Northern Gold N.L.

Northern Territory Operations Office:-

Stuart Highway, Adelaide River
Postal Address: C/o P.O. Adelaide River N.T. 0846
Telephone: (089) 76 7023 Telefax: (089) 76 7025

EL 4736

FINAL REPORT TO

30 JUNE 1989

(Areas Not Converted to Other Tenements)

Compiled By
M Stokes
Northern Gold NL
September 1989

EL 4737 Final Report

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EL 4737 Final Report

1.0 SUMMARY

EL 4736 is located approximately 45 km southeast of Adelaide River on the Stuart Highway in the vicinity of the Cosmopolitan Howley Gold Mine. Exploration on the licence areas not converted to other tenements was conducted in two phases. Initial work included alluvial exploration by Metana Minerals NL conducted under an agreement with Northern Gold NL signed in 1986. Metana carried out water supply studies, geomorphological studies and stream sediment sampling in the area. Northern Gold commenced hardrock exploration on these areas in 1987, with the majority of work being conducted in 1988. Stream sediment sampling was the major activity carried out on the relevant parts of the licence.

2.0 INTRODUCTION

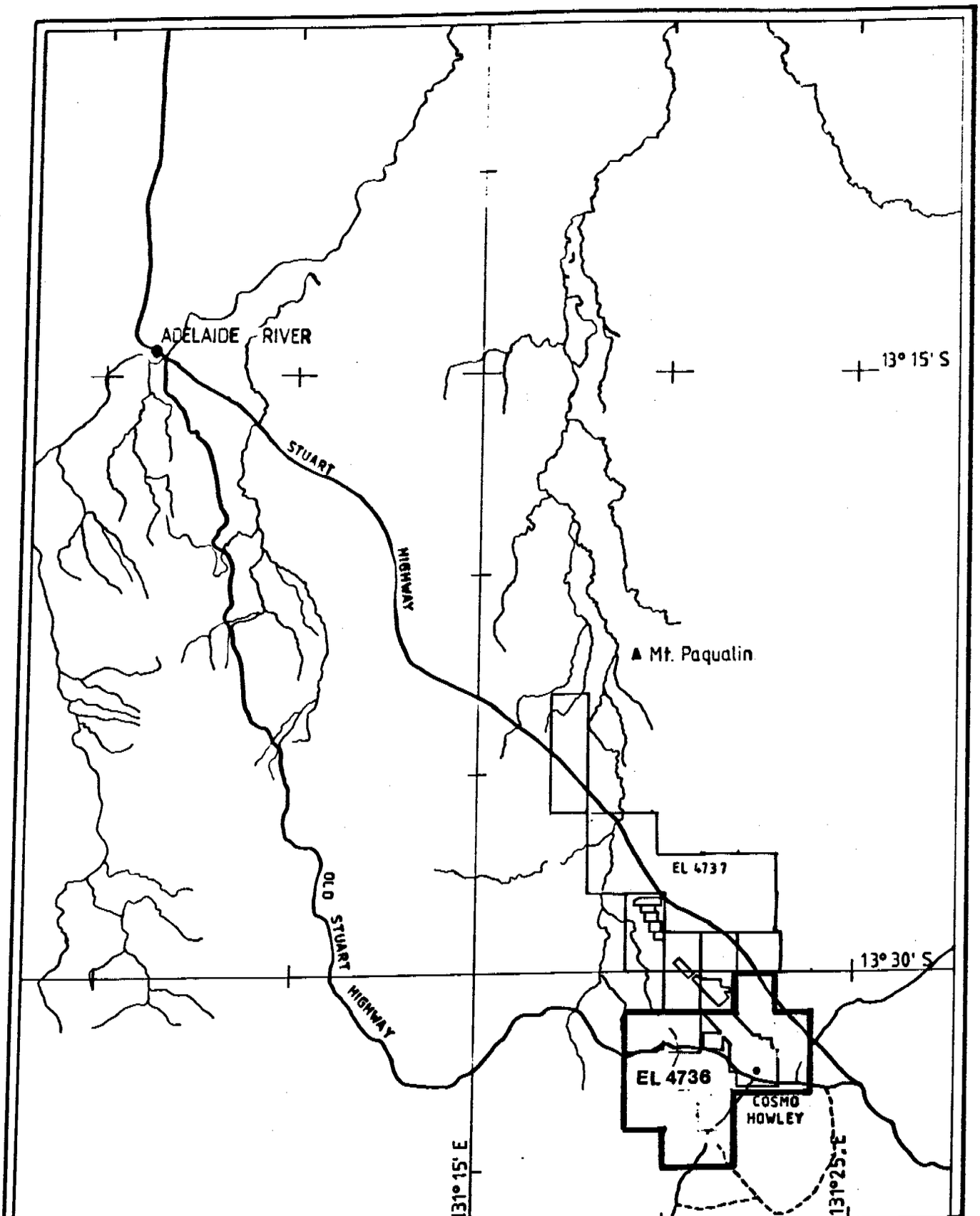
EL 4736 is located approximately 45km southeast of Adelaide River on the Stuart Highway. The licence surrounds the group of leases held by Dominion Gold Mines NL covering the Cosmopolitan Howley gold mine (Figure 1).

The E.L. covered a total of 16 graticular blocks less approximately 600 hectares held by Dominion. Prior to the expiry of the EL, parts of the licence were converted to other tenements. The tenement area not converted covers 8 graticule blocks and the work carried out on these is documented in this report. A report on the areas not relinquished has also been submitted (Stokes 1989). A diagram showing the retained tenements is given in Figure 2.

Access to the area is via the Stuart Highway, The Old Stuart Highway, The Douglas-Daly Road and the Fountain Head road. There is also limited access via 4WD tracks and fence lines (Figure 1).

EL 4736 was applied for by Northern Gold on 2nd January 1985 and the title was subsequently granted on 1 July, 1985. The E.L. was formed by the consolidation of E.L.'s 3040, 3041, 3055, 4235, 4455 and 4444. This consolidation took place in December 1984.

In 1986, a joint venture covering the rights to explore and mine alluvial gold was entered into with Metana Minerals NL on all the Howley tenements. This agreement is still in force. Metana carried out



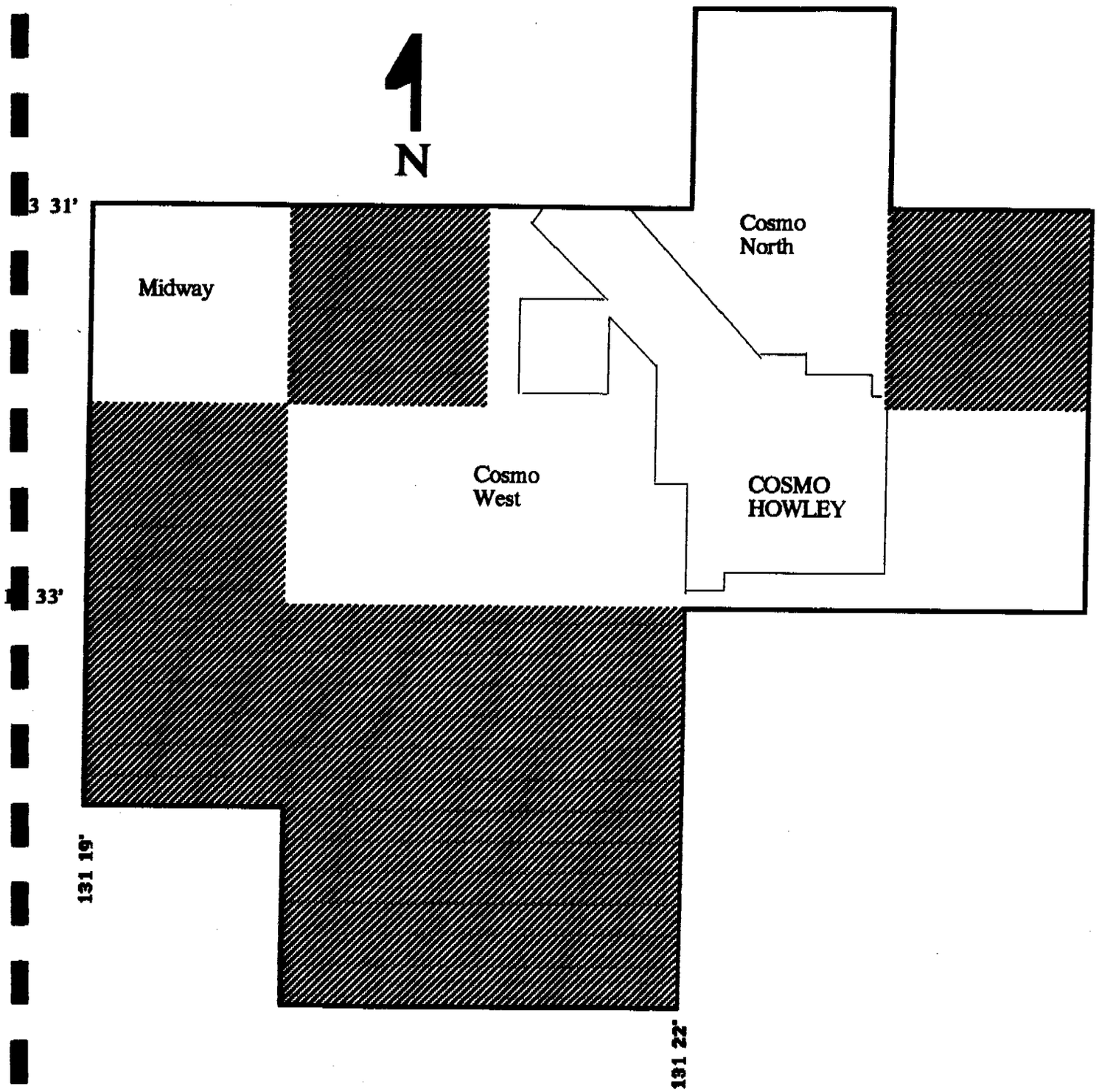
Northern Gold N.L.

Scale 1:250 000	Compiled by	Date December '87
	Drawn by R.M.	No.

TENEMENT

LOCATION MAP

FIG 1



EL 4736
RELINQUISHED
AREAS
Scale 1:50000

Figure 2

mapping, reconnaissance, and sampling of most of the alluvial areas on the licence.

Northern Gold commenced hardrock exploration on the areas in late 1987. A comprehensive stream sediment sampling programme was carried out over the licence area.

3.0 GEOLOGY

Sediments of the Mount Partridge, South Alligator and Finniss River Groups crop out in EL 4736. These are intruded by Zamu Dolerite which occurs as thick sills within the Koolpin Formation of the South Alligator Group. The Wildman Siltstone of the Mount Partridge Group crops out to the southeast of Cosmo Howley mine. Isolated exposures of Wildman Siltstone have also been mapped on the southern EL boundary. The Burrell Creek Formation of the Finniss River Group overlies the South Alligator Group Rocks. This formation is well exposed in the western part of the licence.

The South Alligator Group sediments are tightly folded in the north of EL 4736 and form part of the Howley Anticline - a prominent structure extending from Cosmopolitan Howley in the south to Mt Paqualin, 25 km to the north. South of Cosmo Howley the western anticlinal limb trends southwest and crosses the southern boundary of the EL.

Gold is known to occur along the Howley Anticline associated with quartz vein stockworks, saddle reefs and within shear zones. The mineralization has reached economic grade at Cosmopolitan Howley, Chinese Howley and Big Howley.

A more complete presentation of the geology and mineralization is given by Nicholson and Eupene (1984).

4.0 EXPLORATION ACTIVITY

4.1 Alluvial Exploration

In 1986 Northern Gold NL entered into an agreement with Metana Minerals NL concerning the rights to explore for and treat alluvial gold on Northern Golds Howley leases. Exploration on areas covered by this report include geomorphological studies and stream sediment sampling.

4.1 Geomorphological Studies

In 1986 a geomorphological study was carried out to evaluate the sedimentary sequences and sedimentary environments of the gold bearing gravels, and to map their extent. Air photo interpretation was used to provide a regional overview of the alluvial deposits, and a map was produced of all the alluvials in the project area. Relevant parts of this map are included as Figure 3.

4.12 Pan Sampling

A stream sediment sampling program covering all the major creeks on the licence was conducted. Gravel samples were taken at regular intervals along creeks where good exposures were found. The results of this program in the areas covered by this report were disappointing with all samples showing no colours. The results of this program are shown on Figure 3.

4.2 Hard Rock Exploration

4.21 Geochemical Sampling

Geochemical soil sampling was undertaken in several stages in EL 4736. An initial multi-element reconnaissance survey was conducted along two traverse lines in the area. 56 samples were taken from the relinquished area. Approximately 2 kg of -2mm material was collected from each sample point and sent to Analabs for analysis. The results of this program are shown on Figures 4 and 5, and given in appendix 1. On the basis of this work it was decided that gold analysis alone would outline any anomalous areas.

A regional stream sediment sampling program was undertaken over the whole EL to give rapid coverage of the area. Most samples were sieved to -2 mm in the field or laboratory dried prior to sieving. Nominal 2 kg field samples were re-split to 1 kg and cyanide leached for gold to a detection limit of 0.1 ppb. Sample results and locations are shown as Figures 6, 7, 8, 9 and 10. A description of sampled material and gold grades are presented as appendix 2.

4.22 Aerial Geophysics

An airborne geophysical survey was undertaken over the entire licence area as part of a broader survey encompassing all of Northern Gold's Howley tenements. This work was undertaken in September 1987, with preliminary results received in early

HOWLEY PROJECT

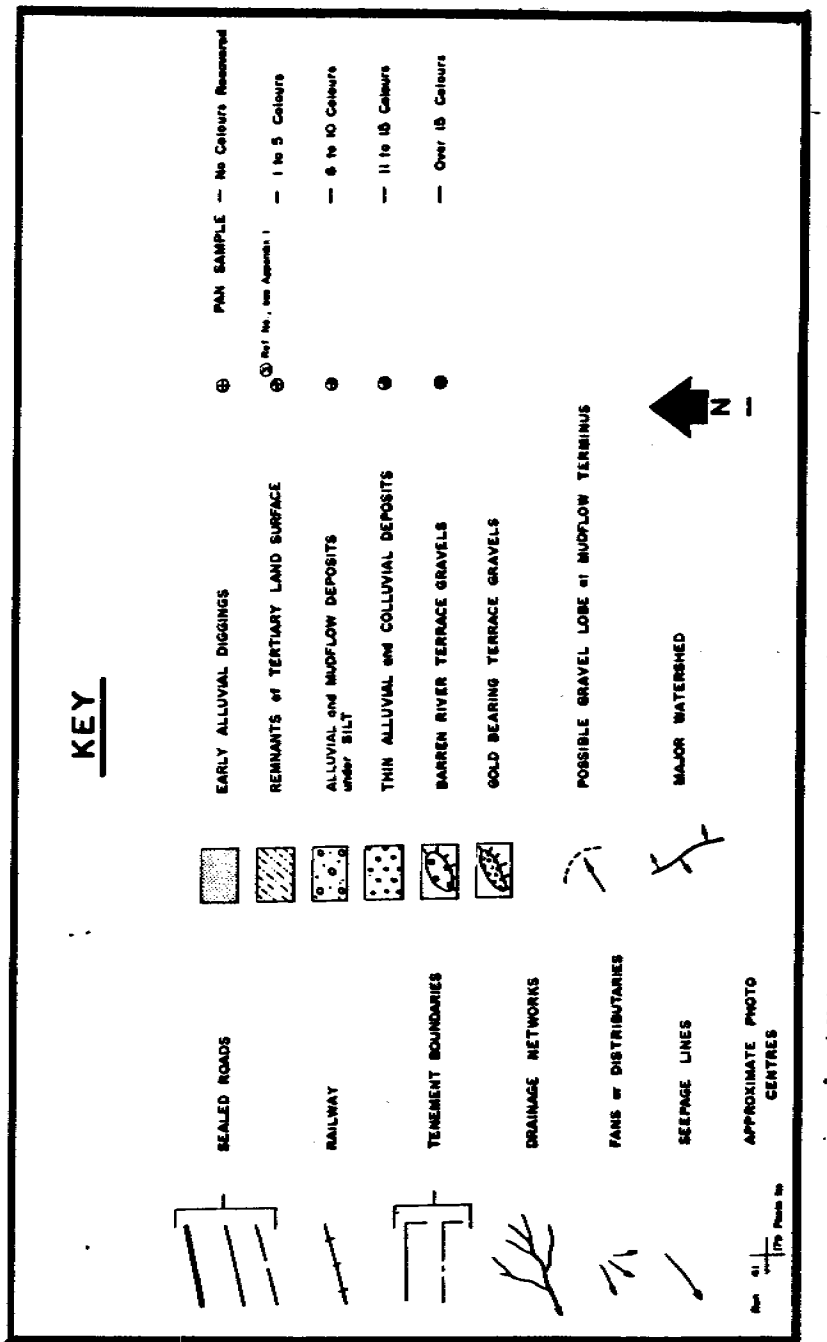
AIR PHOTOGRAPH INTERPRETATION of the ALLUVIAL DEPOSITS

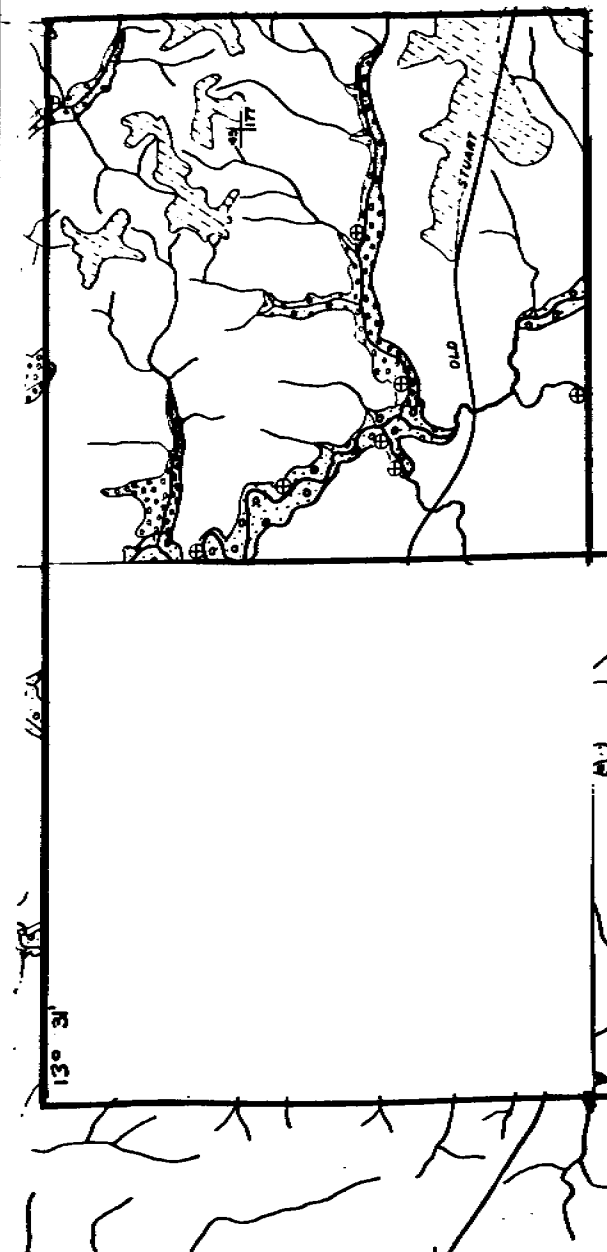
by R. RUSSELL

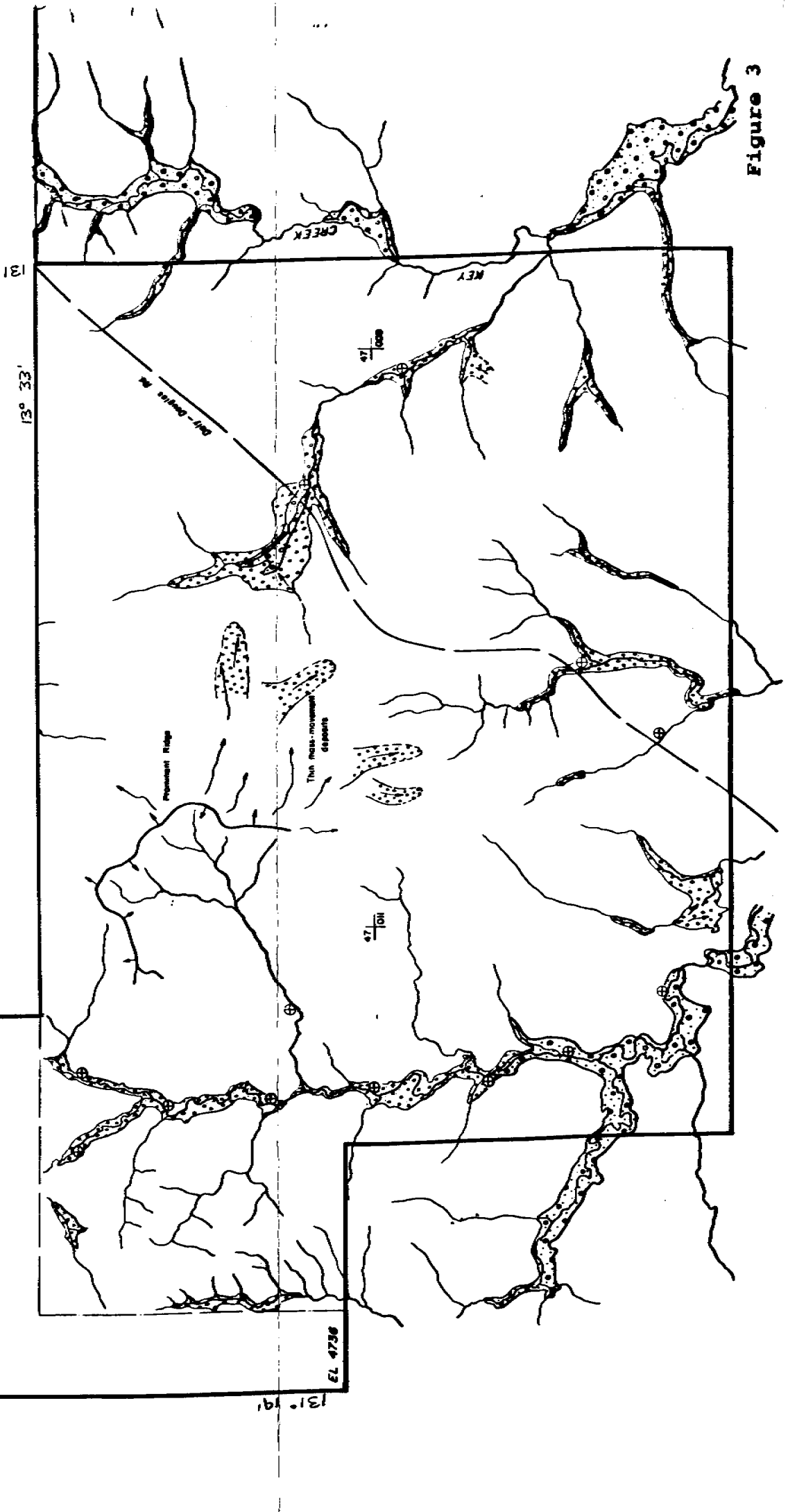
DECEMBER 1986 SHEET B

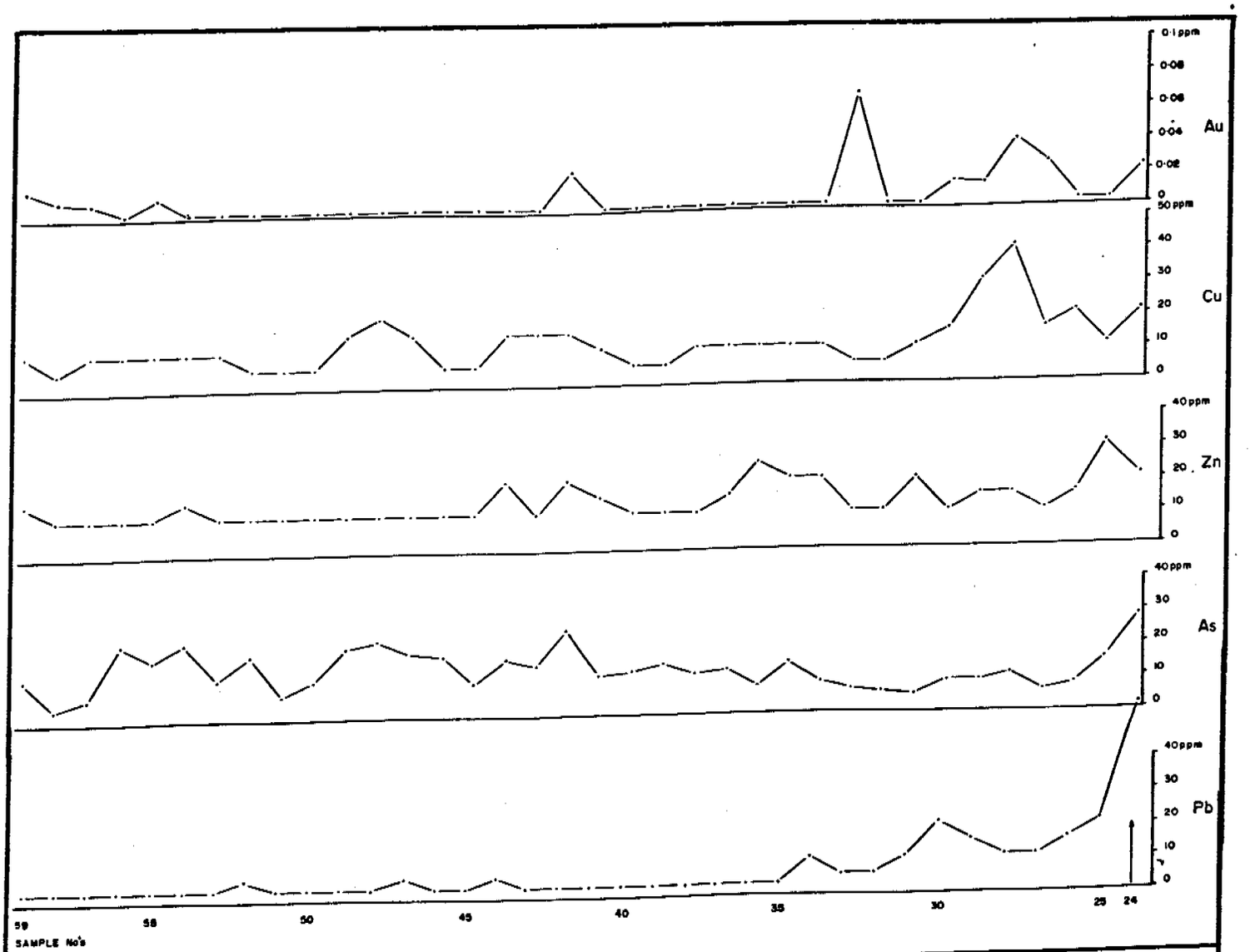
for METANA MINERALS N.L.

Figure 3

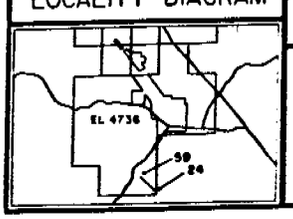








LOCALITY DIAGRAM



NORTHERN GOLD NL

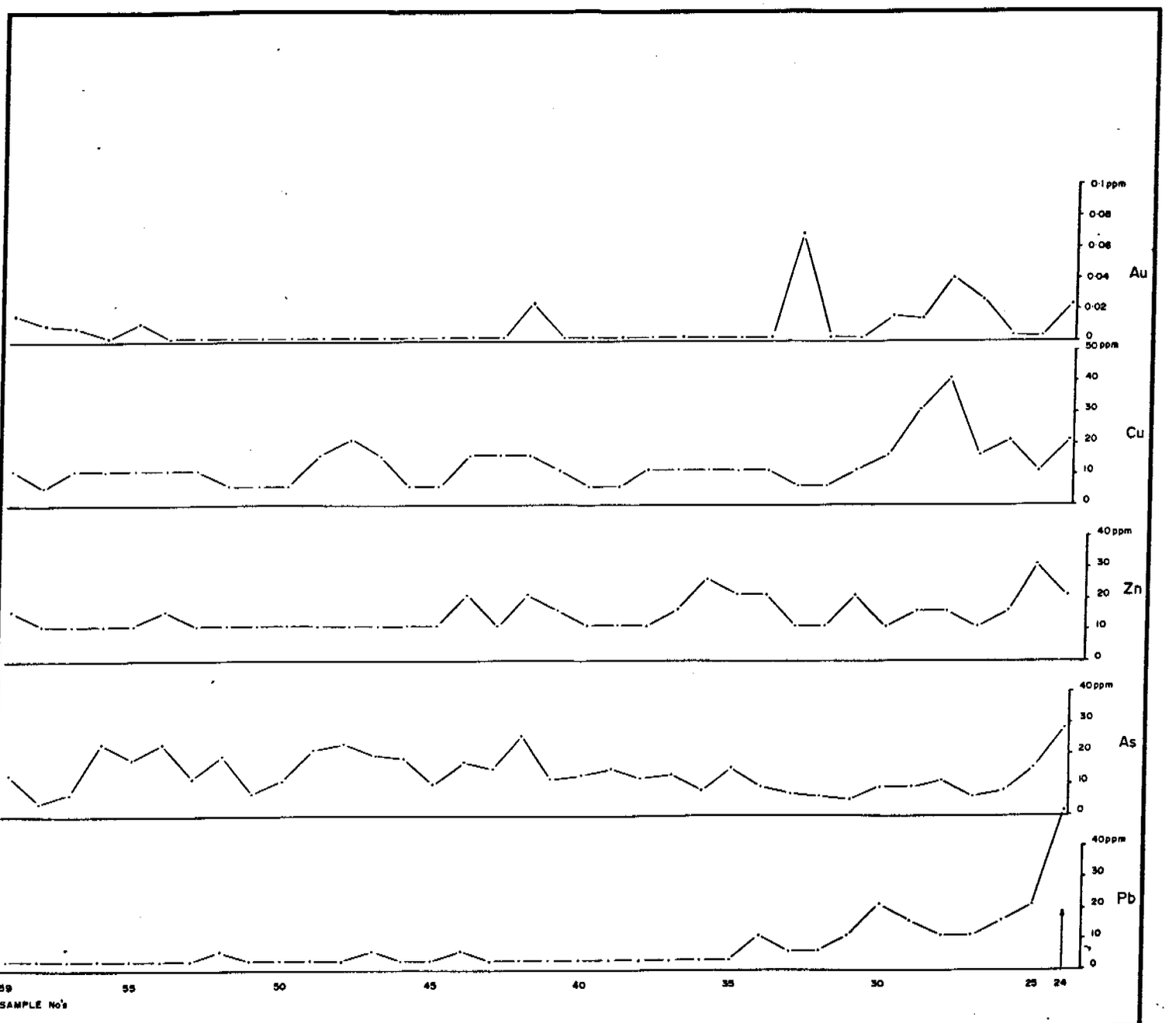
EL 4736
Orientation Soil Geochem
Multi Element Au Cu Zn As Pb

0 50 100 200 300 400 500m

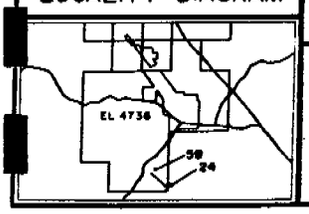
PLAN No. 255

DATE June '88

Figure 4



LOCALITY DIAGRAM



NORTHERN GOLD NL

0 50 100 200 300 400 500m

EL 4736
Orientation Soil Geochem
Multi Element Au Cu Zn As Pb

PLAN No. 255

DATE June '88

Figure 5

Figure 6

NORTHERN GOLD NL

EL 4736
GEOCHEMICAL SAMPLING
Sample Sites and Numbers

SCALE	DATE	SHEET
1: 50000	06/09/99	1 of 1
	REF No.	
	Plotted with MICROMINE	

760000.00E
755000.00E
750000.00N
8505000.00N

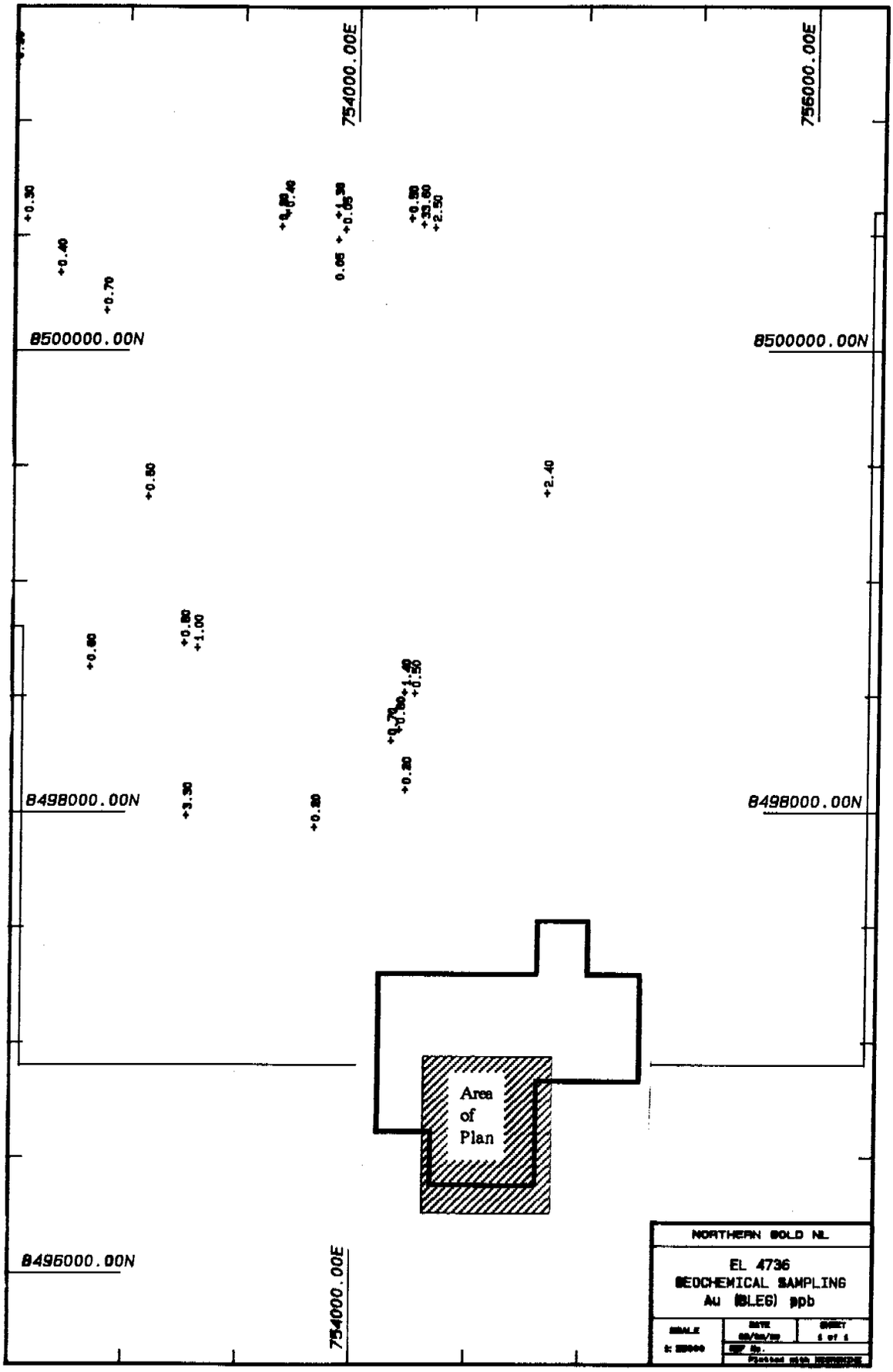

754000.00E
756000.00E
8500000.00N
8498000.00N
8496000.00N
+0.30
+0.40
+0.70
+0.50
+0.60
+0.80
+1.00
+3.90
+0.80
+2.40
+0.20
Area of Plan
NORTHERN GOLD NL
EL 4736
GEOCHEMICAL SAMPLING
Au (BLEG) ppb

Figure 7

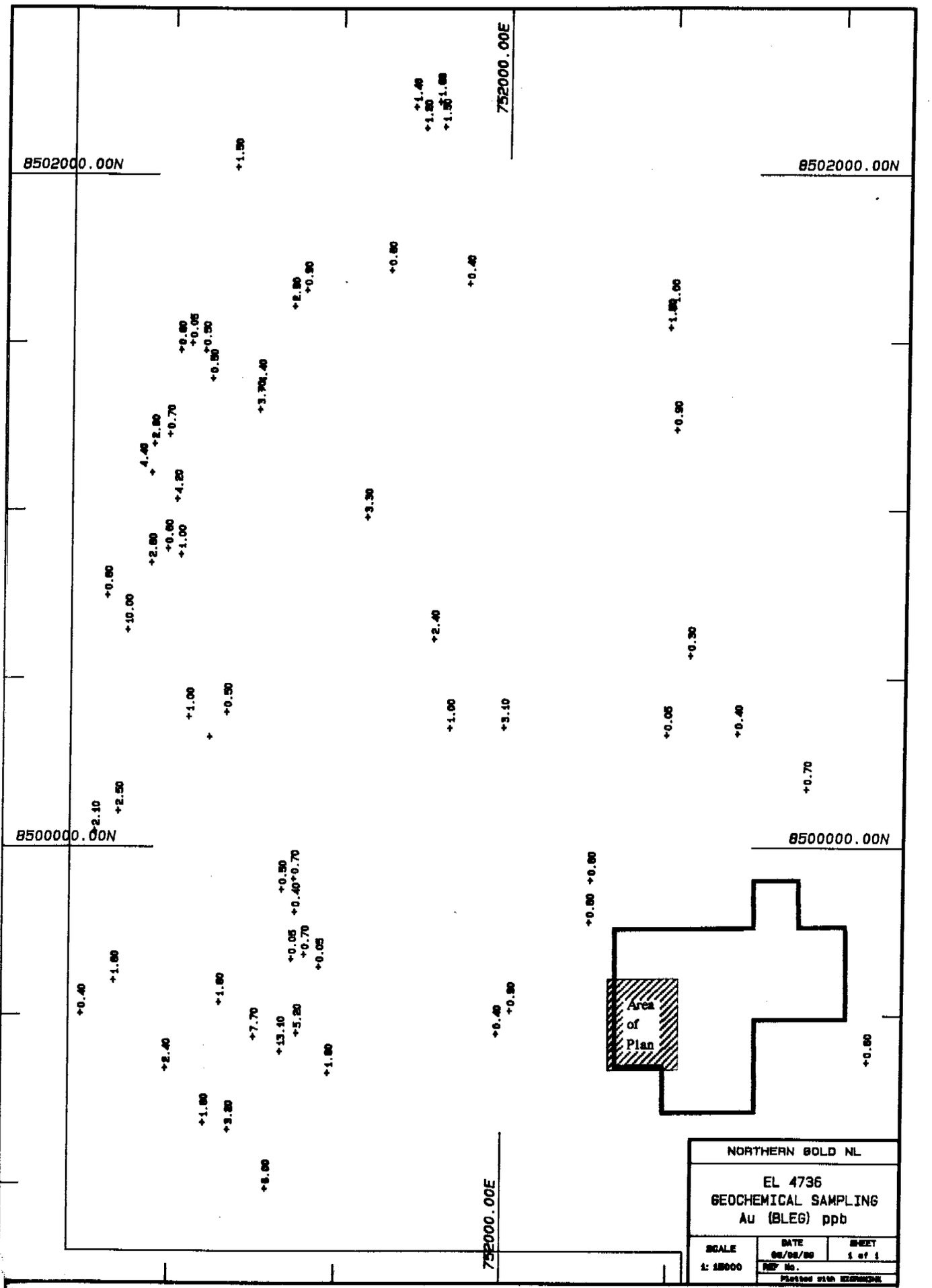

752000.00E
8502000.00N
8500000.00N
Area of Plan
NORTHERN GOLD NL
EL 4736
GEOCHEMICAL SAMPLING
Au (BLEG) ppb
SCALE
1: 15000
DATE
06/06/00
SHEET
1 of 1
REF No.

Figure 8

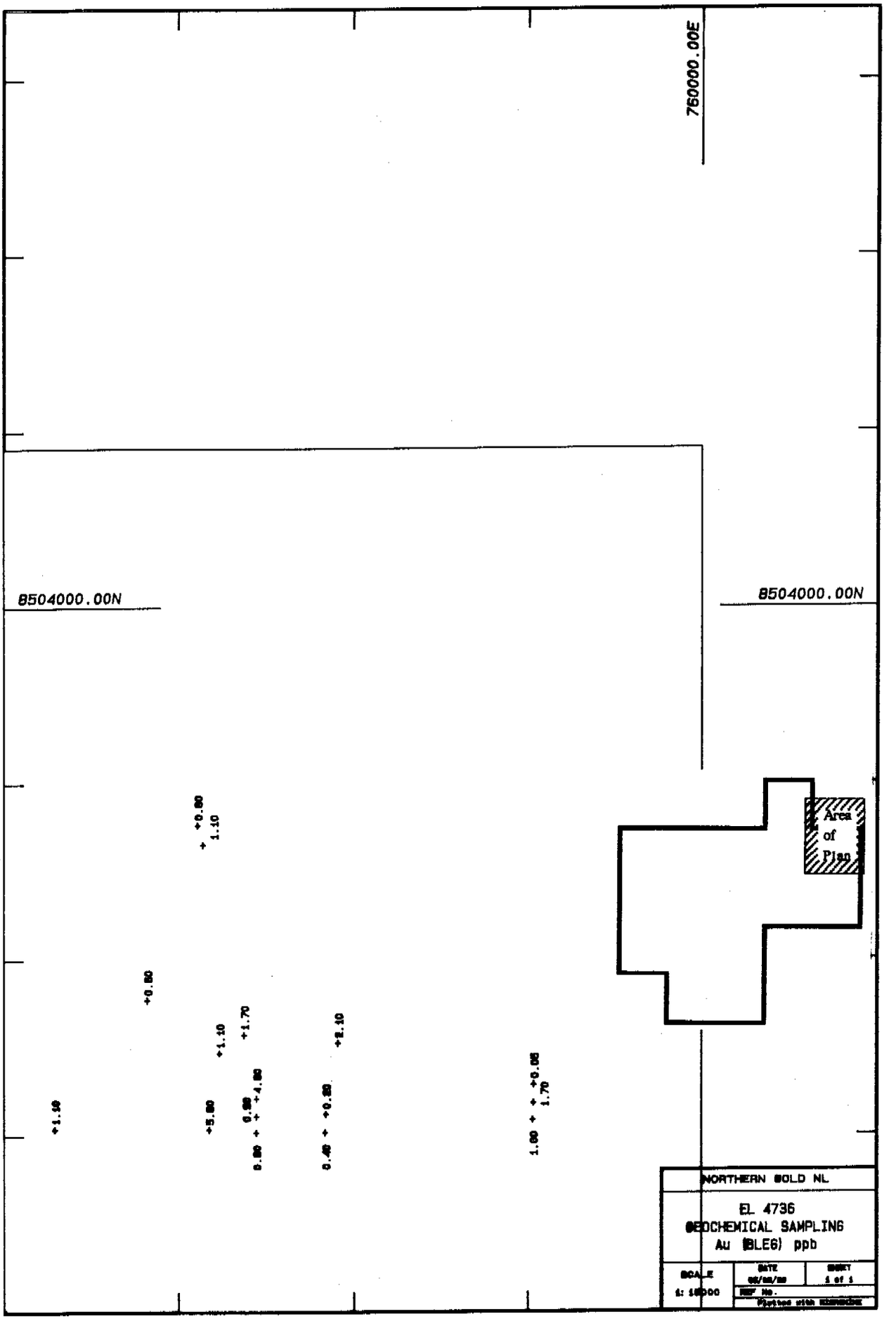

760000.00E
8504000.00N
8504000.00N
Area of Plan
+0.80
1.10
+0.80
+1.10
+1.70
+2.10
+1.50
+5.80
+4.80
+0.80
+0.80
+0.05
1.70
NORTHERN GOLD NL
EL 4736
GEOCHEMICAL SAMPLING
Au (BLEG) ppb
SCALE
1: 10000
DATE
00/00/00
SHEET
1 of 1
REF No.
Plotted with MINAMAP

Figure 9

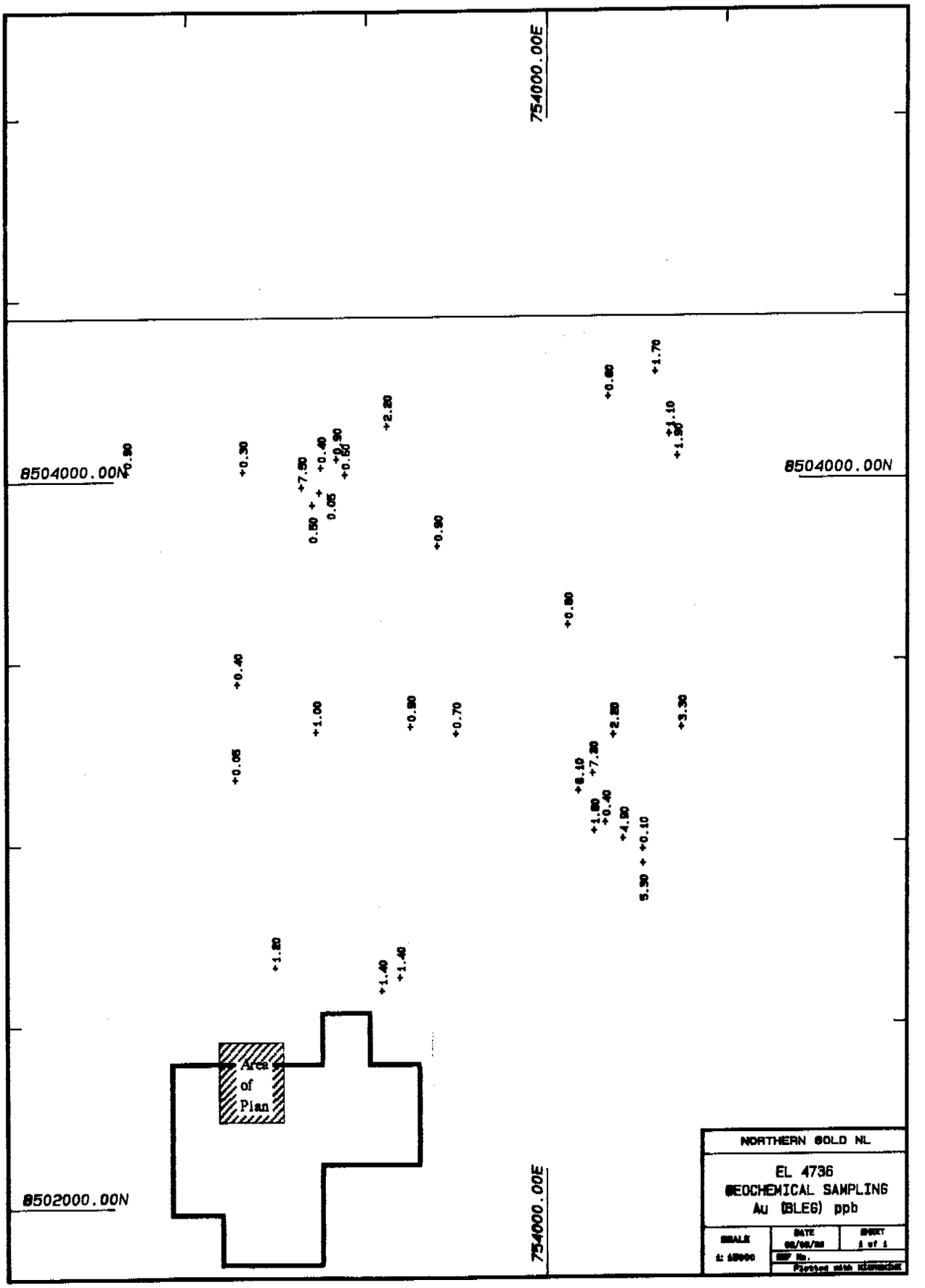

754000.00E
8504000.00N
8504000.00N
8502000.00N
754000.00E
Area of Plan
NORTHERN GOLD NL
EL 4736
GEOCHEMICAL SAMPLING
Au (BLEG) ppb

Figure 10

January 1988. In total, 520 square kilometres were covered by this survey. Results from this survey are shown as contours of radiometric total count (Figure 11) and total magnetic intensity (Figure 12). Technical details of the survey are given in Appendix 3.

In late 1988 after a reappraisal of the Howley area, the aerial geophysical data were sent to Southern Geoscience in Perth. This company specializes in computer enhancements of data. With the aid of Northern Gold staff, their consultants produced eight enhancements, calculated to show the greatest possible information. These were used to aid in interpretation of structural and stratigraphic mapping. Four of these enhancements were printed in cibachrome at a scale of 1:50,000. A photocopy of part of the northeast sun-shadow total magnetic count enhancement is shown as figure 13.

4.23 Other Work

Other work carried out in the E.L. includes site access works, road and track upgrading, tenement boundary marking, reconnaissance and data review.

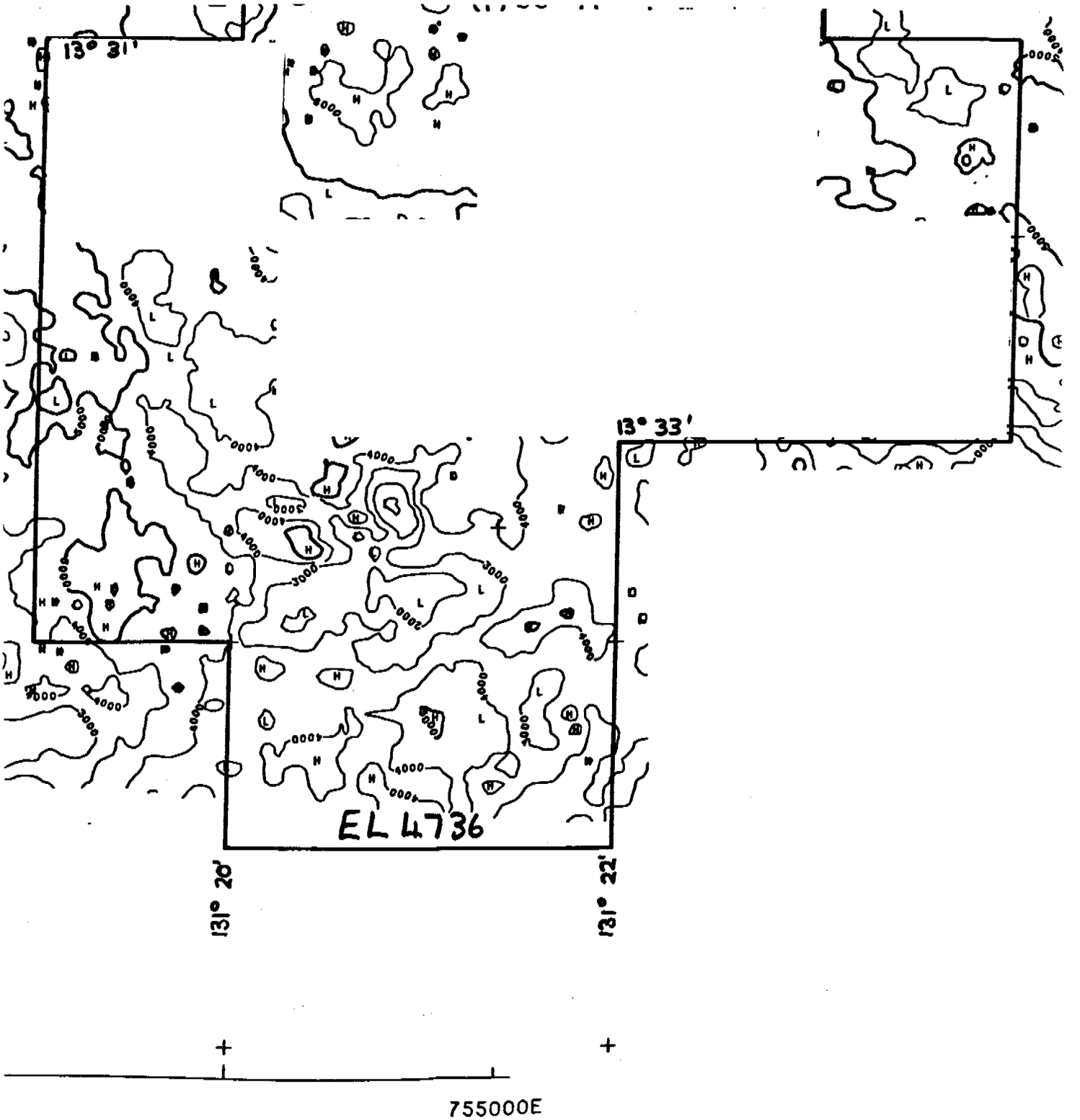


Figure 11.

HOWLEY SURVEY

Contours of Total Count

Scale 1 : 50 000

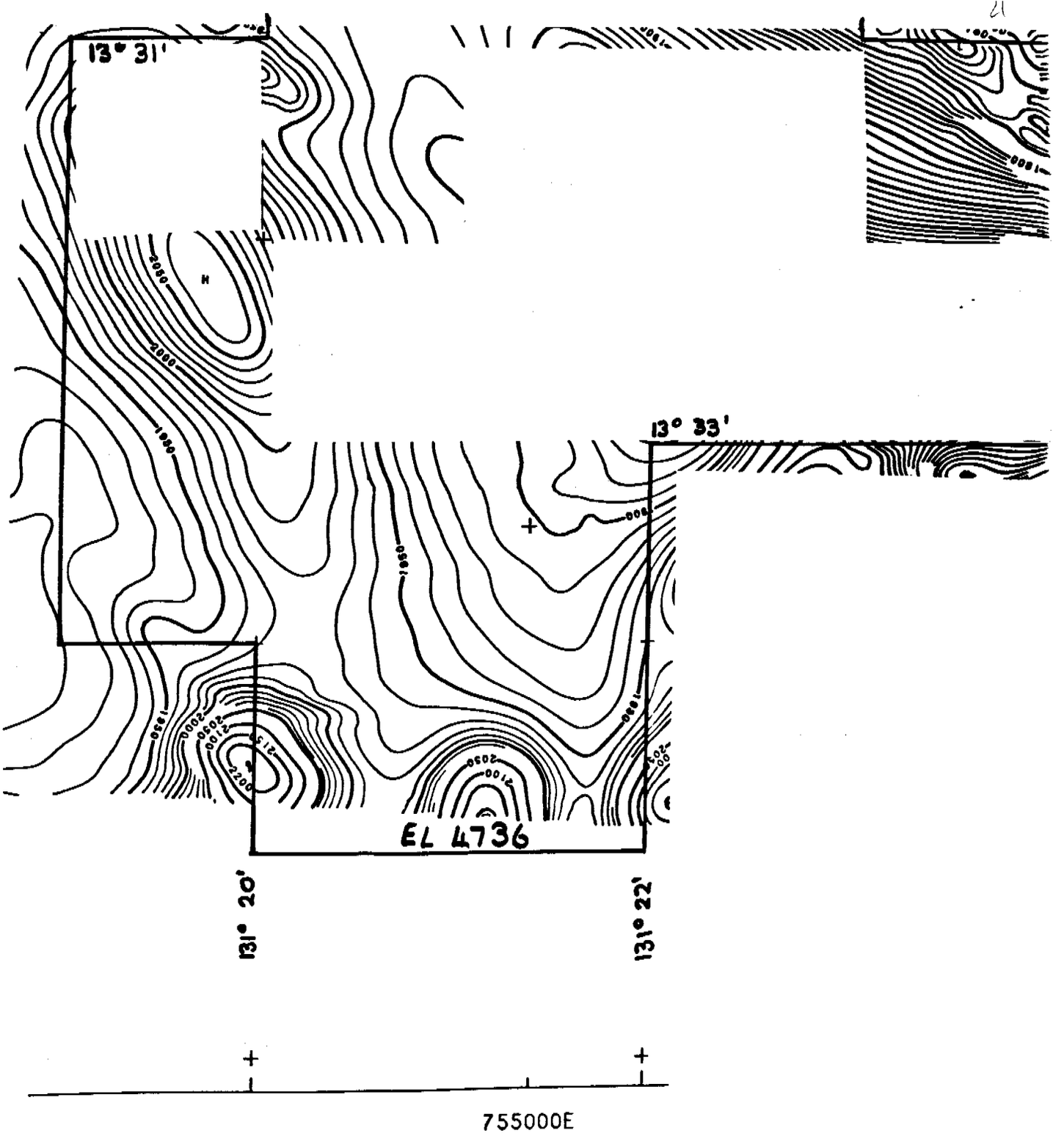


Figure 12.

HOWLEY SURVEY

Contours of

Total Magnetic Intensity

Scale 1: 50 000

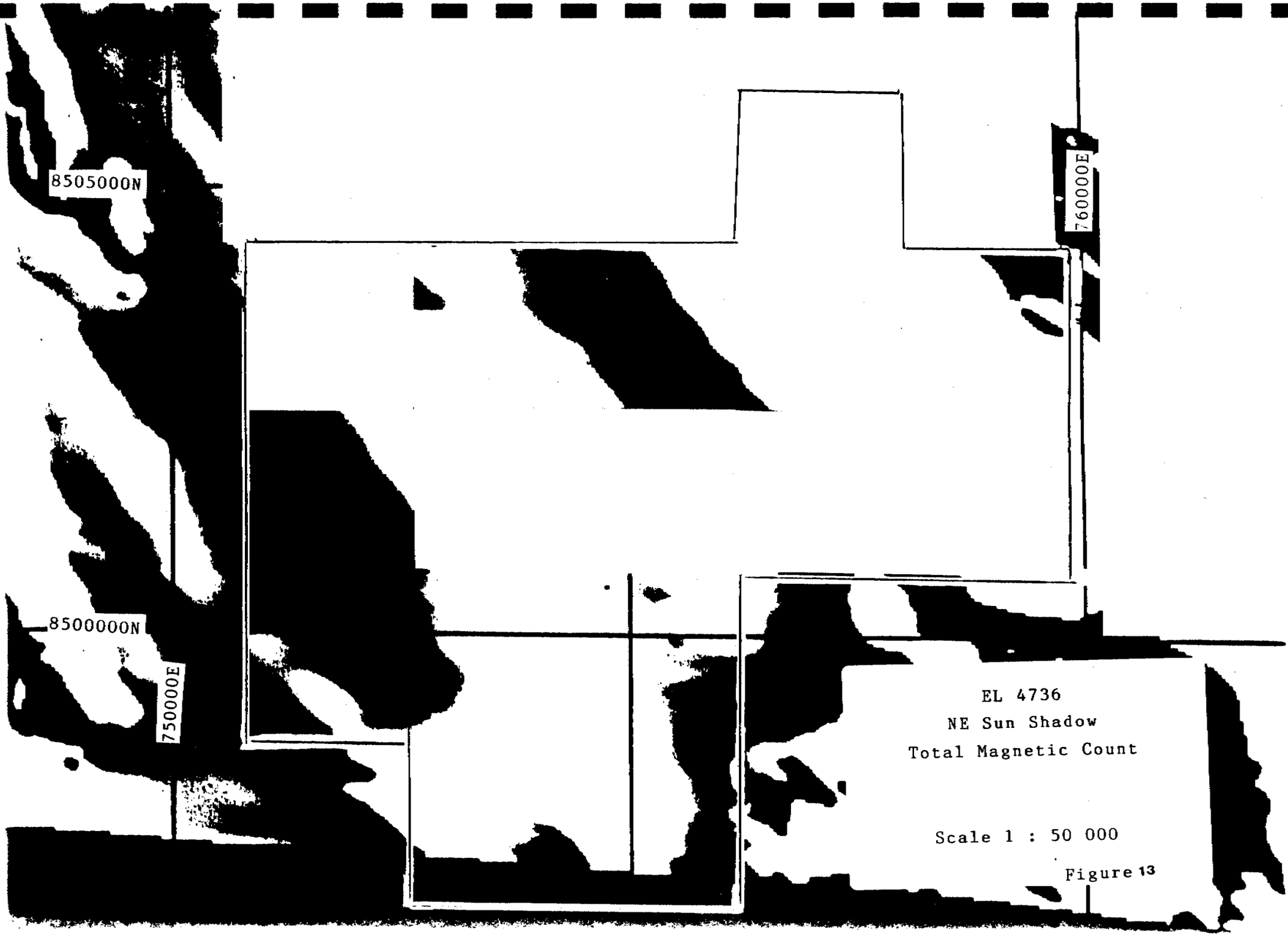

8505000N
8500000N
750000E
760000E
EL 4736
NE Sun Shadow
Total Magnetic Count
Scale 1 : 50 000

Figure 13

4.0 CONCLUSIONS

Two main phases of exploration were carried out on EL 4736. These were an initial phase of alluvial exploration by Metana Mineral NL in 1986 to 1989, and hardrock exploration by Northern Gold NL in 1988 and 1989.

As a result of the exploration approximately 6 graticule blocks were converted to other tenements prior to the expiry of EL 4736. The 8 blocks surrendered showed little indication of economic mineralization.

6.0 REFERENCES

Nicholson P. M. and Eupene G. S. 1984. Controls on Gold Mineralization in the Pine Creek Geosyncline. The Aus. I.M.M. Conference Darwin, N.T. August 1984.

Stokes M.A. 1989. EL 4736 Final Report to 30th June 1989 (Areas Converted to Other Tenements)

APPENDIX 1

MULTI ELEMENT RECONNAISSANCE SURVEY RESULTS

SAMPLE NO	Au	Cu	Pb	Zn	As
24	0.020	20	50	20	27
25	<0.008	10	20	30	14
26	<0.008	20	15	15	7
27	0.030	15	10	10	5
28	0.040	40	10	15	10
29	0.010	30	15	15	8
30	0.020	15	20	10	8
31	<0.008	10	10	20	4
32	<0.008	5	5	10	5
33	0.070	5	5	10	6
34	<0.008	10	10	20	8
35	<0.008	10	<5	20	14
36	<0.008	10	<5	25	7
37	<0.008	10	<5	15	12
38	<0.008	10	<5	10	11
39	<0.008	5	<5	10	14
40	<0.008	5	<5	10	12
41	<0.008	10	<5	15	11
42	0.020	15	<5	20	25
43	<0.008	15	<5	10	14
44	<0.008	15	5	20	16
45	<0.008	5	<5	10	9
46	<0.008	5	<5	10	17
47	<0.008	15	5	10	18
48	<0.008	20	<5	10	22
49	<0.008	15	<5	10	20
50	<0.008	5	<5	10	10
51	<0.008	5	<5	10	6
52	<0.008	5	5	10	18
53	<0.008	10	<5	10	11
54	<0.008	10	<5	15	22
55	0.010	10	<5	10	17
56	<0.008	10	<5	10	22
57	0.010	10	<5	10	6
58	0.010	5	<5	10	3
59	0.020	10	<5	15	12
123	<0.008	10	5	15	5
124	<0.008	15	5	10	6
125	<0.008	10	<5	10	12
126	<0.008	10	10	5	7

SAMPLE NO	Au	Cu	Pb	Zn	As
127	<0.008	15	10	25	21
128	<0.008	10	<5	<5	5
129	<0.008	10	<5	5	1
130	<0.008	10	5	10	7
131	<0.008	10	<5	10	3
132	<0.008	10	<5	5	6
133	0.010	10	<5	<5	2
134	<0.008	20	10	15	15
135	<0.008	10	5	5	8
136	0.010	10	<5	5	2
137	0.010	25	5	5	17
138	0.010	20	<5	5	10
139	<0.008	10	<5	5	4
140	<0.008	10	<5	5	2
141	<0.008	10	<5	<5	3
142	<0.008	20	<5	10	10

APPENDIX 2

STREAM SEDIMENT SURVEY

Sample Description and Assay Results

STREAM SEDIMENT SAMPLES EL 4736

Sample No	Results	AU (ppb)
4015	Creek, silt, soil and rock scree	0.6
4016	Creek, cobbles, gravel, sand, some silt	0.4
4017	Creek, cobble, gravel, sand wash	0.6
4018	Creek, cobble, sand silt wash	0.9
4019	Creek, cobble, gravel, sand silt steep silt/soil banks	2.9
4020	Creek, cobbles, gravel silt	4.4
4021	Broad drainage, silt/soil	3.3
4022	Broad drainage, silt/soil	2/4
4023	Grab sample, copper working Note ppm Au	,0.008ppm
4024	Grab sample, copper working ppm Au	<0.008ppm
4025	Creek, gravel silt wash	0.5
4026	Broad drainage, silt/soil	1.0
4027	Broad drainage, silt/soil	1.9
4028	Broad drainage, gravel/silt	10.0
4029	Broad drainage, gravel/silt	1.0
4030	Creek, gravel, sand wash	3.1
4031	Broad drainage, silt/soil	0.3
4032	Broad drainage, silt/soil	x
4033	Broad drainage, gutter, cobbles, gravel to silt	0.4
4034	Broad drainage, silt/red soil	0.7
4035	Broad drainage silt/soil, pisolitic laterite layer at depth	0.6
4036	Broad drainage, gravel, silt/soil	3.3
4037	Creek, cobbles to silt	0.6
4038	Broad drainage, silt/soil	0.6
4039	Creek, gravel, sand on bedrock	0.9
4040	Creek, cobbles to silt	0.4
4041	Creek, cobbles to silt	1.8
4042	Creek, cobbles, gravel	5.2
4043	Creek, cobbles to silt	13.1
4044	Creek, cobbles to silt	6.0
4045	Creek, cobbles to silt	1.8
4046	Creek, cobbles to silt	1.2
4047	Creek, cobbles to silt sand	2.1
4048	Creek, cobbles to silt sand	2.5
4049	Broad drainage, silt/soil	2.6
4050	Broad drainage, silt/soil	1.4
4051	Creek, gravel, sand	3.0
4052	Creek, gravel, sand	1.8

Sample No	Results	AU (ppb)
4141	Broad drainage, soil, sheetwash	1.1
4142	Broad drainage, soil, sheetwash	0.6
4196	Small broad drainage, soil/silt, some rock fragments	0.5
4197	Small broad drainage, soil/silt, some rock fragments	x
4198	Small broad drainage, some rock fragments	0.6
4199	Small broad drainage, soil/silt	0.9
4200	Small broad drainage, soil/silt	0.4
4201	Small broad drainage, soil/silt	2.2
4202	Creek, steep valley, soil/silt, trace of rock fragments	3.7
4203	Creek, steep valley, soil/silt rock fragments	0.5
4204	Creek steep valley, soil/silt rock fragments	0.5
4205	Creek, steep valley, soil/silt, rock fragments	x
4206	Creek, steep valley, soil/silt, rock fragments	0.8
4207	Broad drainage, silt/soil	0.8
4208	Broad drainage, silt/soil	1.0
4209	Broad drainage, silt/soil	2.8
4210	Broad drainage, small valley, silt/soil	4.2
4211	Broad drainage, small valley, silt/soil, minor rock fragments	4.4
4212	Creek/large erosion gully, rock to sand	0.7
4213	Narrow drainage, silt/soil, minor rock fragments	2.6
4214	Creek sand, silt, some rock fragments	0.6
4215	Creek, sand, gravel, cobbles	0.7
4216	Broad drainage, soil/silt	0.5
4217	Creek,sandy soil/silt	0.4
4218	Broad drainage,silt/soil, some rock fragments	0.7
4219	Narrow drainage, silt/soil, some rock fragments	x
4220	Narrow drainage, silt/soil, some rock fragments	x
4221	Narrow creek/gully, steep valley cobbles, silt on bedrock	7.7
4222	Narrow creek/gully, steep valley cobbles, silt on bedrock	1.8
4223	Creek, silt gravel, some rock fragments	0.4

Sample No	Results	AU (ppb)
4053	Creek, gravel, sand	1.4
4054	Broad drainage, silt/soil	1.2
4055	Creek, cobbles to sand	1.5
4056	Creek, sand, silt in gutter	1.5
4067	Broad drainage, sand, silt	1.0
4068	Creek sand	1.5
4073	Broad drainage, silt/soil, rock fragments	1.4
4085	Broad drainage, soil and rock scree	0.4
4086	Broad drainage, soil and rock scree	1.8
4087	Broad drainage, silt/soil	4.9
4088	Broad drainage, silt/soil, rock scree	0.1
4089	Broad drainage, silt/soil, rock scree	5.3
4090	Broad drainage, silt soil	8.1
4091	Creek cobbles and silt	7.1
4092	Broad drainage,silt/soil	2.2
4093	Creek, silt/soil	3.3
4094	Creek, cobbles to silt	11.4
4095	Broad drainage, silt/soil	2.0
4096	Broad drainage, silt/soil	0.7
4097	Broad drainage, silt/ soil some gravel	0.9
4098	Broad drainage, silt/soil	1.0
4099	Creek, cobbles, gravel	x
4100	Broad drainage, silt/soil	0.4
4101	Creek, silt	0.9
4102	Broad drainage, silt/soil	0.3
4103	Broad drainage, silt/soil	7.5
4104	Creek, silt/soil, some rock fragments	0.9
4109	Broad drainage, silt/soil	1.1
4110	Broad drainage, silt/soil	1.7
4111	broad drainage, silt/soil	0.8
4112	Broad drainage, silt/soil, minor gravel	0.9
4113	Broad drainage, silt/soil	0.8
4114	Broad drainage, silt/soil, slightly sandier	0.7
4115	Broad drainage, silt/soil	2.1
4116	Broad drainage, silt/soil	1.8
4117	Broad drainage, silt/soil	0.9
4118	Broad drainage, silt/soil	0.3
4119	Broad drainage, silt/soil	0.6
4133	Sheetwash, soils, some rock fragments	2.1
4134	Sheetwash, soils, some rock fragments	1.7
4135	Creek, silt/soil, minor gravel	1.1
4136	Creek, mud	5.6
4137	Broad drainage/sheetwash, soil	0.6
4138	Broad drainage soil	1.1

Sample No	Results	AU (ppb)
4224	creek, sandy silt/soil, rock fragments	1.6
4225	Broad drainage, silt/soil, minor rock fragments	2.4
4226	Broad drainage, silt/soil	1.6
4227	Broad drainage, silt/soil	3.2
4230	Broad drainage, soil/silt	0.2
4231	Broad drainage,soil,sandy, small rock fragments	0.4
4232	Broad drainage, colluvial/sheetwash, soil	x
4233	Broad drainage, soil/silt	x
4234	Broad drainage, soil/silt	0.6
4235	Creek, silt/clay	1.0
4236	Creek, gravel wash, silt, rock fragments	0.8
4237	Creek, soil, rock fragments, bedrock shallow	1.4
4238	Creek, soil, rock fragments, bedrock shallow	0.5
4239	Creek, soil, rock fragments, bedrock shallow	0.6
4240	Creek, soil, rock fragments, bedrock shallow	0.7
4241	Creek, gravel wash, rock fragments	0.2
4242	Broad drainage,, soil/silt	0.2

NB: x - below detection limit of 0.1 ppb

APPENDIX 3

TECHNICAL DETAILS OF GEOPHYSICAL SURVEY

AIRBORNE SURVEY SPECIFICATIONS

TRAVERSE LINE SEPARATION :	150 metres
TIE LINE SEPARATION :	4000 metres
TRAVERSE LINE DIRECTION :	090 - 270 degrees True
NOMINAL TERRAIN CLEARANCE :	80 metres
FLIGHT PATH RECOVERY :	Visual recovery on to controlled photography at 1:15,000

AIRBORNE SURVEY EQUIPMENT

AIRCRAFT :	Piper PA-31 Chieftain VH-WJK
MAGNETOMETER SENSOR :	Scintrex Cesium Vapour Sensor Model V-201 mounted in a tail stinger
MAGNETOMETER SENSITIVITY :	0.01 nT
RECORDING INTERVAL :	0.125 seconds
SAMPLE INTERVAL :	Approx 8.5 metres
COMPENSATION :	RMS Automatic Aeromagnetic Digital Compensator operating in real time
SPECTROMETER :	Geometrics GR-800 Differential Gamma Ray Spectrometer recording standard Total Count, Potassium, Uranium, Thorium and Cosmic channels
DETECTOR VOLUME :	33.6 litres
RECORDING INTERVAL :	0.5 seconds (approx 35 metres)
DATA ACQUISITION SYSTEM :	Geometrics G-714 recording on magnetic tape at 800 bpi
FLIGHT LINE RECORD :	VHS-PAL Colour Video System

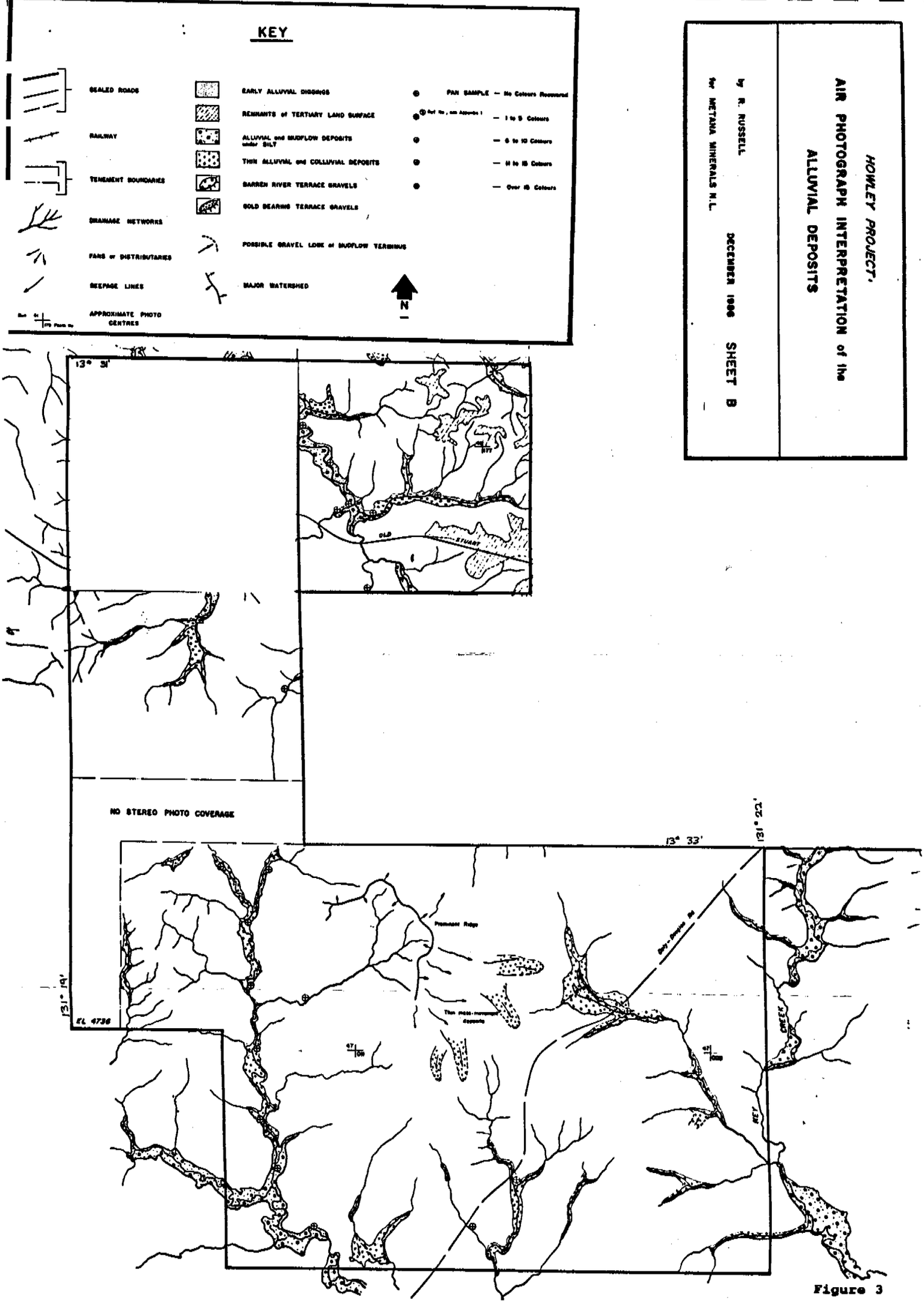

KEY
SEALED ROADS
RAILWAY
TENEMENT BOUNDARIES
DRAINAGE NETWORKS
FANS or DISTRIBUTARIES
SEEPAGE LINES
APPROXIMATE PHOTO CENTRES
EARLY ALLUVIAL DIGGINGS
REMNANTS of TERTIARY LAND SURFACE
ALLUVIAL and MUDFLOW DEPOSITS under SILT
THIN ALLUVIAL and COLLUVIAL DEPOSITS
BARREN RIVER TERRACE GRAVELS
GOLD BEARING TERRACE GRAVELS
POSSIBLE GRAVEL LOAM or MUDFLOW TERMINUS
MAJOR WATERSHED
N
PAN SAMPLE — No Colours Recovered
— 1 to 5 Colours
— 6 to 10 Colours
— 11 to 15 Colours
— Over 15 Colours
HOWLEY PROJECT.
AIR PHOTOGRAPH INTERPRETATION of the
ALLUVIAL DEPOSITS
by R. RUSSELL
for METANA MINERALS N.L.
DECEMBER 1986
SHEET B
13° 31'
131° 19'
131° 22'
13° 33'
NO STEREO PHOTO COVERAGE
EL 4736
Prominent Ridge
OLD ESTUARY
CREEK
REY

Figure 3