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Q-40,4148,55

346001

THE ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED.

West Coast Department.

GEOLOGICAL DEPARTMENT.

MICROFILMED

Report.

on

GROUND CHECKING OF

AIRBORNE ANOMALIES

FINGAL AREA

P. RODDA

I.M. PALTRIDGE

Number: 82

File: Fingal 607.1

GEOPHYSICS

346

4

Q41164

59-296

187 Rep on Ground Checking of Airborne Anomalies, Fingal Area by I.M. Paltridge & P. Rodda

Report 1 on the ground followup of Aero-
Geophysical Anomalies, Fingal concession

1. Introduction

Eight anomalies (1/1, ^{* missing not recovered} 1/2, ^{*} 2/1, 2/3, 2/6, ^{*} 3/5, 6/1 and 6/2) were examined from a base at Mathinna and the results are presented on the accompanying Table 1. The localities of the individual anomalies are shown on Plate A1.

A brief description of the rock types found in this area is given below, but a more complete description may be found in Report 81 File 605.2 (Fingal).

2. General Geology

Mathinna Group consists of slates and quartzites, probably of Silurian age. These sediments have been folded about north to north west trending axes.

Granite is exposed on the western side of the area near Ben Lomond. It is associated with tin/tungsten mineralisation at Aberfoyle and Storeys Creek, and is probably of Devonian age.

Permian sediments consisting of conglomerates, sandstones, quartzites and clays are found capping ridges at many localities. They are essentially flat-lying and frequently give a notable electromagnetic response due to water in the clay bands.

Tertiary basalt overlies granite and Mathinna Group in the region of Upper Esk.

The Lady Mary gold prospect was reported on by Hughes (1947) who recorded very small assay values. No production has been recorded and mineralisation appears to be barren quartz with hematite.

3. Geophysical Investigations

It seems that the response of the airborne electromagnetic equipment was in large part due to water along prominent structural planes or bedding planes. Since the ground surveys were made after a prolonged period of drought, water would not be present on these planes in quantities likely to give an E.M. response. This theory is supported

3. Geophysical Investigations (contd.)

by the fact that the best response was obtained on anomaly 1/1 which lies in an area which has not suffered a prolonged drought.

4. Conclusion

No further work is recommended on these anomalies.

I. M. Paltridge

I.M. Paltridge

Reference: T.E. Hughes (1947) The Dan Rivulet Goldfield
Tasm. Dept. Mines Report (Unpublished)

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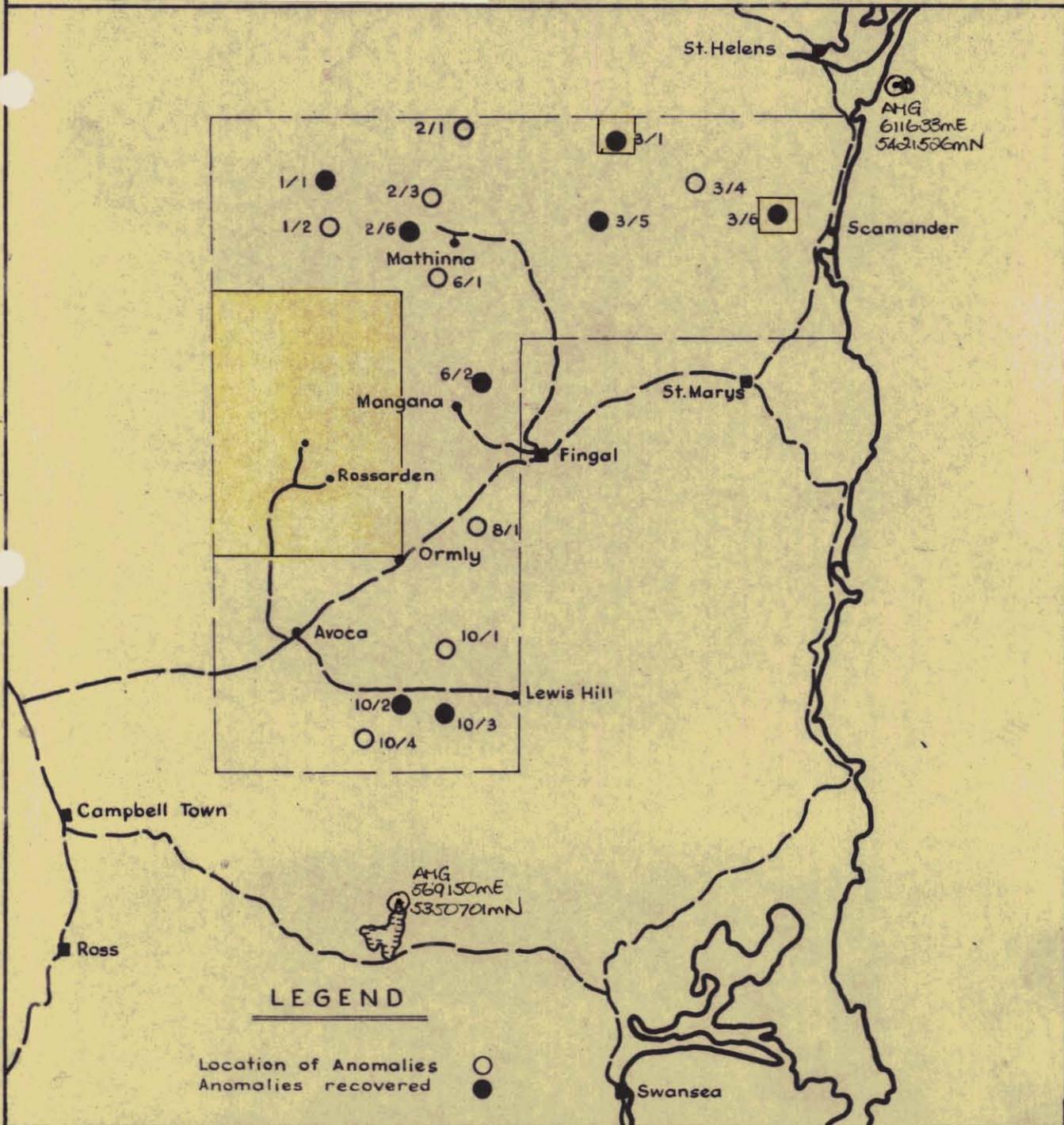
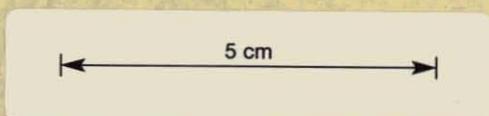
346004

FINGAL PROJECT

SCALE:
8 miles to 1 inch



AMG REFERENCE POINTS ADDED



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TABLE 1

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GEOPHYSICAL RESULTS FOR FINGAL CONCESSION

ANOMALY	TYPE	FORM	GROUND RESULT	COUNTRY ROCK	RECOMMENDATIONS	REMARKS
1/1	EM	Thumbprint, EM on one line. Rather broad. 1.0° phase shift on low frequency.	Low frequency response very indistinct; High frequency better. Conductor of poor quality striking to N.W. dipping to N.E. Probably due to water at lithologic contact.	Tertiary basalt (about 50 ft. thick) overlying Devonian granite.	No further work	Due to dry conditions prevailing here for some months, response is lower than that obtained with Canso equipment.
1/2	Mag.	Thumbprint magnetic, no EM correlation anomaly	Not recovered	Mathinna Group siltstones, slates etc.	No further work	Sharpe D1-M is not sufficiently sensitive for this type of follow up
2/1	EM	Linear anomaly on 4 lines L.F. 1.0° shift Strike parallel to regional.	Not recovered	Mathinna Group	No further work	
2/3	EM	Linear anomaly parallel to and on 1 flight line 0.5° L.F. shift.	Possible EM crossover on 1 line but any conductor present is very weak.	Mathinna Group. Lady Mary gold prospect is situated on this grid	No further work	Airborne response may have been due to water rendered more conductive by the presence of very small amounts of oxidising sulphides.
2/6	EM	Broad circular anomaly L.F. 2.6° shift. Ratio 1.05	Very poor conductors of no definite direction. Due to water-laden clay beds in the Permian succession	Horizontal, bedded Permian sediments about 50' thick	No further work	Dry conditions have resulted in the conductivity of the clays being reduced.
3/5	EM	Narrow anomaly over 5 lines. L.F. 1.7° shift	The anomaly was located by E.M. methods but no detailed work was carried out because of the geological setting	Interbedded sandstones, clays and conglomerates of Permian age 200' thick	No further work	

TABLE 1 (contd.)

ANOMALY	TYPE	FORM	GROUND RESULT	COUNTRY ROCK	RECOMMENDATIONS	REMARKS
6/1	EM	Broad anomaly on 3 lines. L.F. 0.5° shift.	Possible EM crossover on two lines.	Mathinna Group	No further work.	Not definitely recovered. Very weak response.
6/2	EM	Small, restricted, L.F. 0.5° flown too high.	Conductivity very poor, several very weak conductors striking about due north. No definite single conductor.	Mathinna Group	No further work.	

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TABLE II

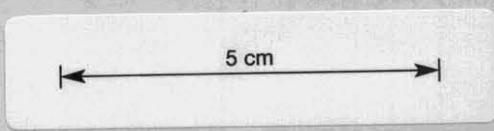
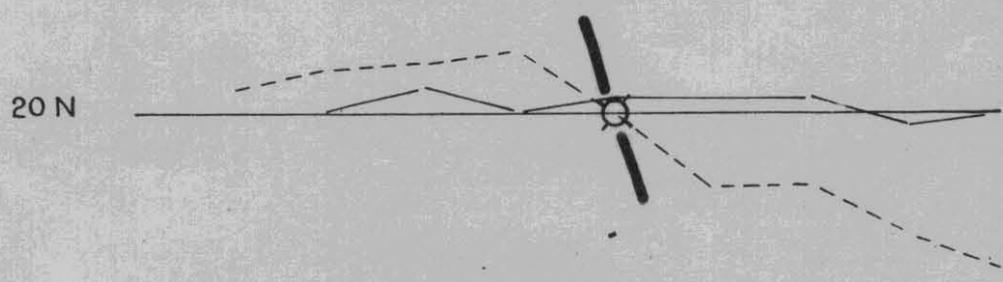
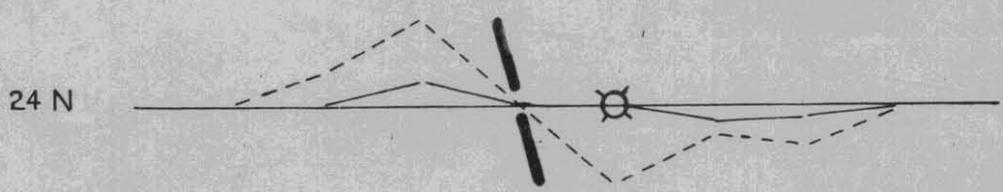
GEOPHYSICAL RESULTS FOR FINGAL CONCESSION

ANOMALY	TYPE	FORM	GROUND RESULT	COUNTRY ROCK	RECOMMENDATIONS	REMARK
3/1	EM	Linear	Good crossover on each line. See Z0.1021	Mathinna Group and granite. See Z0.1022	Further work should consist of gravimetric survey.	Anomaly is probably near granite contact.
3/4	EM	Linear	Not recovered	Mathinna Group slates and quartzite.	No further work.	
3/6	Magnetic	Thumbprint	Anomaly of 1500 gammas. Good EM crossover.	Mathinna Group slate and quartzite.	Further magnetic work, also EM gravimetric.	This anomaly is the subject of separate section.
8/1	EM	Linear	Feeble response: not recovered. See Z0.1023	Mathinna Group slate and quartzite. Z0.1024	No further work.	
10/1	EM	Short, linear; one flight line.	Not recovered. See Z0.1025	Permian limestone, mudstone and sandstone on granite.	No further work.	Possible crossovers to east of grid.
10/2	EM	Linear, bifurcate.	Probable crossover on one line. See Z0.1026	Probably Mathinna Group and granite.	No further work.	
10/3	EM	Linear	Crossover on one line, probable crossover on another, possible crossover on third. See Z0.1027	Granite	No further work.	
10/4	EM	Linear	Not recovered.	Granite	No further work.	Two in-line traverses run but no conductor evident.

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346008

16 E 18 E 20 E 22 E 24 E



LEGEND

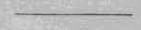
1000 cps

5000 cps

Transmitter position

Definite conductor

Possible conductor



FINGAL PROJECT

ANOMALY 1/1

R.E.M. TRAVERSES

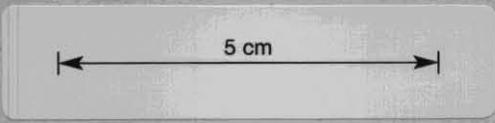
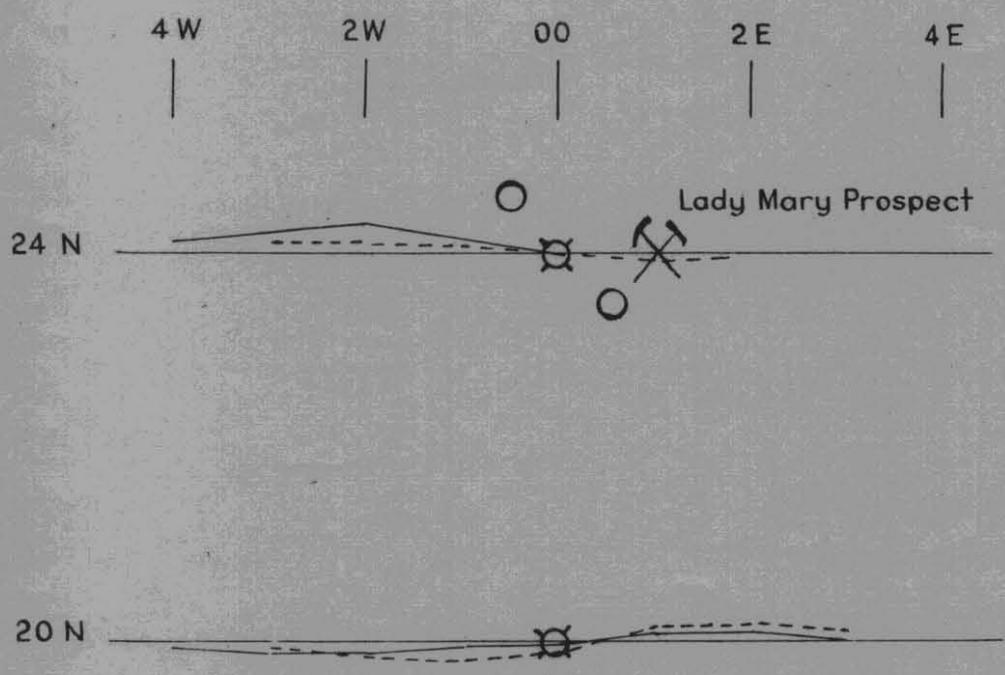
Scale: horizontal 200' to 1"
vertical 20° to 1"

Survey *Jan 1951*

Grid North = 342°M

006

346009



LEGEND

1000 cps

5000 cps

Transmitter position

Definite conductor

Possible conductor



FINGAL PROJECT

ANOMALY 2/3

R.E.M. TRAVERSES

Scale: horizontal 200' to 1"

vertical 20° to 1"

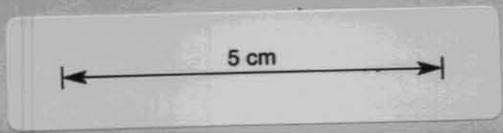
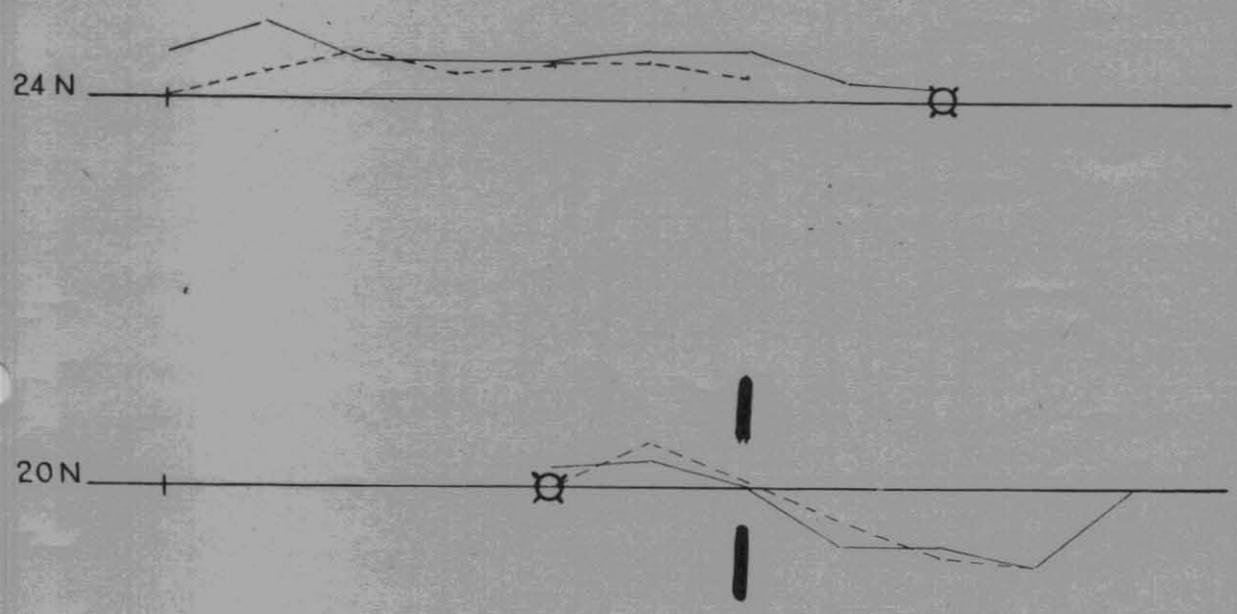
Survey: *Am?*

Grid North = 350° M

007

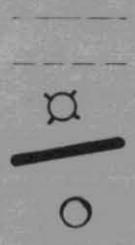
346010

16 E 18 E 20 E 22 E 24 E 26 E



LEGEND

- 1000 cps
- 5000 cps
- Transmitter position
- Definite conductor
- Possible conductor

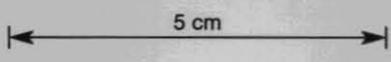
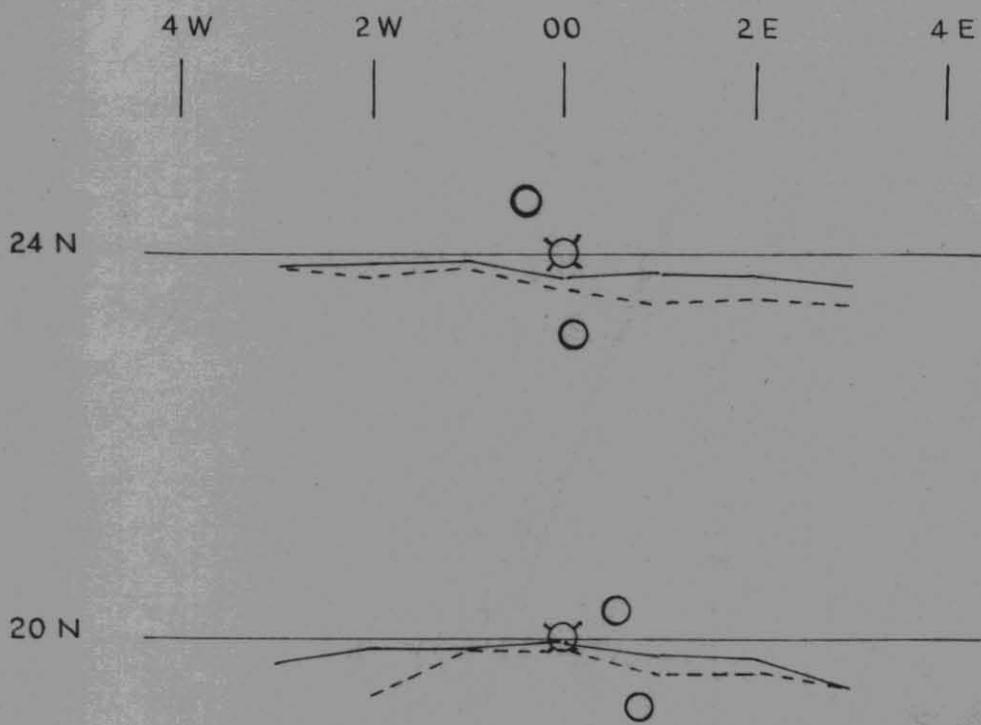


FINGAL PROJECT
ANOMALY 2/6
R.E.M. TRAVERSES

Scale: horizontal 200' to 1"
 vertical 20° to 1"
 Survey *1/4/11*
 Grid North = 354° M

008

346011



LEGEND

1000 cps

5000 cps

Transmitter position

Definite conductor

Possible conductor



FINGAL PROJECT

ANOMALY 6/1

R.E.M. TRAVERSES

Scale: horizontal 200' to 1"
vertical 20° to 1"

Survey: *Aug.*

Grid North = 355° M

17 E

19 E

21 E

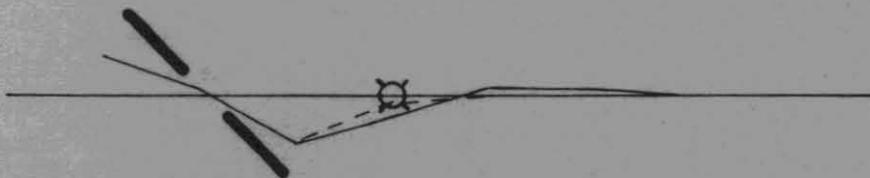
23 E

346012

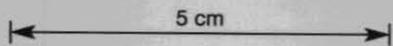
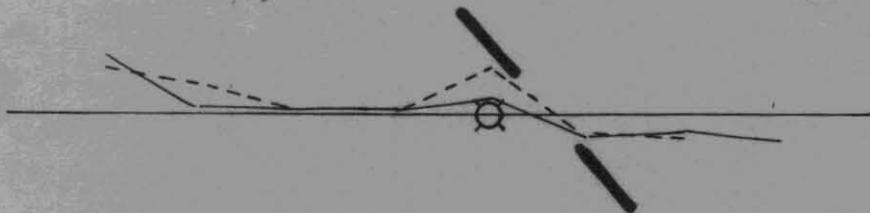
24 N



20 N



16 N



LEGEND

1000 cps

5000 cps

Transmitter position

Definite conductor

Possible conductor



FINGAL PROJECT

ANOMALY 6/2

R.E.M. TRAVERSES

Scale: horizontal 200' to 1"
vertical 20° to 1"

Survey *M.H.*

Grid North = 004° M

Report 2 on the Ground followup of Aero-
Geophysical Anomalies, Fingal Concession

1. Introduction

** missing not received*

Eight anomalies (3/1, 3/4, 3/6, 8/1, 10/1, 10/2, 10/3, 10/4) were examined, based on Scamander, Fingal and Avoca for respective sheet numbers. For positions of anomalies see Plate A1.

The anomalies, with relevant data, are tabulated (Table II) together with the recommendation for each. In three cases, (3/6, 8/1 and 10/1) the geology/geophysical data warrants further space than is convenient in the table, the information is presented below. South-west of St. Helens some field mapping was carried out and is discussed in the second part of this report 2.

2. Geology of Anomalies 3/6, 8/1 and 10/1

A. Anomaly 3/6

- a. Location. The centre of the airborne anomaly is approximately one mile east of the bridge at Upper Scamander.
- b. General Topography. The area is one of reasonably rugged relief, with the sides of the main gully in which the anomaly is placed being 200 to 400 ft. in height, sloping at 30° to 40°. The vegetation is predominantly open timber but with some scrub in the deeper gullays.
- c. General Geology. The rocks in the immediate area belong to the Scamander Slates and Quartzite, which is probably part of the Mathinna Group. A tough, cream coloured orthoquartzite predominates but slate and mudstone also occur. The bedding strikes from 315° to 350° magnetic and dips steeply to the east, isoclinal folding may be present but no evidence of overturning was seen in any of the beds.

Faulting exists in at least three directions, one striking 015° with dips of plus 65° to the ~~east~~^{east} or ~~west~~^{west}, another 110° with dip of plus 75° to the south and a third group trends 100° with a low dip of 15° to the south.

- d. Economic Geology. The magnetic anomaly is associated with the old North Scamander prospect which consists of a small shaft at 10750N 11450E and two adits in the creek floor at 10880N 11410E. Twelvetees

contd.. /

d. Economic Geology (contd.)

(1911) when examining the prospect commented "the vein minerals are pyrite, zinc-blende, a little galena and chalcopyrite, magnetite, pyrrhotite, with quartz and kaolin.. The formation appears to strike a little north of west, and to be largely a replacement of sandstone. Irregular veins of galena, chalcopyrite and sphalerite intersect the formation. The magnetite is massive and the wall rock charged with pyrite. The type is that of replacement deposits." Evidence of this mineralisation can be seen in the short north-east adit which is the only part of the workings which is at present accessible. The mineralisation consists of sporadic blebs of sulphide (sphalerite, with subordinate quantities of chalcopyrite, galena and pyrrhotite) whose distribution is controlled by the bedding, preferably occurring in the quartzitic rather than the argillaceous beds. Other sulphide samples can be obtained from the small dump which is associated with the adits. The fault planes in the north-east adit are barren, carrying only limonite and/or gouge. Mapping elsewhere in the anomaly indicates that the magnetite has a wider distribution than that of the sulphides and consequently the size of the magnetic anomaly cannot be used as a guide to the distribution of the sulphide mineralisation.

Apart from individual cubes of pyrite in the sediments which could be of syngenetic origin, no other zones of sulphide mineralisation were seen in the area although it must be admitted that outcrops are rare.

- e. Ground Geophysics. The Watts vertical force variometer was taken over lines 10400N, 10800N, 11000N and 11200N at a station interval of 100 feet. The anomaly centre of plus 1500 gammas (maximum of 1850 gammas) is in a background value of about 275 gammas. The gradient is steep with a rise of 1500 gammas in 300 feet. The centre of the anomaly is at 10750N 11400E, at the position of the abandoned shaft.

An examination of the tapes from the Canso aircraft revealed a small electromagnetic disturbance associated with the magnetic anomaly. Difficulty was experienced with the steep terrain in using the McPhar dual frequency R.E.M. unit and misorientation undoubtedly occurred between transmitter and receiver. However, a good crossover was obtained on line 10800N at 11450E and a probable one on line 11200N. The crossover on line 10800N is clearly associated with the magnetic high whilst the probable crossover is not.

contd../

013

f. Conclusion The association of the magnetic and electromagnetic anomalies in a zone of sulphide mineralisation indicates that the area warrants further work. This should consist of a magnetic traverse at 10600N and traverses with the R.E.M. vertical loop to obtain a complete coverage of the magnetic anomaly. Gravimetric work would elucidate the area considerably but the steepness of the gulltys may well introduce the terrain correction into the reduction of the results.

B. Anomaly 8/1

Whilst the airborne anomaly axis is situated in slates, mudstones and quartzites of the Mathinna Group (1216), there is a capping of horizontal Permian sediments which occupy a small part of the grid and stretches for some distance in all directions except to the north west. The base of the Permian (for Permian stratigraphy see Table III) was seen resting unconformably on Mathinna slates and the measured column is shown in Table IV.

C. Anomaly 10/1

This anomaly is situated wholly on Permian sediments and therefore is of no economic value. South of the grid, the sequence is exposed in cliffs, down to the unconformity where the sediments lie on granite. The measured column of these sediments is shown in Table V.

The granite, which is coarse, consists mainly of quartz and felspar, with some biotite. Vertical jointing, running approximately east-west, is prominent. Alteration has gone on along these joints, producing greisen (1213, 1215).

3. Regional Mapping

The area to the east of anomaly 3/1 was formerly thought to be granite and when a large area of Mathinna Group was found in this location a limited amount of regional mapping was carried out; the granite-Mathinna contact was determined for a mile of its length and noted along several timber roads.

014

346016

TABLE III

PERMIAN STRATIGRAPHY - ROSSARDEN AREA
(Blissett, 1959)

TOP not visible

- PROSPECT CREEK MUDSTONE
- MISTLETOE SANDSTONE
- BURNT GULLY LIMESTONE
- CASTLE CAREY MUDSTONE
- ABERFOYLE FORMATION

BASE -----

MATHINNA GROUP OR GRANITE

TABLE IV

PERMIAN SUCCESSION NEAR ANOMALY 8/1

TOP

+	30'	Mudstone	CASTLE CAREY MUDSTONE FORMATION
---	-----	----------	------------------------------------

30-50'	Sandstone & pebble quartzite	
--------	---------------------------------	--

4'	Pebble Conglomerate	ABERFOYLE FORMATION
	Boulder Conglomerate	

BOTTOM

MATHINNA GROUP

TABLE VPART OF ABERFOYLE FORMATION
(PERMIAN) NEAR ANOMALY 10/1TOP

Unit 14	5 ft.	Coarse felspathic sandstone
" 13	6 ft.	Fine felspathic sandstone with pebble bands
" 12	2 ft.	Fine felspathic sandstone
" 11	3 ft 6"	Medium felspathic sandstone. Fossiliferous
" 10	1 ft.	Fossiliferous felspathic mudstone
" 9	1 ft.	Pebble conglomerate
" 8	1 ft.	Fine felspathic sandstone
" 7	3 ft.	Pebble conglomerate ($\frac{1}{4}$ " grain size)
" 6	2 ft.	Pebble conglomerate (1" grain size)
" 5	12 ft.	Coarse felspathic sandstone with pebble bands
" 4	17 ft.	Medium to coarse felspathic sandstone; pebble bands
" 3	1 ft. 6"	Fine felspathic sandstone
" 2	12 ft.	Pebble conglomerate (1" - 2" grain size)
" 1	1-2 ft.	Boulder conglomerate.

BOTTOM

GRANITE

A gradual overall decrease in particle size can be seen from the base upwards. The pebble bed of Unit 7 has been affected by contemporaneous slumping, and in one place it is immediately below the Unit 13.

017

3. Regional Mapping (contd.)

The Mathinna Group consists of slates and quartzites, and strikes approximately north south. Dips are usually steep and tight folding has taken place as well as crumpling which was noted in several places.

The granite contact is very well exposed in the bed of the Scamander River where Paul Beahr's Road begins (at the end of Hogan's Road). It is a typical granite consisting of quartz, pink orthoclase and some biotite. It varies considerably in composition, often over a very short distance. Near the contact, half-assimilated sedimentary xenoliths can be seen and one, 9" wide and several yards long, has quartz veins parallel to the remnant bedding (1206). The granite/sedimentary contact is approximately parallel to the bedding and the granite also has prominent joints in this direction.

Peter Rodda.

P. Rodda

Reference: A.H. Blissett, 1959. Geology of the Rossarden - Storey's Creek Area; Mines Dept. Geol. Surv. Bull. No. 46.

W.H. Twelvetees, 1911. The Scamander Mineral District; Tas. Dept. Mines Geol. Surv. Bull. No. 9.

018

10600 E

11000 E

11400 E

346020

11200 N

10800 N

10400 N

5 cm

Mag. North

LEGEND

1000 cps

5000 cps

Transmitter position

Definite conductor

Possible conductor

Probable conductor



FINGAL PROJECT

ANOMALY 3/1

R.E.M. TRAVERSES

Scale: horizontal 200' to 1"

vertical 20° to 1"

Survey:

Grid North = 025° M

019

346021

10600 E

11000 E

11400 E

11800 E

11200 N

28N

10800 N

24N

10400 N

20N

Gr. frag.

Metased frag.

Gr. frag.

Gr. frag.

Gr. & mst. frag.

Qte. frag.

Gr. & Sm. frag.

Xenoliths

Mathinna Group

Metased frag.

Granite

Qte. frag.

Gr.

GN

MN

Mag. North

65
X
Qte

80
X
50

5 cm

FINGAL PROJECT ANOMALY 3/1 GEOLOGY

Scale: 200 feet to 1 inch

Geology:
Grid North = 025° M

020

346022

11000 E

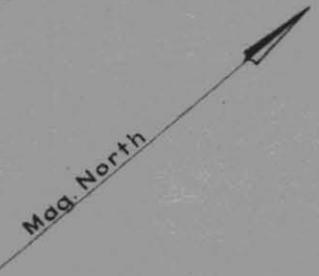
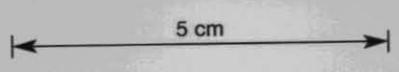
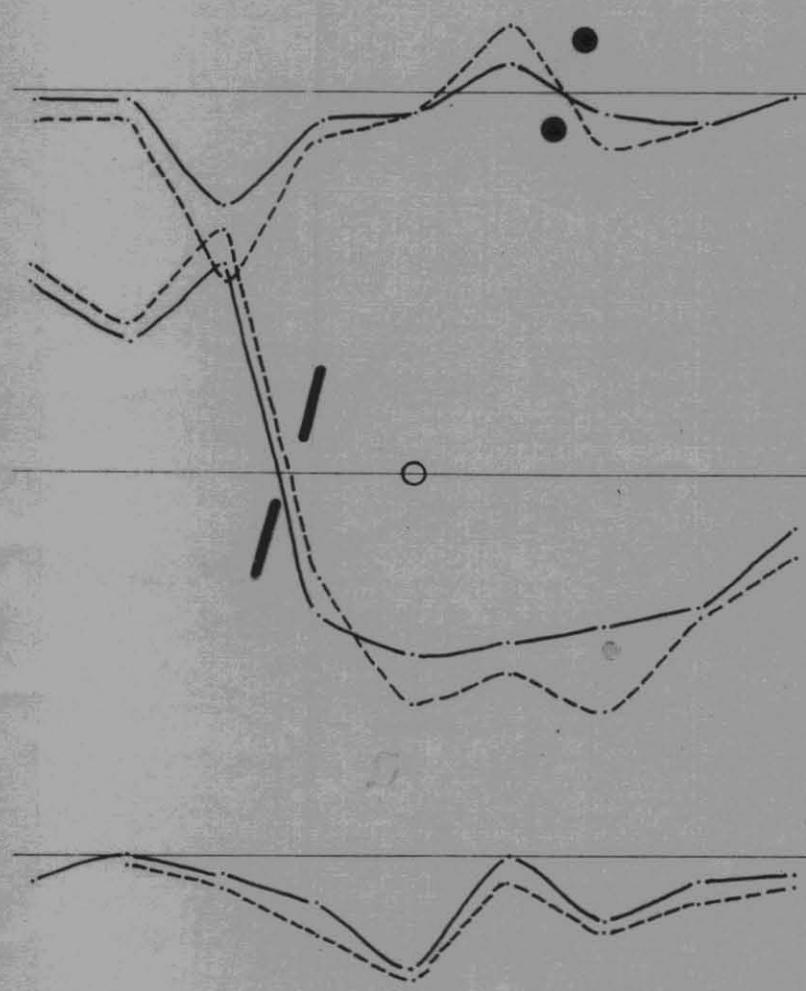
11500 E

12000 E

11200 N 28N

10800 N 24N

10400 N 20N



LEGEND

- 1000 cps —————
- 5000 cps - - - - -
- Transmitter position ○
- Definite conductor ▬
- Possible conductor ○
- Probable conductor ●

FINGAL PROJECT

ANOMALY 3/6
R.E.M. TRAVERSES

Scale: horizontal 200' to 1"
vertical 20° to 1"

Survey:
Grid North = 310°M

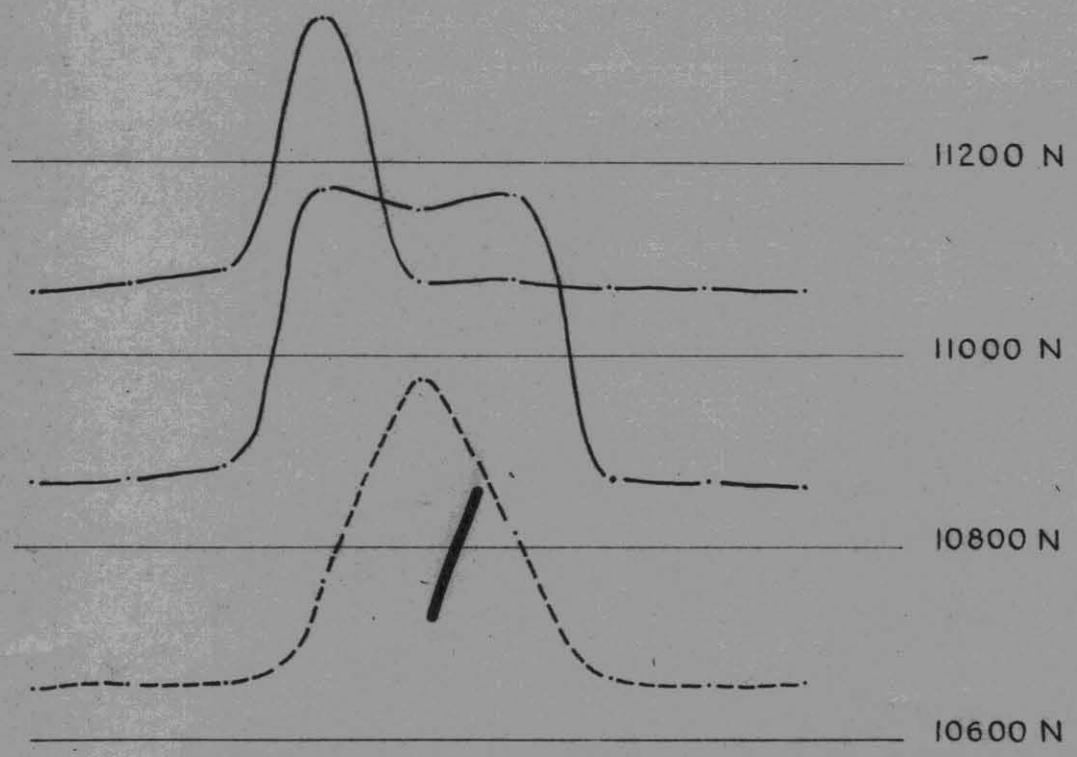
021

346023

11000 E

11500 E

12000 E



FINGAL PROJECT

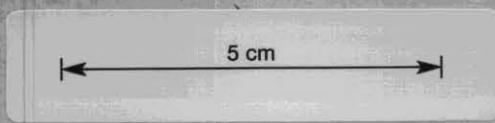
ANOMALY 3/6

MAGNETIC PROFILES

Scale: horizontal 200' to 1"
vertical 1000' to 1"

Survey: Reduced:

Grid North = 310° M



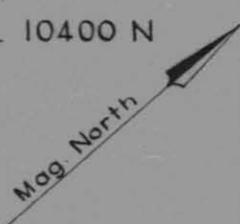
022

346024

11000 E

11500 E

12000 E



FINGAL PROJECT

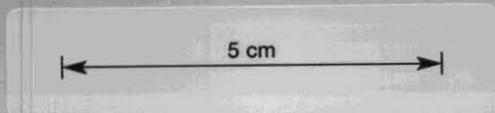
ANOMALY 3/6

MAGNETIC CONTOURS

Scale: 200 feet to 1 inch

Survey:

Grid North = 310° M



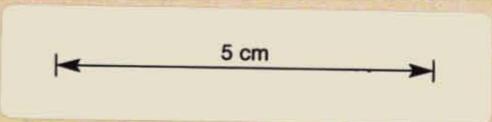
023

10500 E

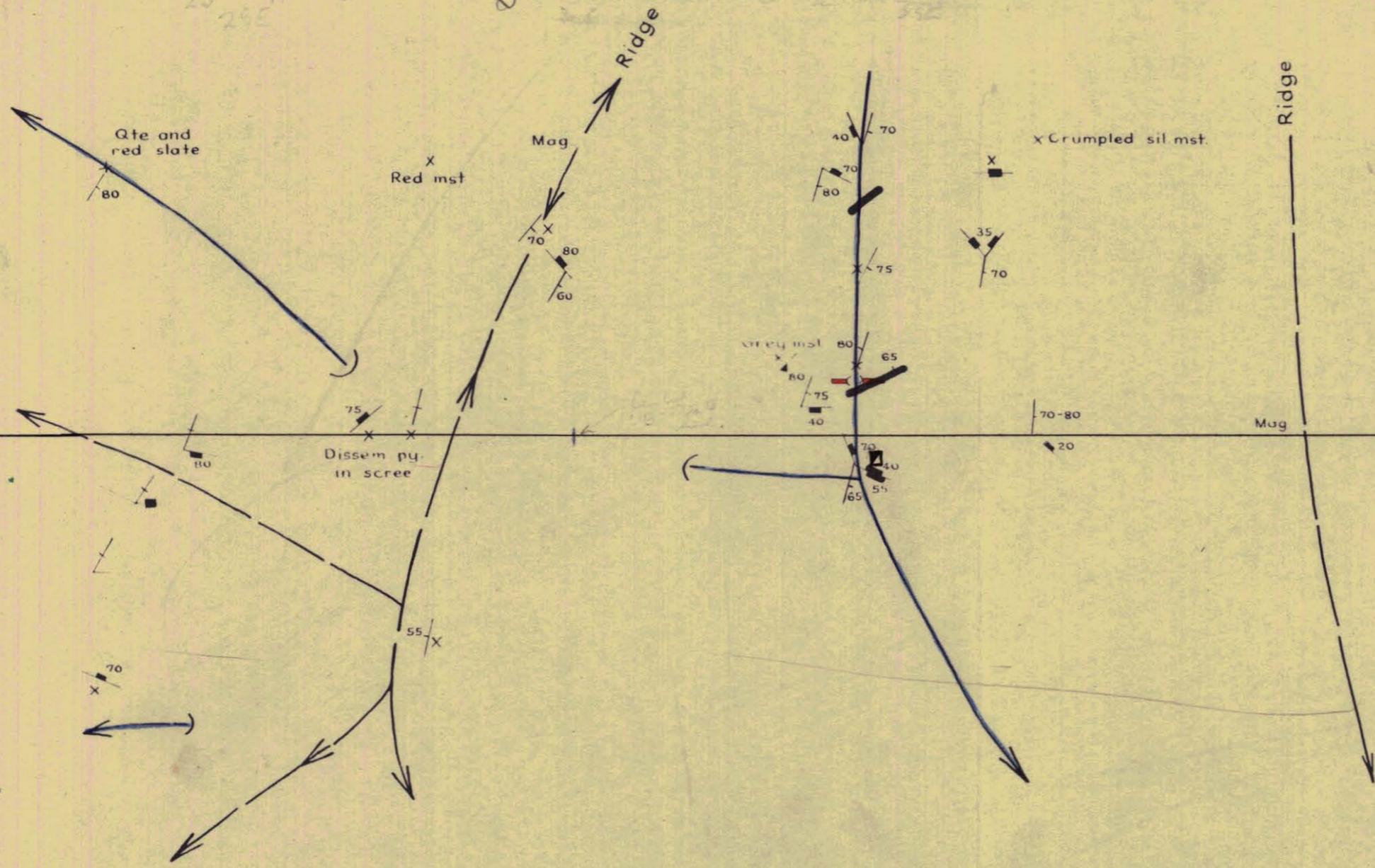
11000 E

11500 E

12000 E



346025



11200 N 28M

11000 N

10800 N 24M

10600 N

10400 N 20M

Sketch Section

WEST

EAST

FINGAL PROJECT
 ANOMALY 3/6
 GEOLOGY

Scale: 200 feet to 1 inch

Geology:
Grid North = 310° M

Adits & Shaft

02A

346020

14 E

18 E

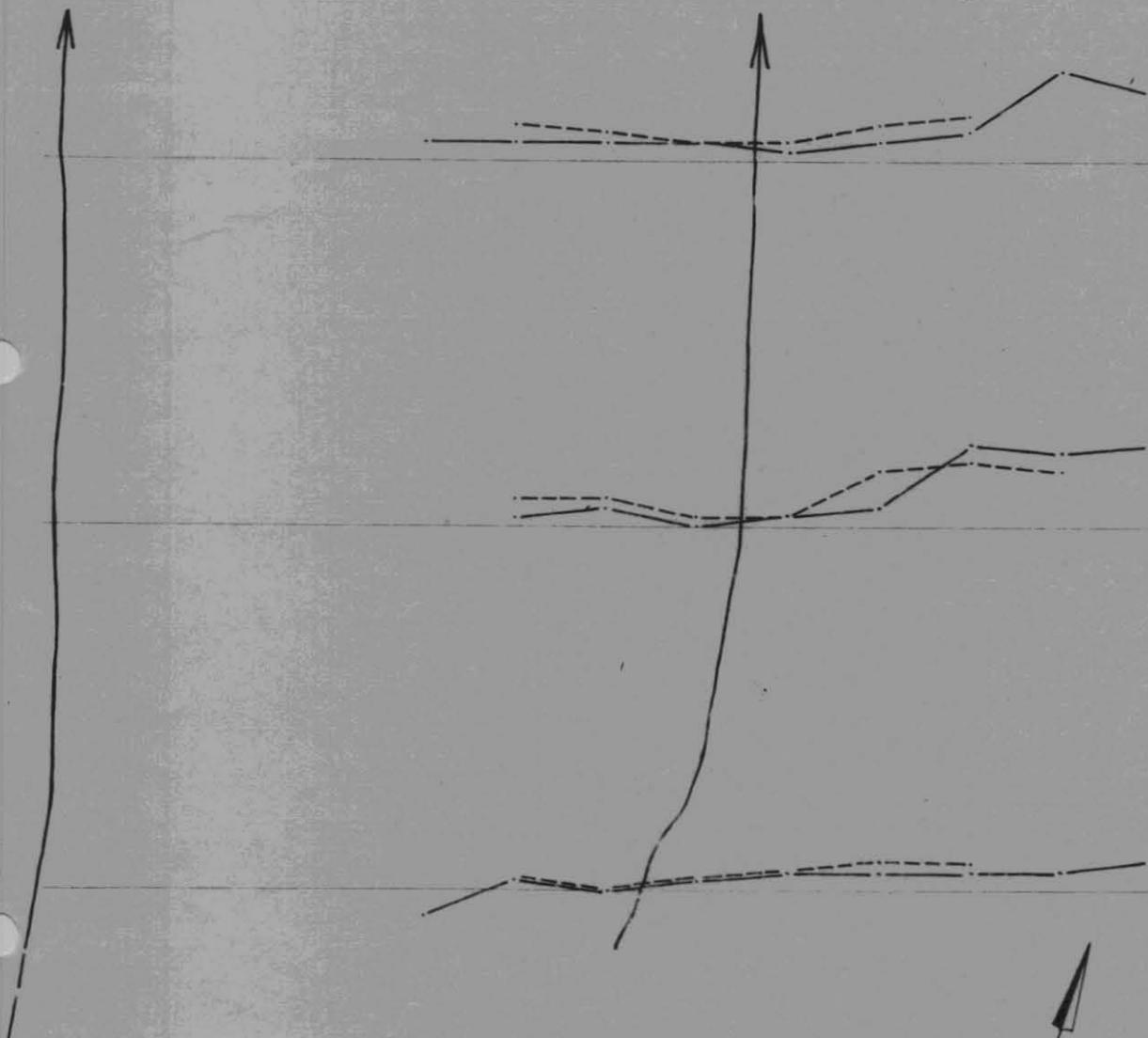
22 E

26 E

28 N

24 N

20 N



5 cm

Mag. North

LEGEND

1000 cps

5000 cps

Transmitter position

Definite conductor

Possible conductor

Probable conductor



FINGAL PROJECT

ANOMALY 8/1

R.E.M. TRAVERSES

Scale: horizontal 200' to 1"

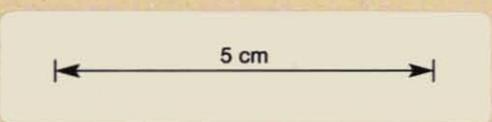
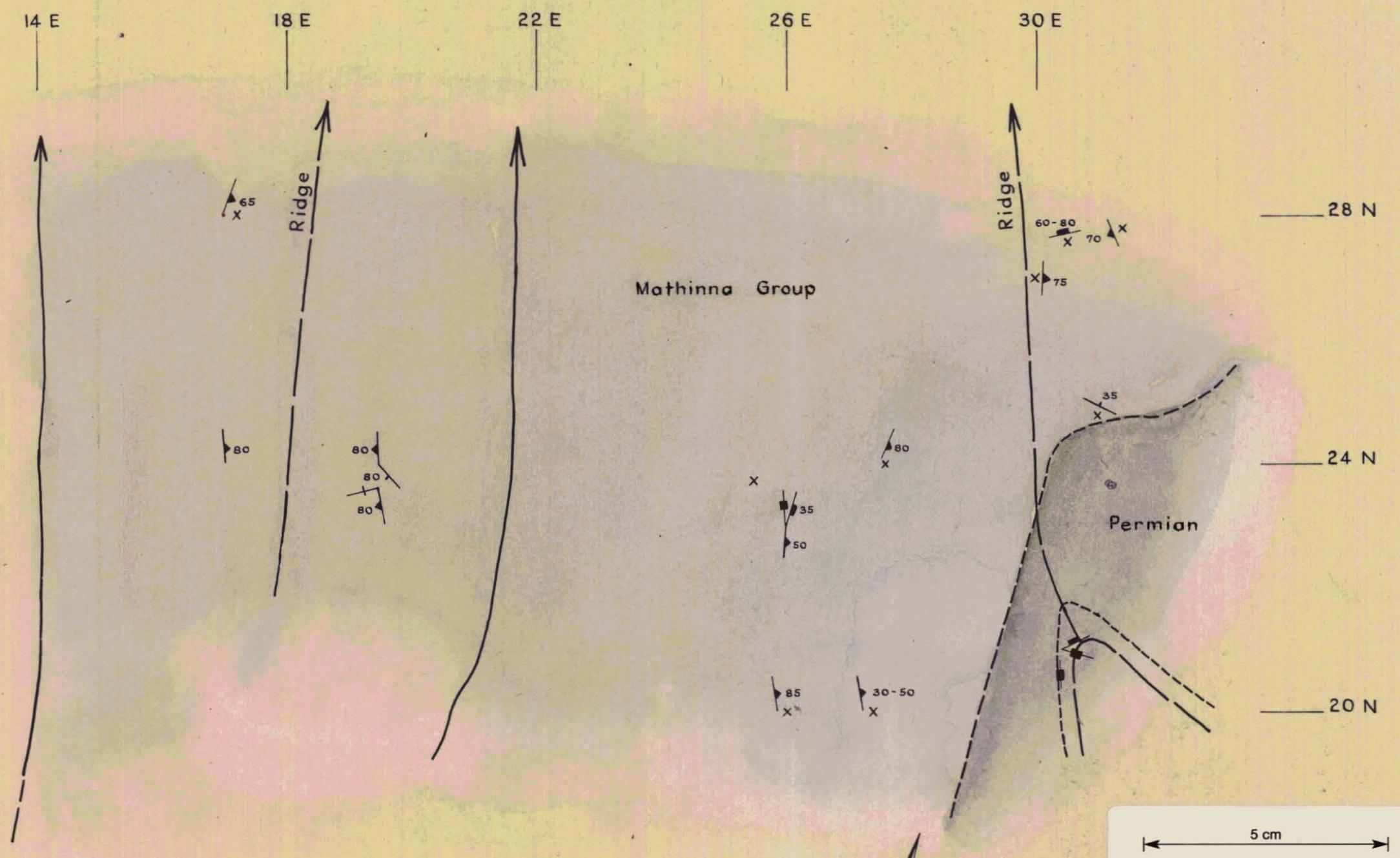
vertical 20° to 1"

Survey:

Grid North = 340°M

025

346027



FINGAL PROJECT
 ANOMALY 8/1
 GEOLOGY

Scale: 200 feet to 1 inch

Geology:
 Grid North = 340° M

026

346028

22 E

26 E

30 E

28 N

24 N

20 N

X
Base Peg.

Mag North

5 cm

LEGEND

1000 cps

5000 cps

Transmitter position

Definite conductor

Possible conductor

Probable conductor

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FINGAL PROJECT

ANOMALY 10/1

R.E.M. TRAVERSES

Scale: horizontal 200' to 1"
vertical 20' to 1"

Survey:
Grid North = 00° M

027

346029

26 E

30 E

34 E

28 N

24 N

20 N

Mag. North

5 cm

LEGEND

1000 cps

5000 cps

Transmitter position

Definite conductor

Possible conductor

Probable conductor



FINGAL PROJECT

ANOMALY 10/2

R.E.M. TRAVERSES

Scale: horizontal 200' to 1"
vertical 20° to 1"

Survey:

Grid North = 015° M

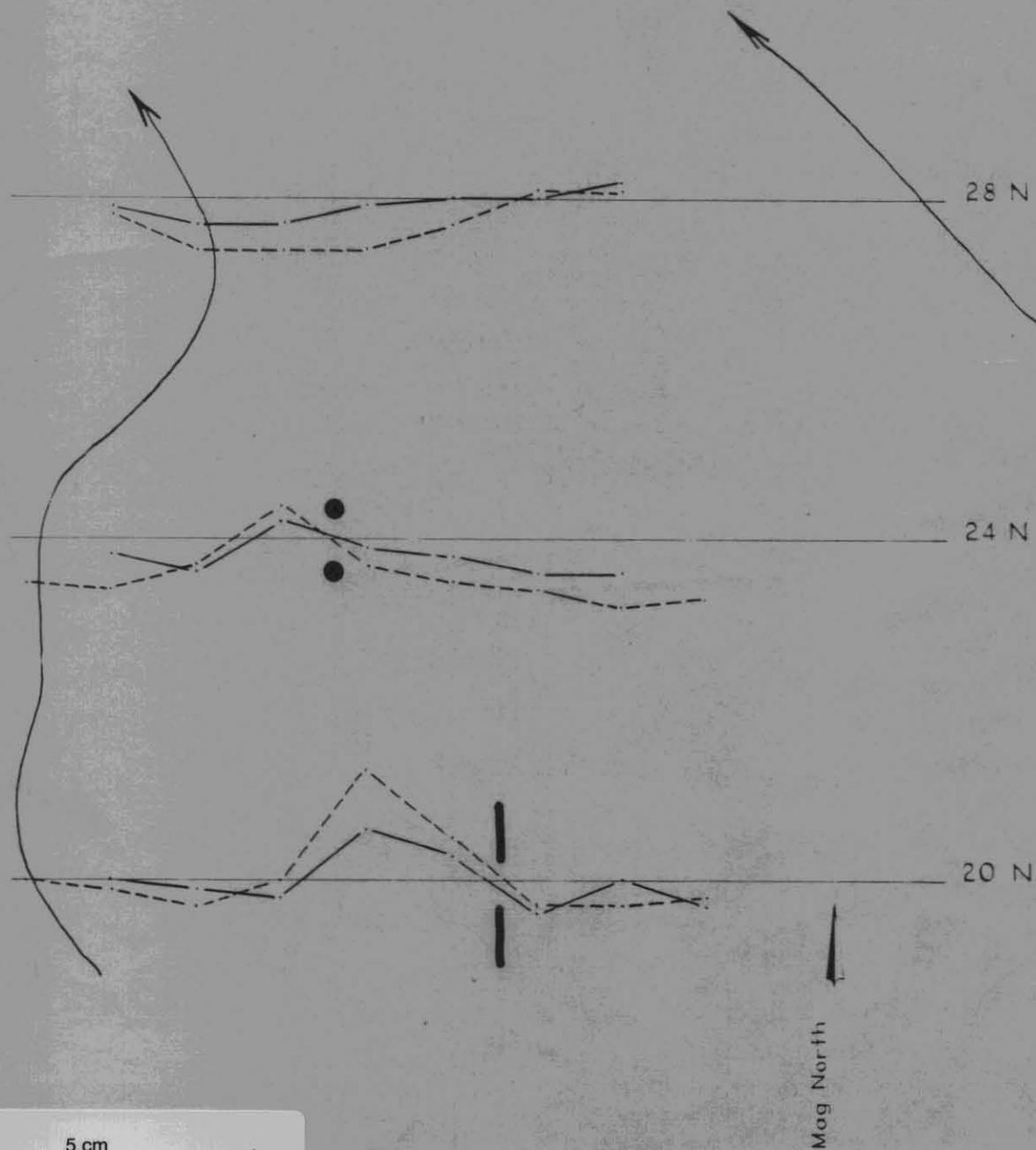
028

20 E

24 E

28 E

346030



LEGEND

1000 cps

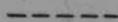
5000 cps

Transmitter position

Definite conductor

Possible conductor

Probable conductor



FINGAL PROJECT

ANOMALY 10/3

R.E.M. TRAVERSES

Scale: horizontal 200' to 1"

vertical 20° to 1"

Survey:

Grid North = 00° M