SUMMARY

This report describes exploration activity undertaken by North Flinders Mines Limited on Exploration Licences 2366, 2367, 2369, 2370, 4529, 6835, 6859, 6938 and 7122. 'Project Area' status has been granted to NFM in relation to these tenements, with an anniversary date of 28th February applying. The agreed reporting date for all licences is 28th March for unrelinquished ground.

Work undertaken includes the following:

- Mapping and rock chip sampling
- Regional laterite sampling survey
- Vacuum and rotary airblast (RAB) drilling
- Reverse circulation (RC) and diamond drilling of defined exploration targets
- Costeaning
- Ground geophysical surveys
- Maintenance of infrastructural support for field operations

The principal commodity sought by NFM in its Tanami exploration is gold. The aim of the Company is to replace and expand the current resource base on which its present mining operation is based.

Positive exploration results for the year to February 1992 are summarised below:

. Discovery of the Callie open pit gold resource. This comprises 990,000 tonnes @ 12.2g Au/t (wholly within ML S154 and excised from EL 2367 so not subject to this report).

. Delineation of the Villa open pit gold resource. This comprises 1,350,000 tonnes @ 3.2g Au/t (wholly within ML S154 and excised from EL 2367 so not subject to this report).

. Delineation of the Fumarole open pit gold resource. This comprises 270,000 tonnes @ 3.2g Au/t (wholly within ML S154 and excised from EL 2367 so not subject to this report).

. Encouraging gold values encountered in prospects at Anomaly 2 (EL 2367), East Ptilotus (EL 2369), Red Eye (EL 2370) and Challenger (EL 2370).

1. INTRODUCTION

This report summarises the work carried out on EL's 2366, 2367, 2369, 2370, 4529, 6835, 6859, 6938 and 7122 by North Flinders Exploration (NFE) during the period 23/3/91 to 28/2/92.

The EL's were combined into a single Project Area by agreement with officers of the Department of Mines and Energy, confirmed by the Director of Mines in a letter dated 9th October, 1990.

The first five chapters of this report provide background information on NFE's exploration activities in the Tanami district.

Regional studies are covered in Chapters 6 and 7, and individual prospects within the expanded Project Area are discussed in Chapters 8 to 24. Location, previous exploration, work undertaken during 1991 and results of that work are detailed for each prospect.

2. LOCATION, ACCESS, INFRASTRUCTURE AND SURVEY CONTROL

2.1 Location

The tenements are located approximately 600km north-west of Alice Springs in the Granites - Tanami region of the Northern Territory (see accompanying plan). The licences are situated on ground covered by 1:250,000 map sheets SF 52-3, The Granites, and SF 52-4, Mount Solitaire.

2.2 Access

Access to the area is by air or via the Tanami Highway. A basic network of pre-existing and newly formed tracks links individual prospect areas to the two major NFE camps at The Granites and Dead Bullock Soak (DBS). A twenty person (approx.) capacity camp was established at DBS to accommodate the exploration team assessing the DBS mineralisation and to provide a base for regional exploration of the surrounding areas. A formed road connects DBS with The Granites.

2.3 Infrastructure

Prior to the presence of NFE in this part of the Tanami, infrastructural support was almost completely lacking. Supplies are trucked or flown to The Granites camp from Alice Springs. Both camps are serviced by telephone and FAX satellite links and water is provided by two remote borefields. One borefield lies 35km east of The Granites and the other 10km north-east of Dead Bullock Soak. Power is locally generated at both exploration bases. The nearest settlements are the Rabbit Flat roadhouse 50km to the north-west on the Tanami Highway and Tanami Downs homestead 60km to the west. The nearest town is Yuendumu some 250km south-east of The Granites on the Tanami Highway.

2.4 Survey Control

Survey control has been established in the current EL's by NFE's surveyor and by contract surveyors.

Surveys fall into two categories:

1. Initial survey control - for photo/mapping control and early reconnaissance work.

2. Grid establishment - for sampling, drilling and mapping programs.

All survey marks have been tied to the Australian Map Grid with trigonometrical survey station control. Extensive use is made of Global Positioning System equipment by staff engaged in regional exploration.

3. PREVIOUS EXPLORATION

Following the discovery of gold in the region in 1900 at a number of locations, both the Tanami and The Granites prospects were worked intermittently up to about the 1960's. The only reported exploration during this time involved limited programmes of diamond drilling around The Granites deposits carried out by Anglo Queensland Mining Pty. Ltd. during the 1940's and by Northern Mining Development NL in the early 1950's. During the late 1960's and early 1970's Geopeko Ltd. carried out preliminary exploration including several diamond drill holes apparently targeted on major aeromagnetic anomalies throughout the region. At least three of the holes were located at The Granites, and while mineralisation was encountered it was not considered sufficient to warrant further work.

Following negotiations with traditional landowners North Flinders Mines Ltd. was granted access to the area now covered by MLS8 in 1983 and commenced a detailed exploration programme that ultimately led to the development and commissioning of the currently producing Granites Gold Mine.

Within a year of granting the first four EL's in 1988, comprehensive regional airborne geophysical, reconnaissance mapping, geochemical sampling and vacuum drilling programmes commenced.

This initial exploration led to the identification of two mineralised areas (Dead Bullock Soak and Lennards Ridge) where work was concentrated for the remainder of the year. No encouraging mineralisation was located at Lennards Ridge, however, at DBS potentially economic grades of gold were intersected in several reverse circulation drill holes in October/November, 1988. Ensuing exploration has delineated 4.9 million tonnes of ore grade material within this area. Production from DBS (covered by ML S154) will begin to supplement mill feed from The Granites (ML S8) in 1992.

4. EXPLORATION OBJECTIVES AND METHODS

It is well established that the Mount Charles Beds host virtually all the know gold mineralisation in The Granites-Tanami region. The emergence of North Flinders' major mining operation at The Granites has reinforced this understanding. Consequently it has been a Company objective to secure exploration licences over areas covering as much of the prospective stratigraphly as becomes available. However, the recent discovery of the high grade, vein hosted Callie gold resource in lithologies beneath those traditionally prospected for gold concentrations has shown other styles of mineralisation should also be considered. Exploration techniques and the interpretation of results have consequently undergone some modification.

Because the expanded Project Area is now so extensive and characterised by very little outcrop, a suitable targeting method is required. NFE's regional reconnaissance programs rely heavily on a high quality airborne magnetic survey (as the host lithologies to gold mineralisation are likely to be magnetic) and on regional sub-surface geochemical sampling (as known gold occurrences lie within clear cut anomalous areas of gold/arsenic enrichment in soils). Other techniques employed include reconnaissance mapping and rock chip sampling of outcrop, multi-element geochemical sampling of soils, use of ground-based electomagnetics to map target lithologies under cover, and vacuum, RAB, RC and diamond drilling.

5. REGIONAL EXPLORATION

5.1 Published Information

The Granites - Tanami Block has been mapped by the BMR as part of a project covering the region with the results of this work presented in BMR Bulletin 197 (Blake et al 1979). A subsequent description of the geology of The Granites Gold Field by Mayer was published by the Australian Institute of Mining and Metallurgy in the Geology of the Mineral Deposits of Australia and Papua New Guinea (1990).

The Granites - Tanami Block consists of Proterozoic sediments, volcanics and granite. Detailed geology and structure is poorly understood due to the lack of outcrop throughout the entire region.

The Block has been divided into the Tanami Complex of probable Lower Proterozoic age consisting of a series of sedimentary and volcanic dominant formations. These have been intruded by a number of Lower and Mid Proterozoic granites and overlain unconformably by Mid and Upper Proterozoic platform sediments.

The most economically prospective lithological unit is comprised by The Mount Charles Beds (and possibly its equivalents) of the Tanami Complex. This formation, consisting of complexly interbedded siltstones, shales, cherts with lesser greywacke, quartzite, Fe-rich chemical sediments and basic volcanics has been subjected to at least mid-greenschist facies grade metamorphism. It is complexly folded with typically 2-3 structural events being apparent. The formation has a typically high iron content, often in the form of magnetite. The formation also hosts most of the known gold occurrences in the region.

5.2 Regional Reconnaissance Mapping by NFE

Reconnaissance mapping of the Tanami EL's at 1:25,000 scale has been in progress since the beginning of 1989. It is effectively complete for the longest standing exploration licences (2366, 2367, 2369, 2370) and ongoing over the remaining tenements. The primary objective of this work is to systematically build up an understanding of the geology (including lithotypes, stratigraphy and structure) of the Tanami EL's that will assist in the regional exploration effort. The program encompasses:

1. Mapping all rock outcrops on the EL's using available airborne colour or infra-red photography.

2. Compiling fact (outcrop) geological maps at 1:25,000 scale by transferring mapping on air photographs directly onto suitable basemaps.

3. Combining and integrating the information with remote sensing data and new drilling results in areas of no outcrop to produce interpretive 1:25,000 geological maps.

4. Supplementing 1:25,000 scale regional mapping with additional information gleaned from prospect mapping.

5. Producing both fact and interpretive geological maps at 1:100,000 scale based on the 1:25,000 mapping, for regional overview purposes. These are supplied with this report.

5.3 Plans

Drawing No	Title	Scale
60-730	Fact Geology, Sheet 2	1:100,000
60-731	Fact Geology, Sheet 3	1:100,000
40-736	Exploration Coverage, Sheet 1	1:100,000
40-737	Exploration Coverage, Sheet 2	1:100,000
40-738	Exploration Coverage, Sheet 3	1:100,000

6. REGIONAL GEOCHEMICAL SURVEY

6.1 Work Undertaken (EL 7122)

Work during 1991 was restricted to EL 7122 and has consisted of provision of access, reconnaissance vacuum drilling (incorporating BLEG and lag sampling) and rock chip sampling. Details of the work are presented in the following table:

Summary of Work Carried Out

Access Tracks ~ 26 km	
Vacuum Drilling	
Base of Hole Samples	72
BLEG Samples	186
LAG Samples	400
No. of Drill Holes	175

The regional geochemical programme was essentially similar to first pass programmes undertaken on other NFM exploration licences with holes drilled to bedrock on a 2km x 1.8km grid with BLEG samples collected at the top of weathered bedrock from drill holes on a 1km x 1.8km grid.

The major change to the nature of the programme has been the adoption of lag sampling in place of the previously utilised laterite sampling. This follows completion of a lag orientation survey and the recognition that it provides a more complete sample coverage than laterite (sensu stricto) while still locating mineralisation. Lag samples were taken at 500 metre spacing along drill traverses by sieving surficial material and collecting approximately 500 grams of the -5mm +2mm fraction.

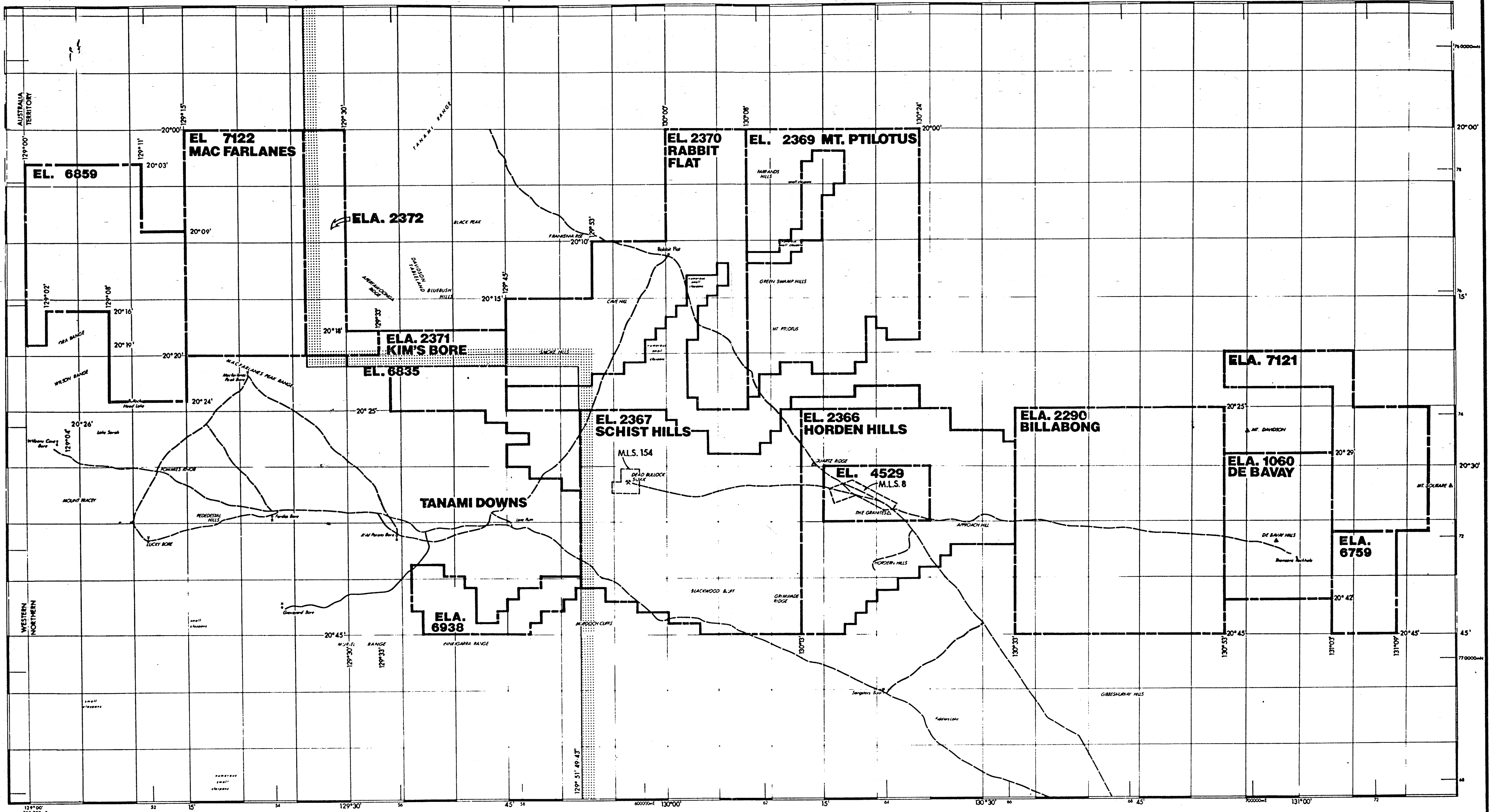
Lag samples were submitted to Genalysis, Perth for multielement analysis as was carried out previously for the laterite samples. Base of hole samples were collected from drill hole material, then submitted to Analabs, Adelaide for gold (code 334, 1ppb detection limit) and arsenic (code 115, 10ppm detection limit) analyses. BLEG samples range in size from 3-5kg and were submitted to Rapley Wilkinson Laboratories, Perth for gold (0.01ppb D.L.), copper (0.01 ppm D.L.) and silver (0.01ppb D.L.) analyses.

Drill holes were drilled along magnetic east-west traverses layed out with compass and speedometer. Each drill hole is marked by flagging tape and perma-tags and accurately located using the Global Positioning System (GPS) instrument, with accuracy of positioning currently estimated to be ± 30 metres.

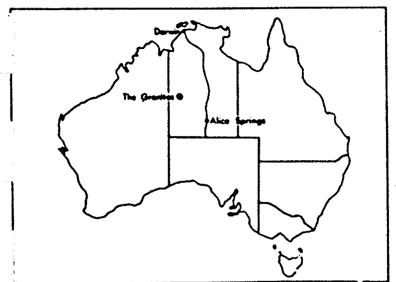
The bulk of EL 7122 has been covered by this initial phase of geochemical exploration. It is anticipated that the programme will be extended to cover much of the remainder of the EL during 1992. The untested central eastern area of the exploration licence is unlikely to be tested as it is covered by lacustrine sediments and calcrete/silcrete associated with recent drainage channels.

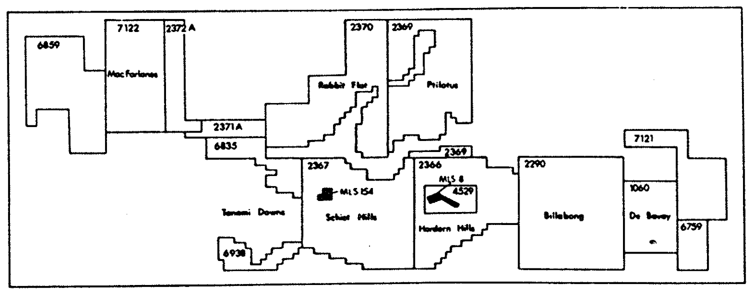
6.2 Results and Discussion (EL 7122)

Two main anomalous areas appear to be defined by the work, both in the central portion of the exploration licence. A third less well defined anomalous area occurs in the central north-west of the exploration licence and a large number of one and two point anomalies are scattered throughout the remainder of the tenement. Significant assay results are shown in Tables I-IV.



LOCATION MAP





LEGEND

Road
Fence
Airfield
Mine
Windpump
Building
Control Point, Major
" " , Minor
" " , Astronomical
Spot Elevation, (metres)
" " , Approximate
Sand Ridges
Relief Shading
Waterhole
Dry Lake
Stream, Intermittent
E.L.A. Boundary
M.L. Boundary
Aboriginal Land Boundary

NORTH FLINDERS MINES LIMITED

Tanami Reconnaissance : Northern Territory.

EL LAYOUT

1:250000

KILOMETRES

DATA BY		AMENDED	A 2/90 CG	B 8/90 CG
DRAWN	MARCH '89	C 4/91 CG	Drg. No. 20-1	

79200E
79600E
80000E
81000E
82200E
82300E
82500E
82700E
82900E
10000N
Ch, B
C Sc
abund. qtz. scree
Ꞓla
Sc
BSc
fg.G
h Sc, Ch, BIF
h Sc, Ch
BIF
micaceous pelitic schists
quartz
toumaline
Ch
scree
h Sc Ch
Fe B Sc
BIF
C Sc
wt. Ch
numerous parasitic 'S' folds with near vertical plunges
OFFICER
HILL
Sc & metasiltstone
granite
(in auger hole)
Ser
Sc
Antrim Plateau Volcanics
Madigan Beds
Davidson Beds
Tanami Volcanics
Blake Beds
fold axis
Interpretive Geological Sketch Plan (1990)
Grid Extension 1991
Kilometres
Scale 1:25,000

EL 7122

530000

540000

550000

77800

77700

77600

Anomalous Area III

Anomalous Area I

Anomalous Area II

EL 7122

MACFARLANES PEAK RANGI

Aeromagnetic Contours,
Geochemical Coverage
and Anomalous Areas.

Anomalous Area

Area not covered by
Geochemical Survey

SCALE (kms)

0 1 2 3 4 5

1:100,000

Figure 2

Table I Anomalous Area I Significant Results

SAMPLE TYPE			
Hole No.	Base of Hole (ppb Au)	Lag	Bleg (ppb Au)
LSV-1014	2	235ppm As	
LSV-1018	1	235 ppm As	1.35
LSV-1021		52 ppm As	1.27
LSV-1022	15		6.01
LSV-1034	3		
LSV-1037			4.46
LSV-1050	18		
LSV-1052	46		
also other lag samples anomalous in As, Sb, Mo.			

Table II Anomalous Area II Significant Results

SAMPLE TYPE			
Hole No.	Base of Hole (ppb Au)	Lag	Bleg (ppb Au)
LSV-1002	2		3.63 poss drainage
LSV-1003		100ppm As	3.05 poss drainage
LSV-1027		150ppm As	1.31
LSV-1028	50ppm As	300ppm As	
also other anomalous lag samples anomalous in As, Sb.			

Table III Anomalous Area III Significant Results

SAMPLE TYPE			
Hole No.	Base of Hole (ppb Au)	Lag	Bleg (ppb Au)
LSV-1-50			2.05
LSV-1059			1.23
LSV-1061			1.48
LSV-1082			1.27
LSV-1084	3		1.08
LSV-1093			1.65

Table IV Other Anomalous Results Potentially Significant

SAMPLE TYPE			
Hole No.	Base of Hole (ppb Au)	Lag	Bleg (ppb Au)
LSV-864			1.38
LSV-884	2		14
LSV-940	7		1.5
LSV-1124	7		
LSV-1130	6 (10ppm As)		
LSV-1136	15 (10ppm As)		
LSV-1140	4 (20 ppm As)		
LSV-1142	6 (20 ppm As)		
LSV-1144	12		
LSV-1150	9		
LSV-1152	1 (10ppm As)		
LSV-1154	5 (10ppm As)		
LSV-1158	3 (20ppm As)		
LSV-1160	7 (10ppm As)		
LSV-1162	5		

The southern end of anomalous area 1 is approximately coincident with the northern end of the large magnetic complex that dominates the geophysical signature of the area. It trends approximately north-westerly into an area of subdued magnetic response. The area is also marked by a low hill of poorly outcropping possible Davidson Beds.

Anomalous area 2 occurs in the east of the EL and again it has a poorly defined north-westerly trend. The southern end of the anomalous zone is approximately coincident with a high amplitude north-south trending magnetic anomaly that lies adjacent to the tenement boundary. The northern end of this feature is obscured by drainage sediments and was not tested during the programme. One interpretation is that the feature may represent the continuity of outcropping and arsenic anomalous Davidson Beds that occur to the south east at Apertawoonga Ridge.

Anomalous area 3 occurs in the central north-west of the tenement in an area of low magnetic response but again it may be inferred to have a crude north-west orientation.

The anomalous results obtained in LSV-864 and 884 are from the southern part of the EL where Davidson Beds outcrop adjacent to an intrusive granite which is coincident with one of the distinctive magnetic lows within the complex.

The large number of base of hole samples (LSV-1130-1162) returning anomalous gold values from the far north of the tenement is unusual. The results are quite high (maximum 15ppb Au) yet no BLEG gold anomalism is observed in the area and geologically the area appeared to be underlain by either Killi Killi Beds or Pargee Sandstone, generally considered unfavourable as potential hosts for mineralisation. The immediate suspicion is of analytical error, and this shall be checked prior to any possible follow up.

A number of anomalous results, particularly for BLEG gold assays were obtained from areas of apparent drainage sediments. This is somewhat puzzling. A possible explanation is that the anomalous results represent physically remobilised and transported gold that is 'trapped' either physically as particles in clay rich sediments or chemically within calcareous sediments. Regardless, the degree of concentration is considerable (peak result in inferred drainage is 4ppb Au) and sufficient to produce a significant anomaly.

6.3 Plans (EL 7122)

Drawing No	Title	Scale
A	Lag Assays for Au and As	1:25000
B	Lag Assays for Mo and Sb	1:25000
C	Vacuum Drilling, Base of Hole, Au and As Assays	1:25000

7. REGIONAL GEOPHYSICS

During 1991 there was no need to add to the existing airborne magnetics and radiometrics database. Existing high quality and image-processed surveys already cover NFE's Tanami exploration licences. Airborne magnetic data were used throughout the year to focus ground-based exploration activity.