APPENDIX 1

A REVIEW OF EXPLORATION BY WILGA MINES NL

1993 - 1996

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WILGA MINES EXPLORATION 1993-1995

The exploration strategy adopted by Wilga Mines was initially directed toward a comprehensive regional geochemistry programme. Previous explorationists on the eastern Bonaparte largely neglected geochemistry and defined drill targets by geophysical techniques in conjunction with geological criteria.

Wilga Mines considered that a complete geochemical database might present opportunities to generate targets away from known and tested areas and completed soil sampling orientation studies in known mineralised areas, (Gellatly, 1993). The unproven gas vapour phase (GVP) and mobile metal ion (MMI) analytical techniques were trialled during the orientation phase. GVP and conventional geochemistry gave coherent anomalies and these methods were selected for the regional soil programme.

Semi-detailed gravity and IP surveys were implemented as follow-up in two areas on EL7832. Geophysical consultant, N Hungerford assessed the results of these surveys in addition to reviewing open file data, (Hungerford, 1995a & 1995b).

Open File reports (Appendix 1) were accessed and existing drill information was compiled to produce a drillhole database. Wilga Mines completed limited RC and diamond drilling at Sandy Creek, Winchrope, Ochre Mine and Wicklow.

In 1996 a more extensive gravity survey was carried out covering most of the prospective ground in ELs 8480, 8481, 6969 and 7832. This has produced a number of gravity anomalies interpreted as burried carbonate bodies favourable for Zn-Pb sulphide accumulation.

Review of the available data is continuing with a view to recommending a detailed programme for the 1997 field season.

REGIONAL GEOCHEMISTRY PROGRAMME

Introduction

Systematic soil sampling on 400 metre spaced lines was carried out in 1994 and was designed to cover a 40 kilometre zone of prospective, northeast trending Burt Range Formation dolomites located between Rocky Knob and Flapper Hill. The area to the south of Rocky Knob was excluded because the Cuesta Ridge EL (8352) had not been granted.

Soil samples were collected routinely at a depth of 12-15cm at intervals of 100m on east-west crosslines and were screened to -2mm in the field. Portions of the primary sample from each site were used to make two composite samples each containing five subsamples, each composite thus representing a 500 metre interval. Compositing of samples was used in the initial reconnaissance stage primarily to reduce the number of samples for GVP analysis.

One set of composite samples was despatched to Genalysis Laboratories, screened to -200 microns and assayed for Cu, Pb and Zn by Acid digest/AAS (conventional geochemistry). The second composite sample batch was submitted to Magellan Petroleum for GVP analysis. Primary samples were retained for follow-up of any anomalous composite results.

Conventional Geochemistry

The conventional base metal geochemical results located and defined all the previously known areas of mineralisation and also two previously unknown areas, (Figures 1 & 2):

a) Turkeys Nest, 516500E/8290500N
BHP diamond hole, BGD-8: 75-76m, 1m @ 4.11% Pb; 80-81m, 1m @ 8.15% Pb.

b) Sandy Creek 521000E/8297000N
Geological Resource: 3.2Mt @ 4.38% Pb, 2.45% Zn and 15 g/t Ag.
Mineralisation at Sandy Creek is indicated by a small high order geochemical response specific to the area of outcropping Burt Range Formation. Extensive areas and depths (25-30 metres) of recent transported material largely mask the ore system from detection by conventional geochemical techniques.

c) Winchrope Hill 526000E/8304000N
Aquitaine record various weakly anomalous drilling intercepts. Surface rock-chip samplees collected by Wilga assayed up to 0.95% Pb + Zn (Winchrope Hill) and 1.75% Pb+Zn (Brown Hill 2km south-south west of Winchrope Hill)

d) Ochre Mine Hills 530500E/8307000N
Various prospects identified by Aquitaine with best drill intercept, NBC-4022: 54-60m, 6m @ 8.45% Zn.

e) West Ochre Mine 529000E/8308000N
Previously unrecorded, highly anomalous soil geochemistry and limonitic and bituminous breccias.

f) Wicklow 535000E/8313500N. Previously unreported ferruginous breccias. The broad mid-order geochemical anomalies located east of 534000E correlate with highly oxidised Devonian sediments. Drilling indicates oxidation prevails to depths in excess of 210 metres, downgrading this area.

Structure: A sharply defined N-S structure on 534000E coincides with the eastern (sinistral) margin of a possible interpreted transfer zone, referred to here as The Bunibunil Transfer, (Figure 2). The western (dextral) shear associated with the Bunibunil Transfer transects the Ochre Mine Hills on 530500E. The very low geochemical response north of 8311000N and west of 534000E correlates with a southerly orientated indentation of the Shelf Tract margin (as defined by seismic) and thus with Milligans Formation cover. The irregularity of the Shelf Tract marginal structure which is mirrored by the conventional geochemistry plot is viewed as supporting evidence for the postulated Bunibunil Transfer. The alternative interpretation is that this is a graben structure bounded by normal faults.

In either case the net structural effect is similar in that the base of the Milligans Formation is relatively downthrown against older formations providing possible trap structures favourable to the accumulation of base-metal sulphides.

Oxidation: Strong weathering and oxidation of all Burt Range Formation outcrops has been recorded. In addition, deep oxidation has been noted in the Burt Range Formation in some drillholes, although the overlying Milligans Formation is generally unoxidised and sulphide-bearing. The Wicklow area and to a lesser extent the Ochre Mine areas are those most affected by oxidation.. In other areas eg BZ-5 and BZ-10 the Burt Range Formation is fresh and sulphide-bearing. The oxidisation noted in some areas is probably the result of pre Border Creek Formation uplift and localised weathering.

515000 520000 525000 530000 535000 540000 545000

325000
320000
315000
310000
305000
300000
295000
290000

FLAPPER HILL

BUNDABURG BORE

OCHRE MINE

WINCHROPE HILL

SANDY CREEK

ALPHA HILL

TURKEYS NEST

ROCKY KNOB

1.25%

0 ppm

0 4000 8000

Scale 1:200000

VISIDATA
INTERDEX

Bonaparte Gulf Basin

Soil Geochemistry

Log(Zn)

Fig.

524000 526000 528000 530000 532000 534000

314000

312000

310000

308000

306000

304000

302000

NORTH OCHRE MINE

BUNTBUNTLL TRANSFER ZONE

OCHRE MINE

WINCHROPE HILL

BUNIBUNIL

4400 ppm

0 ppm

524000 526000 528000 530000 532000 534000

VISIDATA

INTERDEX

0 1500 3000

Scale 1:75000

DJIBITGUN

Soil Geochemistry

Log(Zn)

Fig.

Gas Vapour Phase Geochemistry

Gas Vapour Phase geochemistry is a newly-developed technique which may be able to detect concealed metalliferous mineralisation. It involves separation of the clay fraction of soils, degassing of the clays, and analysis of the desorbed gasses in a mass spectrometer.

The method produces relative results, and to establish the signature of carbonate-hosted zinc-lead mineralisation, test traverses were carried out over Sorby Hills and Cadjebut deposits as well as a selected target area near the Ochre Mine. Further details of the process are discussed in Gellatly (1993).

Follow-up primary analyses (Figures 3 & 4) confirmed the geochemical anomalism of these areas but there was no detailed correlation between composite and primary results. It was noted that some low order composite anomalies gave rise to high order primary anomalies and conversely, primary analyses pertaining to high order composites may not necessarily be anomalous.

Magellan Petroleum's Technical Manager, D S Thiede suggested that direct comparison of composite and primary data sets is hazardous given the variable clay content of a composite samples and the possibility of chemical reactivity between the mixed soils. Where both composite and primary results were available, the primary data set was given precedence.

Two standards were regularly submitted and duplicates were also analysed during the programme to promote confidence in data reliability. A comparison of results for the standards show a reasonable consistency (Table 1), especially for samples submitted during the early stages of the programme. The variation in results for Standard 1 submitted over the latter stages of the programme may indicate sample degassing with time.

TABLE 1 GVP Results of programme standards

BATCH No	STD No	SAMPLE No	GVP SUM	GVP COUNT
1	1	54956/60	829	266
1	1	55336/40	498	233
2	1	55726/30	325	205
2	1	55836/40	397	240
1	1	55931/35	263	193
3	1	56516/20	90	98
4	1	56851/55	42	55
4	1	57146/50	194	147
5	3	57054	415	276
10	3	58039	465	164

LEGEND

Primary Sample Location & Results — e.g. 2 0 7 46 / 9

Escarpment

Drill hole

Cup	Point Spring Sandstone
Clm	Milligans Formation
Clbg, Clbk, Clbs	Burt Range Formation

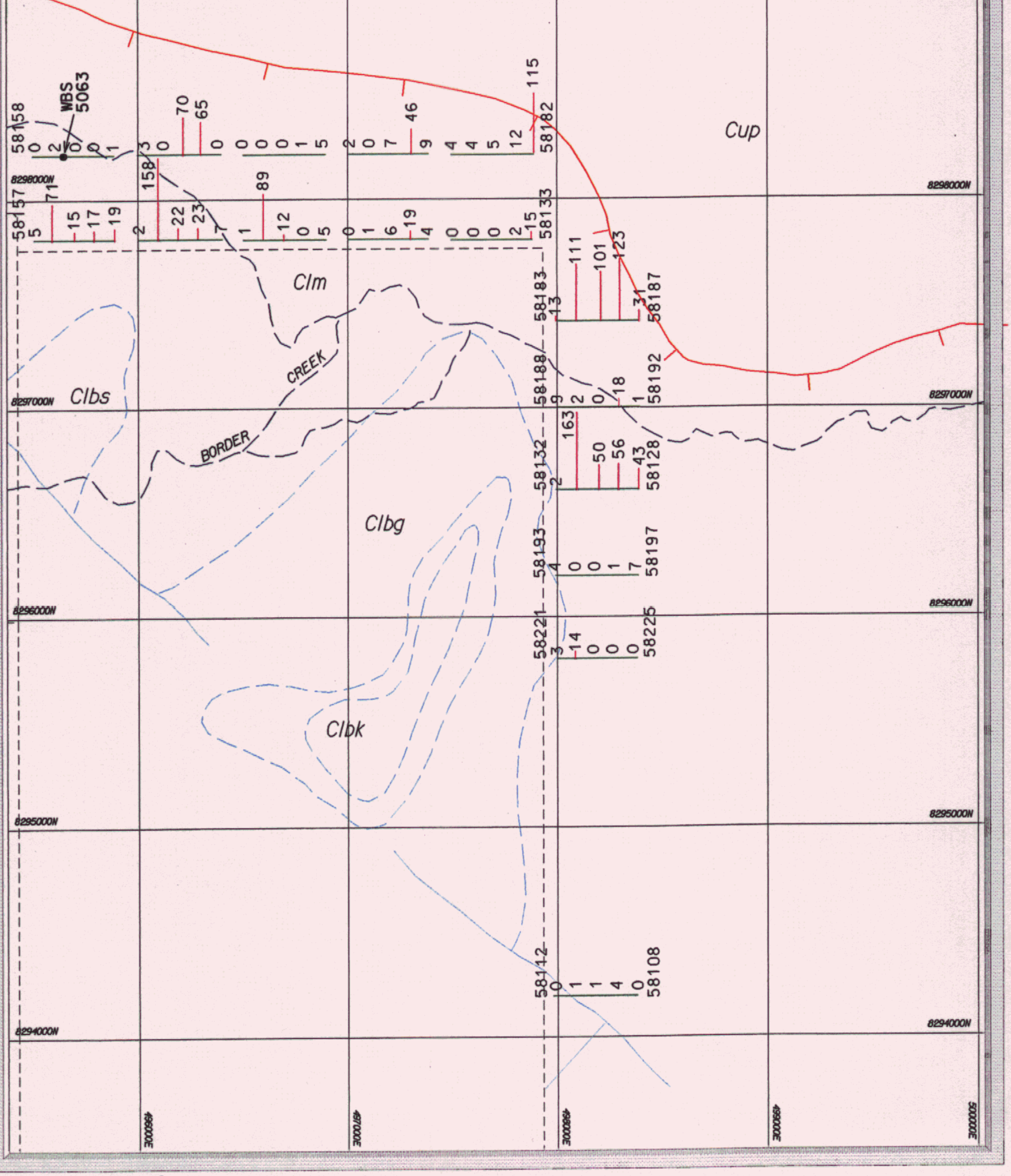
LOCALITY DIAGRAM

N

WILGA MINES N.L.

EL80/1686
BORDER CREEK
RELATIVE GVP
SUM ANOMALISM
PRIMARY DATA

PLAN NO:	4	
COMPILED:	STEVE VINCENT	18/2/98
DRAWN:	DOMINIC BANKS	18/2/98
CHECKED:	DOMINIC BANKS	18/2/98
APPROVED:	STEVE VINCENT	18/2/98
SCALE:	1:25,000	AMG



Four GVP targets were drilled during 1995. Results were inconclusive and a reevaluation of the raw mass spectrometer data in conjunction with soil type, oxidation and lithological criteria is in progress. Soils collected from and adjacent to the mineralised BZ-10 drillhole are being used to develop an alternative GVP template that may improve specificity for eastern Bonaparte type mineralisation.

Numerous GVP anomalies coincide with the prospective Burt Range Formation and have yet to be adequately explained or evaluated.

GEOPHYSICS

Drill target generation by explorationists prior to 1993 was largely achieved with geophysical methods and primarily by IP surveying. The most intensive activity was confined to the Sorby Hills and Sandy Creek mineralised systems with reconnaissance surveying in regional areas. Previous workers considered IP to be of limited use because drilling confirmed that most anomalies could be attributed to minor pyrite occurrences. In particular the response from the pyrite-bearing Milligans Formation may reduce the response from possible sulphide accumulations lower in the sequence.

Wilga Mines collated eastern Bonaparte geophysical data contained in 24 NTDME annual reports and engaged Hungerford Geophysical Consultants to review the data. The aim of the exercise was to define drill targets from existing data and to identify useful methods for possible inclusion into future programmes. Semi-detailed gravity and IP surveying was carried out on the Winchrope Hill, North Ochre Mine and North Wicklow areas in 1995 and further, more extensive gravity, work was carried out in August - September 1996 on all of the then current ELs (8480, 8481, 6969 and 7832).

1995 Ochre Mine Geophysical Surveys

Distinct northeast and east-northeast trending IP (phase) anomalies were defined by Hungerford, (Figure 5). The northeast trending set located north of 8308400N are offset relative to the southern, east-northeast trending set by an east-west fault. These structures, in addition to east-southeast normal faulting confirmed by Aquitaine drilling in The Gap, are consistent with inferred north-south dextral shearing and consequently add weight to the postulated Bunibunil Transfer zone.

Anomalous IP (phase) trends are therefore considered in terms of Riedel (R') dilational structures that have acted to focus and/or trap mineralising fluids in the Ochre Mine area. Further definition and drilling of the Riedel dilations immediate to the Burt Range Formation/Milligans Formation contact is highly recommended for future programmes. The combination of known feeder structures coincident with a shale cap-rock present prime exploration targets.

1996 Gravity Surveys

As a result of positive indications form the localised 1995 gravity survey, a much more extensive gravity survey was carried out in 1996, covering a strike of about 40km from near Bundaburg Bore in the north to near Rocky Knob in the South, as well as selected areas within the Border Creek EL.

This survey successfully delineated a significant number of discrete positive gravity anomalies which are interpreted as zones of subsurface carbonates, probably dolomites. Interpretation of the structure of these gravity highs leads to numerous possible drill target areas for future, more focussed drilling programmes.

The result of this gravity survey, combined with those of the smaller 1995 survery are given in Plan A1.

DRILL TARGET SELECTION

Both geophysical and geochemical target types were tested. Drill sites selected on geophysical criteria proved to be the most rewarding with mineralised intercepts generally coincident with marcasitic/pyritic hydraulic breccia zones. While targets can be defined by IP, additional but barren targets may be idicated by the IP response of the pyritic black shales of the Milligans Formation.

Drillholes BZ1 to 4 at Sandy Creek were based on the results of previous drilling and were sited to test for northerly extensions to the known mineralisation but were largely unsuccessful because of drilling difficulties which resulted from an inexperienced driller and inappropriate drilling techniques, although BZ1 was probably a successful test of the intended target.

Drillhole BZ5 was drilled to test an IP anomaly due north of Winchrope Hill and encountered disseminated sulphide mineralisation in carbonate fault breccia - probably Clb_2 in contact with Devonian or Precambrian rocks to the east.

Drillhole BZ6 was recommended on the basis of the existing data. An IP anomaly situated east of the Sandy Creek deposit (521250E/8297800N) was drilled during the 1995 programme. Due to access difficulties the site had to be relocated to the southern extremity of the IP anomaly, some 500 metres south of the preferred position, (BZ-6).

BZ7 and 8 are referred to in the following section.

IP and gravity surveying was completed during the 1995 programme at North Ochre Mine and North Wicklow. The North Ochre Mine area (BZ-10) was prioritised because previous exploration had indicated potential and the North Wicklow site (BZ-9) was selected on the basis of the areas GVP anomalism and lack of geophysical information.

Hungerford assessed the IP and gravity data and made several suggestions regarding potential drill sites at North Ochre Mine. A combined Gravity/IP target (529300E/8310000N) was drilled (BZ-10) because it presented a clear opportunity to avoid the Ochre Mine's prevailing oxidised conditions.

DRILLING

During the 1994 and 1995 field seasons, Wilga Mines completed limited RC and diamond drilling totalling 1614 metres over 11 holes, (Table 2, 2a).

Table 2
Summary of Wilga Mines Drilling

Hole No	EL	Coordinate		RC/blade	NQZ	Total	Comment
(prefix BZ-)		East	North	(m)	(m)	Depth (m)	
01	6969	521250	8298150	92.7	27.7	120.4	
02	6969	521075	8297700	84.0		84.0	
03	6969	520940	8297600	68.5		68.5	Abandoned
04	6969	520990	8297895	48.0		48.0	Abandoned
04a	6969	520975	8297910	48.0	69.5	117.5	
05	8480	526450	8305600	27.0	66.0	93.0	
06	6969	521200	8297300		87.5	87.5	Partly oxidised
07	6969	525100	8304000	13.5	211.0	224.5	
08	8480	526400	8306800	16.2	212.1	228.3	
09	7832	535280	8315280	27.1	179.9	207.0	Completely oxidised
10	7832	529300	8310000	15.9	232.4	248.3	
11	7832	529600	8308800	31.0	56.2	87.2	Completely oxidised
TOTALS				471.9	1142.3	1614.2	

Table 2a Drill intercepts >0.5%Zn or >0.5%Pb

Hole No (Prefix BZ-)	Interval (m)	Zn (ppm)	Pb (ppm)	Zn + Pb (ppm)	m%Zn	m%Zn+Pb
01						
02	50-52	0.50%		0.50%	Tr	Tr
03						
04						
04a						
05	26-27 27-28 32-34 34-36 62-64	1200 2050 2050 3100 1.70%	1.5% 1.08% 1.95% 8200 5000	16200 12850 21550 11300 22000	4.76	13.88
06	24-26 26-28 28-30 50-52 52-54 56-58 64-66	5000 1.25% 5800 6000 9000 1.20% 1.65%	195 470 270 3200 680 480 1600	5195 1.30% 6070 9200 9680 1.25% 1.81%	13.36	14.75
07	144-146 154-156 172-174	7400 7800 1.8%	540 1300 205	7940 9200 18205	6.64	7.07
08						
09						
10	54-56 60-62 66-68 76-78 78-80 82-84 86-88 88-90 90-92 94-96 98-100 100-102 102-104 104-106 106-108 108-110 112-114 130-132 132-134 172-174 174-176	1.25% 6800 5800 7800 7400 5800 6200 1.35% 8000 1.60% 6800 1.20% 6800 7200 6600 9200 6000 5600 5200 6000 4500	270 330 165 780 2400 175 100 225 265 680 820 2250 860 4300 6200 1700 230 300 320 410 5800	1.277% 7130 5970 8580 9800 5980 6300 1.373% 8270 1.668% 7620 1.425% 7660 1.150% 1.280% 1.090% 6230 5900 5520 6410 1.030%	32.24	38.86
11	10-12 32-34 34-36 38-40 40-42 42-44	5620 7400 1.2% 6400 5600 9600	800 520 900 290 740 390	6420 7920 1.29% 6690 6340 9990	9.32	10.05

Sandy Creek: No additional contribution to resources (as at August, 1990) was made by limited Wilga's drilling at Sandy Creek. Variably oxidised hydraulic breccias were intersected in BZ-06 situated east of the Sandy Creek deposit and coincident with the southern end of a north-south tending IP anomaly. Both the main zone (520750E) and the eastern trend (521250E) are clearly apparent on a log(m%Zn) image of drill data (Figure 6).

A recent review of drill data for the Sandy Creek area has indicated that the high grade section of the main zone has been inadequately tested to the north, south and southwest. Significant increases in resource tonnage and grade are possible with further drilling on the main zone. In addition future drilling along 521520E (to the north east of the main zone) may possibly add to the Sandy Creek resources

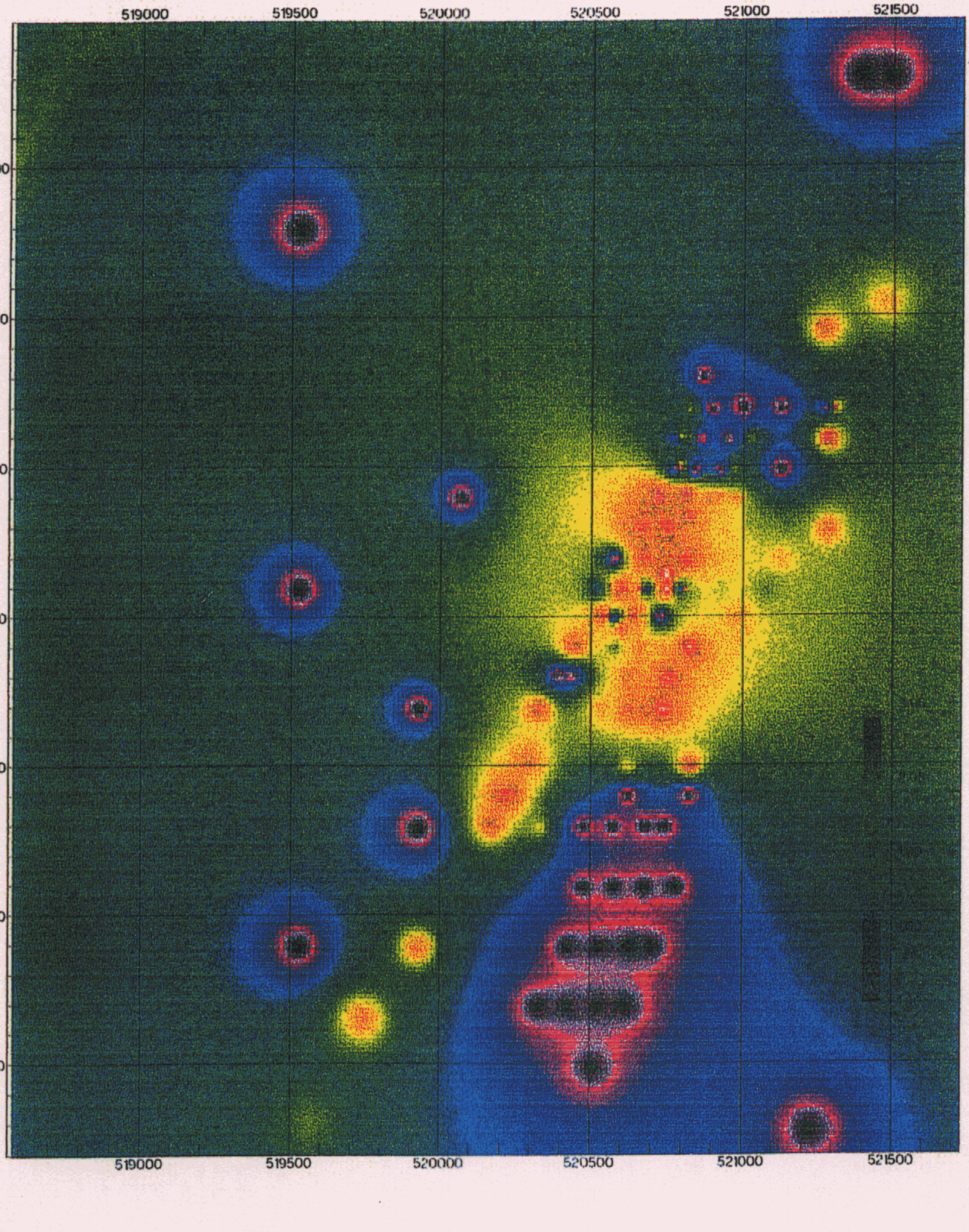
Winchrope Hill: Three drillholes (BZ-05, 07 & 08) were completed in the Winchrope Hill and North Winchrope areas by Wilga Mines. Minor sphalerite and galena intercepts were encountered in each. Significant potential remains owing to the presence of numerous untested or inadequately tested IP anomalies located between Sandy Creek and Winchrope Hill. For example, an IP anomaly situated west of Winchrope Hill was tested by inclined drillholes NBK-1034 & 1035 that were set at an azimuth of 090^0. The IP anomaly is coincident with the confluence of what appear to be R and T dilation structures associated with a second order north-northeast trending sinistral shear. (Refer to photointerpretation of Gellatly (1993)). If this is the case then a preferred drill azimuth of 45^0 would be required to adequately test for any fault controlled mineralisation indicated by the IP anomaly. The main target however, remains as major Irish style stratiform ore bodies.

North Ochre Mine: The vertical diamond hole, BZ-10 (529300E/ 8310000N) constitutes the most successful hole drilled by Wilga Mines to date, both in terms of establishing mineralisation well clear of the Ochre Mine's prevailing oxidation and overall content (32.24m%Zn using a 0.5% cut-off grade). Numerous other IP anomalies defined by the 1995 geophysical programme require follow-up drill testing. Further semi-detailed gravity surveying in this area in 1996 has outlined a significant carbonate zone area which presents further possible drill targets.

North Wicklow: Drilling of BZ-09 gave similar results to those in neaby NBF1001 and confirms that this part of the "Wicklow block" is relatively unprospective. Considerable sinistral movement is apparent on the block's western margin (ie the eastern margin of the Bunibunil Transfer) and associated dilational structuring is expected here (eg The Alligator prospect). The area to the west of the fault here is considered to be more prospective.

519000 519500 520000 520500 521000 521500

8298500
8298000
8297500
8297000
8296500
8296000
8295500



519000 519500 520000 520500 521000 521500

N

INTERDEX

0 400 800

Scale 1:20000

WILGA MINES N.L.

SANDY CREEK

Drill Data

Log metre % Zn

GEO: S. VINCENT	SCALE 1:20000	REPORT:
DRAWN:	DATE: 28-04-1995	PLAN: 14

REFERENCES

GELLATLY, D.C., 1993: EL7832, Annual report for the year to October 1993. NTDME, C.R. WA93.077. Unpub..

HUNGERFORD, N., 1995a: Review of eastern Bonaparte Gulf geophysical data for Wilga Mines NL. Unpub..

HUNGERFORD, N., 1995b: East Bonaparte Basin report on geophysical surveys July/August 1995 for Wilga Mines NL.. Unpub..

HUNGERFORD, N., 1996: Legune Area, East Bonaparte Basin Gravity Interpretation for Wilga Mines NL. Unpub..

526,000E
530,000E
534,000E
538,000E

8,318,000N
8,314,000N
8,310,000N
8,306,000N

UPPER CARBONIFEROUS
Border Creek Formation
LOWER CARBONIFEROUS
Milligans Formation
Burt Range Formation
DEVONIAN
Ninbing Group (Undifferentiated)
Cockatoo Group

R IP phase anomaly with coincident resistivity high
RO-1 Prospect
BZ-9 Drillhole
Trig-station
Shear
Outcrop

0 .5
KILOMETRES

E.L. 7832

MARGIN
TRACT
Ridge
Gravity
SHELF

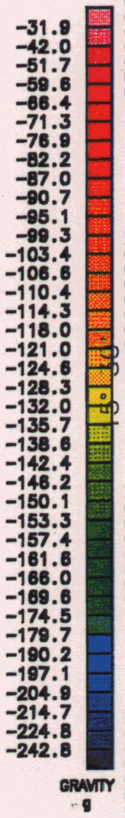
BZ-9
BZ-10
4022
RO-1
WICKLOW
NORTH OCHRE MINE
OCHRE MINE
THE GAP
β-PROSPECT
transfer zone
ALLIGATOR
BUNIBUNIL

WILGA MINES N.L.

LEGUNE E.L.7832
IP (Phase) Anomalies

rep1963

128° 45'
129°
129° 15'
470000E
480000E
490000E
500000E
510000E
520000E
530000E
540000E
550000E
8320000N
8310000N
8300000N
8290000N
8280000N
8270000N
15° 15'
15° 30'



Scale 1:250000

2500 0 2500 5000 7500 10000 12500 15000

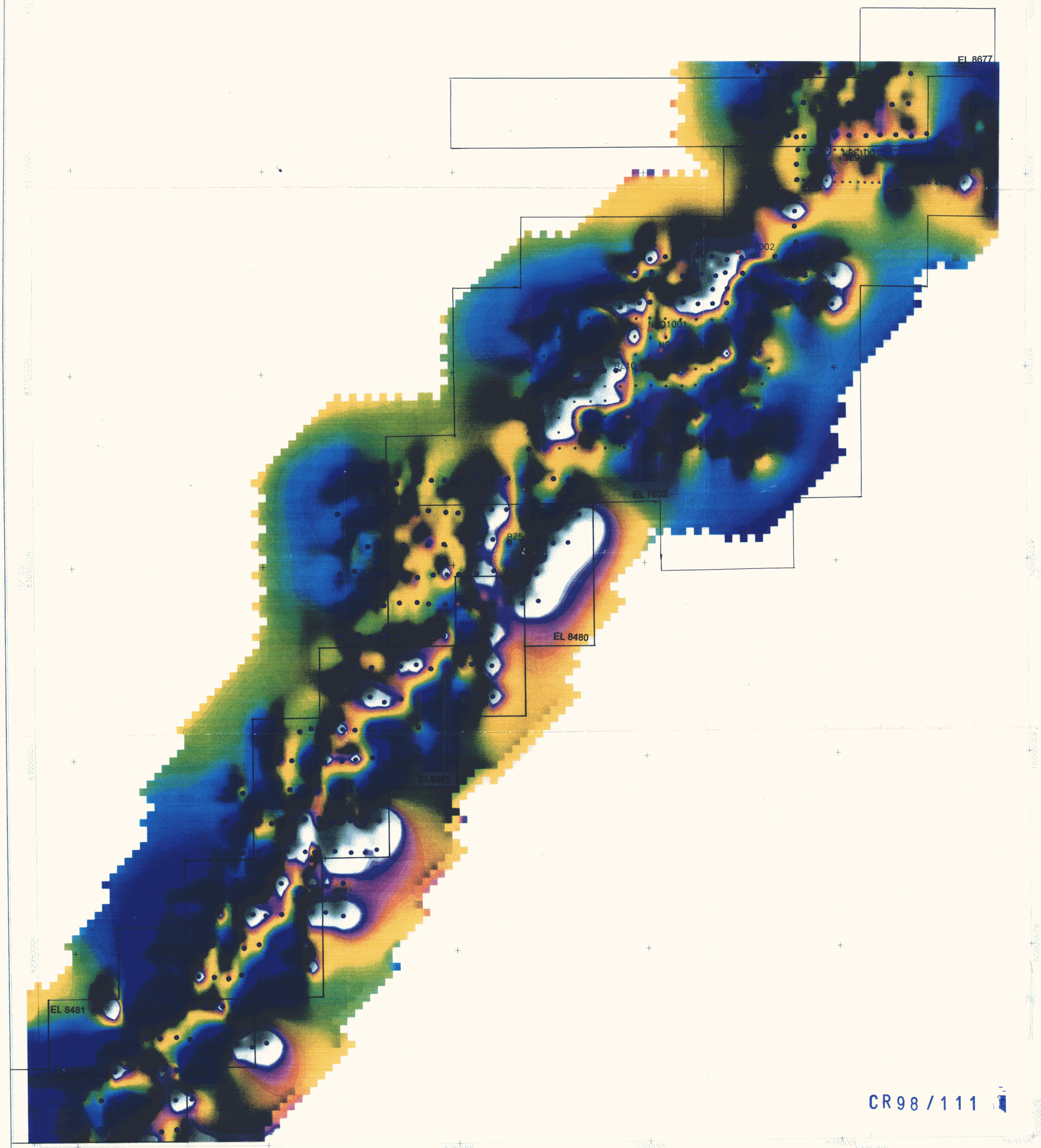
(meters)

WILGA MINES NL

BONAPARTE BASIN, WA
BOUGUER GRAVITY

CI=10gu
AGSO DATA

HUNGERFORD GEOPHYSICS



CR98/111

WILGA MINES

EAST BONAPARTE BASIN, NT
GRAVITY SURVEYS, excl AGSO
BOUGUER GRAVITY, 2.67gm/cc

1st VERTICAL DERIVATIVE
shaded from south-east
mesh=200m, random gridding
GEOTEX(blue), WGC(red

HUNTFORD GEOPHYSICS P/L

Scale 1:50000

1000 0 1000 2000 3000
(metres)

8a