0090 SPV0089 SPV0085 SPV0084 SPV0083 SPV0082 SPV0081 SPV0080 SPV0079 SPV0078 SPV0077 SPV0076 SPV0075

SPV0029 SPV0028 SPV0027 SPV0026 SPV0025 SPV0024 SPV0023 SPV0022 SPV0021 SPV0020 SPV0019 SPV0018 SPV0017 SPV0016 SPV0015 SPV0014 SPV0013 SPV0012 SPV0011 SPV0010 SPV0009 SPV0008 SPV0007 SPV0006 SPV0005 SPV0004 SPV0003 SPV0002 SPV0001 SPV0050 SPV0051 SPV0052 SPV0053 SPV0054 SPV0055 SPV0056 SPV0057 SPV0058 SPV0059 SPV0060 SPV0061 SPV0062 SPV0063 SPV0064 SPV0065 SPV0066 SPV0067 SPV0068 SPV0069 SPV0070 SPV0071

SPV0072 SPV0073 SPV0074

STUART HIGHWAY

EL9085 - SPRINGBOK

7635000N

392500E 395000E 397500E

N
W E
S

0 500m
SCALE 1:25,000

UTM Zone 53 (AGD66)

Normandy NFM Limited
NORMANDY EXPLORATION PTY LTD

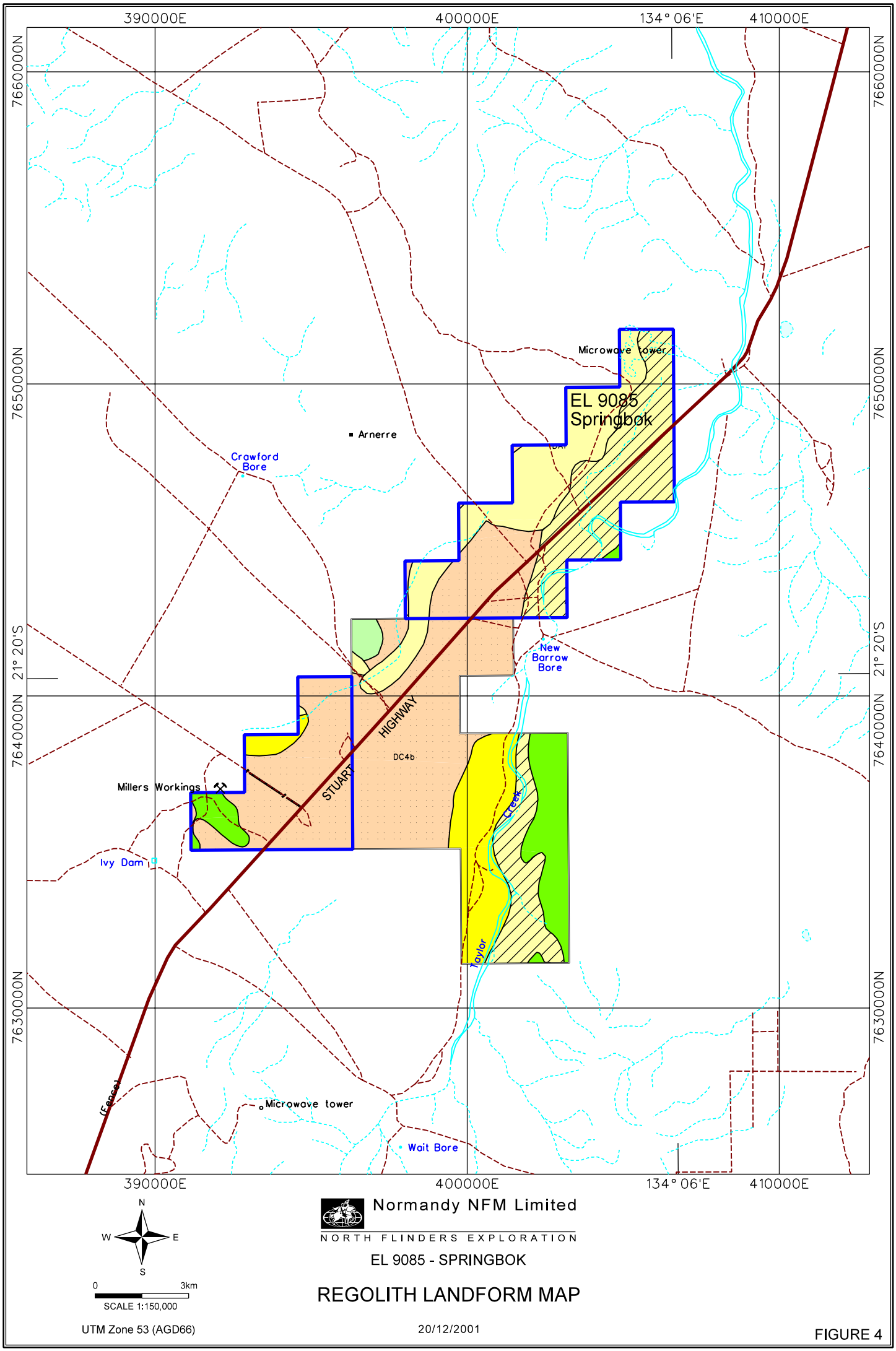
EL9085 - SPRINGBOK

VACUUM HOLE LOCALITY PLAN

29/10/2001

FIGURE 3

T:\MSDATA\diagram\barrow\sprav002.dgn



Normandy NFM Limited

NORTH FLINDERS EXPLORATION

EL 9085 - SPRINGBOK

REGOLITH LANDFORM MAP

UTM Zone 53 (AGD66)

20/12/2001

FIGURE 4

T:\msdata\diagram\barrow\sprag001.dgn

LITHOLOGICAL DESCRIPTORS

al	Alluvium.
amp	Amphibolite.
d	Dolerite.
(gr)/g	Granite.
m?	Mafic of Indeterminate type.
peg	Pegmatite.
pyr	Pyrite.
q	Vein quartz.
sch	Micaceous schist.
si	Low tempertature opaline silica.
ss	Sandstone.
(gr)/8 o	RAB drillhole (Normandy) with bottom of hole lithology and depth to bedrock.
●(g)	Power and Water Authority water bore with bottom of hole geology. (position may be slightly inaccurate)
x sch	Outcrop/subrop with lithology.
	Abandoned workings.
	Gate.
	Fence line.
	Track/Road.
	Major Road (sealed).
	Mill.
	Dam.
	Stream.
	Elevated pottasium response with highest response hatched.

RELICT REGIME

Nodular hematitic laterite with cutins.

EROSIONAL REGIME

Prominent outcrop and associated debris as steep hills, ranges and pinnacles.

Low hills, frequent outcrop exposures, thin lithic soils.

Outcrop exposures of low relief.

Outcrop/Subcrop exposures and thin (<2m) proximal colluvial soils.

DEPOSITIONAL REGIME

Valley plain colluvial detritus with associated thick mulga/accacia cover. Generally thinly developed (<4m) over bedrock. With thin cover of aeolian sand (2cm).

As for DC4a but with thin vegetative cover and possibly more deeply developed.

Valley side colluvial detritus.

Alluvium in minor channels (active).

Alluvium in major channels (active).

Alluvial sheetwash (intermittently active).

Palaeochannel, not longer active and usually cut by DA1 and DA2, low temperature chalcedonic silica is locally developed.

Basinal sediments of the Warrabri basin (Tertiary)

Sand dunes.

Swamp.

NB) Compiled from interpretation of Landsat Thematic Mapper (TM) and Multispectral Scanner (MSS) Imagery with the Geo-rectified (TM) Imagery being used as a base map. Other data sets, used in the interpretation phase were multi-client radiometrics and NOREX and Northern Territory Power and Water Resources drill hole information. Some interpretation and spatial discrepancies are regrettable but inevitable.

T:\msdata\diagram\barrow\sprag001.dgn

8. REFERENCE LIST / ANNUAL REPORT BIBLIOGRAPHY

References

Blake, T.U.; Stewart, A.J.; Sweet, I.P. and Hone, I.E., 1987. Geology of the Proterozoic Davenport Province, Central Australia. Bureau of Mineral Resources, Australia, Bulletin, 226.

Black, L.P.; 1981: Age of the Warramunga Group, Tennant Creek Block, Northern Territory, BMR Journal of Australian Geology and Geophysics, 6, 253-257.

Haines, P W et al, (1991): Explanatory Notes 1:250,000 Geological Map Series, Barrow Creek SF 53-6. Department of Mines and Energy. Northern Territory Geological Survey. Darwin.

Shaw, R D and Stewart, A J, (1975): Arunta Block, regional geology. In Knight C L (Editor), Economic Geology of Australia and Papua New Guinea: 1 Metals. AusIMM, Melbourne.

Reports to NT DME

Morris, T. 1997. First Annual Report for Exploration Licence 9085 (Springbok) for the period 12/11/96 to 11/11/97. Normandy Gold, Tennant Creek. Normandy RN 22066.

Smith, M.E.H. & Adrichem, S.M. 1998. Second Annual Report for Exploration Licence 9085 (Springbok) for the period 12/11/97 to 11/11/98. Normandy NFM Ltd. Normandy RN 24386

Smith, M.E.H. 2000. Report for the Barrow Creek Project covering the 1999 Field Season. Normandy NFM Ltd. Normandy RN: 26794

Whittaker, E.J. 2001. Report for the Barrow Creek Project covering the 2000 Field Season. Normandy NFM Ltd. Normandy RN: 28023

Smith, M.E.H., 1999. First Relinquishment Report for EL9085 (Springbok). Normandy NFM Ltd. Normandy RN: 24387.

APPENDIX 1
DIGITAL DATA

Appendix 1: **Springbok Vacuum Drilling Sample Data, Assays and Logs**

EL9085(F)2001_DRILLHOLES.dat

APPENDIX 2
LITHOLOGICAL LEGEND FOR BARROW CREEK

ROCK TYPE

AMP	-	Amphibolite	HORN	-	Hornfels
CA	-	Calcrete	MP	-	Metapelite
CHT	-	Chert	PEG	-	Pegmatite
CLY	-	Clay	QTZ	-	Quartzite
CO	-	Colluvium	RHY	-	Rhylolitic Volcanics
CRB	-	Carbonate	RS	-	Red Soils
DIO	-	Diorite	S	-	Schist
DOL	-	Dolerite	SAP	-	Saprolite
EL	-	Eluvial	SIL	-	Silcrete
FER	-	Ferricrete	SL	-	Siltstone
GNE	-	Gneiss	SK	-	Skarn
GR	-	Granite	SST	-	Sandstone
GRD	-	Granodiorite	PHY	-	Phyllite
H	-	Haematite			

MINERALOGY

a	-	andalusite	h	-	haematite
amp	-	amphibole	k	-	kaolin
as	-	arsenopyrite	li	-	limonite
Au	-	gold	ml	-	malachite
b	-	biotite	mn	-	manganese
c	-	chlorite	mv	-	muscovite
cly	-	clay	po	-	pyrrhotite
cp	-	chalcopyrite	px	-	pyroxene
crb	-	carbonate	py	-	pyrite
cs	-	cassiterite	q	-	quartz
ep	-	epidote	Sc	-	sericite
f, fld	-	feldspar	t	-	talc
gn	-	galena	tm	-	tourmaline
gt	-	garnet			

STRUCTURE, ALTERATION AND TEXTURE

bi	-	bleaching	Fz	-	fracture zone
BOCO	-	base of oxidation	lm	-	laminated
bx	-	brecciated	Si	-	silicification
ds	-	disseminated	Sz	-	shear zone
F	-	fault	tr	-	trace
Fol	-	foliation	V,v	-	vein (prefix mineral)
			WT	-	water table

BIBLIOGRAPHIC DATA SHEET

REPORT NUMBER:	CR29244
REPORT NAME:	FINAL REPORT FOR EL9085 (SPRINGBOK) 12 November 1996 to 11 October 2001
PROSPECT NAMES:	SPRINGBOK
TENEMENT NUMBERS:	EL9085
OWNER/JV PARTNERS:	NORMANDY GOLD EXPLORATION PTY LTD, NORMANDY NFM LIMITED AND YUENDUMU MINING COMPANY NL
AGREEMENTS:	BARROW CREEK JOINT VENTURE (BCJV) TANAMI-ARUNTA REGION JOINT VENTURE (TARJV)
COMMODITIES:	GOLD
TECTONIC UNITS:	ARUNTA INLIER
STRATIGRAPHIC UNITS:	BULLION SCHIST, LEDAN SCHIST, HATCHES CREEK GROUP, BARROW CREEK GRANITIC COMPLEX, GEORGINA BASIN, AMESBURY QUARTZITE AND DULCIE SANDSTONE.
1:250,000 MAP SHEET:	BARROW CREEK SF53-6
1:100,000 MAP SHEET:	CRAWFORD 5655 TAYLOR 5755
KEYWORDS:	GEOPHYSICS, REGIONAL AEROMAGNETIC, REGIONAL RADIOMETRIC, VACUUM DRILLING, REGOLITH SURVEY