15. EAST PTILOTUS (EL 2369)

15.1 Introduction

The East Ptilotus prospect lies 28km north-west of The Granites and is presently the most advanced regional prospect within the NFM exploration tenements of the Tanami region, excluding the Granites and Dead Bullock Soak environs.

During 1989 rock chip sampling at East Ptilotus located a zone of strongly gold and arsenic anomalous ferruginous and cherty rocks, with a strike extent in excess of 2.5km, and markedly similar to the gold and arsenic anomalous lithologies at Mt. Ptilotus.

Further exploration during 1990 and 1991 delineated four main strongly gold anomalous zones. The two western zones were tested by costeaning, RC and diamond drilling. The anomalous zones to the east were subsequently tested by costeaning together with geophysical surveys (EM and magnetics), RAB and follow-up RC drilling. Results from this work clearly indicated potentially economic mineralisation is present at East Ptilotus.

Gold mineralisation delineated to date is associated with pyritic alteration zones (15% pyrite) within a predominantly massive coarse grained dolerite. These mineralised alteration zones are interpreted to be shear splays within a larger bounding regional fault/shear system.

The mineralised shears, defined by shallow surface drilling, are typically elongate (300 to 500m), subvertical tabular bodies, 10 to 20m wide with an overall grade in the 0.5 - 1.5 g/t range. Intersections, within these sub-economic low grade ore bodies, indicate zones of higher grade mineralisation (2-6g/t) are present within the plane of mineralisation.

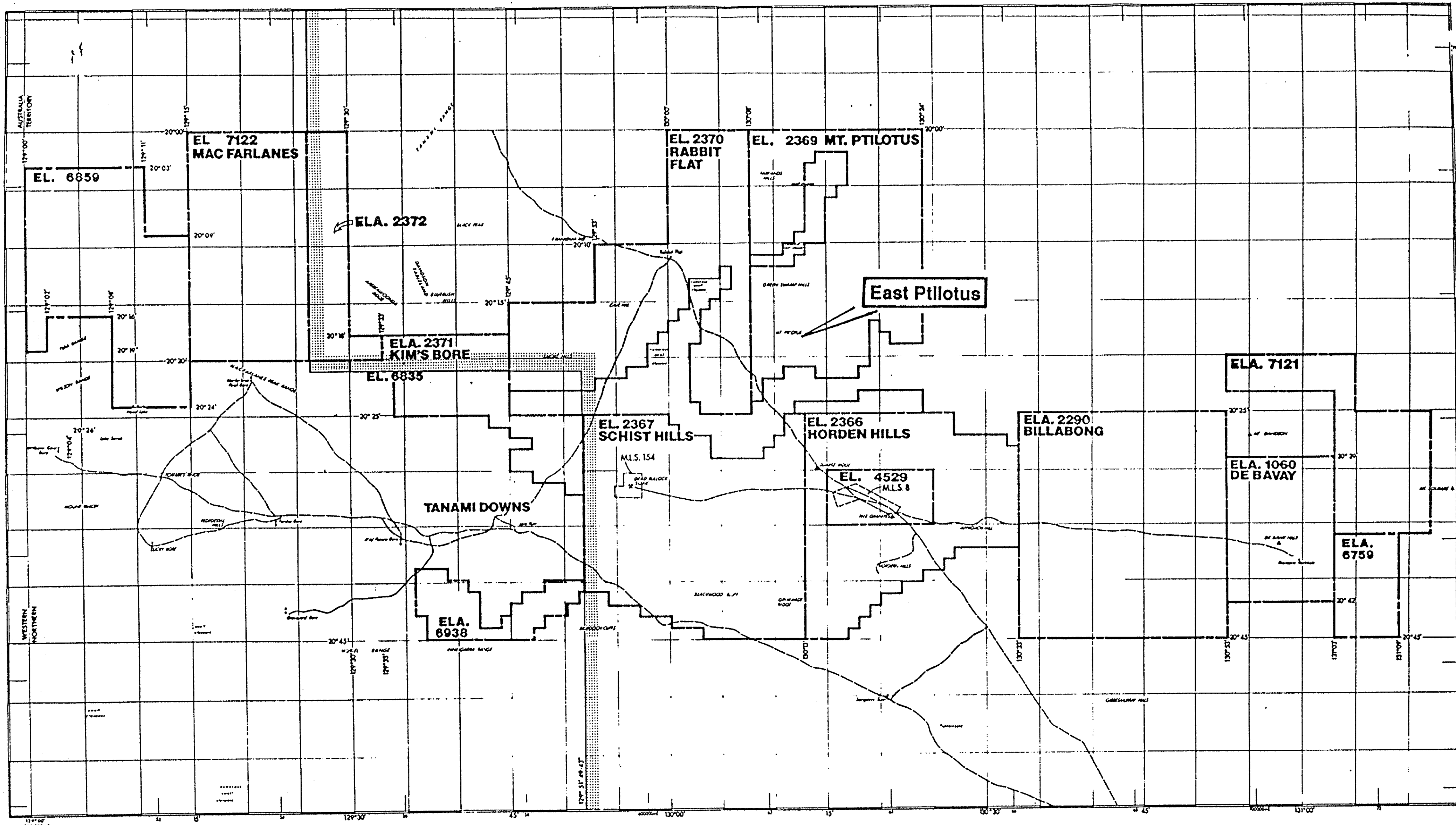
15.2 Work Undertaken

Work completedin the year to December 1991 includes:

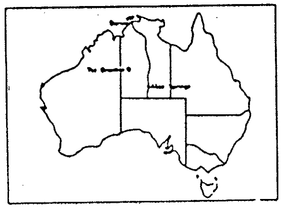
- 10 lines of Max-Min EM for a total of 9.05 line kilometres.
- 35 lines of close spaced(5m) ground magnetics for a total of 35.9 line kilometres.
- 10 lines of induced polarisation survey for a total of 10 lines kilometres.
- Grid based,bedrock/geochemical RAB drilling for a total of 219 holes,3267 metres and 1024 samples.
- RC drilling of "potentially economic" mineralised zones,east of 22000E ,for a total of 22 holes,1392 metres and 1419 samples.
- Remapping of costeans for structural details of quartz vein directions.
- Structural interpretation,of the prospect area,using existing field data with the aim of targeting high grade "lenses" within the outlined low grade zones.

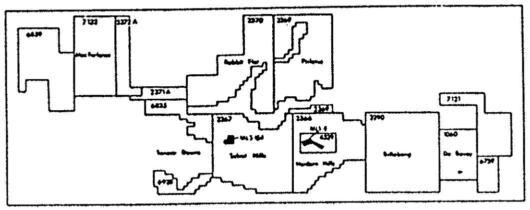
15.3 Results

Results for 1991 have been encouraging with location of further mineralisation open to the south and higher grade intersections in RC drilling suggesting the possibility of higher grade (> 3-3.5 g/t Au) lenses with probable structural plunges.



LOCATION MAP





LEGEND

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

NORTH FLINDERS MINES LIMITED

Tanami Reconnaissance : Northern Territory

EL LAYOUT

1:250000

KILOMETRES

DATA BY		AMENDED		
DRAWN	MARCH '89			Drg. No. 20-1

Em Max-Min Survey

Interpretation of EM data, clearly shows the presence of numerous conductive zones of varying intensity. However these conductive zones do not directly correlate to known mineralisation, but may represent shear splays off the major regional shear(s),which are bounding and/or coincident with mineralisation, as can be seen on sections 22200E,22300E,22450E,22550E and 22600E.

Ground Magnetic Survey

Contouring of the close spaced (5m) magnetic data shows that the initial aim of delineating possible magnetite depleted zones associated with the intensely altered and mineralised zones was unsuccessful. However it does highlight two regions of highly elevated and spiky magnetics.The first region appears to be a wedge between the two major regional north west trending shears and the second region east of line 23000E.These two regions are interpreted to represent the upper portions of the stratigraphically older Blake Beds, seen elsewhere as having a strong magnetic signature.

The IP survey was initially programmed for 3 test lines to be completed along lines 22600E, 22700E and 22800E with the aim of delineating the pyritic alteration zones at depth and therefore targets for deeper drilling. Results of the initial three test lines highlighted two highly anomalous zones, one to the north and the second to the south, together with smaller or at least less distinct anomalies generally adjacent and overshadowed by the major anomalies. The two major anomalous zones are interpreted to represent bounding major regional faults/shears containing saline waters and/or graphite. The less distinct anomalies are interpreted to represent the pyritic zones associated with the smaller shear splays which are known to host gold mineralisation.

Although the two major anomalies, regional shears, are not directly associated with presently known mineralisation, there appeared to be a distinct trend evident. This trend when coupled with ground magnetic interpretation indicated a possible structural intersection point to the east beyond the gridded prospect area. Therefore a further 6 lines were conducted to the east aimed at this new intersection target and one further line to the west for increased coverage.

An initial interpretation suggests that the northern IP anomaly fades out or becomes deeper to the east and the southern anomaly persists beyond the lines completed but at greater depths, with possible sulphides.

The simplified geology plan shows an interpretation based on IP results and known geology from previous drilling and costeaning. The major features clearly evident in the interpretation are:

1. Two major regional and bounding shears
2. One sulphide zone being subparallel to regional shears the other apparently cross cutting the dolerite body
3. Major intersection of the sulphide zones near a lithological contact.
4. Possible sulphides within the regional shear zones to the east within pelitic sediments
5. Large proportion of sulphide zones untested by RC drilling.

Altogether the test IP survey conducted at East Ptilotus appears to have been sucessful in delineating the broad location of the major regional shear zones and pyritic alteration zones associated with gold mineralisation. SIROTEM, in the future, may provide for a more precise method of locating the desired pyritic features.

RAB Drilling

Extensional bedrock/geochem RAB drilling,lines 100m apart with holes every 25m, to the south was successful in closing off the anomalous area of zone 3 and delineating further zones 5 and 6. Peak values of 120ppb Au/320ppm As in zone 5 and 72ppb Au/110ppm As in zone 6 were encountered.

RC Drilling

A total of 22 holes on 8 lines were drilled east of 22100E with only one hole (PRC062) not reaching the proposed depth.

The geology of each section clearly shows zones of intense alteration correlating very well with varying degrees of mineralisation. Results were generally very encouraging with the best intersections highlighted in the following table.

1991 RC DRILLING HIGHLIGHTS (>1.0 g/t)

Drill Hole	From(m)	Interval(m)/Grade(g/t)	Comments
PRC048	29	2/1.11	
PRC049	31	8/2.15	
PRC050	44	5/1.01	
	51	1/1.04	
	63	2/1.32	
PRC052	12	14/2.91	
	27	4/1.30	
	32	2/6.44	
PRC053	38	19/2.14	
	58	7/1.15	
	67	1/1.05	
PRC054	25	2/1.08	
	34	1/1.05	
	39	3/1.75	
PRC057	5	4/1.77	
	13	8/1.11	
	22	4/1.10	
	27	3/1.10	
	37	1/1.19	
	45	3/1.0	OPEN TO DEPTH
PRC058	0	6/3.86	
	10	1/1.59	
	27	10/1.27	
	41	7/2.44	OPEN TO DEPTH
PRC062	26	2/1.16	
	42	1/1.53	

Drill Hole	From(m)	Interval(m)/Grade(g/t)	Comments
PRC064	10	1/2.19	
	16	3/1.47	
PRC065	7	5/1.22	
	13	6/1.95	
	25	4/1.09	
	37	3/1.73	
PRC066	36	8/1.33	
	51	7/1.16	
	108	2/1.14	
PRC068	51	3/1.53	
PRC069	5	3/1.28	
	14	2/1.03	

Costean Mapping

Presently gold mineralisation is known to be associated with pyritic alteration zones where an increase in quartz vein content is evident from deeper drilling. Costeans excavated during early 1990 have therefore been remapped with the aim of determining any predominant quartz vein sets. The principle objective was to determine if any major set or sets of quartz veins were not satisfactorily intersected by the trajectories of drillholes in previous programmes.

Stereographic plotting of quartz vein dips and strikes mapped in costeans indicates six predominant dip and strike orientations.

76 N / 260
69 NW / 229
44 NW / 225
48 W / 202
VERT / 276
83 S / 255

A study of these vein orientations in relation to the drill hole trajectories suggests that only three of the six vein directions were adequately tested by past drilling to the north. Assuming that gold mineralisation is associated with the quartz veins, any additional drilling should be towards the south-east within the alteration zone.

15.4 Prospect Geology - Discussion

The geology of the East Ptilotus prospect consists of four major lithological subdivisions.

1) MADIGAN BEDS
2) DAVIDSON BEDS
3) BLAKE BEDS?
4) INTRUSIVE DOLERITE

The Madigan Beds can be subdivided ,in the immediate area, into two members.The upper member consists of bedded pelites grading to quartz-rich greywackes.The lower member (or probable lens) is predominantly pelite to graphitic and chloritic schists and bedded cherts.This lower member or lens is apparently conformable with the Davidson Beds and is folded around the western nose of the regional south west plunging,overturned anticline.

The Davidson Beds consist of graphitic schists, ferruginous cherts and schists, very minor BIFs and also very minor extrusive? mafics.The ferruginous cherts and schists are likely to represent oxidised and extremely weathered forms of sheared, brecciated and quartz veined graphitic and chloritic schists as seen at depth in diamond drilling.

The third major lithological unit, possible Blake Beds, consists of fine grained pelites with minor cherts.They appear to be very similar to the pelites of the Madigan Beds in RAB drilling chips but are defferentiated by an elevated and spiky magnetic signature.

The fourth lithological unit ,possible Tanami Volcanics, consists of intrusive , coarse grained dolerite to quartz dolerite sill(s).This mafic sill(s) represents in excess of 50% of the rocks recognised to date at the East Ptilotus prospect area and is by far the most prospective for Au mineralisation. The development of true BIFs appears to be a minor lithological component.

The major structure of the prospect area is a large overturned , south-west plunging anticline with numerous smaller associated parasitic folds. The sub-outcrop pattern details a thickened nose of Davidson Beds , with attenuated limbs and a core of intrusive dolerite underlain by possible Blake Beds.Later period(s) of deformation have then refolded areas but have not grossly changed the previous fold pattern.

The prospect area is then bounded to the north and bisected by an en-echelon set of major regional faults or shears, trending WNW, forming the major regional East Ptilotus fault system.This fault system parallels the Ptilotus and Lennard Ridge Fault systems that combine to form the Tanami-Redeye-Lennards Ridge-Ptilotus-East Ptilotus-HOF "mineralised corridor".

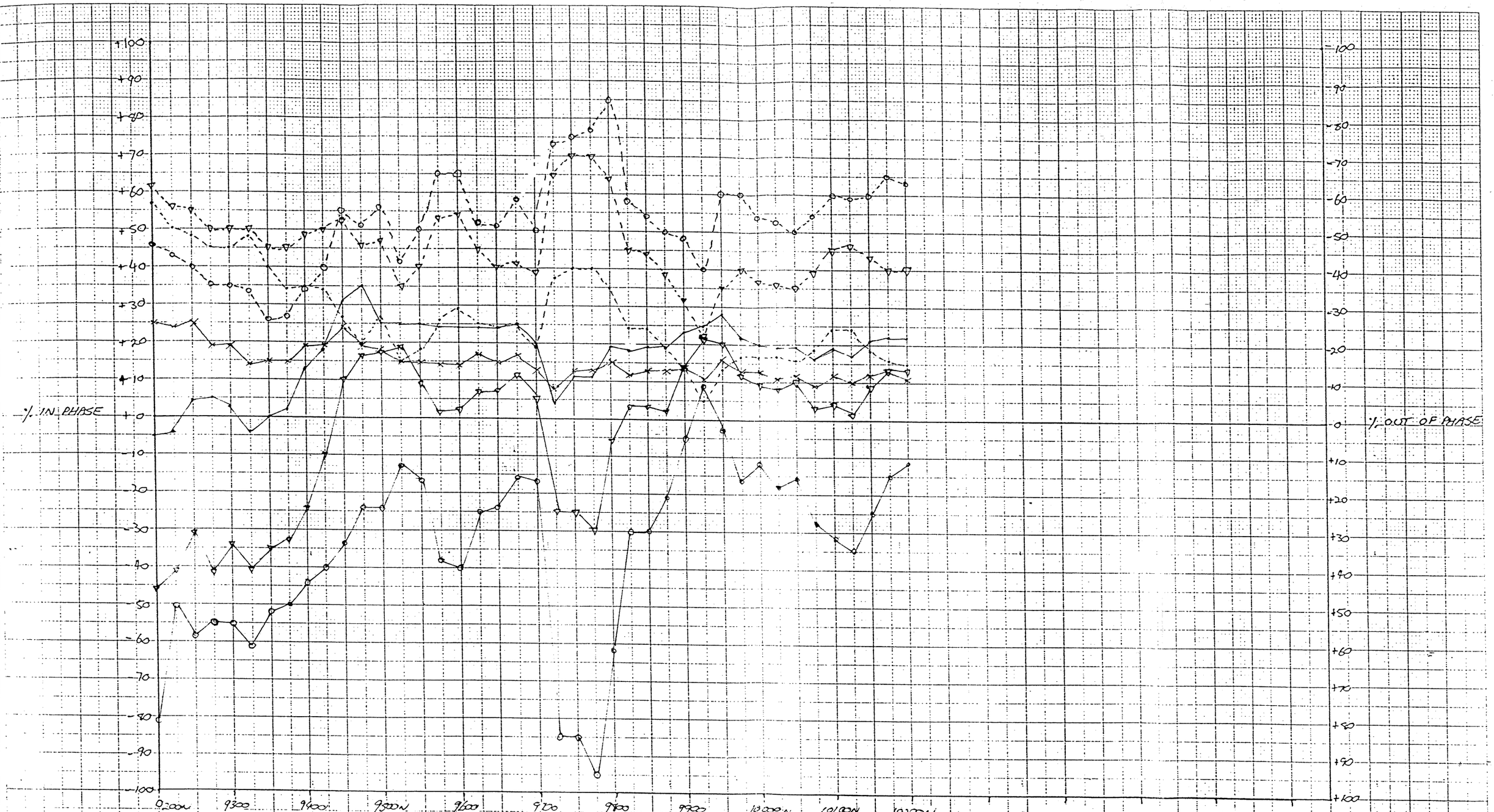
The mineralisation is interpretted to have been channelled up and along the major "mineralised corridor" being then deposited in a brittle to ductile regime within splays off the major regional shears in structurally and chemically receptive iron rich dolerites and sediments.

From diamond and RC drilling it can be seen that extensive alteration has occurred in association with the ore fluids passing through these ductile/brittle shear splays within the dolerite.The alteration includes an actinolite zone, a very extensive and pervasive chlorite zone, chlorite-carbonate,biotite and pyrite zones. Generally highly anomalous gold(> 0.2ppm) is intimately associated with the pyrite and chlorite-carbonate zones, with pyrite up to 15% observed in holes PRC066 and PRC069.

The application of structural analysis to these brittle-ductile wrench zones, based on the limited structural information available suggests that the dolerite has behaved as a homogenous isotropic mass. Therefore applying this model to the area it can be shown that the presently known low grade mineralisation is orientated along the "P" shears. Furthermore the principal areas for higher grade mineralisation are likely to occur at the intersections of this "P" shear and dilational structures,e.g.R,R'and T.

15.5 Plans

Drawing No	Title	Scale
300-1286	Mt Ptilotus - Plan Showing Geochemical Sampling Sheet 21	1:2500 (not available)
300-1287	Mt Ptilotus - Plan Showing Geochemical Sampling Sheet 22	1:2500 (not available)
300-1219	East Ptilotus - RAB X-Section Geol & Assays 22300E	1:500
300-1220	East Ptilotus - RAB X-Section Geol & Assays 22400E	1:500
300-1221	East Ptilotus - RAB X-Section Geol & Assays 22500E	1:500
300-1222	East Ptilotus - RAB X-Section Geol & Assays 22600E	1:500
300-1223	East Ptilotus - RAB X-Section Geol & Assays 22700E	1:500
300-1224	East Ptilotus - RAB X-Section Geol & Assays 22800E	1:500
300-1225	East Ptilotus - RAB X-Section Geol & Assays 22900E	1:500
300-1226	East Ptilotus - RAB X-Section Geol & Assays 23000E	1:500
300-1235	Mt Ptilotus - Plan Showing Fact Geology Sheet 20	1:2500
300-1236	Mt Ptilotus - Plan Showing Fact Geology Sheet 21	1:2500
300-1237	Mt Ptilotus - Plan Showing Fact Geology Sheet 22	1:2500
300-1288	Mt Ptilotus - RC X-Section, Geol & Assay 22200E	1:500 (not available)
300-1289	Mt Ptilotus - RC X-Section, Geol & Assay 22300E	1:500 (not available)
300-1290	Mt Ptilotus - RC X-Section, Geol & Assay 22450E	1:500 (not available)
300-1291	Mt Ptilotus - RC X-Section, Geol & Assay 22550E	1:500 (not available)
300-1292	Mt Ptilotus - RC X-Section, Geol & Assay 22600E	1:500 (not available)
300-1293	Mt Ptilotus - RC X-Section, Geol & Assay 22700E	1:500 (not available)
300-1294	Mt Ptilotus - RC X-Section, Geol & Assay 22725E	1:500 (not available)
300-1295	Mt Ptilotus - RC X-Section, Geol & Assay 22775E	1:500 (not available)
300-1238	Mt Ptilotus - Plan Showing Fact Geology Sheet 11	1:2500
300-637	Mt Ptilotus - Plan Showing Fact Geology Sheet 12	1:2500
300-1200	Ptilotus - Interpretive Geology	1:25000



FREQUENCIES — IN-PHASE — OUT-OF-PHASE

3555 Hz — o—o — o - - - o

1777 Hz — ∇—∇ — ∇ - - -∇

888 Hz — ·—· — · - - -·

222 Hz — x—x

Tx - Rx SEPARATION - 100 m

CONDUCTORS

GOOD

MEDIUM

POOR

SCALE

100m

NORTH FLINDERS EXPLORATION

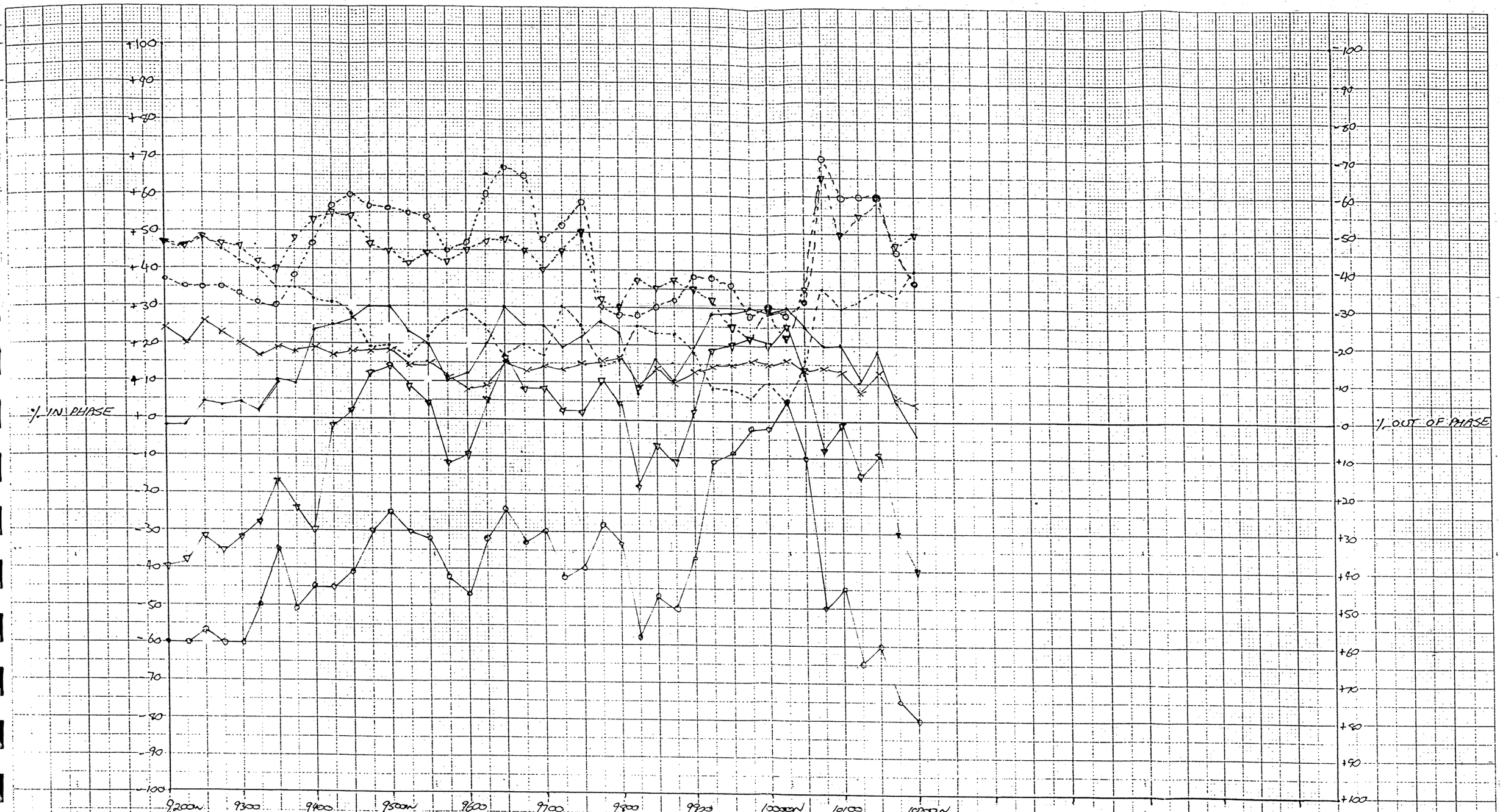
PROSPECT: EAST PYLOTUS

LINE : 23000E

MAX-MIN PROFILE

ARB MARCH 1991

MICADOR



FREQUENCIES — IN-PHASE — OUT-OF-PHASE

3555 Hz — o—o — o---o

1777 Hz — ▽—▽ — ▽---▽

888 Hz — ·—· — ·---·

222 Hz — x—x — x---x

T_x - R_x SEPARATION - 100 m

CONDUCTORS

GOOD

MEDIUM

POOR

SCALE

100m

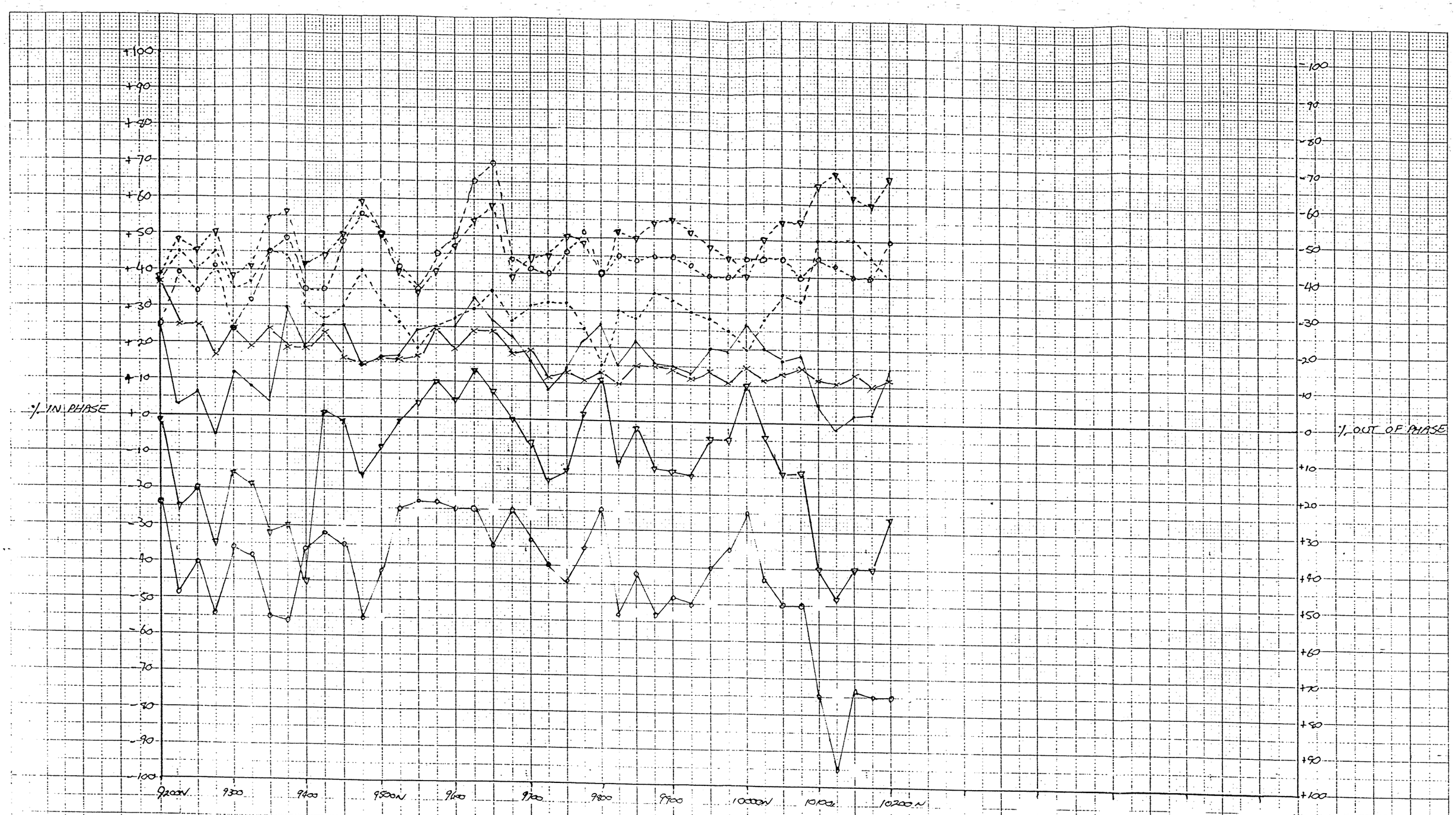
NORTH FLINDERS EXPLORATION

PROSPECT: EAST PILOTUS

LINE : 22900E

MAX-MIN PROFILE

AFB MARCH 1991



+100 +90 +80 +70 +60 +50 +40 +30 +20 +10 +0 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100

% IN PHASE

-100 -90 -80 -70 -60 -50 -40 -30 -20 -10 -0 +10 +20 +30 +40 +50 +60 +70 +80 +90 +100

% OUT OF PHASE

9200 9300 9400 9500 9600 9700 9800 9900 10000N 10100 10200

FREQUENCIES	IN-PHASE	OUT-OF-PHASE
3555 Hz	o—o	o - - - o
1777 Hz	▽—▽	▽ - - - ▽
888 Hz	·—·	· - - - ·
222 Hz	x—x	

T_x - R_x SEPARATION -100m

CONDUCTORS

GOOD

MEDIUM

POOR

SCALE 100m

NORTH FLINDER'S EXPLORATION

PROSPECT: EAST PYTHOTUS

LINE :22700

MAX-MIN PROFILE

AAB MARCH 1991

% IN PHASE

+100 +90 +80 +70 +60 +50 +40 +30 +20 +10 +0 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100

% OUT OF PHASE

-100 -90 -80 -70 -60 -50 -40 -30 -20 -10 -0 +10 +20 +30 +40 +50 +60 +70 +80 +90 +100

9200N 9300 9400 9500N 9600 9700 9800 9900 10000N 10100 10200N

FREQUENCIES — IN-PHASE — OUT-OF-PHASE

3555 Hz
1777 Hz
888 Hz
222 Hz

T_x - R_x SEPARATION - 100 m

CONDUCTORS

GOOD
MEDIOM
POOR

SCALE

100m

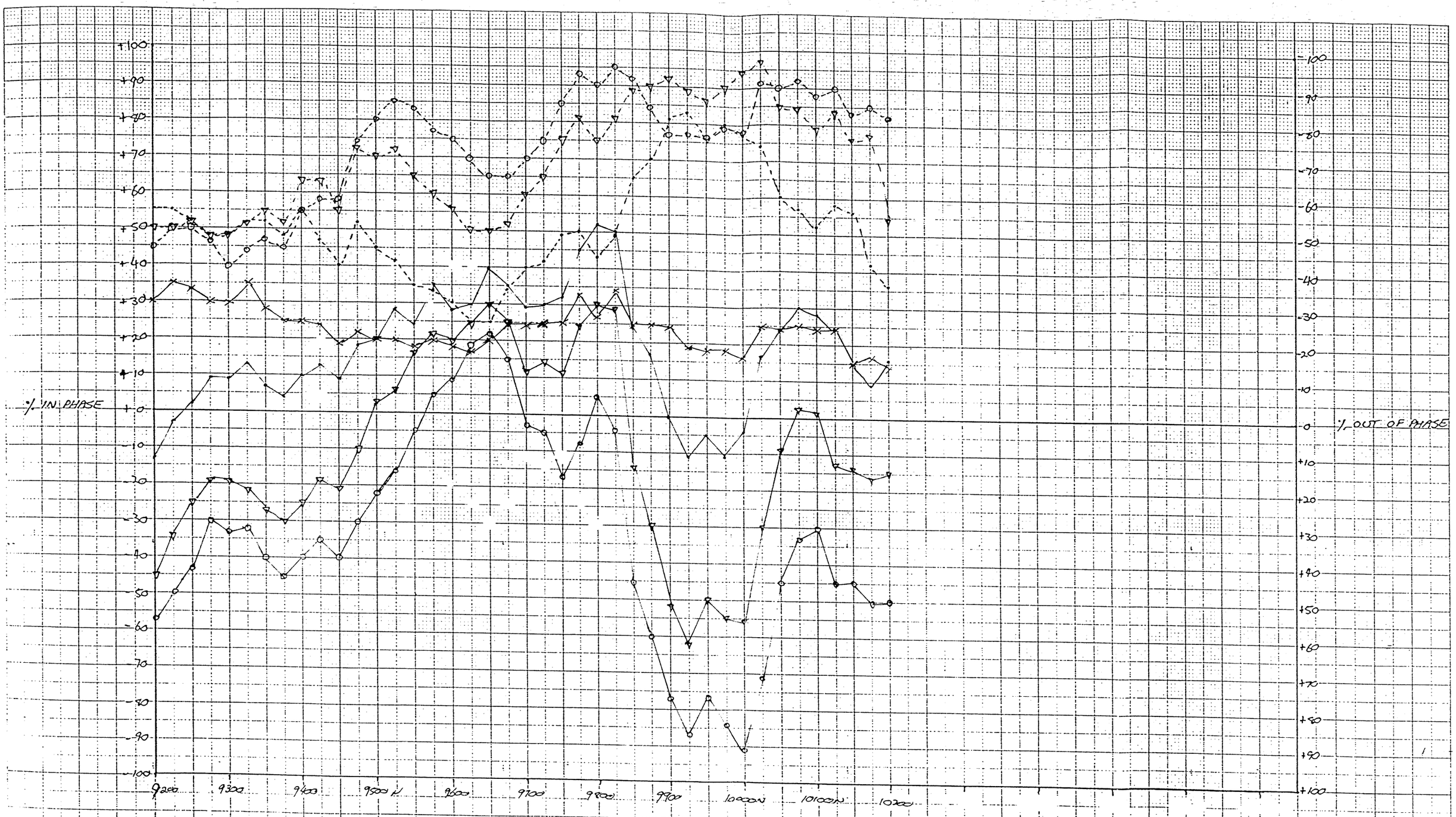
NORTH FLINDERS EXPLORATION

PROSPECT: EAST PT ICONUS

LINE : 22600E

MAX-MIN PROFILE

AFB MARCH 1991



FREQUENCIES

3555 Hz
1777 Hz
888 Hz
222 Hz

Tx - Rx SEPARATION - 100 m

IN-PHASE

OUT-OF-PHASE

CONDUCTORS

GOOD
MEDIUM
POOR

SCALE

100m

NORTH FLINDERS EXPLORATION

PROSPECT: EAST PITLOTUS

LINE : 225000E

MAX-MIN PROFILE

AFB MARCH 1991

+100 +90 +80 +70 +60 +50 +40 +30 +20 +10 +0 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100

% IN PHASE

-100 -90 -80 -70 -60 -50 -40 -30 -20 -10 0 +10 +20 +30 +40 +50 +60 +70 +80 +90 +100

% OUT OF PHASE

9200N 9300 9400 9500N 9600 9700 9800 9900 10000N 10100 10200N

FREQUENCIES

3555 Hz
1777 Hz
888 Hz
222 Hz
Tx - Rx SEPARATION - 100m

IN-PHASE

OUT-OF-PHASE

CONDUCTORS

GOOD
MEDIUM
POOR

SCALE

100m

NORTH FLINDERS EXPLORATION

PROSPECT: EAST PTOLOTUS

LINE : 22400E

MAX-MIN PROFILE

AEG MARCH 1991

MICADOR

+100 +90 +80 +70 +60 +50 +40 +30 +20 +10 0 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100

-100 -90 -80 -70 -60 -50 -40 -30 -20 -10 0 +10 +20 +30 +40 +50 +60 +70 +80 +90 +100

% OUT OF PHASE

9200N 9300 9400 9500 9600 9700 9800 9900 10000 10100 10200

FREQUENCIES	IN-PHASE	OUT-OF-PHASE
3555 Hz	o—o	o - - - o
1777 Hz	▽—▽	▽ - - - ▽
888 Hz	·—·	· - - - ·
222 Hz	x—x	

Tx - Rx SEPARATION - 100m

CONDUCTORS: GOOD ═══ MEDIUM ═══ POOR - - -

SCALE: 100m

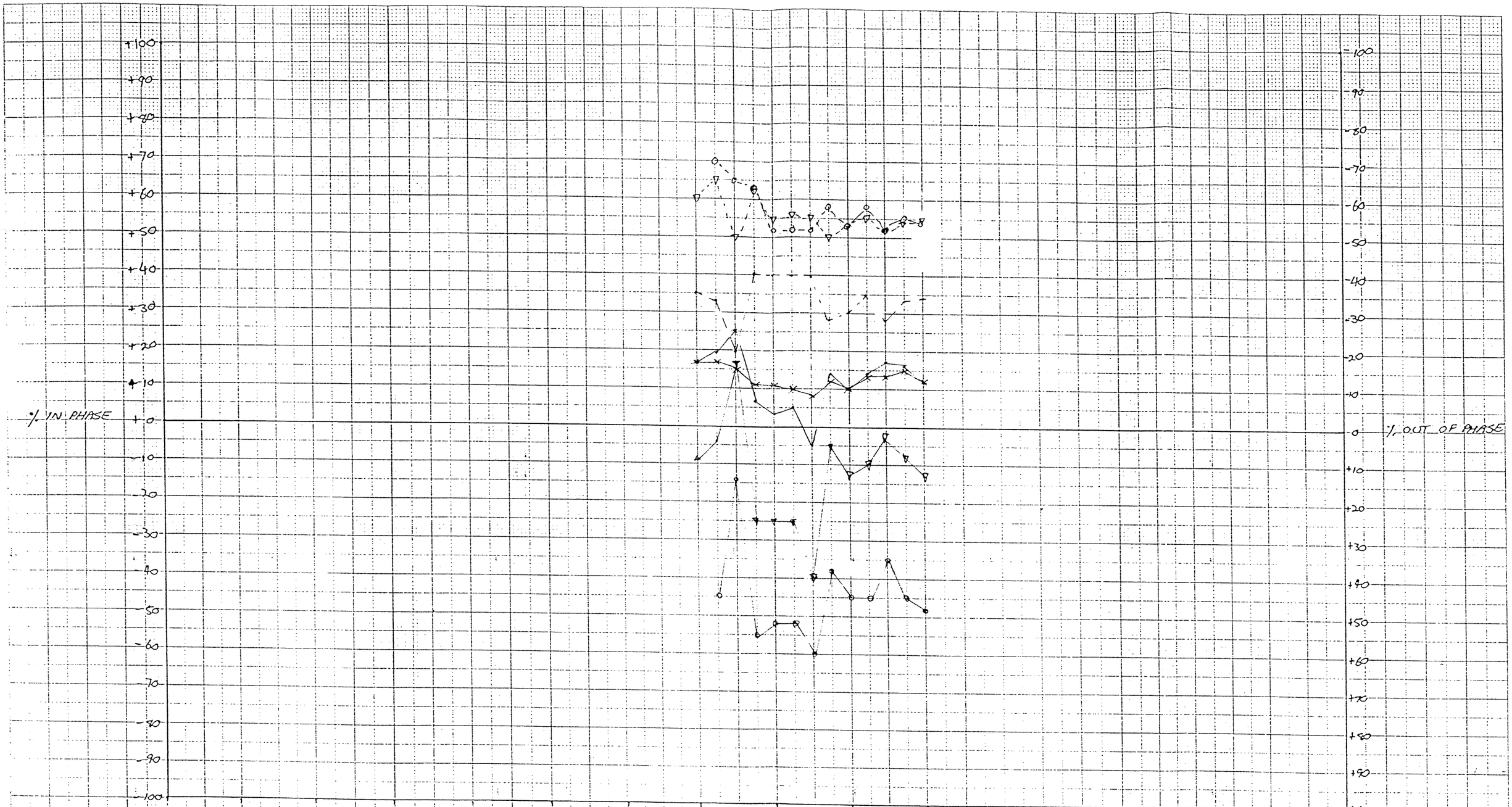
NORTH FLINDERS EXPLORATION

PROSPECT: FAST PATHOLOGUS

LINE : 22300E

MAX-MIN PROFILE

AFB MARCH 1991



FREQUENCIES

3555 Hz
1777 Hz
888 Hz
222 Hz

Tx - Rx SEPARATION - 100m

IN-PHASE

OUT-OF-PHASE

CONDUCTORS

6000
MEDIUM
POOR

SCALE

100m

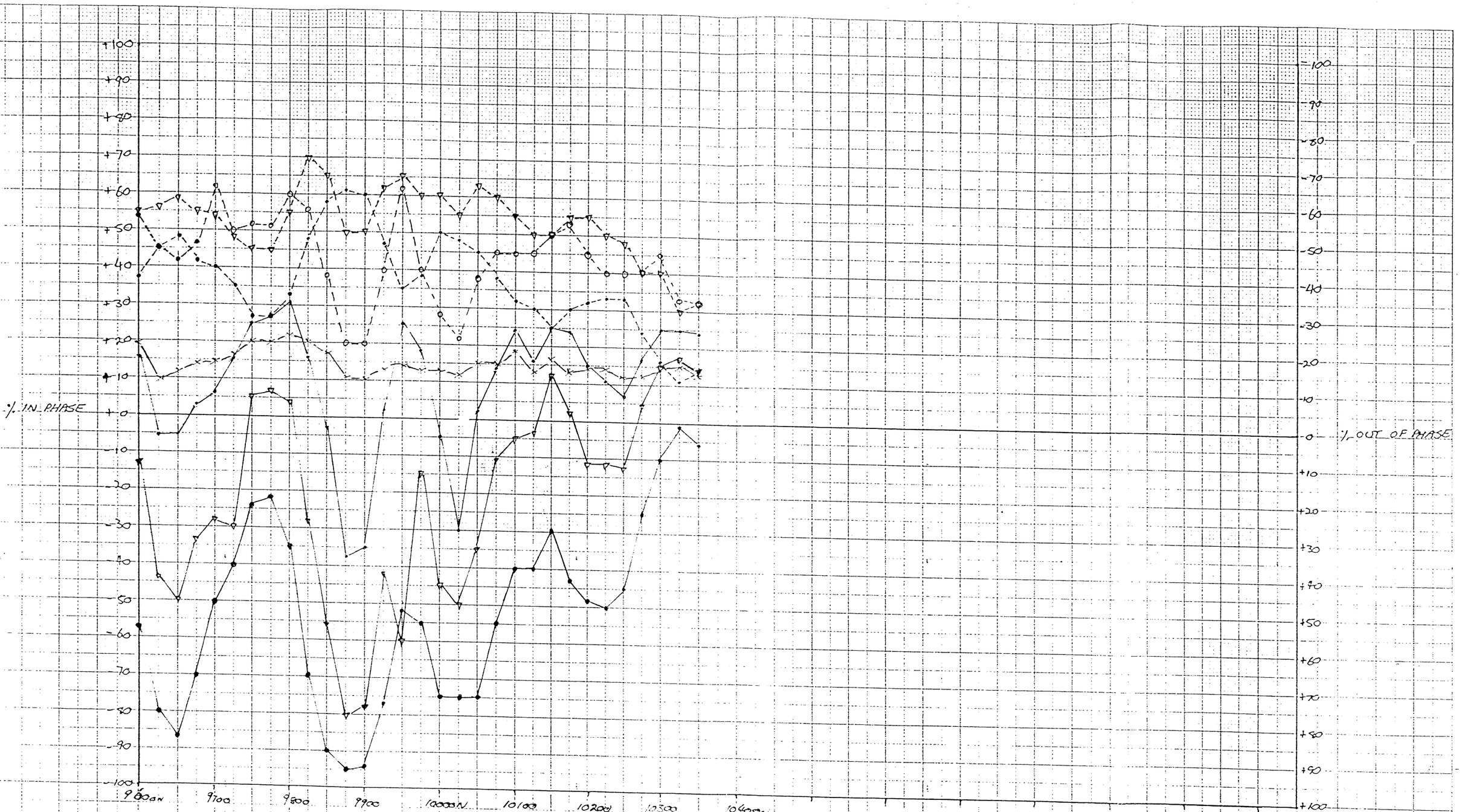
NORTH FLINDERS EXPLORATION

PROSPECT: EAST PTILOTUS

LINE : 22200E

MAX-MIN PROFILE

AFB MARCH 1991



FREQUENCIES — IN-PHASE — OUT-OF-PHASE

3555 Hz	o—o	o - - - o
1777 Hz	▽—▽	▽ - - - ▽
888 Hz	·—·	· - - - ·
222 Hz	×—×	

$T_x - R_x$ SEPARATION - 100 m

CONDUCTORS

GOOD	═══
MEDIUM	———
POOR	- - -

SCALE

100 m

NORTH FLINDERS EXPLORATION

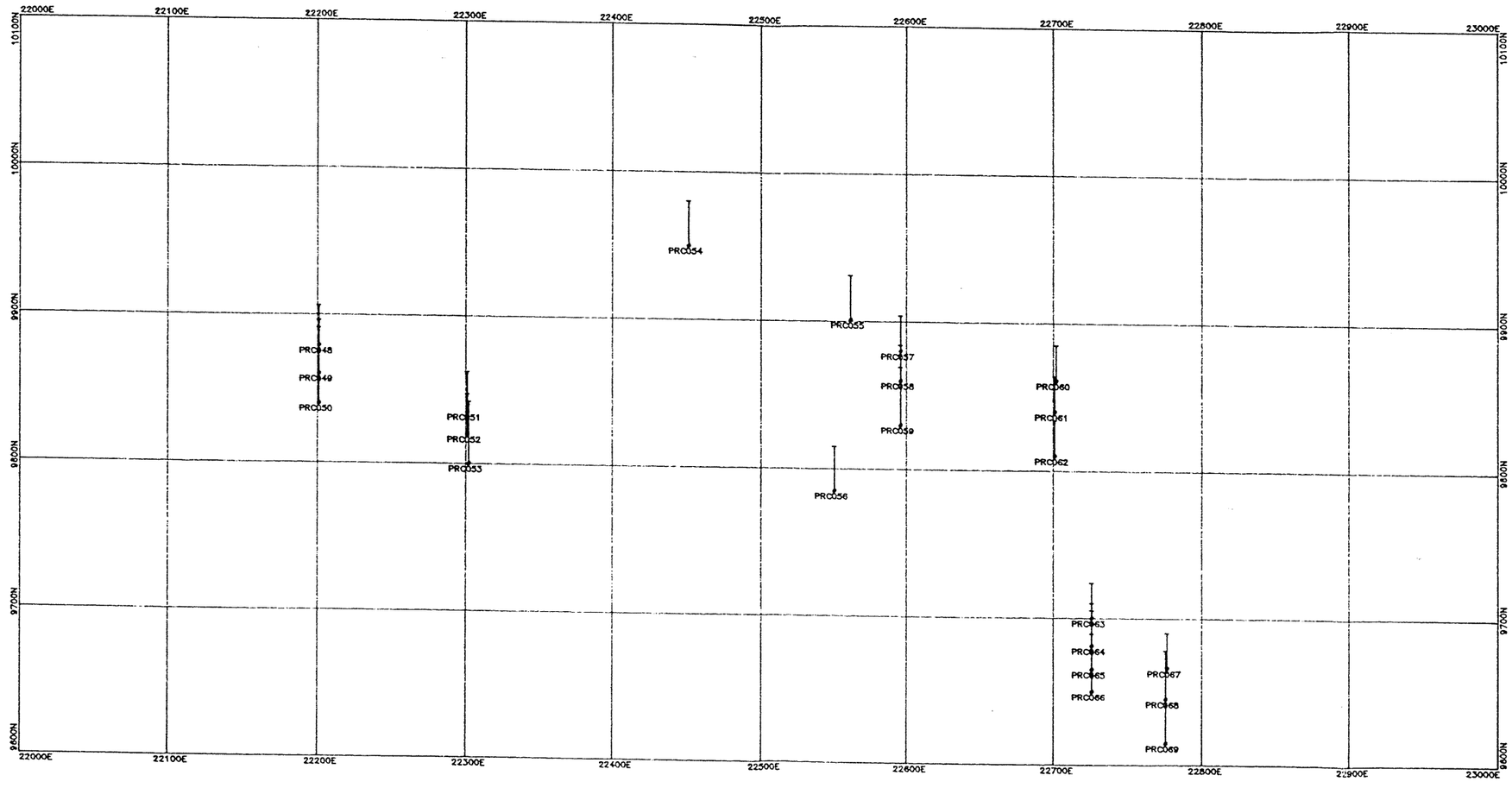
PROSPECT: LEAS PATCH

LINE : 21600E

MAX-MIN PROFILE

AAS MARCH, 1991

MICADOR



EAST PTILOTUS
1991 RC DRILLING
LOCATION PLAN

FIG 5

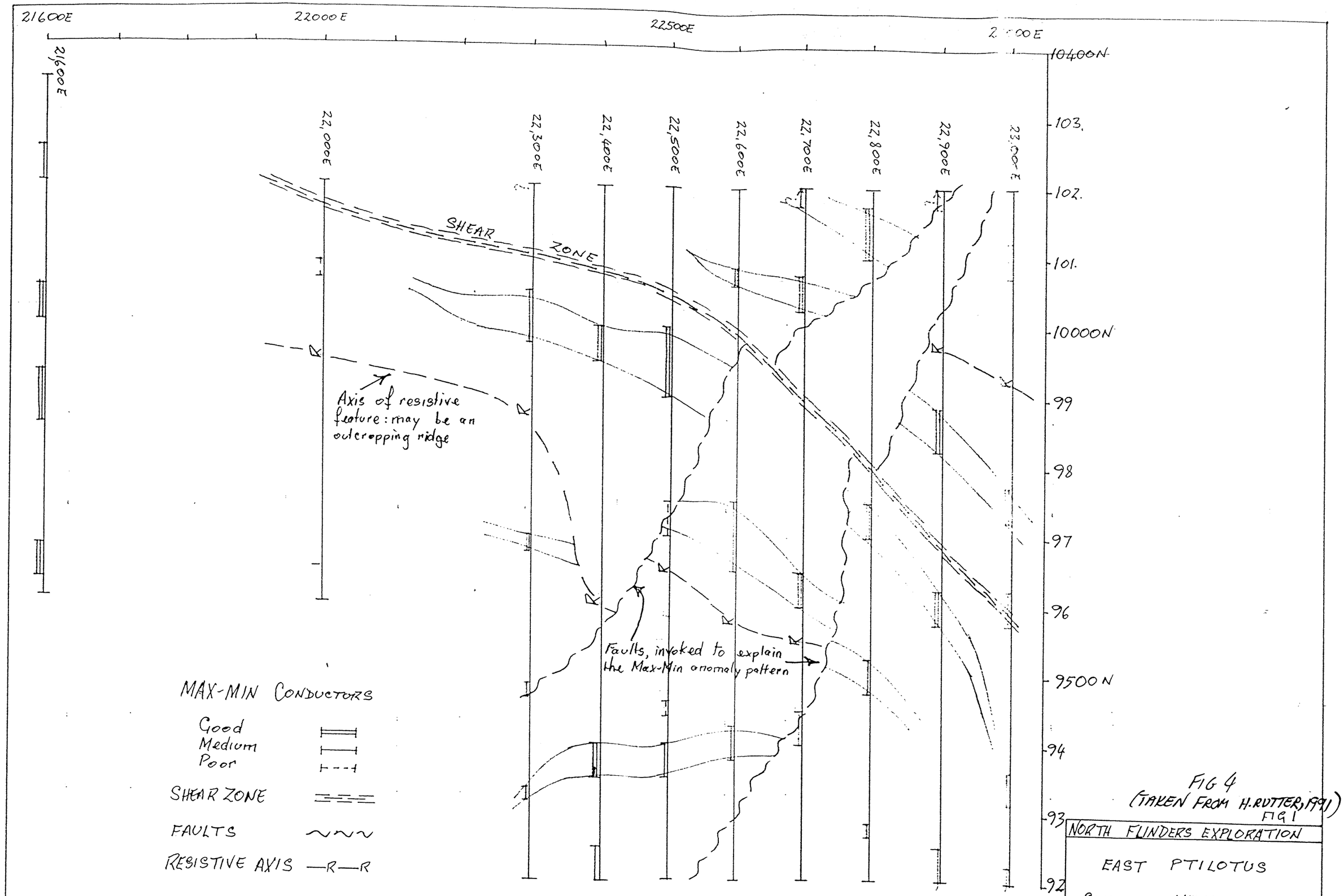


FIG 4
(TAKEN FROM H. RUTTER, 1991)
FIG 1

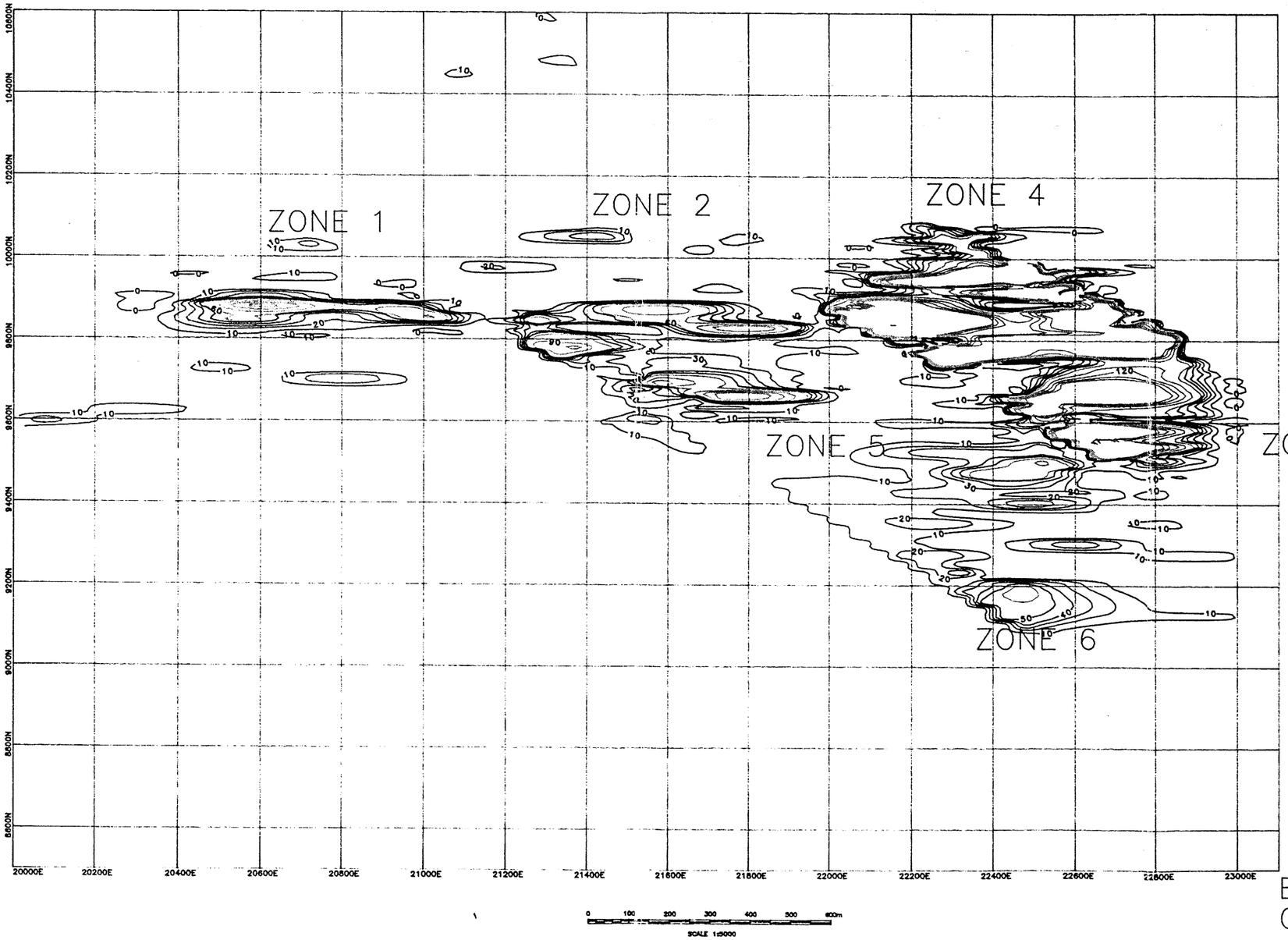
NORTH FLINDERS EXPLORATION

EAST PTILOTUS

SUMMARY OF MAX-MIN-DATA

MAR. 1991 1:5,000 Hugh Rutter

Geophysical Exploration Consultants P/L



EAST PTILOTUS
GOLD CONTOURS

ppb.

FIG 3