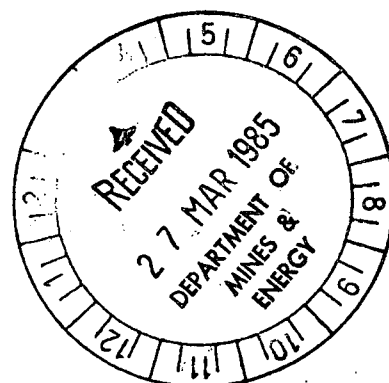


NORTHERN GOLD N.L.
FINAL REPORT EL's 3040, 3041
3055, 4235, 4444 and 4455, HOWLEY
AREA, NORTHERN TERRITORY
DECEMBER 1984

OPEN FILE



Licences: 3040, 3041, 3055, 4235, 4444 and 4455
Licensee: Northern Gold N.L./Talmina Trading P.L.
Operator: Northern Gold N.L.
Period: 1982 - 1984
Location: Pine Creek 1:250,000 SD52-B
 Tipperary 1:100,000 5170
Author: B. D. Richardson/G. Bravo

**NORTHERN TERRITORY
GEOLOGICAL SURVEY**

CR 85 / 099

T A B L E O F C O N T E N T S

1. INTRODUCTION

SECTION 1 - Interim Report on Exploration Activities
El 4444, East Cosmopolitan Howley,
Northern Territory

SECTION 2 - Progress Report on Exploration Activities
EL's 3040, 3041, 3055, 4235 and 4455
South Howley Area, Northern Territory
December 1984

2. FIGURES

1. Exploration Licences and Mining Tenements Howley
- Bridge Creek Areas.

1. INTRODUCTION

In December 1983, Northern Gold N.L. became the operator of 17 Exploration Licences previously held or operated by Talmina Trading P.L. in the Howley area, Northern Territory. In December 1984 these tenements were consolidated and two Exploration Licences were applied for, E.L.A. 4736 and 4737 (Fig. 1). This report describes the results of exploration carried out on EL's 3040, 3041, 3055, 4235, 4444 and 4455 now covered by E.L.A. 4736.

The licences surround the block of claims held by BHP-Homestake that cover the Cosmo Howley mine and the Howley Anticline Structure. EL 4444 covers part of the eastern limb of this anticline and contains prospective units of the Middle Koolpin Formation. Gold bearing alluvials shedding east from the Howley Line were tested in EL's 3040 and 3055. Little work was carried out west of the Howley Line but this area contains an anticlinal structure paralleling the main Howley Anticline and consequently is prospective for a similar style of mineralisation. Tin bearing pegmatites also occur in EL's 4455 and 4235.

The exploration programme is on-going but the majority of work has involved the preliminary assessment of the alluvials and the testing of the Koolpin Formation east of Cosmo Howley. The report on EL 4444 is presented in Section 1 while the work carried out on the other areas is summarised in Section 2. A summary of tenements is given below:

<u>EL</u>	<u>AREA</u> (km ²)	<u>DATE OF GRANT</u>	<u>LICENSEE</u>
3040	3	8/1/82	Talmina Trading P.L.
3041	3	8/1/82	Talmina Trading P.L.
4235	6	17/6/83	Talmina Trading P.L.
4444	3	16/7/84	Northern Gold N.L.
4455	3	16/3/84	Northern Gold N.L.

HOWLEY AREA



LOCALITY MAP

13° 30'

13° 30'

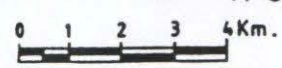
131° 20'

LEGEND

Cret Kp	Petrel Fm
Pgb	Burnside Granite
Pdz	Zom Dolerite
Ptb	Burrell Creek Fm
Pso	Mt. Bonnie Fm
Psg	Gerowie Tuff
Psk	Koolpin Fm
Ppw	Wildman Siltstone

SYMBOLS

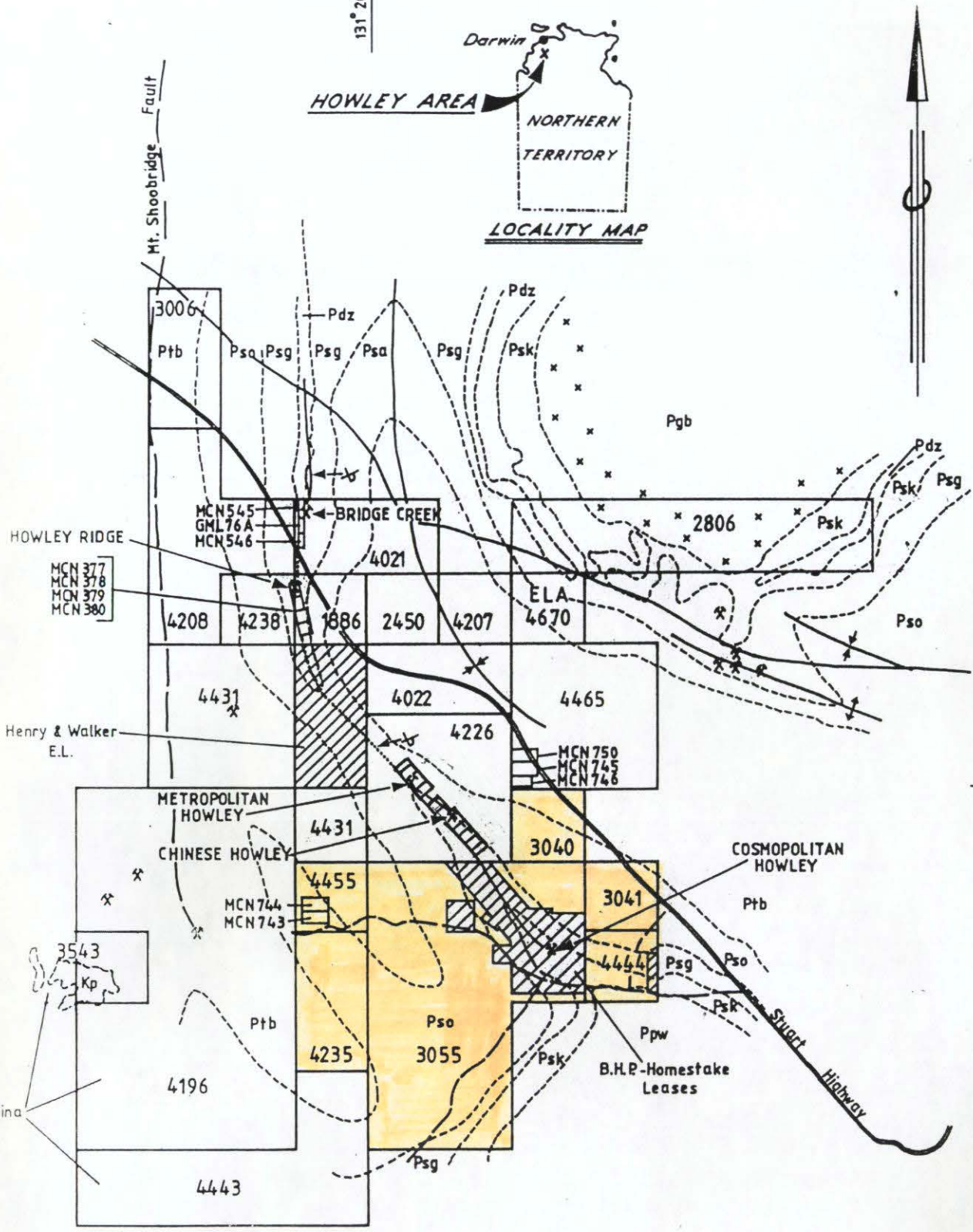
*	Old workings
~	Anticline
~	Syncline
~	Overtuned anticline



ELA 4736
" 4737

NORTHERN GOLD N.L. EXPLORATION LICENCES AND MINING TENEMENTS HOWLEY — BRIDGE CREEK AREAS

Fig 1



INTERIM REPORT ON EXPLORATION ACTIVITIES

E.L.4444, EAST COSMOPOLITAN HOWLEY

NORTHERN TERRITORY

A. P. BRAVO

G. N. KATER

NOVEMBER 1984

C O N T E N T S

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2. CONCLUSIONS AND RECOMMENDATIONS
3. GEOLOGICAL SETTING
4. WORK DONE AND RESULTS
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 - 4.2 GEOLOGICAL MAPPING
 - 4.3 GEOPHYSICS
 - 4.4 COSTEANING & SAMPLING
5. PROPOSED DRILLING PROGRAMME

APPENDIX 1 COSMOPOLITAN HOWLEY MINE
 ANACONDA - GEOPEKO JOINT VENTURE
 GEOLOGICAL SUMMARY - AUGUST 1984

APPENDIX 2 ANALABS ANALYTICAL REPORT
 NO. 999.0 14 1020
 RESULTS OF ANALYSES FROM
 COSTEAN CHIP SAMPLES

L I S T O F M A P S

- FIGURE ECH-1 EXPLORATION LICENCES AND MINING TENEMENT
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- FIGURE ECH-2 E.L. 4444. EAST COSMPOLITAN HOWLEY
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- FIGURE ECH-3 RRMIP CHARGEABILITY (RPS) CONTOURS
 TOGETHER WITH GEOLOGY AND LOCATIONS
 OF PROSPOSED DRILL HOLES

1. INTRODUCTION

Exploration Licence 4444 comprising one block of approximately 3.3 square kilometres was granted to Northern Gold N.L. on July 16, 1984.

The licence area is free of other encumbrances except for a block of ML's (1596-1608B) which partially overlap the eastern boundary (see tenement Plan, Fig. 1).

The EL is located in the NE corner of the Tipperary 1:100,000 Sheet approximately 175 kilometres SSE of Darwin at latitude 13°32' south and longitude 131°24' east.

Access is via the Stuart Highway and then south along the Fountainhead Road to its intersection with the old Highway which is central to the described area of activity.

The area was previously explored by the Bureau of Mineral Resources, which conducted geochemical sampling and drilled one diamond drill hole (DDH-1), located at grid position 49,995N; 50,320E (see geological plan ECH-2), apparently to test for copper mineralisation. As far as is known, no analyses were conducted on the drill core (Bulletin No. 12, Sullivan & Iten, 1952).

This report outlines the work done and results of exploration since activities commenced in July, 1984.

The exploration by Northern Gold N.L. has been directed towards locating gold mineralisation associated with the Middle Koolpin Formation. Work carried out so far has consisted of interpretive air photo mapping, gridding, geophysical surveying using the Rapid Reconnaissance Magnetic Induced Polarisation (RRMIP) electrical technique, grid geological mapping at 1:2,500 scale, Costeining of RRMIP anomalies and continuous horizontal chip sampling of rocks exposed in the costeans.

2. CONCLUSIONS AND RECOMMENDATIONS

2.1 RRMIP geophysical surveys in E.L. 4444 have shown an extensive conductive and chargeable anomalous zone extending over an easterly strike length of 1,600 metres coinciding with units of the Koolpin formation, east-south-east of the old Cosmopolitan Howley mine.

2.2 Geological mapping and geochemical sampling at surface and in costeans has identified several units of Koolpin formation two of which coincide with the major RRMIP anomalous zone and anomalous arsenic values. These units comprise an upper banded siliceous ironstone formation (Psks) and an adjacent sequence of pyritic mudstones, micaceous siltstones, slates, shales and calcareous sediments (Pskp). RRMIP anomalous centres often coincide with folding and flexuring of the two units.

2.3 Gold mineralisation is usually associated with sulphides and is present in the Psks and Pskp units, quartz veins in the Gerowie Tuff and dolerite contact zones.

2.4 Five inclined diamond drill holes (about 850 metres total) are proposed, drilling grid south at 60° to test geophysical anomalous centres correlating with the Psks and Pskp units, anomalous surface arsenic geochemical values and sometimes structural flexures. Analyses of drill core should include gold, silver, arsenic, manganese and in selected portions, copper and lead.

2.5 Additional drilling would depend on the results of the preliminary programme.

3. GEOLOGICAL SETTING

The geological environment is noted for its past gold production from a number of old mines including Metropolitan, Chinese and Cosmopolitan Howley mines located along the axis of the Howley Anticline.

E.L. 4444 covers the area immediately east south east of the Cosmo Howley old workings and the northern limb of the Howley Anticline strikes west to east through the centre of the E.L.

Koolpin Formation, which hosts the stratiform gold mineralisation, consists of micaceous to phyllitic brown siltstone containing siliceous and sulphide facies iron formation, altered calcareous siltstone and pyritic as well as carbonaceous shale. Grey carbonaceous mudstone at the top of the Koolpin Formation is overlain by laminated tuffaceous siltstone, interbedded, felsic chert and quartzite belonging to the Gerowie Tuff. The sediments were intruded at several levels by sills of Zamu Dolerite prior to the major phase of regional deformation.

The geology and mineralisation of the ore horizon as it occurs at Cosmopolitan Howley is summarised in the attached handout provided by Anaconda Australia who are currently carrying out exploration of the deposit (see Appendix 1).

4. WORK DONE AND RESULTS

The main target of exploration so far has been the stratiform gold mineralisation associated with sulphides in the Middle Member of the Koolpin Formation.

The programme consisted of:

- 4.1 gridding
- 4.2 geological mapping
- 4.3 RRMIP geophysical survey
- 4.4 costeaning and sampling

The work done and the results are described below:

4.1 Gridding

For the purpose of geological mapping and the geophysical survey, a grid, with base line at 090° magnetic, was laid out using toposil and hand-held monocular compass.

Pegs were positioned at 100 metre intervals on cross lines 100 metres apart.

Following initial airphoto interpretation the grid was positioned between the western boundary of EL4444 and the ML's on the eastern boundary to cover the maximum strike length of the Koolpin Formation.

4.2 Geological Mapping

The gridded area was mapped in detail on 50 metre traverses and plotted at 1:2,500 scale.

Rock exposures were found to be reasonable although float mapping was necessary in some areas on the steeper hill slopes.

The dominating geological features of the mapped area are the two prominent ironstone horizons developed on surface above zones of interbedded banded iron formation and chemical sediment. They can be traced almost continuously within the Koolpin Formation along strike and provide evidence at a number of locations of structural flexure and parasitic folding.

The lower, combined haematitic ferruginous gossan and siliceous ironstone and the upper siliceous ironstone proved to be useful stratigraphic markers so that it was possible to map at least 5 units within the Koolpin Formation besides the ubiquitous red-brown, finely laminated micaceous siltstone.

The units are shown on the geological map (Figure ECH-2) and can be identified as set out in the legend. To further identify some lithologies 6 specimens (TSH 25 - TSH 30) were collected and sent to Dr. B. J. Barron for petrological description. Sample details are set out below:

SAMPLE NO.	DESCRIPTION	LOCATION
TSH 25	Greyish-red tuffaceous siltstone Psg	Costean SH1/47m
TSH 26	Grey shale Pskc	SH1/67m
TSH 27	Tremolite/actinolite rock with module Psks	SH1/160m
TSH 28	Laminated greywacke Psks	SH1/169m
TSH 29	Greywacke with sulphide casts Psks	SH1/180m
TSH 30	Spotted greywacke with fine vein meshwork Pskf	SH5/30m

The results of this work have not been received to date.

The lower iron formation which has been designated Pskf on the map is approximately 15 metres thick. The sequence consists of banded haematitic units and tremolite/actinolite rock interbedded with reddish micaceous siltstone overlying thin units of siliceous iron formation in blue-grey spotted haematitic schist.

Dolerite which has consistently intruded at a level above the Pskf unit has been altered at the contact to talc carbonate.

At the southern end of costean SH1 and in the SW area of the grid the Pskf is underlain by 60 metres of reddish brown micaceous siltstone containing thin quartz BIF's which appear to diminish along strike to the east as they are not as prominent in costeans SH2 and SH5.

The upper siliceous iron formation Psks is approximately 25 metres thick and overlies a sequence containing tremolite/actinolite rock and ovoid modules in laminated grey siltstone (module conglomerate).

Above the Psks sequence, pyritic shale Pskp and grey to sooty carbonaceous shale Pske have been intruded by dolerite producing bleached argillic (Kaolinised) alteration zones at the contact.

The grey carbonaceous shale is distinctive and marks the top of the Koolpin Formation.

4.3 Geophysics

RRMIP surveys consisting of three standard arrays (designated 28N, 29N and 30N) were carried out in July 1984. At the completion of the survey a detailed array (39N) centred on 50050N/51000E was run to determine the structure and to aid interpretation of the primary data.

The objective of the survey was to locate and define areas containing segregations of sulphides in quartz reef systems or sulphide/gold mineralisation in units of the Koolpin Formation.

A description and explanation of the method, parameters measured, data presentation and discussion of results are contained within: "Comments on Rapid Reconnaissance Magnetic Induced Polarisation Surveys over various Exploration Licences, near Howley Northern Territory - Scintrex Pty. Ltd., August, 1984."

The results indicated a series of strong MMR conductors semi-continuous but traceable throughout the length of the grid. They were interpreted by Scintrex Pty. Ltd. to be due to a narrow source with near vertical dip and great depth extent.

The form of the MMR response appears consistent with the mapped geology and highlights the continuity along strike as well as the structure of the iron formation horizons Psks and Pskf.

The RPS (chargeability) data shows a large, broadly sinuous internal IP response following the track of the MMR conductor. I is attributable to a highly conductive and extremely chargeable zone containing disseminated to semi-continuous sulphides.

The peak RPS anomalies, which are quite substantial, all occur north of the surface outcrop of the siliceous banded iron formation Psks, and are believed to coincide with sulphide mineralisation in both the Pskp and Pskc units at depth.

A second, less developed conductor axis, which is apparent 100m south of the major conductor, could be associated with the Pskf unit.

4.4 Costeaning and Costean sampling

A number of costeans were proposed to test the major anomalous RRMIP peaks along strike, assist with geological mapping and conduct geochemical rock channel sampling.

Six costeans numbered SH1 to SH6 were dug with a backhoe for a total length of 897 metres. Details of the costeans and their objective are set out below:

COSTEAN	LOCATION	LENGTH	TARGET
SH1	50000E/50400N to 50020E/50024N	0 to 380 metres	RRMIP & stratigraphy
SH2	50193E/50055N to 50191E/49990N	0 to 65 metres	Stratigraphy & Pskf
SH3	50400E/50227N to 50400E/50048N	0 to 175 metres	RRMIP & stratigraphy
SH4	50590E/50168N to 50590E/50040N	0 to 126 metres	RRMIP & stratigraphy
SH5	50665E/50008N to 50677E/49958N	0 to 57 metres	Stratigraphy & Pskf
SH6	51407E/50072N to 51383E/49978N	0 to 97 metres	RRMIP & stratigraphy

Costeans were dug to a depth to which chip samples could be taken in undisturbed weathered rock. The samples were collected from the wall, immediately above the floor, as continuous grooves over 5 metre lengths. Sampling, in each costean was conducted from north to south. Sample weights varied between 1.5 and 2 kg.

All horizontal channel samples were submitted to Analabs, Darwin for analysis for Cu, Pb, Zn, Ag, As and Au.

Gold was determined, following, aqua regia attack, from a 50 gm sample weight with AAS finish. Arsenic was determined using the pressed powder XRF method.

The results, together with sample intervals, are included in Appendix 2. 157 samples were submitted.

The gold values were low, possibly due to surface leaching, with a best value of 0.25 g/t from a channel sample crossing the Pskp-Psks contact in SH-6. Increases in arsenic values are over the Pskp unit at surface sometimes extending into the upper banded iron formation (Psks).

Based on their correlation with anomalous arsenic values, together with some low gold values, the Psks and Pskp units are the most prospective horizons.

5. PROPOSED DRILLING PROGRAMME

A preliminary scout drilling programme is proposed to test possible gold-sulphide mineralisation with the Pskp and Psks units of the Koolpin Formation with E.L. 4444.

Diamond drilling is proposed with all holes initially inclined at 60° from horizontal towards grid south with depths to at least 150 metres. The proposed collar locations of the drill holes (see accompanying RRMIP survey plan) in order of priority are as follows:

DDH-1:

50225N, 50390E. This drill hole, 10 metres west of costean SH-3, is proposed to test a strong RRMIP anomalous zone, coinciding with Pskp unit comprising a sequence of pyritic mudstones, siltstones, calcareous sediments and grey to black sooty carbonaceous slates and shale overlying the upper siliceous banded iron formation (Psks). The shape of the RPS contours suggests an overall vertical to steep northerly dip. In the nearby costean SH-3 the Pskp unit has a distinctively higher arsenic background (100 to 350 ppm) than surrounding units (15 to 65 ppm). The shape of the geophysical anomaly correlated with surface geology suggests strong structural flexuring at this location.

DDH-2:

50200N, 50480E. This drill hole, between costeans SH-3 and SH-4, is proposed to test another portion of the same anomalous zone as DDH-1. At this location there is a strong fold in the upper banded iron formation (psks) and the hole should intersect both the Pskp and Psks units at depth. It is noteworthy that in costean SH-4, 110 metres east of the proposed hole higher arsenic values (110 to 170 ppm) coincide with the Pskp unit at surface than those values (20 to 80 ppm) associated with surrounding rock-types.

DDH-3:

50265N, 50100E. This drill hole is proposed to test two sub-parallel anomalous RRMIP zones associated with structural flexuring of the Koolpin Formation. The shape of the RPS contours suggests an overall vertical to steep northerly dip. The hole would be expected to intersect the updip portion of the source of the northern zone associated with the Pskp unit and the source of the southern zone, associated with the Psks unit (B.I.F.) at depth. Depending on results additional drilling with collars at 50300N, 50100E and 50250N, 50165E may be warranted. In the costean SH-1, 50 metres west of the proposed DDH-

3, anomalous arsenic values (120 to 360 ppm) coincide with the Pskp unit and the northern part of the Psks unit with some low background gold values. Arsenic background values in surrounding rock types vary from 25 to 80 ppm.

DDH-4:

50100N, 50980E. This drill hole is proposed, 20 metres west of the Fountainhead Road, to test a strong RRMIP anomalous centre with its source near the contact of the Pskp and Psks units. Interpretation of the results from both the standard and detailed RRMIP arrays suggests near vertical to steep northerly dips. The hole should encounter the source at around 80 to 90 metres vertical depth.

DDH-5:

50065N, 51400E. This hole is proposed, close to costean SH-6 to test an anomalous centre, with its source at depth probably close to the contact between the Pskp and Psks units. Dip is interpreted to be steeply north. In costean SH-6, a five metre horizontal channel sample (SH-6, 70-75) crosses above mentioned contact and contains anomalous geochemical values of 220 ppm Arsenic and 0.25 g/t gold. This is the most southern part of a broad arsenic anomalous zone (60 to 340 ppm) coinciding with the Pskp unit and the Zamu dolerite. Background arsenic values in surrounding units range from 15 to 55 ppm.

A P P E N D I X 1

COSMOPOLITAN HOWLEY MINE

ANACONDA GEOPEKO JOINT VENTURE

GEOLOGICAL SUMMARY - AUGUST 1984

HISTORY

- ° Cosmopolitan Howley discovered in 1890's worked under tribute by Chinese.
- ° Produced about 30,000 ozs to 1900, (12 g/t).
- ° 1900-1930's no activity
- ° 1939 Anglo Queensland sunk a shaft (53m) and completed an underground sampling program, no recorded production.
- ° 1957-1963, BMR completed an eight hole diamond drill program.
- ° 1974 acquisition by BHP, two diamond holes drilled.
- ° 1939-1975, 15 diamond drill holes for 1753m.
- ° 1976, Homestake option, 19 diamond drill holes for 2224 metres. Nine underground holes for 391 metres.
- ° 1982 Geopeko-Anaconda option from BHP-Homestake.
- ° 1982 - 1984 21 holes for 7410 metres.

STRATIGRAPHY

The stratigraphic column set up for the Golden Dyke Dome by Nicholson is illustrated in Figure 1. The I1 to I5 package is present at Cosmo, however, we now divide the Middle Koolpin into a lower stratigraphic unit (I1 to I3) capped by a major carbonate horizon with a gold peak at the I3 level; and an upper stratigraphic package (M3, I4, M4 and I5 units) which has been the major target of the 1982-1984 program.

STRUCTURE

The sequence at Cosmo has been folded into an asymmetrical anticline plunging to the northwest at 50-70°. The limbs of the fold are sheared and faulted, parasitic folds are common on both limbs with a major thickening of the I5 BIF on east limb, the parasitic folds plunge at 15-40°.

A pre-deformation hornfels fabric now shows an axial plane cleavage/foliation overprint.

A series of faults with east block north and up modify the anticlinal structure, the most significant feature of which is the juxtaposition of the outer east limb "actinolite facies" BIF adjacent the main fold nose "graphitic facies" BIF, Figures 2 and 3.

A deep drill section 1800N is shown in Figure 4.

MINERALIZATION

The detailed examination of mineralized drill core from the Cosmopolitan Howley Mine suggests that a number of mechanisms have been operative in concentrating the gold in BIF and related lithologies of the Middle Koolpin Formation. Three controlling factors have been proposed:

1. Stratiform gold related to exhalative sulfide facies BIF.
2. Concentration by deformation into tight fold positions.
3. An epigenetic overprint of gold introduced by quartz veins in the axial zone of the anticline - probably late deformation in age.

1. Stratiform Gold:

Gold mineralization correlates with sulfide facies (pyrite-pyrrhotite \pm arsenopyrite) I5 iron formation. Gold grades terminate abruptly in the M4 pelites and in the hanging wall carbonaceous mudstones. This lithological control is picked out by the Al content which exceeds 3% in the more pelitic rocks. Both Ca (1-5%) and Mn (3000ppm) values are high in the iron formation and correlate well with the gold grades. Arsenic values show a broad anomalism over the mineralized intervals and falls in the range of ± 1000 ppm with local peaks in excess of 5000 ppm. The iron content varies from 10-15% and equates broadly with an estimate of the modal sulfide content.

In summary gold mineralization shows a strong correlation with lithology which is reflected in positive correlations with As, Fe, Ca and Mn and an inverse relationship to Al content. There is an absence of quartz veins or fracture systems which could provide channelways for mineralizing fluids, and of significant alteration which could be related to epigenetic processes in drill core. Consequently, a post-deformation genesis to the gold is not evident on either a macro or micro scale.

2. Remobilization

No obvious evidence can be seen of the influence of the contact metamorphic event on the distribution of gold. The principle metamorphic changes were probably isochemical with the conversion of semi-cacareous pyritic "siltstone" layers to tremolite-actinolite rich bands. The interbedded layers of chert merely recrystallised and it is likely that pyrrhotite formed at this stage from existing pyrite.

There is considerable evidence to suggest that gold has preferentially concentrated in the hinge zone of the Howley anticline and this is borne out by the decrease in quantity of Chinese workings in the limb positions at surface. Gold grades attenuate markedly in the relatively underformed limb positions. In the axial zone of the fold the I5 BIF unit has been repeated by strike faulting which is thought to represent the final phase of the deformation when the competent BIF beds responded to the tight folding by brittle failure.

The occurrence of what is interpreted to be favourable facies BIF (i.e. high sulfide content, well banded, amphibole rich, low Al, high Fe, Ca, Mn and visible arsenopyrite) in limb positions commonly has background grades in the order of 1-3 g/t Au. It is believed that these reflect primary protore grades which require a secondary concentrating process such as deformation to achieve grades of 5-8 g/t Au, present in the fold nose.

3. Quartz Vein Gold

The "Main Fault" is quartz veined with milky quartz blows up to 3m wide pinching and swelling within a graphitic shear. The margins of the quartz veins are brecciated with fragments of country rock set in a quartz sulphide matrix.

Alteration haloes adjacent to quartz veins comprise intense argillic (kaolin) plus pyrite with weaker silicification and core sulphide \pm quartz breccias/veins.

This style of mineralization has resulted in altered mudstones carrying gold to +3 g/t level with high grade values in "BIF units" cut by the vein system.

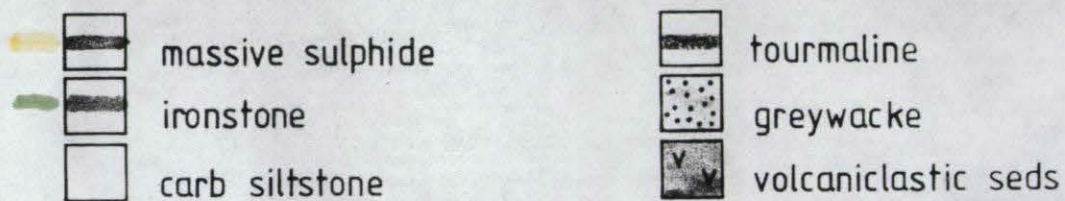
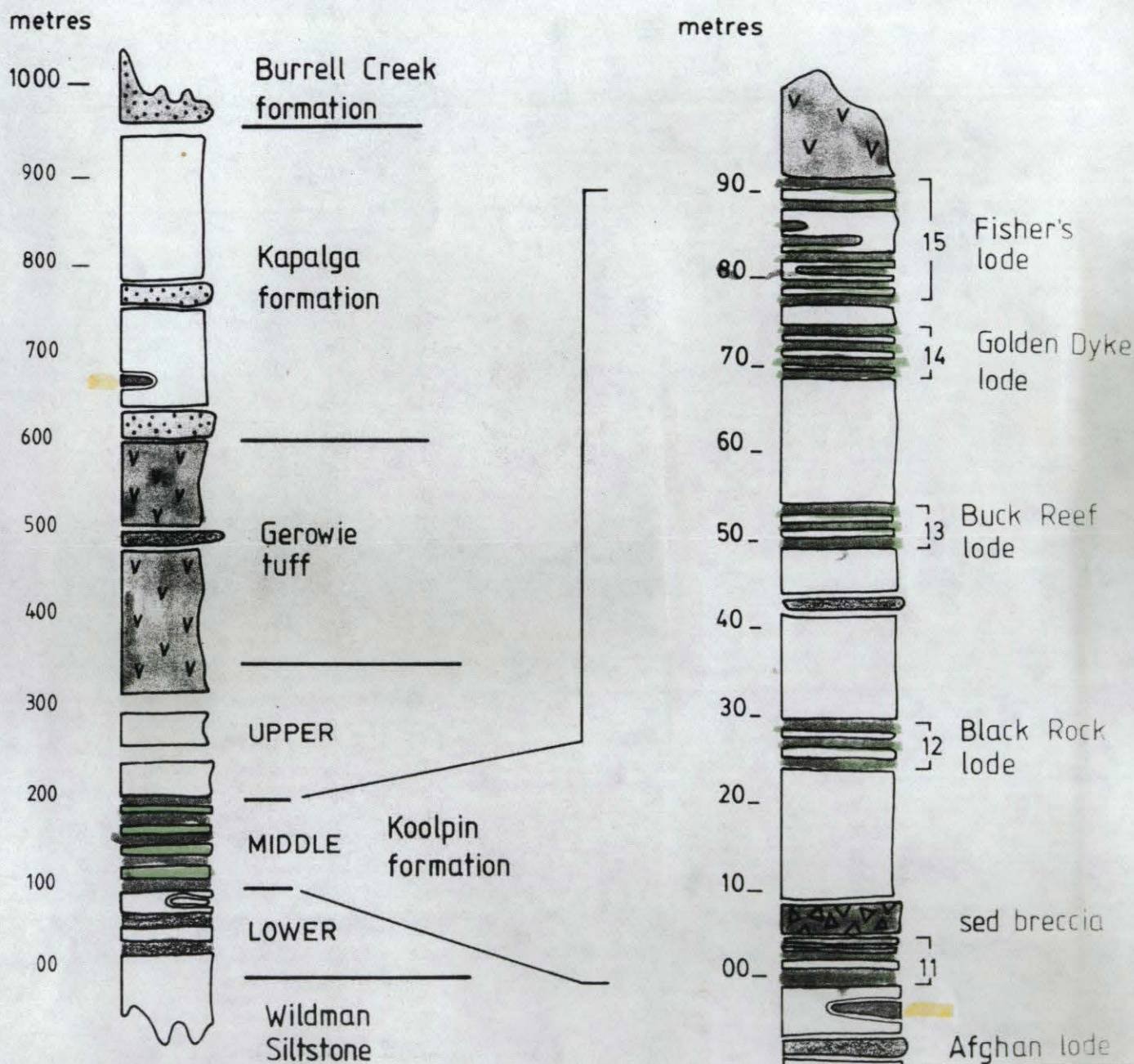
ACKNOWLEDGEMENTS

Homestake/BHP gave permission for the release of data by the Anaconda/Geopeko JV partners.

The summary given is from review of the JV program M. Kavanagh and R. Furnell of Anaconda Australia Inc and P. Wilson (formerly of Geopeko), now with Pan Con and C. Ricketts of Geopeko.

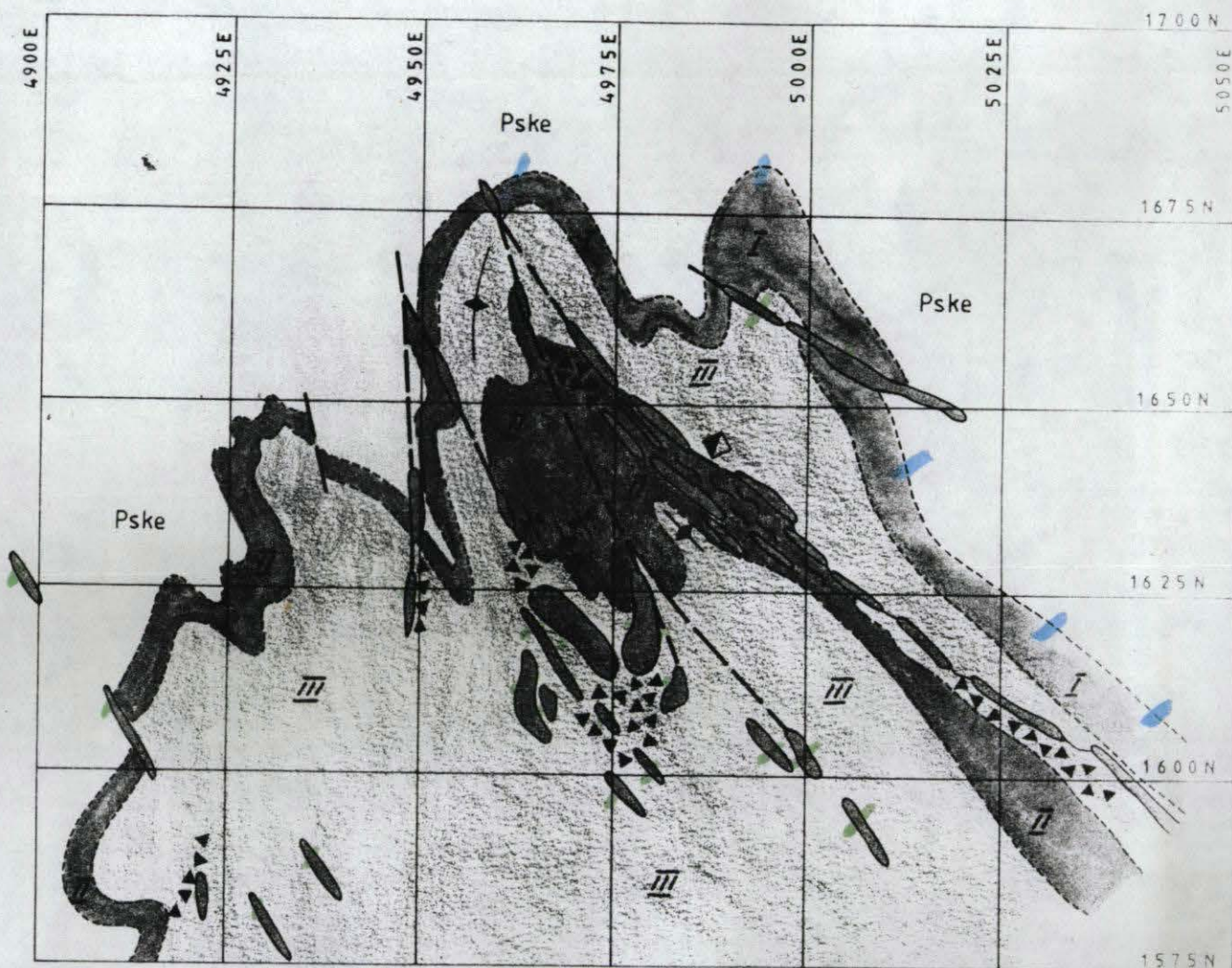
GOLDEN DYKE PROJECT

lower proterozoic stratigraphic column



COSMO HOWLEY

SURFACE GEOLOGY

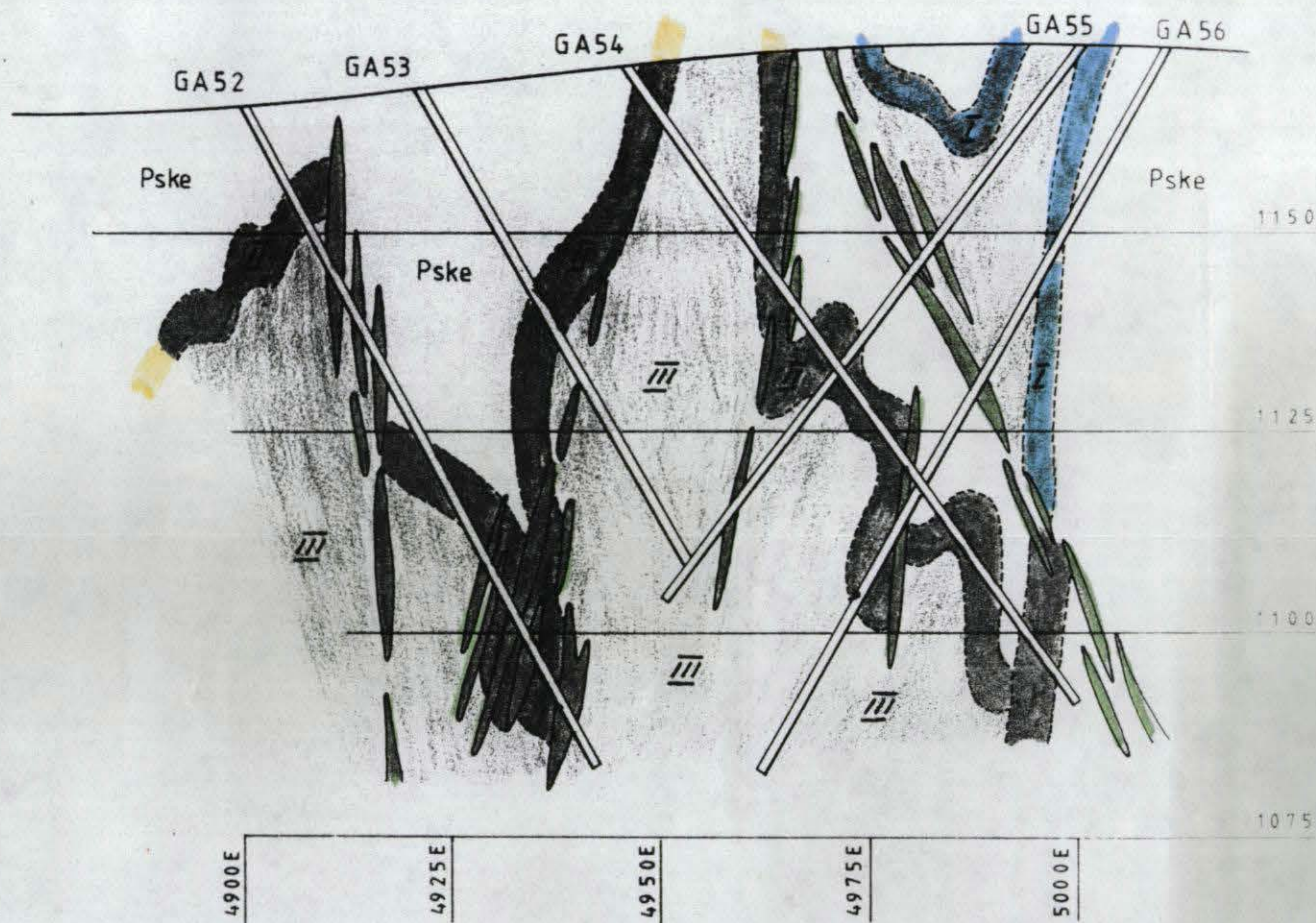


- Pske Upper Koolpin.
- I 15 BIF Garnet/Actinolite Facies.
- 15 BIF Graphitic Facies.
- III Upper M4 Mudstone/BIF.
- Breccia.
- Quartz Veins.

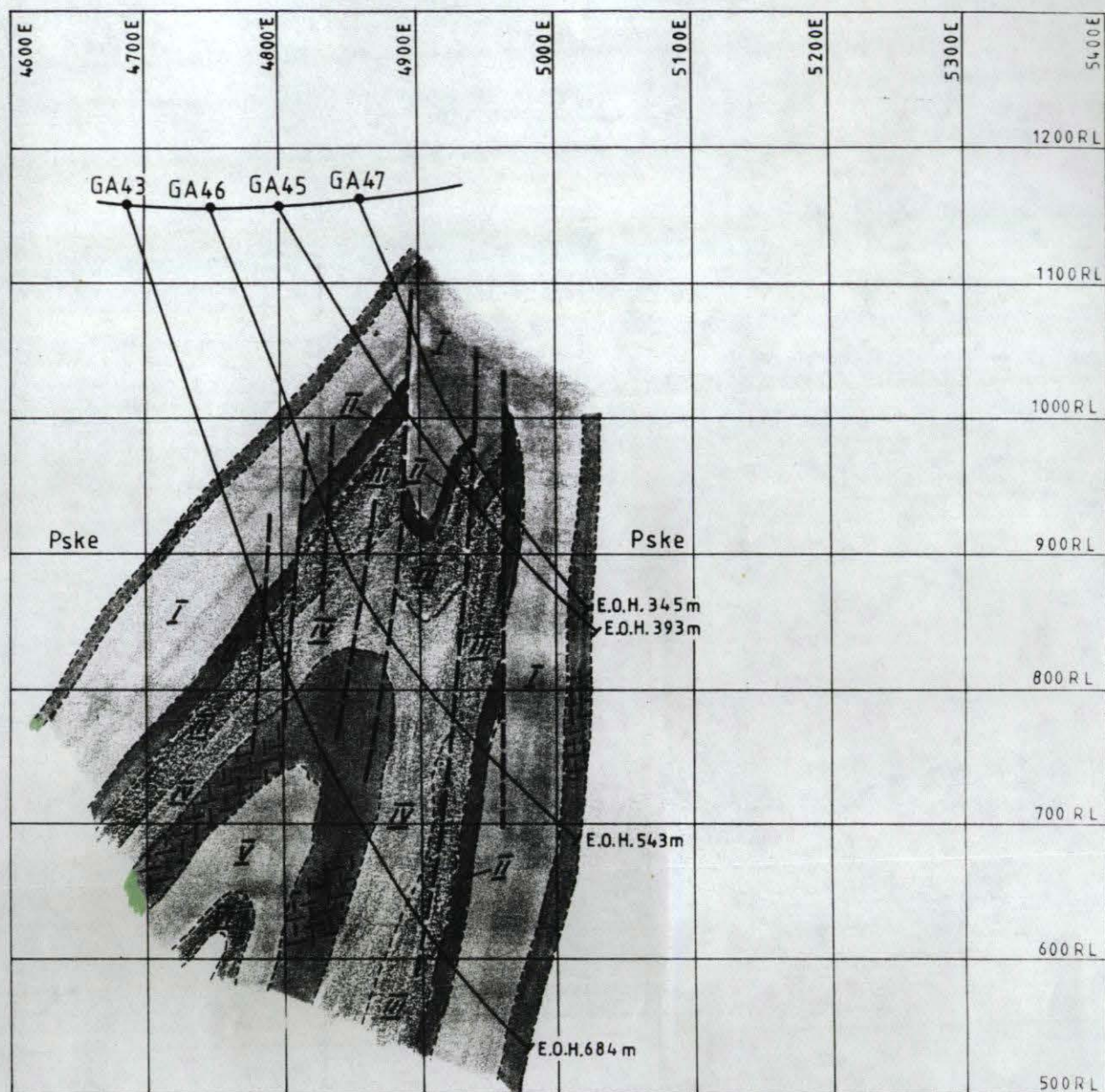
25m









COSMO HOWLEY
SECTION 1660N

INTERPRETED GEOLOGY

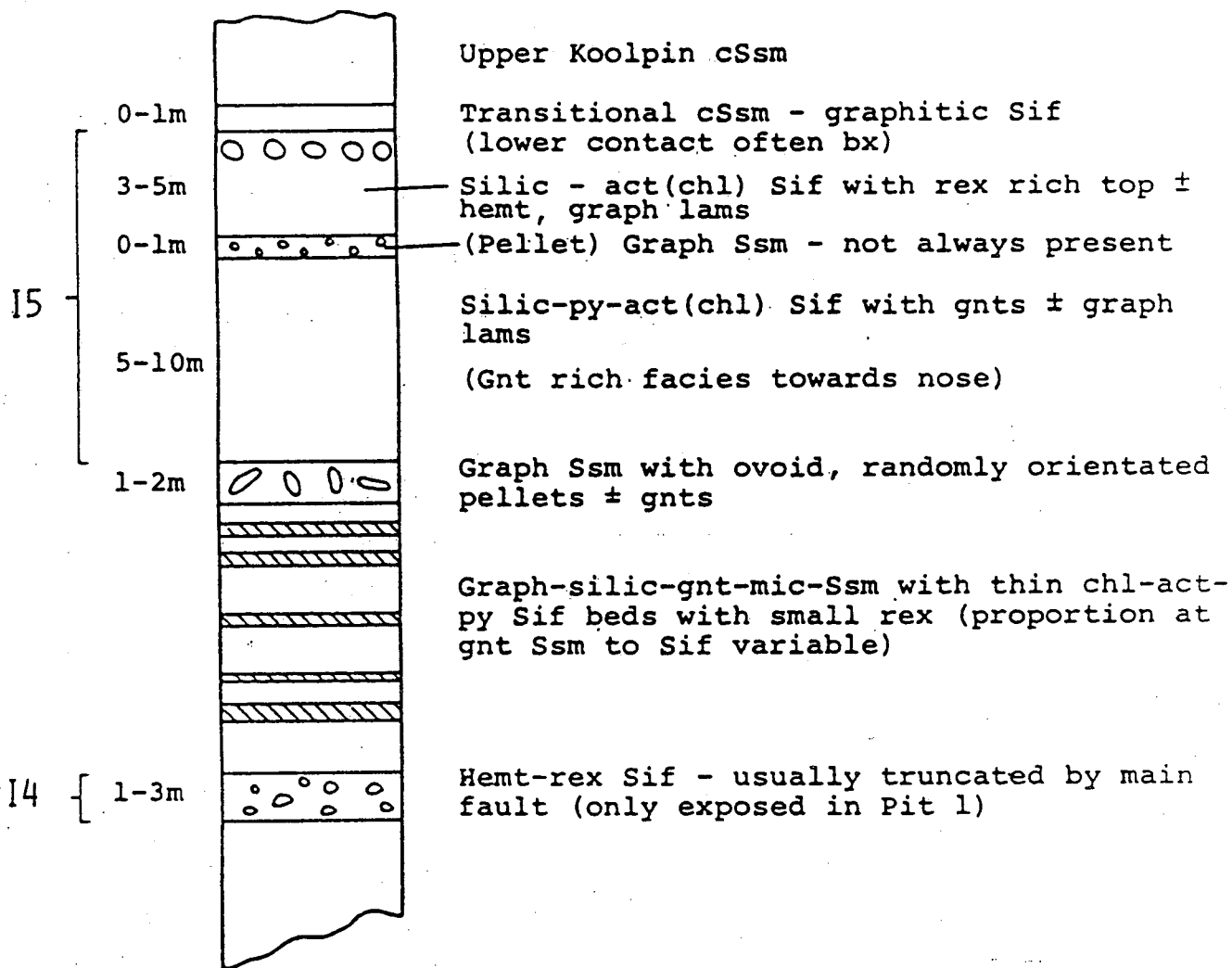


- Pske Upper Koolpin.
- / 15 BIF Garnet/Actinolite Facies.
- 15 BIF Graphitic Facies.
- /// Upper M4 Mudstone/BIF.
- / Quartz Veins.



 Pske	Upper Koolpin	 M4 BIF - Mudstone
 Metadolerite		 M4 Mudstone
 Carbonaceous mudstone		 M3 BIF - Mudstone - Carbonate
 15 Banded Iron Formation		 13 Banded Iron Formation

COSMO HOWLEY
Section 1800N



COSMOPOLITAN HOWLEY

STRATIGRAPHIC COLUMN

EAST OF MAIN FAULT

COSMOPOLITAN HOWLEY

STRATIGRAPHIC COLUMN

WEST OF MAIN FAULT (PIT 5)

15

1-3m

0-1m

1-2m

10-15m

14

2-3m

10-40m

Hemt-silic Sif with large rex pods

Hemt-silic Sif with small scattered rex pods

Graph-Ssm with ovoid pellets - nature of pellets varies along strike

Graph Ssm \pm gnt \pm hemt

Silic-seric-graph Ssm \pm gnt, chl-rex (white spotted rock)

Graph-seric-hemt stained phyllite \pm thin Sifs

Silic Sif (Ssm) \pm rex pods (not always present)

Pink-brown musc-biot-hemt stained phyllites \pm thin Sifs

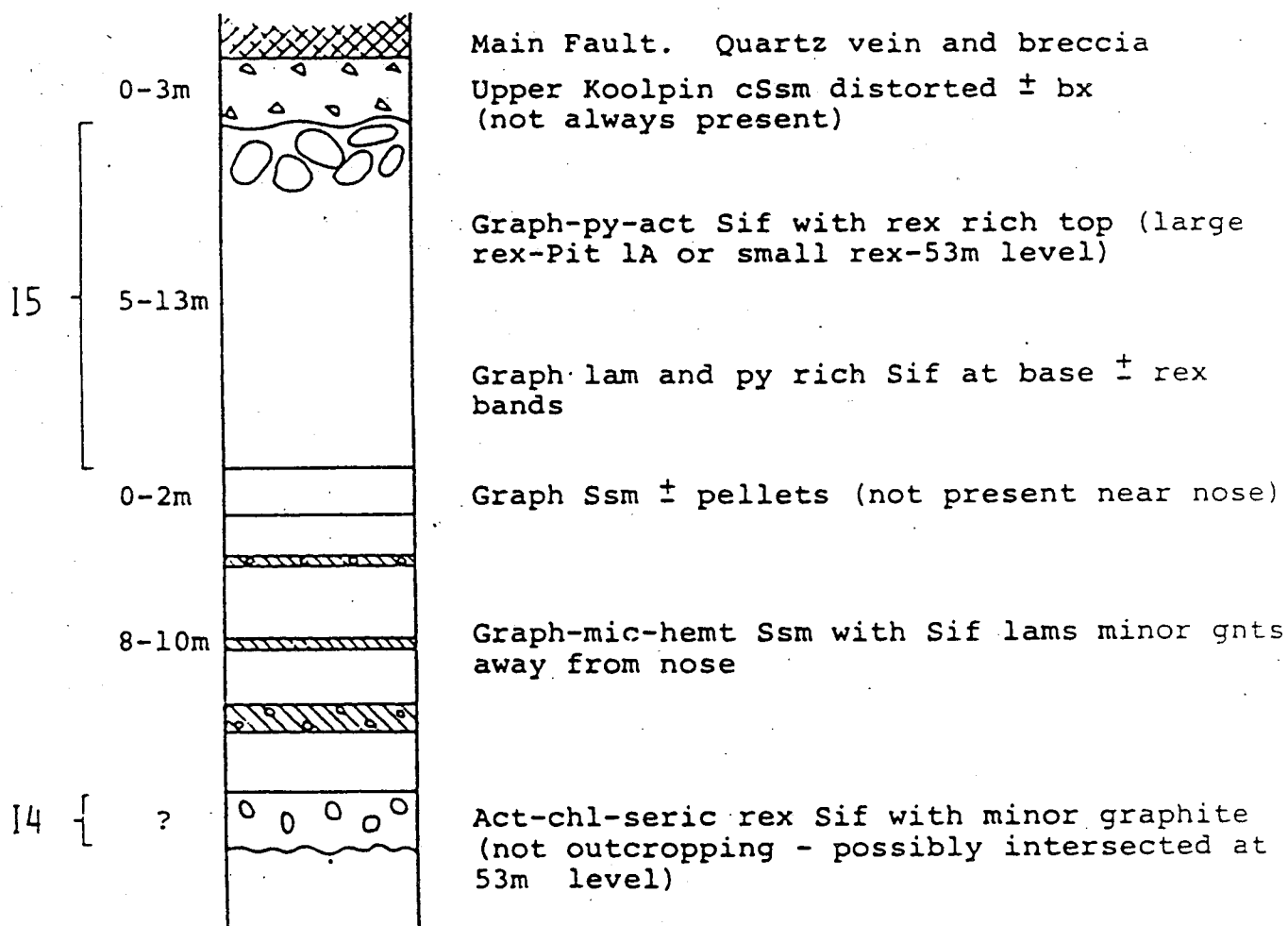
Gabbro

ZAMU
DOL.

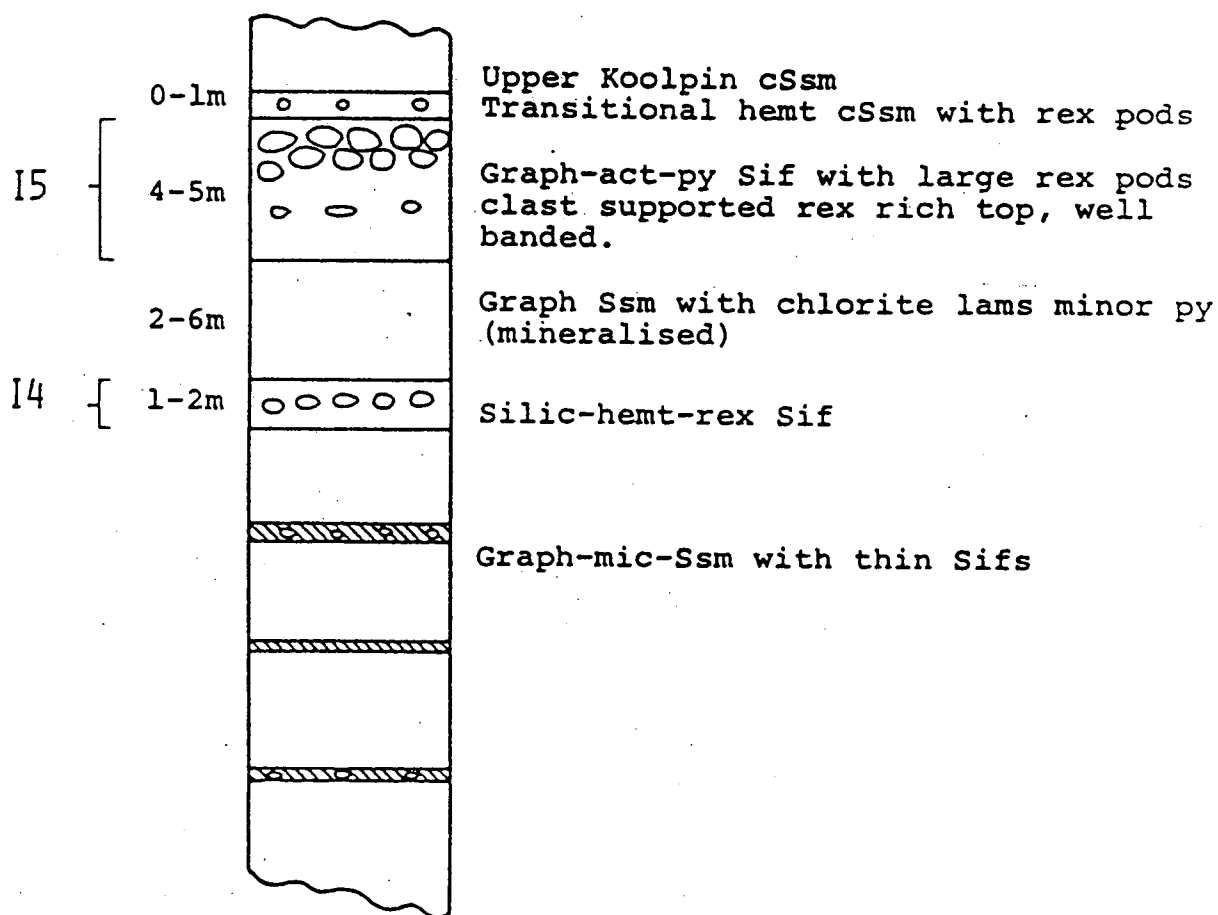
COSMOPOLITAN HOWLEY

STRATIGRAPHIC COLUMN

WEST OF MAIN FAULT (CENTRAL WEDGE)



COSMOPOLITAN HOWLEY
 STRATIGRAPHIC COLUMN
 WEST OF CENTRAL WEDGE



A P P E N D I X 2

ANALABS ANALYTICAL REPORT

RESULTS OF ANALYSES OF CHIP

SAMPLES - COSTEANS SH-1 TO SH-6

ANALABS

ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

SH1		NORTH TO SOUTH.		999.0 14 1004		22.10.84		NG 47		1 OF 1	
TUBE No.	SAMPLE No.	Cu	Zn	Pb	Ag	Au	Pb				
1	SH-1 100-110	280	240	25	x	x	5			2400	2000
2	110-120	120	330	45	x	0.095	x			2400	2000
3	120-125	330	590	55	x	0.005	5			2400	2000
4	125-130	255	155	170	x	0.005	85			Bkp	
5	130-135	210	20	180	x	0.015	190			↑	
6	135-140	290	10	150	x	x	360				
7	140-145	100	30	180	x	0.015	340				
8	145-150	240	20	210	0.5	0.010	150			↓	
9	150-155	460	25	240	0.5	x	345			Bkp	
10	155-160	210	30	360	x	x	1450			Bks	
11	160-165	135	135	120	x	0.005	40				
12	165-170	80	110	80	x	x	10				
13	170-175	50	255	75	1.0	x	x				
14	175-180	35	170	65	x	x	x			Bks	
15	180-185	20	165	30	x	0.005	x			Bks - Bkm	
16	185-190	30	145	60	x	0.005	x			Bkm	
17	190-195	25	105	40	x	x	x			Bkm	
18	195-200	50	140	70	x	x	x			Bkm	
19											
20		PART OF COSTAN				SH-1					
21											
22											
23	DETECTION	5	5	2	0.5	0.005	5				
24	DIGESTION										
25	METHOD	101	101	401	101	305	101				

Results in ppm unless otherwise specified

T = element present; but concentration too low to measure

X = element concentration is below detection limit

- = element not determined

AUTHORISED OFFICER

B. J. Doe

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A division of MacDonald Hamilton & Co. Pty. Ltd.
52 Murray Road, Welshpool, W.A. 6106

Phone (09) 458 7999

Telex AA92560

ANALYTICAL REPORT No. 999.0 14 1020

THIS REPORT MUST BE READ IN CONJUNCTION WITH THE ACCOMPANYING ANALYTICAL DATA

Northern Gold N.L.
c/-P.O. Howard Springs
NT

ORDER No.

PROJECT

NG 47

DATE RECEIVED

RESULTS REQUIRED

17.10.84

No. OF PAGES
OF RESULTS

DATE
REPORTED

No.
OF COPIES

TOTAL No. OF SAMPLES

3.11.84

3

139

PRE-TREATMENT

ANALYSIS

SAMPLE NUMBERS	DRY	CRUSH	SPLIT	PUL- VERISE	SIEVE	OTHER SEE REMARKS	NONE	REFER TO ANALYSIS SECTION	PREPARATION	METHOD
SH1-6		1	3	2 4				Cu Pb Zn As Au		101 401 305

RESULTS
TO

COSTEANS SH-1 TO SH-6
EAST COSMOPOLITAN HOWLEY.
E.L. 4444.

RESULTS
TO

REMARKS

ALL COSTEAN DISTANCE
IN METRES TAKEN
FROM NORTH TO SOUTH

GEOLOGICAL UNITS SHOWN
IN RIGHT HAND COLUMN

STATE OF SAMPLES

ANALYSIS — PREPARATION

ANALYSIS — METHOD

whole core	WC	perchloric acid	A1	calc acid	CA	atomic absorption	AAS
pit core	SC	hydrochloric acid	A2	specific sulphide	SS	x-ray fluorescence	XRF
ring	CU	nitric acid	A3	ether mixed acids	MA	spectrophotometry	SPEC
block	Ro	aqua regia	A4	alkaline etch	EA	colorimetry	COL
chip	SO	nitric-perchloric	A5	volatilization	VO	chromatography	CHR
ter	PU	HF mixture	A6	ignition	IG	titration	TTN
ue	WA	HF under pressure	A7	pressed powder (XRF)	PP	other chemicals means	CHEM
from sediment	TI	fusion	A8	glass fusion (XRF)	GF	miscellaneous	MISC
heavy mineral	SS					fluorescence	FLUOR
	HM					inductively coupled plasma	ICP

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ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

METRES FROM NORTH TO SOUTH			999.0 14 1020			3.11.84		NG47		1 OF 6	
TUBE No.	SAMPLE No.		Cu	Zn	As	Au	Pb				
1	SH1 0-10		80	30	130	x	20			Psg	
2	SH1 10-20		35	40	80	x	15			A	
3	SH1 20-25		65	35	85	x	10				
4	SH1 25-30		50	100	110	0.025	20				
5	SH1 30-35		45	175	55	0.005	5				
6	SH1 35-40		35	190	45	x	20				
7	SH1 40-45		55	130	60	x	20			↓	
8	SH1 45-50		115	175	45	x	25			Psg	
9	SH1 50-55		245	340	45	0.005	10			Psg - Pskc	
10	SH1 55-60		290	100	120	0.005	55			Pskc	
11	SH1 60-65		130	10	95	x	50			↑	
12	SH1 65-70		95	10	170	x	65				
13	SH1 70-75		90	20	250	x	75				
14	SH1 75-80		125	15	180	x	80				
15	SH1 80-85		420	10	85	x	80			↓	
16	SH1 85-90		250	5	70	x	125			Pskc	
	SH1 90-95		160	20	80	x	90			ZAMU	DOLENT
18	SH1 95-100		200	245	30	x	30			ZAMU	DOLENT
	* * *									* * *	
19	SH1 200-210		120	95	60	x	10			ZAMU	DOLENT
20	SH1 210-220		135	70	25	x	40			↑	
21	SH1 220-230		150	120	80	x	75				
22	SH1 230-240		145	80	40	x	30			↓	
23	SH1 240-250		135	120	65	x	65			ZAMU	DOLENT
24	SH1 250-260		140	60	75	x	40			ZAMU - Pskf	
25	SH1 260-265		125	40	140	x	30			Pskf	

Results in ppm unless otherwise specified

T = element present; but concentration too low to measure

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* * * SEE NEXT PAGE FOR SH1 100-200 METRES. * * *

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ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

NORTH TO SOUTH			999.0 14 1020			3.11.84		NG47		2 OF 6	
TUBE No.	SAMPLE No.		Cu	Zn	As	Au	Pb				
1	SH1 265-270		50	30	210	x	20			Pskf	
2	SH1 270-280		65	50	85	0.005	15			Pskf	
3	SH1 280-290		40	50	85	x	10			Psk	
4	SH1 290-300		20	75	70	x	25			↑	
5	SH1 300-310		20	80	160	x	10				
6	SH1 310-320		20	80	150	x	15				
	SH1 320-330		20	85	70	x	15				
8	SH1 330-340		30	110	75	x	x				
9	SH1 340-350		55	65	95	x	15				
10	SH1 350-360		50	35	80	x	10				
11	SH1 360-370		25	20	85	x	15			↓	
12	SH1 370-380		25	25	140	x	20			Psk	
13	SH2 0-5		60	110	65	x	20			ZAMU	DOLENT
14	SH2 5-10		60	155	50	x	30			↑	
15	SH2 10-15		60	130	45	x	15				
16	SH2 15-20		120	90	40	x	25				
	SH2 20-25		90	60	65	x	25			↓	
18	SH2 25-30		65	85	530	x	25			ZAMU	DOLENT
19	SH2 30-35		15	75	190	x	10			Pskf	
20	SH2 35-40		30	165	90	x	25			↑	
21	SH2 40-45		40	150	130	x	10			↓	
22	SH2 45-50		40	160	150	x	15			Pskf	
23	SH2 50-55		20	135	60	x	x			Psk	
24	SH2 55-60		25	110	60	x	20			Psk	
25	SH2 60-65		40	95	70	x	15			Psk	

Results in ppm unless otherwise specified

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- = element not determined

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ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

NORTH TO SOUTH			999.0 14 1020			3.11.84		NG47		3 OF 6	
TUBE No.	SAMPLE No.		Cu	Zn	As	Au	Pb				
1	SH3 0-5		145	25	65	x	50			Pske	
2	SH3 5-10		210	165	20	x	60			Pske	
3	SH3 10-15		180	325	55	0.005	235			ZAMU	DOLEXIT
4	SH3 15-20		130	620	70	0.005	155			↑	
5	SH3 20-25		220	810	15	x	220				
6	SH3 25-30		485	335	45	0.005	60			↓	
7	SH3 30-35		95	25	55	x	130			ZAMU	DOLEXIT
8	SH3 35-40		95	25	65	x	105			Ps kp	
9	SH3 40-45		75	25	100	0.010	110			↑	
10	SH3 45-50		75	25	170	x	85				
11	SH3 50-55		115	25	220	x	90				
12	SH3 55-60		350	25	190	x	75				
13	SH3 60-65		155	20	290	x	400				
14	SH3 65-70		170	15	240	x	135				
15	SH3 70-75		80	15	100	x	90				
16	SH3 75-80		100	20	110	x	90				
17	SH3 80-85		210	20	160	x	90				
18	SH3 85-90		255	15	190	x	125				
19	SH3 90-95		175	15	350	x	225				
20	SH3 95-100		180	20	140	x	175			↓	
21	SH3 100-105		125	25	130	0.005	405			Ps kp	
22	SH3 105-110		105	30	50	0.005	105			Ps kp - Psks	
23	SH3 110-115		65	30	55	0.025	40			Psks	
24	SH3 115-120		175	75	30	0.010	35			Psks	
25	SH3 120-125		160	110	35	0.110	40			Psks	

Results in ppm unless otherwise specified

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ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

NORTH TO SOUTH.

999.0 14 1020

3.11.84

NG47

4 OF 6

TUBE No.	SAMPLE No.	Cu	Zn	As	Au	Pb			
1	SH3 125-130	25	40	25	x	45		Psks	
2	SH3 130-135	25	110	35	0.005	20		Ps km	
3	SH3 135-140	20	125	60	x	25		↑	
4	SH3 140-145	20	220	25	0.020	35			
5	SH3 145-150	25	225	15	x	20			
6	SH3 150-155	35	130	20	x	20			
7	SH3 155-160	30	95	25	x	10			
8	SH3 160-165	45	70	45	x	35			
9	SH3 165-170	35	95	40	0.005	20		↓	
10	SH3 170-175	45	115	65	0.005	25		Ps km	
11	SH4 0-5	480	15	30	x	115		Pske	
12	SH4 5-10	160	160	55	0.135	55		↑	
13	SH4 10-15	65	240	35	x	25		Pske	
14	SH4 15-20	150	140	70	x	35		Pske - ZAMU	
15	SH4 20-25	150	110	100	x	60		ZAMU	DOLERITE
16	SH4 25-30	90	100	30	x	75		↑	
17	SH4 30-35	130	120	35	x	120		ZAMU	DOLERITE
18	SH4 35-40	375	110	30	x	130		ZAMU - Pskp	
19	SH4 40-45	295	15	60	x	130		Ps kp	
20	SH4 45-50	165	15	110	x	100		↑	
21	SH4 50-55	190	15	170	x	120			
22	SH4 55-60	315	15	170	x	115		↓	
23	SH4 60-65	280	20	110	x	75		Ps kp	
24	SH4 65-70	115	20	80	x	165		Ps ks	
25	SH4 70-75	100	130	50	x	25		Ps ks	

Results in ppm unless otherwise specified

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ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

NORTH TO SOUTH			999.0 14 1020			3.11.84		NG47		5 OF 6	
TUBE No.	SAMPLE No.		Cu	Zn	As	Au	Pb				
1	SH4 75-80		35	215	50	x	35			Psks	
2	SH4 80-85		20	105	70	x	20			↑	
3	SH4 85-90		25	185	30	x	25			Psks	
4	SH4 90-95		25	180	55	x	20			Pskm	
5	SH4 95-100		10	100	55	x	25			↑	
6	SH4 100-105		20	65	30	x	15				
7	SH4 105-110		25	80	20	x	10				
8	SH4 110-115		100	130	30	x	10			↓	
9	SH4 115-120		640	85	35	x	40			Pskm	
10	SH4 120-126		265	80	30	0.050	100			ZAMU	DOLERITE
11	SH5 0-5		135	65	40	0.005	45			ZAMU	DOLERITE
12	SH5 5-10		25	60	35	x	10			↑	
13	SH5 10-15		45	135	35	x	20			↓	
14	SH5 15-20		20	160	100	x	10			ZAMU	DOLERITE
15	SH5 20-25		10	85	140	x	25			Ps kf	
16	SH5 25-30		20	110	200	x	10			Ps kf	
17	SH5 30-35		20	85	180	x	15			Ps kf	
18	SH5 35-40		40	90	100	x	15			Ps k	
19	SH5 40-45		25	100	70	x	25			↑	
20	SH5 45-50		40	110	55	x	25			Ps k	
21	SH5 50-57		50	85	50	x	10			Ps k	
22	SH6 2-10		130	10	20	x	45			Ps g	
23	SH6 10-15		120	10	15	x	30			Ps ke	
24	SH6 15-20		130	10	15	x	55			↑	
25	SH6 20-25		80	5	20	x	55			Ps ke	

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ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

NORTH TO SOUTH			999.0 14 1020			3.11.84		NG47		6 OF 6	
TUBE No.	SAMPLE No.		Cu	Zn	As	Au	Pb				
1	SH6 25-30		90	5	30	x	60			Pske	
2	SH6 30-35		85	5	15	x	60			↑	
3	SH6 35-40		135	10	50	x	100			↓	
4	SH6 40-45		375	105	240	0.040	85			Pske	
5	SH6 45-50		205	90	340	x	125			ZAMU	DOLERITE
6	SH6 50-55		265	60	110	x	165			↑	
7	SH6 55-60		320	145	110	x	65			ZAMU	DOLERITE
8	SH6 60-65		160	15	60	x	170			Pske	
9	SH6 65-70		330	15	190	x	260			Pske	
10	SH6 70-75		160	10	220	0.250	190			Pske - Psks	
11	SH6 75-80		150	40	40	x	40			Psks	
12	SH6 80-85		150	30	20	x	25			Psks.	
13	SH6 85-90		110	85	20	0.020	30			Psks - Pskm	
14	SH6 90-97		55	45	55	x	25			Pskm	
15											
16											
17											
18											
19											
20											
21											
22											
23	DETECTION		5	5	2	0.005	5				
24	DIGESTION										
25	METHOD		101	101	401	305	101				

Results in ppm unless otherwise specified

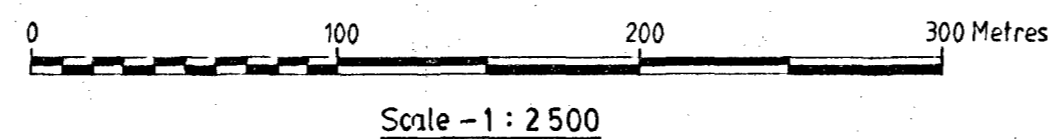
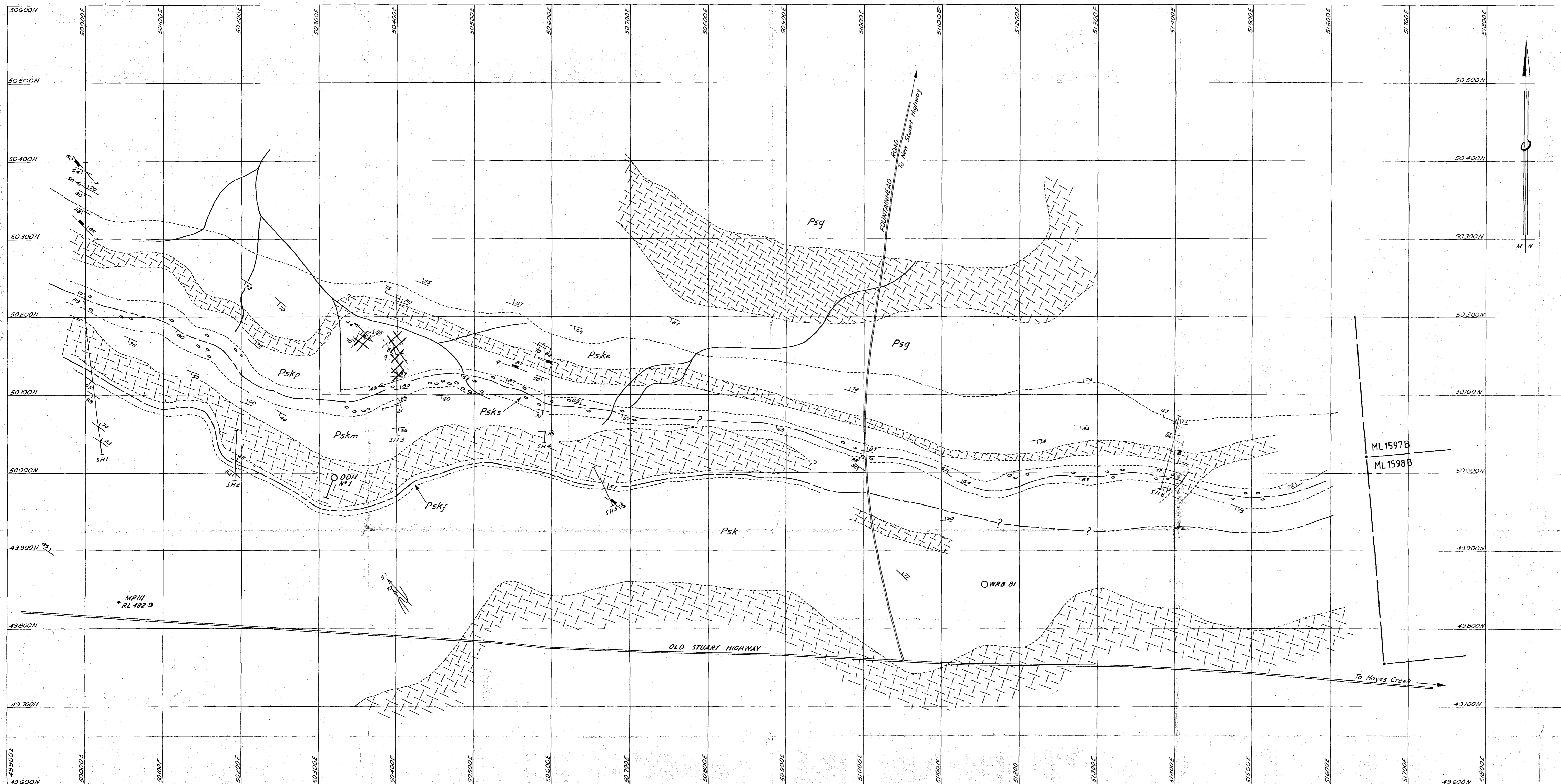
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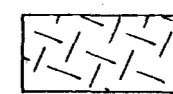
B.D.



NORTHERN TERRITORY
GEOLOGICAL SURVEY

GN85 / 099

LEGEND



ZAMU DOLERITE

Psg

GEROWIE TUFF Laminated, sandy tuffaceous siltstone.

Pske

Carbonaceous siltstone.

Pskp

Pyrite-rich muscovite/biotite siltstone with graphitic laminae. *Gossans*

Pskg

Pyrite/pyrrhotite SIF interbedded with tremolite/actinolite layers and ovoid nodules ooo.

Pskm

Brown muscovite-sericite siltstone

Pskf

SIF & haematite-rich BIF in laminated siltstone with minor tremolite/actinolite layers and ovoid nodules ooo.

Psk

Laminated micaceous to phyllitic siltstone.

Geological boundary — identified and inferred (?)

Strike and dip of strata.

Strike and dip of fracture with quartz - q.

Strike and dip of cleavage.

Minor fold with dip and plunge of axial surface.

Drill hole DDH 1 (See BMR Bulletin No. 12)

Registered water bore No. 81.

Major road.

Minor creek.

Costean.

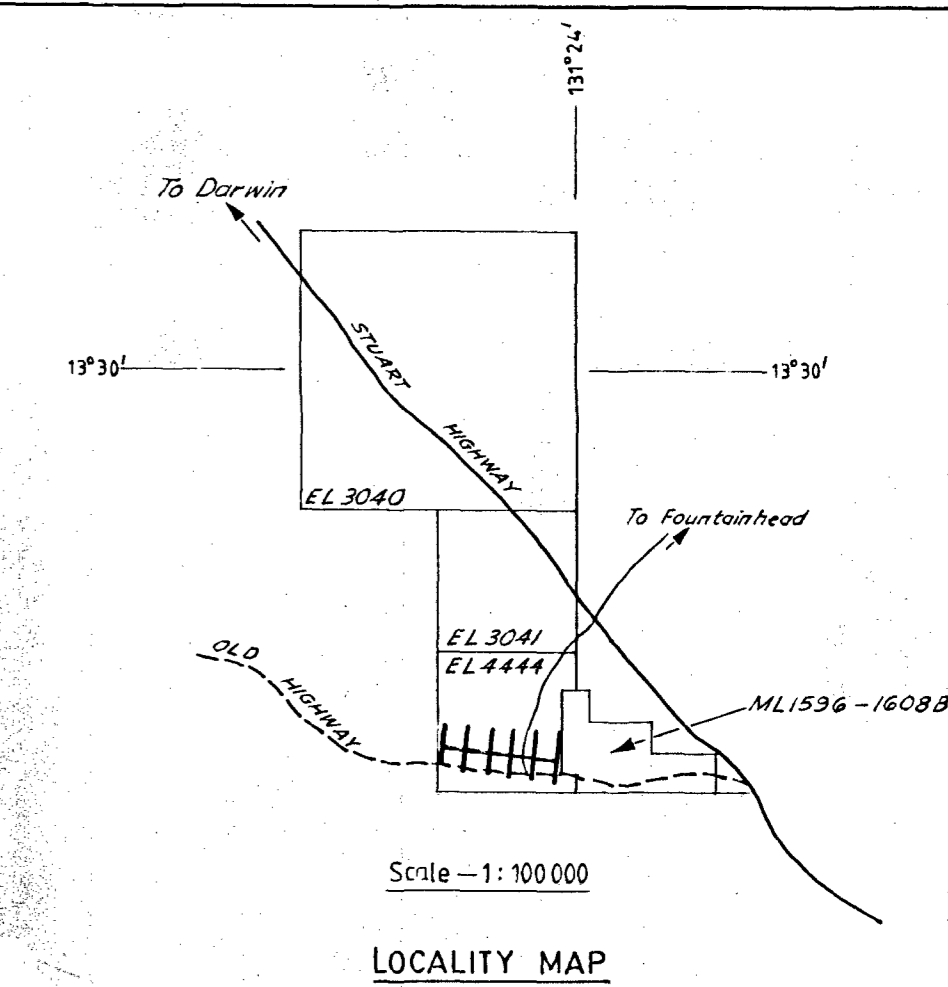
NORTHERN GOLD N.L.

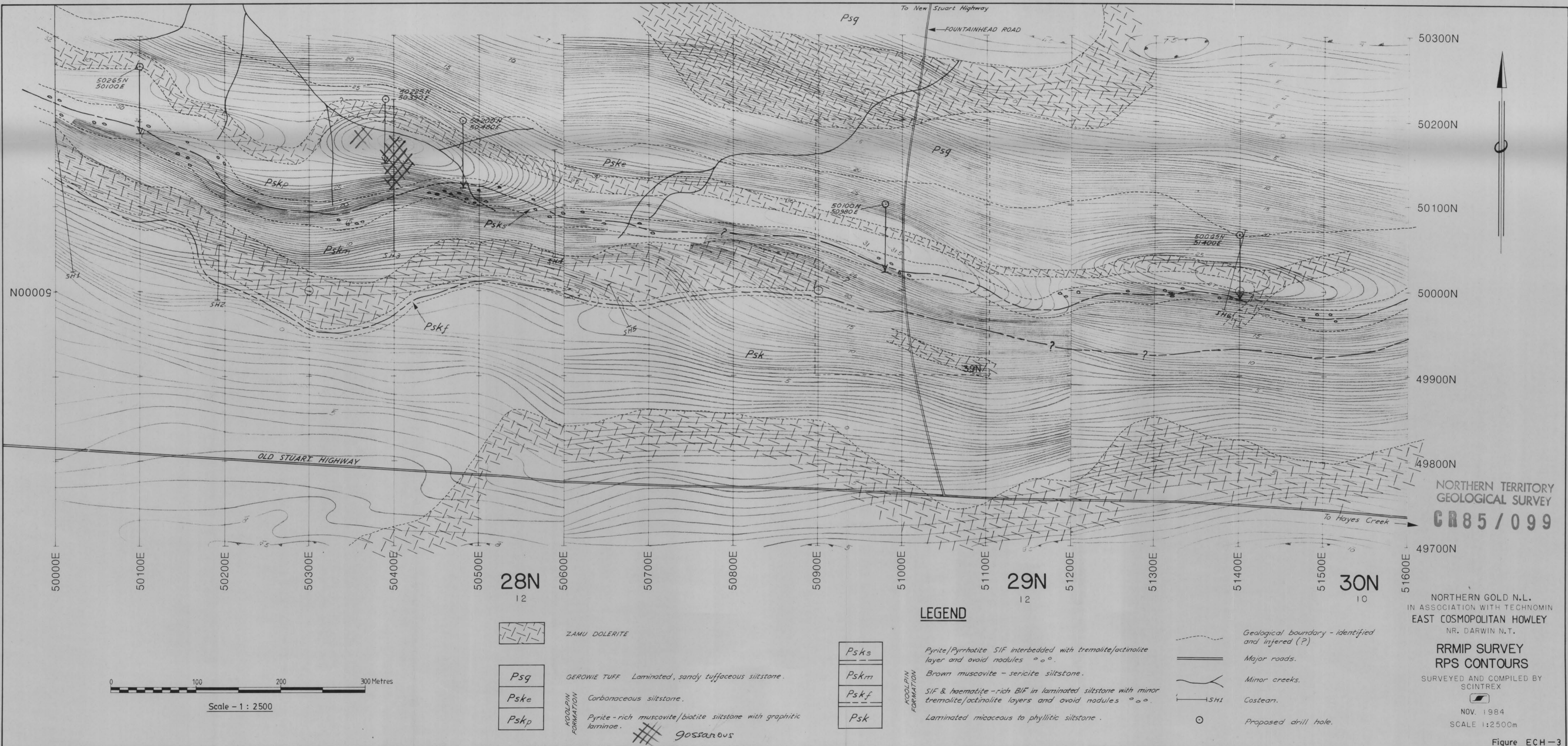
PROJECT HOWLEY — NORTHERN TERRITORY

E.L.4444 EAST COSMOPOLITAN — HOWLEY

GEOLOGICAL MAP

Compiled by	A.P.B.	Additions by	
Date	Nov. 1984	Date	
Drawn by		DRAWING NO.	Figure ECH-2
Scale	1 : 2500		





SECTION TWO

PROGRESS REPORT ON EXPLORATION ACTIVITIES -

EL's 3040, 3041, 3055, 4235 and 4455,

SOUTH HOWLEY AREA, NORTHERN TERRITORY

DECEMBER 1984

T A B L E O F C O N T E N T S

1. INTRODUCTION
2. WORK DONE AND RESULTS
 - 2.1 EL's 3040 - 3055
 - 2.2 EL's 3041 - 4235 - 4455

F I G U R E S

1. EL 3040 and 3055 Alluvial Testing Programme
2. EL 3040 and 3055 Alluvial Testing Programme - Sample Site Locations

T A B L E S

1. South Howley Alluvial Testing Programme 1983. Assay Values
 > 0.1g/t Au

A P P E N D I X

1. Assay Results - Alluvial Sampling Programme
 South Howley 1983
2. Assay Results - Alluvial Sampling Programme
 South Howley 1984

1. INTRODUCTION

The majority of gold bearing alluvials occur east of the Howley Line and between the Fleur de Lyes uranium/gold prospect and the Metropolitan Howley mine. Two palaeo - channels defined by shallow Chinese diggings run in a north-east direction from the anticline axis zone and can be traced for at least 2 kilometres. Near the ridges numerous eluvial and alluvial diggings occur most of which are covered by the BHP-Homestake leases. Northern Gold N.L. has conducted two alluvial testing programmes in the South Howley area, the first in December 1983 covering the alluvials in EL's 3040 and 3055. The second programme concentrated mainly on the palaeo-channel systems within EL 4226 with minor testing in EL 3055. The relevant results from both programmes are summarised in the following pages.

In areas away from the alluvials only general reconnaissance and prospecting was carried out but further work is planned in the 1985 season.

2. WORK DONE AND RESULTS

2.1 EL's 3040 - 3055

During the 1983 programme 85 slots and 7 trenches were dug on gridded lines across the alluvials using a Komatsu Hydraulic Excavator (Fig. 1&2). A vertical channel sample was collected from each horizon with sample width generally 1 metre or less. The average sample weight was 10 kgs and each sample was panned and the concentrate sent for gold analysis using the AAS technique. A total of 371 samples were sent to Fox Laboratories for analysis (Appendix 1)

All assay values greater than 0.1g/t Au are shown on Table 1.

TABLE 1 SOUTH HOWLEY ALLUVIAL TESTING PROGRAMME 1983
 ASSAY VALUES > 0.1g/t Au*

<u>SLOT NO.</u>	<u>DEPTH</u>	<u>LOG</u>	<u>Au g/t Au</u>
S2	0-1.0		0.105 *
	1.0-1.5		0.098
	1.5-2.0		0.086
	2.0-2.3		0.193 *
S5	0-0.6		0.010
	0.6-1.0		0.215 *
	1.0-1.5		0.004
S6	0-0.6		0.078
	0.6-1.2		BLD
	1.2-2.0		0.020
	2.0-2.2		0.337 *
S8	0-1.0		0.542 *
	1.0-2.1		0.215
	2.1 - 2.3		0.070
S12	0-1.1		0.02
	1.1-2.0		0.01
	2.0-3.0		0.01
	3.0-3.3		0.152 *
S14	0-0.3		0.132 *
	0.3-1.0		0.036
	1.0-2.1		0.064
	2.1-2.3		0.665 *
S25	0-0.5		0.112 *
	0.5-1.5		0.009
	1.5-2.2		0.120 *
S26	0-1.0		0.006
	1.0-1.8		0.240 *

TABLE 1 (Continued)

<u>SLOT NO.</u>	<u>DEPTH</u>	<u>LOG</u>	<u>Au g/t Au</u>
S30	0-0.6		0.452 *
	0.6-1.1		0.012
	1.1-2.1		0.058
S31	0-0.6		0.155 *
	0.6-1.3		0.175 *
	1.3-1.9		0.030
	1.9-2.6		0.013
S48	0-0.8		0.002
	0.8-2.2		0.158
S49	0-0.6		0.005
	0.6-1.2		0.012
	1.2-1.7		0.111 *
	1.7-2.3		BLD
S72	0-0.8		0.004
	0.8-2.0		0.048
	2.0-2.9		0.500 *
S75	0-1.4		BLD
	1.4-2.0		0.15 *
	2.0-3.0		0.008
	3.0-4.0		BLD

COSTEANS

C1/20S	0-1.0	0.045
	1.0-2.0	0.108 *
C1/30S	0-1.0	0.031
	1.0-1.8	0.155 *
C2/40N	0-1.2	0.023
	1.2-2.6	2.131 *

TABLE 1 (Continued)

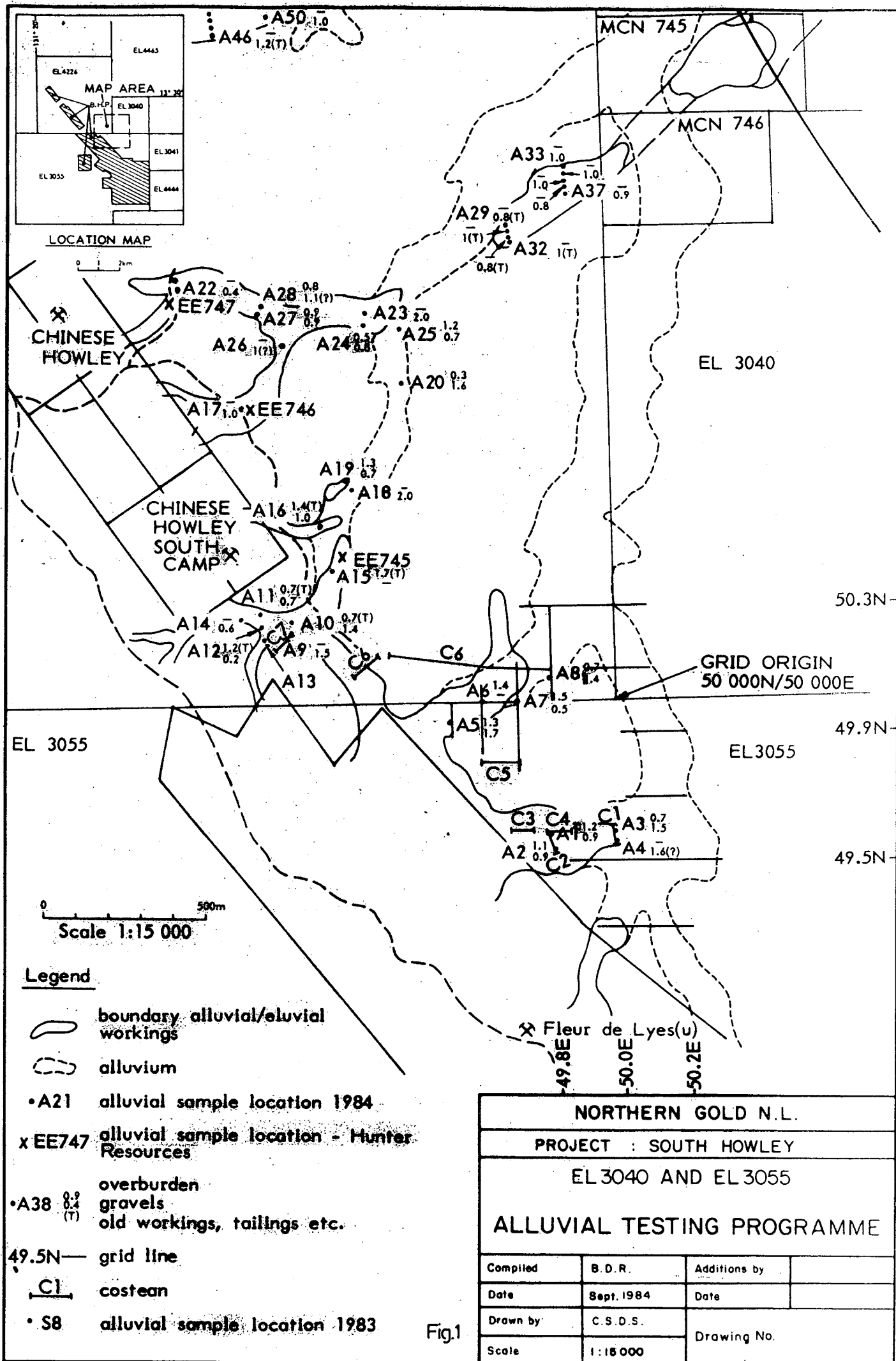
<u>COSTEANS</u>	<u>DEPTH</u>	<u>LOG</u>	<u>Au g/t Au</u>
C2/33N(A)	0-1.0		0.17
	1.0-1.8		0.01
	1.8-2.9		BLD
C2/20N	0-1.0		0.18
	1.0-2.0		0.10
C2/10N	0-1.0		BLD
	1.0-2.0		0.74 *
C2/3N	0-1.0		BLD
	1.0-2.0		0.01
	2.0-3.0		0.10 *
	3.0-4.0		0.02
C3/66E	0.8-1.5		0.01
	1.5-2.7		0.15 *
C4/22E	0-1.2		0.04
	1.2-2.0		0.04
	2.0-3.2		0.27 *
C6/12W	0-0.5		0.03
	0.5-1.8		0.10 *
C6/51W	0-1.1		0.50 *
	1.1-1.8		0.06
	1.8-2.3		0.11 *
C6/55W	0-1.0		1.04 *
	1.0-2.4		BLD

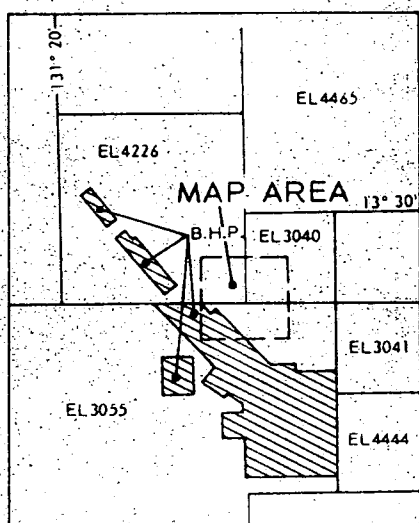
During the second alluvial testing programme, September 1985, seven slots were excavated in EL 3055 to confirm some of the anomalous results returned from the 1983 programme (Fig. 1). Samples were collected as before but the average weight of each sample was increased to 18 kgs. The concentrates were sent to SGS Laboratories and the results are presented in Appendix 2.

2.2 EL's 3041 - 4235 - 4455

Exploration Licences 4235 and 4455 straddle part of an anticlinal axis parallel and to the west of the Howley Line. This area is prospective for a similar style of mineralisation to that of the Chinese and Metro Howley mines. To date Northern Gold N.L. has carried out only general reconnaissance and prospecting over this area but in the 1985 season an exploration programme is planned to cover this prospective anticlinal axis zone. These tenements are also prospective for tin associated with pegmatites emanating from the Mount Shooobridge area.

Exploration Licence 3041 occurs to the east of the Howley line and contains folded and faulted units of the Gerowie Tuff and Mount Bonnie Formations. The area is prospective for gold mineralisation associated with minor anticlinal structures especially when the structures contain sulphide rich iron formations. Limited prospecting and photo geological studies have been carried out over the area but further work is planned for the 1985 season.





LOCATION MAP

0 1 2km

C6

BHP
HOMESTAKE
LEASES

C3

C4

S79
S80
S81

C2

S82

S83

S84

S85

S86

S87

S88

S89

S90

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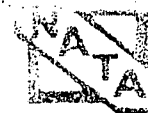
S363

S364

S365

A P P E N D I X 1

ASSAY RESULTS ALLUVIAL TESTING PROGRAMME
SOUTH HOWLEY 1983



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CLIENT Att: A. Hope
Northern Gold,
GPO Box 5326,
SYDNEY. NSW. 2001

Copy to: N. Wigg
50 Barker Rd,
HOWARD SPRINGS, NT

REPORT OF ANALYSIS

DATE RECEIVED	DATE REPORTED	SAMPLE ADVICE No.	SAMPLE TYPE	SAMPLE PREPARATION
6.2.84	9.2.84	14901/02	Conc.	SP22

SAMPLE NO.	Wt(g)	Au	wt Samples																
S1 0-1.2m	4.506	7.01																	
1.2-1.5	6.158	5.89																	
S2 0-1.0	5.923	89.27	5	0.105															
1.0-1.5	5.074	96.82	5	0.075															
1.5-2.0	6.574	78.34	6	0.086															
2.0-2.3	8.808	87.72	4	0.193															
S3 0-1.3	8.020	32.89																	
1.3-1.6	6.060	20.73																	
1.6-2.0	5.980	13.46																	
2.0-2.8	4.997	25.54	16																
2.8-3.0	6.921	7.62	1																
S4 0-0.7	4.997	10.44																	
0.7-1.1	12.523	30.39																	
1.1-1.9	5.462	10.46																	
1.9-2.05	6.279	8.92																	
S5 0-0.6	10.447	15.64																	
0.6-1.0	9.550	225.65	10	0.215															
1.0-1.5	7.336	4.75	8	0.078															
S6 0-0.6	5.636	110.56	87	0.076															
0.6-1.2	7.882	10.94	9																
LIMIT OF DETECTION		0.04																	
ANALYTICAL METHOD		PM1																	



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DATE RECEIVED	DATE REPORTED	SAMPLE ADVICE No.	SAMPLE TYPE	SAMPLE PREPARATION
6.2.84	9.2.84	14901/02	Conc.	SP22

SAMPLE No.	Wt(g)	Au	Wt Samples																
S1 0-1.2m	4.506	7.01																	
1.2-1.5	6.158	5.89																	
S2 0-1.0	5.923	89.27	5	0.105															
1.0-1.5	5.074	96.82	5	0.035															
1.5-2.0	6.574	78.34	6	0.086															
2.0-2.3	8.808	87.72	4	0.193															
S3 0-1.3	8.020	32.89																	
1.3-1.6	6.060	20.73																	
1.6-2.0	5.980	13.46																	
2.0-2.8	4.997	0.54	1																
2.8-3.0	6.921	7.62	1																
S4 0-0.7	4.997	77.44																	
0.7-1.1	12.523	30.39																	
1.1-1.9	5.562	40.96																	
1.9-2.05	6.279	8.92																	
S5 0-0.6	10.447	15.44	11	0.215															
0.6-1.0	9.550	225.65	10	0.215															
1.0-1.5	7.338	54.75	9	0.054															
S6 0-0.6	5.636	110.56	8	0.076															
0.6-1.2	7.882	0.74	9																
LIMIT OF DETECTION		0.04																	
ANALYTICAL METHOD		PM1																	



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REPORT OF ANALYSIS

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DATE RECEIVED	DATE REPORTED	SAMPLE ADVICE No.	SAMPLE TYPE	SAMPLE PREPARATION
6.2.84	9.2.84	14901/02	Conc.	RE: 0757

SAMPLE No.	Wt(g)	Au																
SS12 2.0-3.0	7.004	21.16	12															
3.0-3.3	4.106	184.79	5	0.1521														
S13 0-1.3	8.143	8.55																
1.3-1.9	4.717	0.93																
1.9-2.5	7.630	112.38																
S14 0-0.13	13.993	56.46	6	0.15														
0.3-1.0	12.071	24.19	6	0.036														
1.0-2.1	8.304	23.12	10	0.072														
2.1-2.3	8.439	551.75	7	0.465														
S15 0-1.1	9.529	15.32																
1.1-1.6	8.814	6.83																
1.6-3.0	7.881	20.72																
S16 0-0.7	7.821	13.86																
0.7-1.3	8.324	5.10																
1.3-2.0	4.337	58.51																
2.0-2.5	4.183	17.51																
S17 0-0.7	8.642	1.76																
0.7-1.5	6.635	3.54																
1.5-2.1	4.554	10.95																
S18 0-1.0	10.826	4.92																
LIMIT OF DETECTION		0.04																
ANALYTICAL METHOD		PM1																



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REPORT OF ANALYSIS

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DATE RECEIVED	DATE REPORTED	SAMPLE ADVICE No.	SAMPLE TYPE	SAMPLE PREPARATION
6.2.84	9.2.84	14901/02	Conc	RE: 0757

SAMPLE No.	Wt (g)	Au																	
S18 1.0-2.0	5.747	0.17																	
2.0-2.5	6.260	0.05																	
S19 0-0.5	7.616	2.43																	
0.5-1.8	9.178	1.47																	
S20 0-0.7	10.289	73.01																	
0.7-1.4	10.051	4.98																	
1.4-2.1	7.992	27.43																	
S21 0-0.5	6.775	12.42																	
0.5-1.3	6.980	104.76																	
1.3-1.5	Missing	XXXXX																	
1.5-1.7	7.555	65.52																	
S22 0-1.0	9.157	36.06																	
1.0-1.9	10.969	71.45																	
1.9-2.1	5.518	21.67																	
S23 0-1.0	3.003	32.22																	
1.0-1.5	7.761	28.75																	
S24 0-1.0	4.811	18.37																	
1.0-1.4	3.692	40.36																	
S25 0-0.5	2.100	426.19	8	0.112															
0.5-1.5	2.206	60.74																	
LIMIT OF DETECTION		0.04																	
ANALYTICAL METHOD		PM1																	



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REPORT OF ANALYSIS

DATE RECEIVED	DATE REPORTED	SAMPLE ADVICE No.	SAMPLE TYPE	SAMPLE PREPARATION
6.2.84	9.2.84	14901/02	Conc.	RE 0757

SAMPLE No.	Wt(g)	AU																	
S25 1.5-2.2	3.512	342.04	10	0.120															
S26 0-1.0	1.808	31.32	10	0.05															
1.0-1.8	2.674	1080.78	12	0.240															
S27 0-1.0	2.039	8.40																	
1.0-1.2	1.293	5.70																	
S28 0-1.2	3.498	24.12																	
S29 0-0.8	4.648	261.94	13	0.094															
0.8-1.4	1.990	0.41	15																
S30 0-0.6	22.203	183.25	9	0.452															
0.6-1.1	1.414	22.07	8																
1.1-2.1	4.821	132.49	11	0.058															
S31 0-0.6	1.000	349.37	9	0.15															
0.6-1.3	6.716	262.25	10	0.175															
1.3-1.9	3.231	94.58	10	0.22															
1.9-2.6	3.821	27.28	8	0.013															
S32 0-0.9	2.693	310.8																	
0.9-1.5	6.801	86.0																	
1.5-2.2	1.048	335.3																	
S33 0.0-0.8	3.610	52.2																	
0.8-2	6.924	64.4																	
LIMIT OF DETECTION		0.04																	
ANALYTICAL METHOD		PM1																	



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REPORT OF ANALYSIS

DATE RECEIVED	DATE REPORTED	SAMPLE ADVICE No.	SAMPLE TYPE	SAMPLE PREPARATION
6.2.84	9.2.84	14901/02	Conc.	RE: 0757

SAMPLE No.	Wt(g)	Au																
S34 0.0-5	9.944	20.6																
0.5-1.3	11.782	8.13																
1.3-1.7	11.838	32.7																
1.7-2.4	2.403	4.52																
S35 0-1.5	13.014	3.93																
1.5-2.9	4.544	1.61																
2.9-3.5	21.357	3.25																
S36 0.9	12.147	1.49																
0.9-1.8	13.224	5.51																
1.8-2.5	9.850	3.63																
S37 0-1.3	12.975	0.21																
S37 1.3-1.9	12.978	9.64																
1.9-3.1	11.249	6.21																
S38 0-1.8	2.897	2.46																
1.8-2.9	31.749	24.96																
S39 0.4	20.968	15.05																
S39 0.4-1.1	15.030	23.62																
1.1-2.5	18.289	16.78																
S40 0-0.3	15.662	0.56																
0.3-1	15.213	1.22																
LIMIT OF DETECTION		0.04																
ANALYTICAL METHOD		PM1																



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REPORT OF ANALYSIS

DATE RECEIVED	DATE REPORTED	SAMPLE ADVICE No.	SAMPLE TYPE	SAMPLE PREPARATION
6.2.84	9.2.84	14901/02	Conc.	RE: 757

SAMPLE No.	Wt (g)	AU																	
S40 1.2	15.018	0.12																	
2.2-5	14.556	3.79																	
S41 0-0.4	1.850	8.17																	
0.4-1	18.618	1.62																	
1.1-8	16.486	9.83																	
1.8-2.6	17.172	19.58																	
S42 0.0-5	12.193	5.93																	
0.5-2	17.206	0.00																	
2-2.5	20.054	18.14																	
S43 0-0.5	18.848	10.45																	
0.5-1.5	8.793	7.68																	
S44 0.1-1	15.164	1.73																	
S45 0.0-3	3.440	1.85																	
0-1.1-1	15.132	2.45																	
1.1-2.3	11.833	BLD																	
S46 0-0.5	12.258	0.86																	
0.5-1.7	14.638	BLD																	
1.7-2.0	6.343	BLD																	
S47 0-1	4.401	0.65																	
1-1.9	12.529	2.19																	
LIMIT OF DETECTION		0.04																	
ANALYTICAL METHOD		PM1																	



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REPORT OF ANALYSIS

DATE RECEIVED	DATE REPORTED	SAMPLE ADVICE No.	SAMPLE TYPE	SAMPLE PREPARATION
6.2.84	9.2.84	14901/02	Conc.	RE: 757

SAMPLE No.	Wt(g)	Au																	
S47 1.9-2.5	7.023	11.35																	
S48 0-0.8	7.270	2.20	9	0.002															
0.8-2.2	5.891	241.47	9	0.158															
S49 0-0.6	9.658	5.18	9																
0.6-1.2	9.069	21.0	16	0.012															
1.2-1.7	3.732	121.69	14																
1.7-2.3	4.973	0.83	10	BLD															
S50 0-0.9	3.046	71.22																	
0.9-2.3	5.684	18.25																	
S51 0-0.8	7.568	15.41																	
0.8-1.5	5.859	3.35																	
1.5-2.0	7.547	63.93																	
S52 0-0.5	7.985	0.30																	
0.5-1	10.465	5.27																	
1-3.2	7.384	3.67																	
2.2-2.6	10.121	4.70																	
S53 0-0.9	11.568	9.64																	
0.9-1.5	13.178	100.36																	
1-5.3	8.451	15.20																	
S54 0-1.3	11.007	5.79																	
LIMIT OF DETECTION		0.04																	
ANALYTICAL METHOD		PM1																	



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REPORT OF ANALYSIS

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Northern Gold

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DATE RECEIVED	DATE REPORTED	SAMPLE ADVICE NO.	SAMPLE TYPE	SAMPLE PREPARATION
6.2.84	9.2.84	14901/02	Conc.	RE: 0757

SAMPLE No.	Wt. (g)	Au																
S54 1.3-2.2	9.005	99.80																
0.2-2.5	14.693	16.88																
S55 0-0.8	14.229	10.45																
0.9-1.8	13.774	37.98																
S56 0-1	5.901	36.94																
1-1.6	7.331	11.01																
S57 0-5	8.255	2.59																
0.5-1.7	30.203	10.39																
S58 0-0.5	24.869	1.35																
0.5-1.7	17.903	10.51																
1.7-2.5	13.308	6.80																
S59 0-1	15.280	8.71																
S59 1-2.3	7.942	1.32																
S60 0-1	9.631	0.85																
S61 0-1	9.756	0.13																
1-1.8	14.460	14.40																
1.1-8.3	20.751	24.64																
S62 0-0.4	16.246	0.76																
0.4-1.5	10.603	2.20																
1.5-2.2	6.762	10.55																
LIMIT OF DETECTION		0.04																
ANALYTICAL METHOD		PM1																



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REPORT OF ANALYSIS

DATE RECEIVED	DATE REPORTED	SAMPLE ADVICE No.	SAMPLE TYPE	SAMPLE PREPARATION
6.2.84	9.2.84	14901/02	Conc.	RE: 0757

SAMPLE No.	Wt. (g)	Au																
S63 0-0.7	11.926	3.03																
0.7-1.4	12.670	5.35																
1.4-2.2	11.500	59.13																
S64 0-0.5	12.273	25.88																
0.5-1.8	10.598	4.56																
1.8-2.3	7.371	2.36																
S65 0-0.5	8.587	13.11																
0.5-1.6	9.184	18.85																
1.6-2.2	9.073	9.71																
2.2-3.5	7.158	11.68																
S66 0-1	5.533	12.79																
1-2	8.797	10.30																
S67 0-5	21.798	2.98																
0.5-1.7	6.189	2.14																
1.7-3	9.166	2.93																
S68 0-1.8	12.521	8.16																
1.8-2.5	10.881	6.12																
2.5-2.9	5.098	0.15																
S69 0-1.1	11.270	0.22																
1-1.2	12.176	9.59																
LIMIT OF DETECTION		0.04																
ANALYTICAL METHOD		PMI																



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Northern Gold
SYDNEY. NSW. 2001
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REPORT OF ANALYSIS

DATE RECEIVED	DATE REPORTED	SAMPLE ADVICE No.	SAMPLE TYPE	SAMPLE PREPARATION
6.2.84	9.2.84	14901/02	Conc.	RE; 0757

SAMPLE No.	Wt. (g)	Au.																
S69 2-2.6	12.857	102.08																
S70 0-2	10.578	13.69																
2-3	14.143	7.88																
3-3.5	10.452	59.68																
S71 0-0.5	6.853	5.80																
0.5-1.7	14.171	5.09																
1.7-2.9	9.071	0.23																
S72 0-0.8	13.023	2.41	7	0.006														
0.8-2	9.941	58.03	12	0.046														
2-2.9	14.827	340.59	10	0.50														
S73 0-1	13.333	3.77																
1-2.1	13.085	0.74																
S74 0-1	13.254	2.10																
1-1.9	14.735	0.41																
1.9-3	11.048	BLD																
3-3.3	14.313	BLD																
S75 0-1.4	12.958	BLD	9	BLD														
1.4-2	11.637	126.86	10	0.10														
2-3	11.197	8.23	12	0.008														
3-4	11.614	0.59	10	BLD														
LIMIT OF DETECTION		0.04																
ANALYTICAL METHOD		PM1																



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NORTHERN GOLD

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REPORT OF ANALYSIS

			DATE RECEIVED	DATE REPORTED	SAMPLE ADVICE No.	SAMPLE TYPE	SAMPLE PREPARATION
			6.2.84	9.2.84	14901/2	Conc.	RE 757
SAMPLE No.	Wt. (g)	Au					
S76 0.0 - 1.2	29.257	0.18					
1.2 - 2.5	15.503	0.69					
2.5 - 3.0	14.943	2.06					
3.0 - 4.5	15.304	0.07					
S77 0.0 - 0.4	8.991	BLD					
0.4 - 1.0	13.688	0.68					
1.0 - 2.5	5.291	3.66					
S78 0.0 - 1.0	6.542	0.93					
1.2 - 2.2	8.724	BLD					
S79 0.0 - 1.0	14.489	2.12					
1.0 - 1.6	4.873	5.49					
S80 0.0 - 1.0	11.944	5.19					
1.0 - 1.7	3.617	28.54					
S81 0.0 - 8.0	16.473	8.79					
0.8 - 1.6	3.600	10.76					
S82 0.0 - 1.0	16.794	28.37					
1.0 - 2.4	18.842	77.93					
S83 0.0 - 1.0	1.598	68.6					
1.0 - 1.8	1.617	188.62					
1.8 - 2.4	1.121	270.40					
LIMIT OF DETECTION		0.04					
ANALYTICAL METHOD		PM1					



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Northern Gold
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REPORT OF ANALYSIS

				DATE RECEIVED	DATE REPORTED	SAMPLE ADVISE NO.	SAMPLE TYPE	SAMPLE PREPARATION
				6.2.84	13.2.84	14901/02	Conc.	SP22
SAMPLE NO.	Wt. (g)	AU	CST					
C1/5N 1-2	10.786	7.41						
C1/ON 0-0.4	9.718	32.22						
0.4-0.8	6.401	0.85						
C1/5S 0-0.9	7.808	5.27	7					
0.9-1.4	12.232	87.17	17	0.150				
C1/9S 0-0.9	3.089	100.56	11					
0.9-1.8	4.425	211.30	14					
1.8-2.6	1.542	299.93	13					
C1/15S 0-1	4.478	53.15						
1-2	2.293	47.04						
C1/20S 0-1	2.694	236.17	14	0.045				
1-2	1.819	711.93	12	0.108				
C1/25S 0-1	3.290	98.97	12					
C1/30S 0-1	7.951	39.07	10	0.031				
1-1.8	4.282	253.68	7	0.155				
C1/35S 0-0.6	8.816	30.17						
C1/35S 0.6-1.8	9.708	6.01						
C1/40S 0-1	13.454	31.17						
C1/40S 1-2.2	5.954	3.04						
C2/50N 0-1.4	13.147	30.42						
LIMIT OF DETECTION		0.04						
ANALYTICAL METHOD		PM1						



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REPORT OF ANALYSIS

		DATE RECEIVED	DATE REPORTED	SAMPLE ADVICE NO.	SAMPLE TYPE	SAMPLE PREPARATION
		6.2.84	13.2.84	14901.02	Conc.	SP22
SAMPLE No.	Wt. (g)	Au				
C2/50N 1.4-2	9.734	7.42				
2.3	10.560	26.32				
C2/40N 0-1.2	16.196	13.01	9	0.023		
1.2-2.6	15.344	1805.26	13	2.031		
C2/40N(A) 0-1.2	11.632	65.55				
1.2-2.6	7.785	185.93	11	0.13		
C2/33N 0-1	10.068	11.72	10			
C2/33N 1-1.8	12.112	18.70	16			
1.8-2.9	8.638	0.51	10			
C2/33N(A) 0-1	3.815	265.73	6	0.17		
1-1.8	6.031	19.11	10	0.01		
1.8-2.9	7.108	1.34	6	0.001		
C2/20N 0-1	9.803	182.72	10	0.18		
1-2	18.888	64.06	10	0.10		
C2/10N 0-1	16.289	2.08	8	BLD		
1-2	9.562	694.8	1	0.1		
C2/3N 0-1	8.757	7.25	10	BLD		
1-2	2.781	34.43	6	0.01		
2-3	8.017	130.19	10	0.10		
3-4	9.027	17.62	10	0.02		
LIMIT OF DETECTION		0.04				
ANALYTICAL METHOD		PM1				

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REPORT OF ANALYSIS

DATE RECEIVED			DATE REPORTED			SAMPLE ADVISE NO.			SAMPLE TYPE			SAMPLE PREPARATION		
6.2.84			13.2.84			14901/02			Conc.			RE 757		
SAMPLE NO.	WT.G	AU												
C4/10E 0.0 - 0.6	15.195	35.08												
0.6 - 1.9	14.361	5.80												
1.9 - 2.4	10.154	15.66												
C4/22E 0.0 - 1.2	22.416	15.45	9	0.04										
1.2 - 2.0	15.715	23.78	9	0.04										
2.0 - 3.2	1.451	2205.40	12	0.21										
C4/30E 0.0 - 0.5	12.163	6.97												
0.5 - 1.4	12.253	5.57												
1.4 - 2.5	11.467	64.21												
C4/40E 0.0 - 1.0	18.390	21.24												
1.0 - 2.3	8.900	17.43												
C5 10W	6.543	5.54												
20W	4.607	2.88												
30W	7.695	BLD												
40W	7.792	1.81												
50W	6.173	5.08												
60W	4.435	0.14												
70W	6.136	5.87												
80W	5.541	2.10												
90W	12.168	10.31												
LIMIT OF DETECTION		0.04												
ANALYTICAL METHOD		PM1												



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REPORT OF ANALYSIS

			DATE RECEIVED	DATE REPORTED	SAMPLE ADVISE NO.	SAMPLE TYPE	SAMPLE PREPARATION
			6.2.84	13.2.84	14901/02	Conc.	RE 757
SAMPLE No.	Wt(g)	Au					
C5 100W	4.000	4.94					
110W	3.844	1.82					
120W	3.926	3.02					
C6/12W 0.0 - 0.05	9.124	35.69	11	0.03			
C6/12W 0.5 - 1.8	6.809	203.22	14	0.10			
C6/20W 0.0 - 0.9	7.682	5.82					
C6/20W 0.9 - 1.5	4.153	41.48					
C6/20W 1.5 - 2.1	7.603	13.05					
C6/30W 0.0 - 1.2	4.775	35.08					
1.2 - 2.2	4.364	3.15					
C6/40W 0.0 - 0.9	9.023	28.73					
0.9 - 2.2	6.652	2.67					
C6/51W 0.0 - 1.1	12.429	359.0	9	0.50			
1.1 - 1.8	8.247	62.22	8	0.06			
1.8 - 2.3	4.567	252.35	10	0.11			
C6/55W 0.0 - 1.0	7.844	329.0	10	1.04			
1.0 - 2.4	4.012	3.33	9	BLD			
C6 61W	8.434	8.83					
65W	7.211	2.04					
70W	4.347	18.1					
LIMIT OF DETECTION		0.04					
ANALYTICAL METHOD		PM1					



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REPORT OF ANALYSIS

DATE RECEIVED			DATE REPORTED			SAMPLE ADVISORY			CONCENTRATION			SAMPLE PREPARATION		
6.2.84			13.2.84			14901/02			Conc.			RE 757		
SAMPLE No.	wt(g)	Au												
C6 75W	9.256	3.76												
80W	8.442	65.0												
85W	4.499	1.58												
90W	19.877	5.75												
95W	12.217	1.00												
100W	7.688	1.87												
105W	11.284	29.41												
110W	4.298	0.44												
C7 5W	6.559	21.71												
10W	4.561	6.28												
15W	13.499	23.10												
20W	3.929	126.46												
25W	5.251	8.74												
30W	9.546	41.25												
35W	7.172	6.69												
XXXXXXXXXXXXXXXX														
LIMIT OF DETECTION		0.04												
ANALYTICAL METHOD		PM1												

P.P.M. UNLESS OTHERWISE STATED

SIGNATORY

NR No. F 0789

A P P E N D I X 2

ASSAY RESULTS ALLUVIAL SAMPLING PROGRAMME

SOUTH HOWLEY 1984



SGS Australia Pty. Ltd.

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74 McEvoy St., Alexandria, Sydney, N.S.W. 2015
Telephone 699 7626 Telex: SGSSYD AA22398

WESTERN AUSTRALIA
80 Railway Parade, Queens Park
Telephone 458 1421 Telex: SGSPTH AA92624

NORTHERN GOLD N.L.
Suite 1602
National Mutual Centre
SYDNEY - N.S.W. 2000

Attention: Mr Reg Hardy

Our ref LA 3613

February 4, 1985

Your ref

Date received 11. 1.85

1. 2.85

ANALYSIS OF SAMPLES SUPPLIED

Date completed

SYDNEY

Issued at

ANALYTICAL REPORT

	Sample Ref.	Dry Wt (g)	As Supplied (g)	As Supplied (g)	Sample Ref.	Dry Wt (g)	Au mg
1							
2	A1 1.2-2.2	9.875	1.35	25	0.05	A10 0 - 1.2	5.348 4.2026 0.16
3	A2 0 - 1.1	5.406	0.216	10	0.02	1.2 - 2.2	4.874 1.3825 0.05
4	H - 2	8.080	0.775	12	0.06	A11 0 - 0.7	5.228 1.1302 0.09
5	A3 0 - 0.7	8.304	1.33	14	0.09	0.7 - 1.6	6.915 7.3017 0.43
6	0.7 - 1.5	4.642	0.172	25	0.01		
7	1.5 - 2.6	2.583	0.358	22	0.02		
8	A4 0 - 0.6	3.732	0.323	13	0.02		
9	0.6 - 1.6	4.265	0.408	15	0.03	Hg Amalgamation	
10	A5 0 - 1.3	4.053	0.708	8	0.09		
11	1.3 - 2.1	3.468	0.772	20	0.04		
12	A6 0 - 1.4	5.977	43.3	18	1.55		
13	A7 0.2 - 1.5	7.164	0.064	12	0.005		
14	1.5 - 2M	5.700	1.64	26	0.06		
15	A8 0 - 0.7	4.250	0.335	15	0.02		
16	0.7 - 1.3	4.271	0.650	24	0.03		
17	1.3 - 2.1	4.584	1.38	20	0.07		
18	A9 0 - 1.1	2.430	4.94	20	0.25		
19	1.1 - 1.9	5.572	1.24	18	0.07		
20	* A5 2.1 - 3.5	6.715	1.43	18	0.08		

