

NORTHAMPTONSHIRE ARCHAEOLOGY

*A GEOPHYSICAL SURVEY AT
THORPE AND ASGARBY ESTATES,
KIRBY LA THORPE, LINCOLNSHIRE
NOVEMBER 2002*



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NORTHAMPTONSHIRE ARCHAEOLOGY
NORTHAMPTONSHIRE COUNTY COUNCIL
NOVEMBER 2002

A GEOPHYSICAL SURVEY AT
THORPE AND ASGARBY ESTATES,
KIRBY LA THORPE, LINCOLNSHIRE
NOVEMBER 2002

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10 DEC 2002
Highways & Planning
Directorate

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GEOPHYSICAL SURVEY AT THORPE AND ASGARBY ESTATES,

KIRBY LA THORPE, LINCOLNSHIRE, NOVEMBER 2002

ABSTRACT

Geophysical surveys were undertaken on two areas of land with a combined area of approximately 20 hectares at The Thorpe and Asgarby Estates, Kirby La Thorpe, Lincolnshire. Reconnaissance magnetometer survey was carried out across both areas but only seven anomalies were detected, four of these anomalies may represent linear features. Subsequent detailed magnetometer survey of 4 hectares of land targeting the anomalies and blank areas revealed a pattern of land drains and modern gas pipelines.

1 INTRODUCTION

Northamptonshire Archaeology conducted geophysical surveys on two areas of land with a combined area of approximately 20 hectares at The Thorpe and Asgarby Estates, Kirby La Thorpe, Lincolnshire. (NGR TF 1015 4410; Fig 1). The work was commissioned by The Robert Doughty Consultancy Ltd on behalf of the Thorpe and Asgarby Estates, as part of a planning application for development of a reservoir and fishing lake. The geophysical survey met the requirements of a Brief issued by Joanna Hambly, North Kesteven Heritage Officer on 1 August 2002. The purpose of the work was to identify the extent and nature of any buried archaeological remains.

2 TOPOGRAPHY AND GEOLOGY

At the time of the survey Field 1, the proposed reservoir site, was stubble and Field 2, the proposed fishing lake, was under crop. The British Geological Survey has mapped the underlying geology as Jurassic Oxford Clay with overlying soils of the Denchworth Series. The two fields were flat.

3 ARCHAEOLOGICAL BACKGROUND

The site lies within an area of rich archaeological remains, identified as cropmarks and recovered artefacts. A recent archaeological excavation of some of these cropmarks prior to the installation of a high-pressure gas pipeline, to the north of the reservoir site, identified Iron Age and Romano-British settlement. Within the area of the reservoir (Field 1) no cropmarks were identified, but any continuation of a curvilinear cropmark to the west would extend into the development area.

The area of the reservoir development (Field 1) was an historic meeting place in the Saxon period, once possibly identified by a now lost Saxon stone marker. Medieval field boundaries and post-medieval building remains have been recorded in the area of the development, (NA 2002).

4 *METHOD*

Both reconnaissance and detailed surveys were undertaken using a Geoscan Research FM36 Fluxgate Gradiometer. All fieldwork was in accordance with English Heritage Guidelines (EH 1995).

4.1 *RECONNAISSANCE SURVEY*

For the reconnaissance survey transects were set out at 20m intervals across the field north to south and were then traversed at rapid walking pace whilst continually monitoring the magnetic response of the ground. Where readings $>+3\text{nT}$ or $<-3\text{nT}$ above or below the general background level were observed, more detailed investigation was carried out in the locality to ascertain the extent of the anomalous reading. The positions of all anomalies greater than 2m x 2m in extent were then plotted (Figs 2 and 3).

4.2 *DETAILED SURVEY*

A total of ninety-seven separate 20m x 20m grid-squares were surveyed in detail. Each grid-square was traversed at rapid walking pace via parallel traverses spaced at 1m intervals. A sample trigger recorded readings every 0.25m along the traverse. At the end of each grid the sensor alignment was checked and a tilt error of below $\pm 2\text{nT}$ per $\pm 2^\circ$ tilt was maintained.

The data were analysed using Geoplot 3.0 software. Low magnetism is shown as white and high magnetism as black in the resultant plots. The data were processed using an algorithm to remove magnetic spikes, thereby reducing extreme readings sometimes caused by stray iron fragments and spurious effects due to the inherent magnetism of soils. The 'Zero Mean Traverse' algorithm was used in order to 'smooth' the variation between individual grid-squares. No other processing functions were employed. The raw and processed data is presented here in the form of greyscale plots (Figs 24 and 25).

5 *SURVEY RESULTS*

The reconnaissance survey located only seven anomalies (Figs 2 and 3, A-G). Three of the anomalies identified were isolated, the other four were believed to be linear.

The anomalies detected by the reconnaissance survey were investigated by a detailed survey. Blank areas were also investigated as a control on the reconnaissance survey. The 20m x 20m grids were placed randomly in blocks of four or six over the two sites to cover an area of 20% of the total area.

FIELD 1, RESERVOIR SITE

A total of eighteen individual areas were investigated in detail (Figs 4-21, 24 and 26).

AREA 1r (FIG 4)

Two linear anomalies were identified. The first runs east to west across the north of the area. The second runs south-west to north-east and intersects the other anomaly, which was identified from the reconnaissance survey (Fig 2, C).

AREA 2r (FIG 5)

A single linear anomaly that runs south-west to north-east was identified.

AREA 3r (FIG 6)

A linear anomaly that runs south-west to north-east, identified from the reconnaissance survey (Fig 2, D).

AREA 4r (FIG 7)

Two parallel linear anomalies that both run south-west to north-east.

AREA 5r (FIG 8)

A single linear anomaly, which runs south-west to north-east, identified from the reconnaissance survey (Fig 2, B). Six isolated sub circular anomalies were also identified.

AREA 15r (FIG 18)

A south-west to north-west orientated linear anomaly.

AREAS 6r-14r, 16r-18r (FIGS 9-17, 19-21)

The remaining areas of the reservoir site contained no significant anomalies.

FIELD 2, FISHING LAKE (BORROW PIT)

A total of four individual areas were investigated in detail (Figs 22, 23, 25 and 27).

AREA 1b (FIG 22)

A modern pipeline affected this area and no archaeology was identified.

AREA 2b (FIG 23)

Three parallel linear anomalies were identified that run north to south.

AREA 3b (FIG 23)

The detailed survey identified three parallel linear anomalies, orientated north to south.

AREA 4b (FIG 23)

Seven parallel linear anomalies, orientated north to south, were identified from the detailed survey. Three of these anomalies were identified from the reconnaissance survey (Fig 3 E, F & G). The survey also identified an east to west orientated linear anomaly.

6 CONCLUSION

While several linear and isolated anomalies were recorded from the reconnaissance survey, the subsequent detailed survey revealed these features as modern land drains. The drains follow a single orientation in each field leading water to open watercourses at the edge of the field.

Detailed survey also recorded six sub-circular anomalies, which are isolated spikes caused by metallic materials probably of recent date. There was also a clear modern pipe (Area 15r).

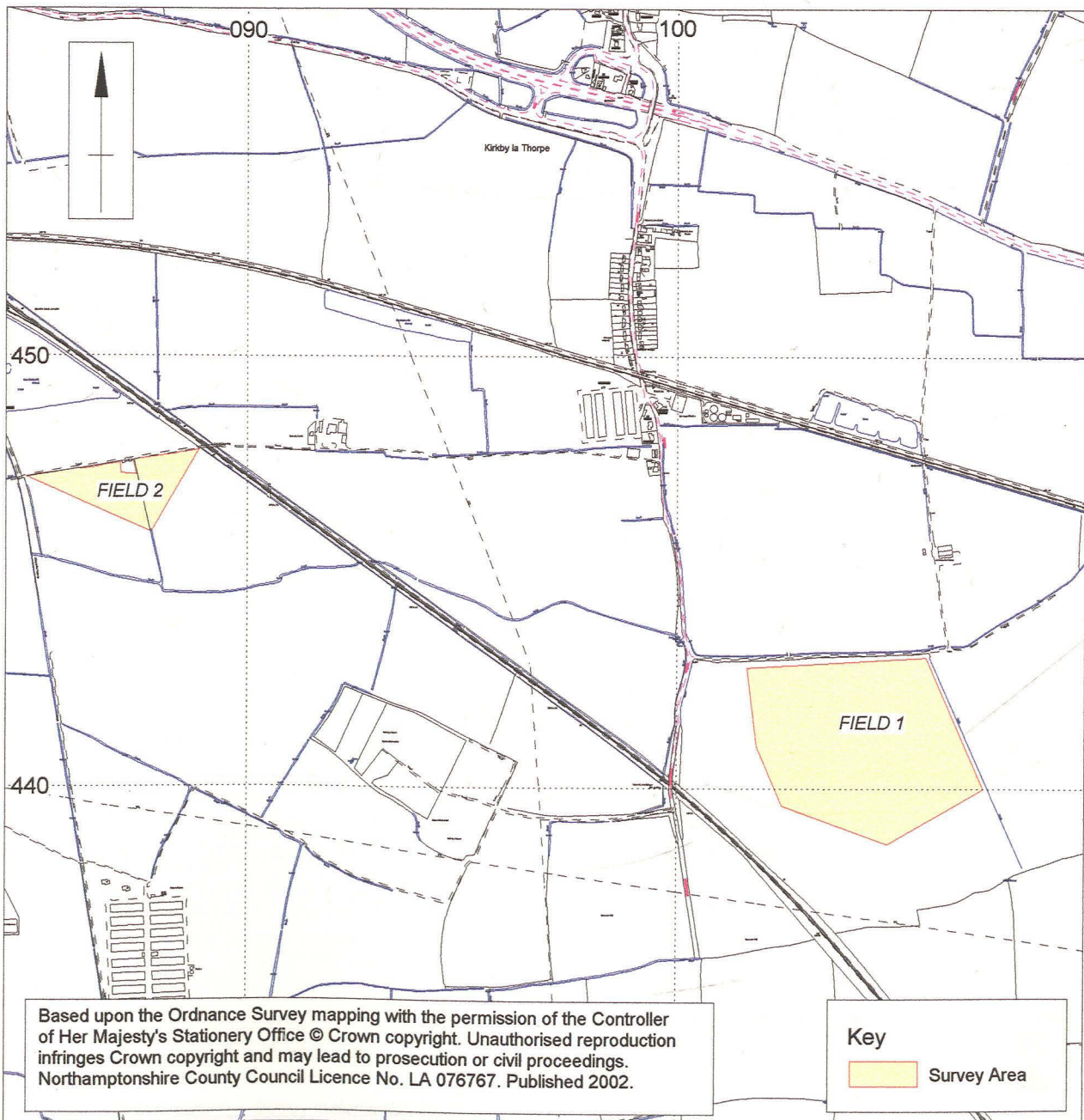
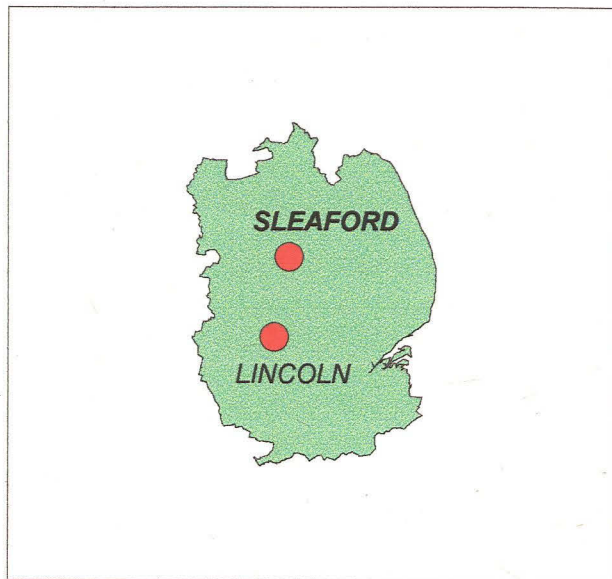
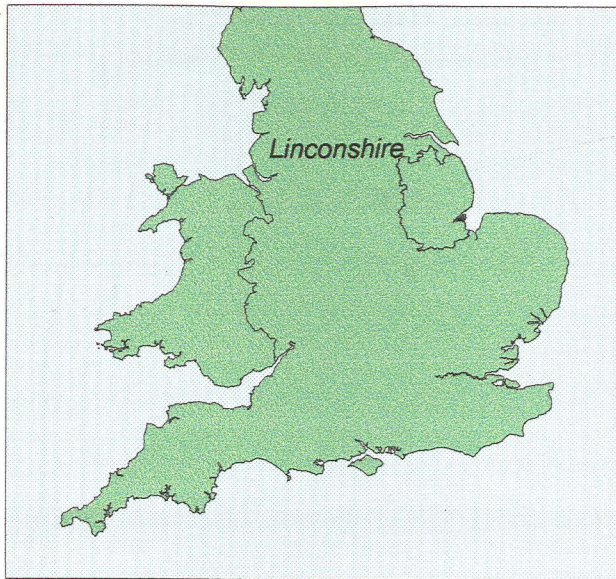
The land drains stand out due to a low background magnetic response, but their magnetic response was actually low, in the order of +1nT to +2nT with some higher readings, which were picked out in the reconnaissance survey.

7 REFERENCES

English Heritage 1995 *Geophysical Survey in Archaeological Field Evaluation*,
Research and Professional Services Guideline No. 1

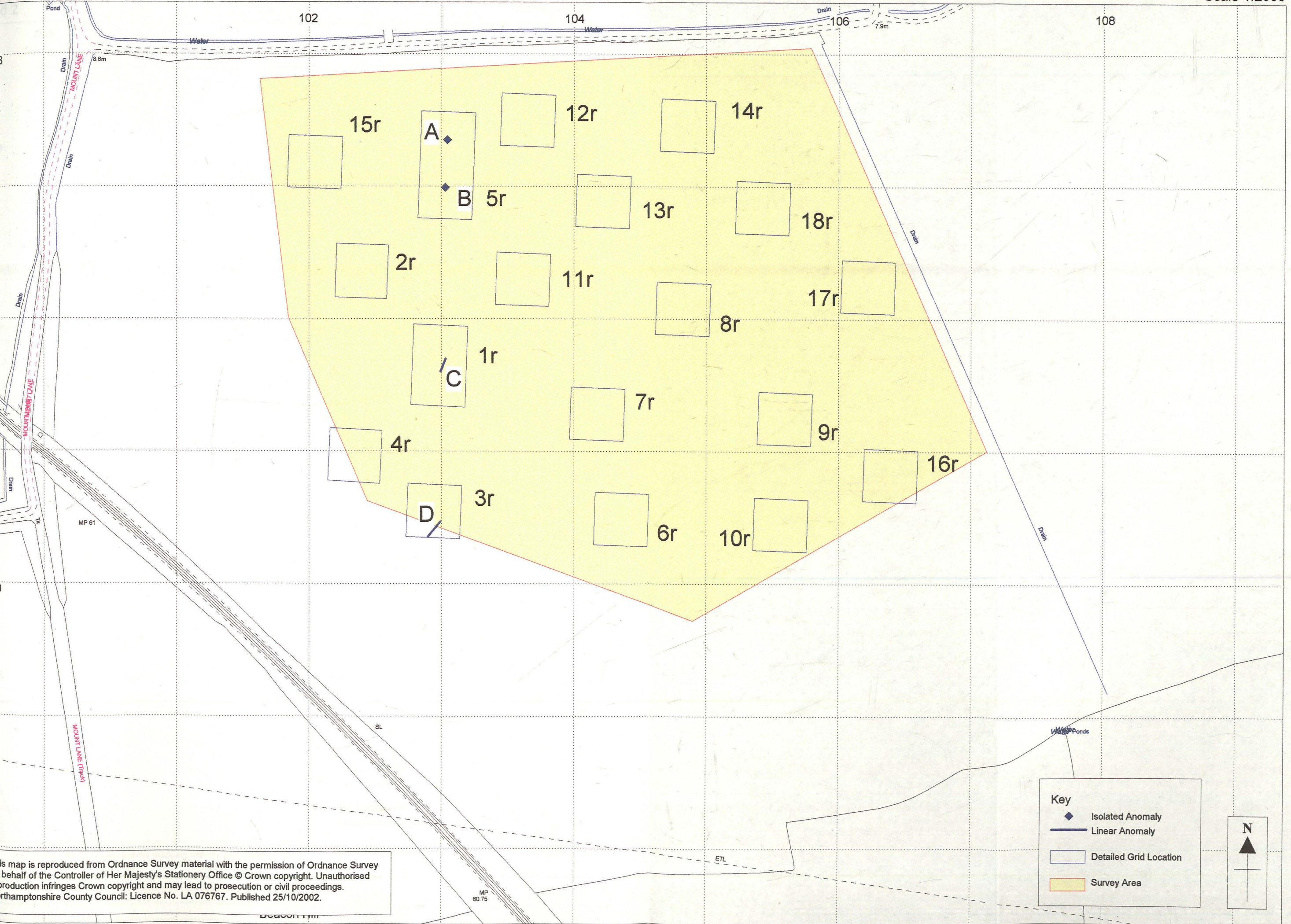
NA 2002 *Archaeological Specification for a geophysical survey for the evaluation of land at Kirby La Thorpe, Lincolnshire*, Northamptonshire Archaeology report

Location Map



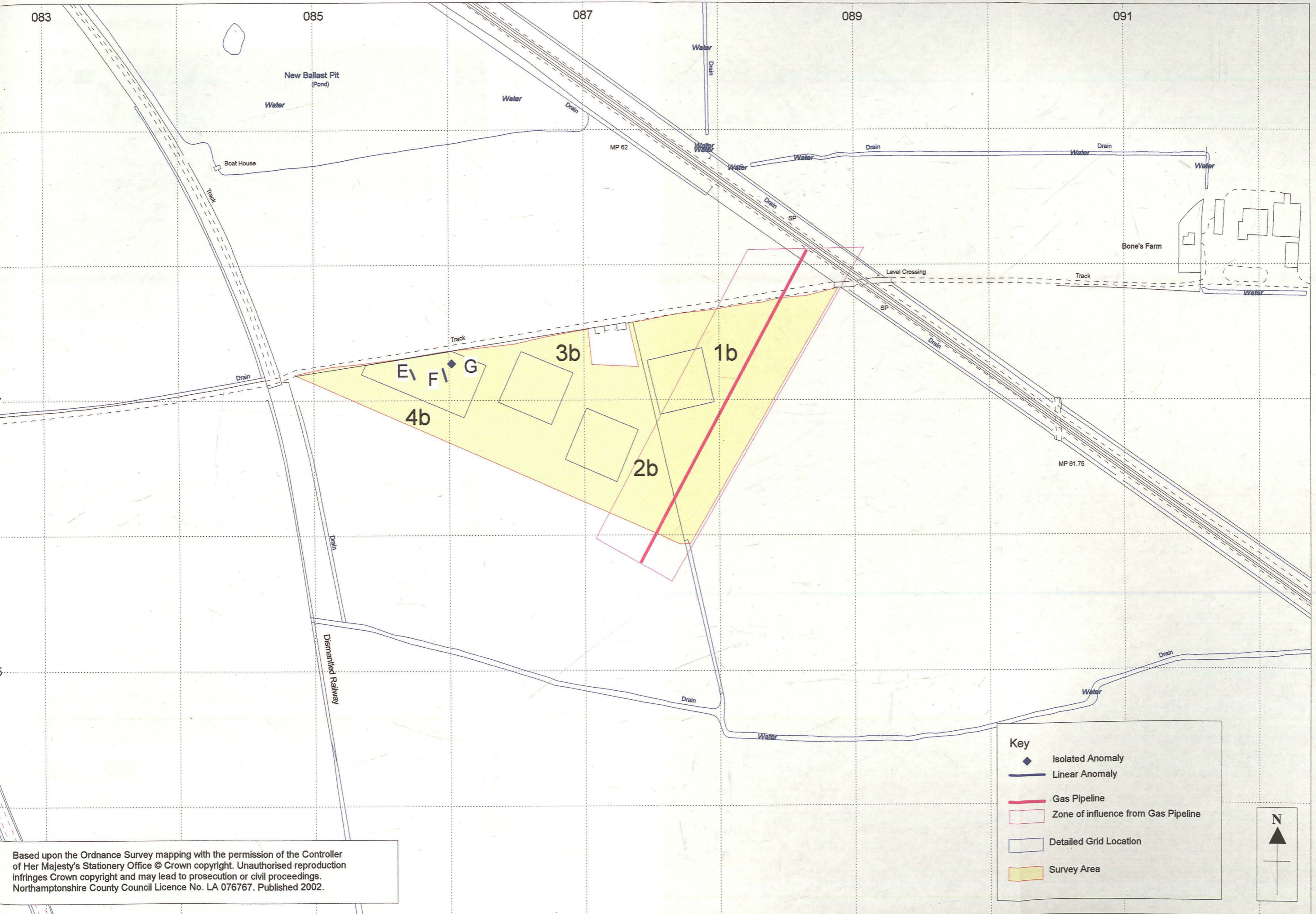
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Fig 1



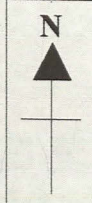
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Fig 2



Key

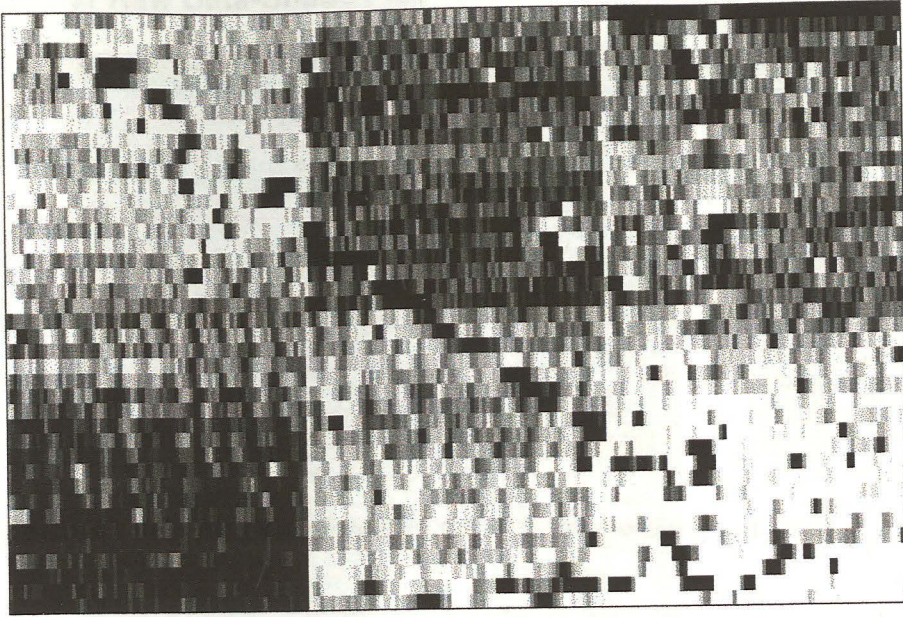
- ◆ Isolated Anomaly
- Linear Anomaly
- Gas Pipeline
- Zone of influence from Gas Pipeline
- Detailed Grid Location
- Survey Area



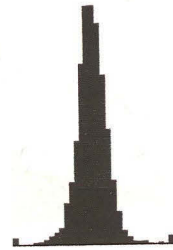
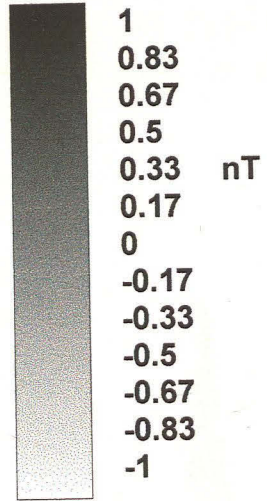
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Fig3

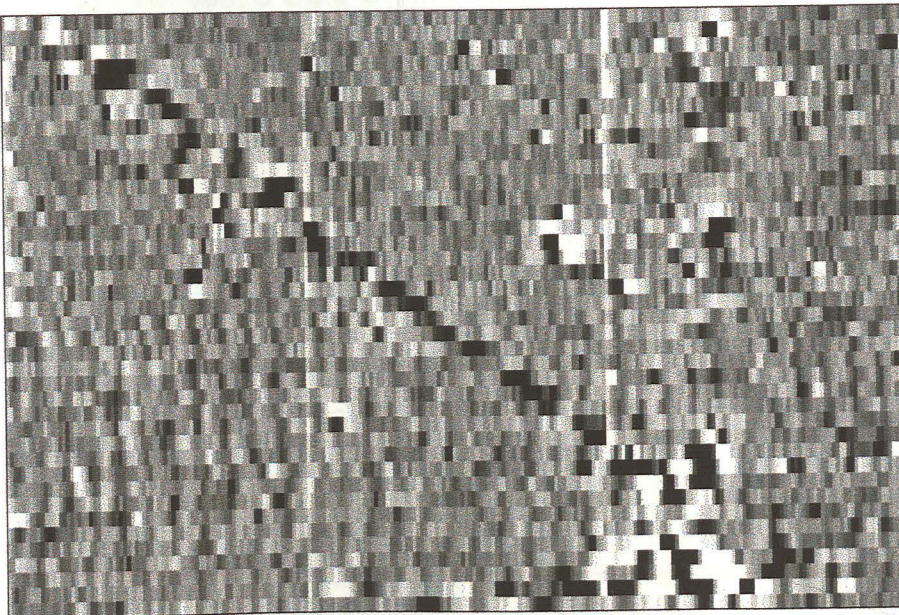
1r Raw Data-Shade Plot



20m



1r Processed Data-Shade Plot



20m

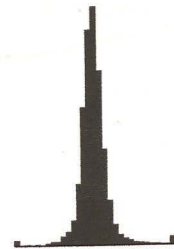
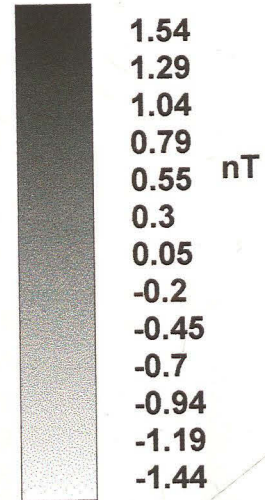
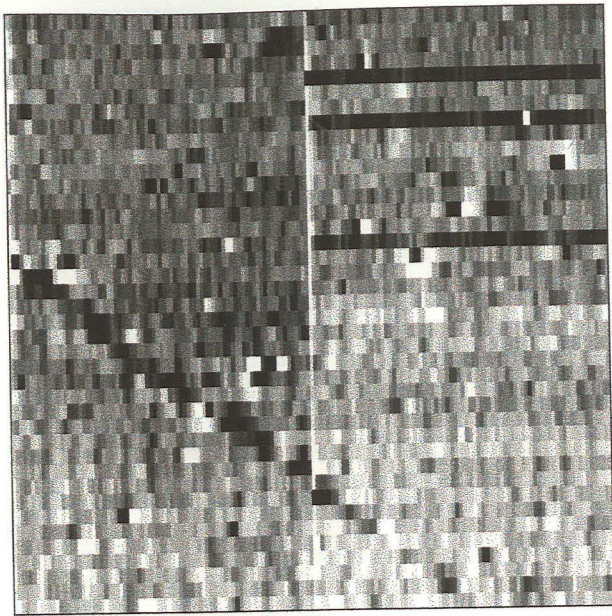


Fig 4

2r Raw Data-Shade Plot

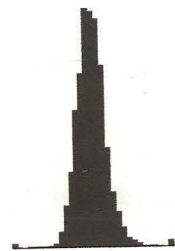


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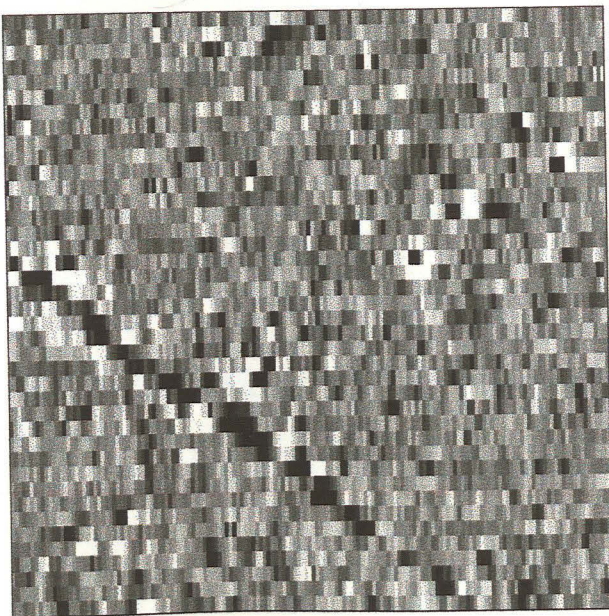


1.32
1.07
0.82
0.58
0.33
0.08
-0.16
-0.41
-0.66
-0.91
-1.15
-1.4
-1.65

nT



2r Processed Data-Shade Plot



20m



1.03
0.86
0.69
0.52
0.35
0.17
0
-0.17
-0.34
-0.51
-0.69
-0.86
-1.03

nT

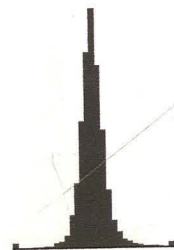
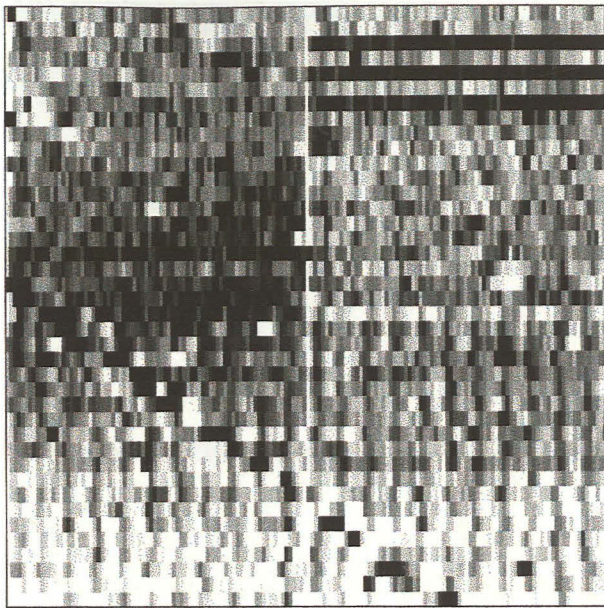


Fig 5

3r Raw Data-Shade Plot



20m

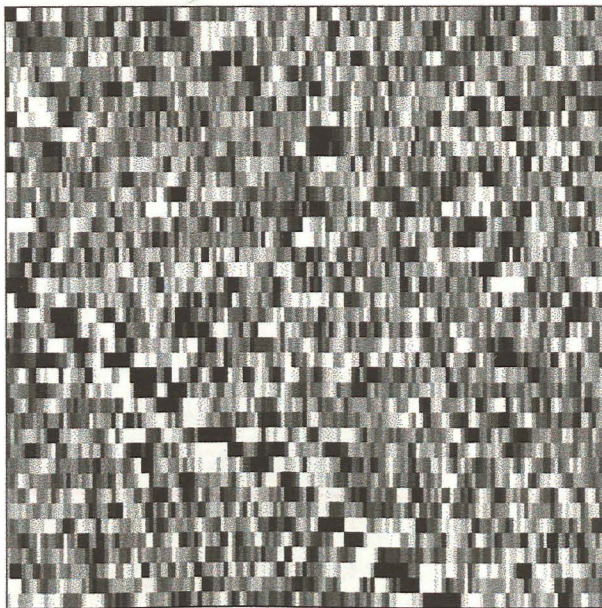


0.95
0.81
0.66
0.52
0.37
0.23
0.08
-0.06
-0.21
-0.35
-0.5
-0.64
-0.78

nT



3r Processed Data-Shade Plot



20m



0.61
0.51
0.41
0.31
0.21
0.11
0.02
-0.08
-0.18
-0.28
-0.38
-0.48
-0.58

nT

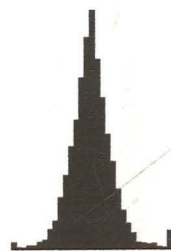
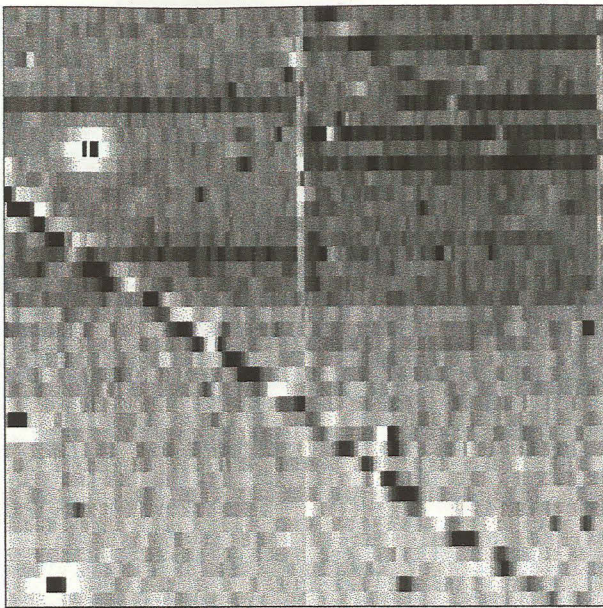
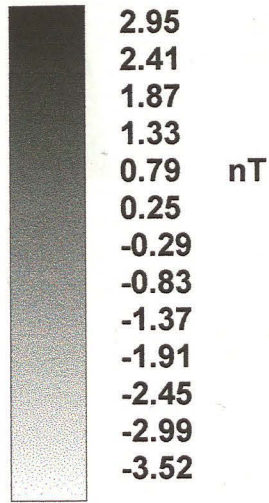


Fig 6

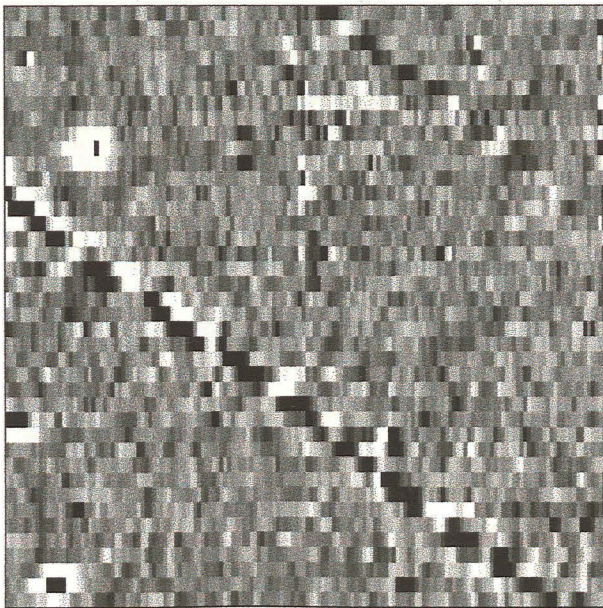
4r Raw Data-Shade Plot



20m



4r Processed Data-Shade Plot



20m

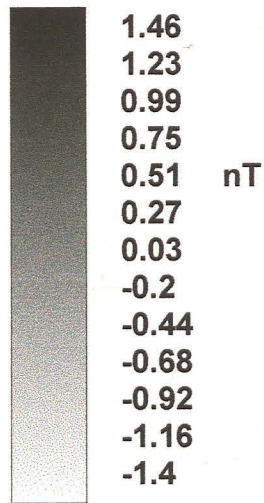
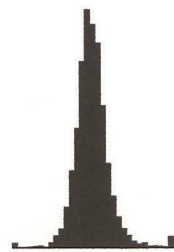
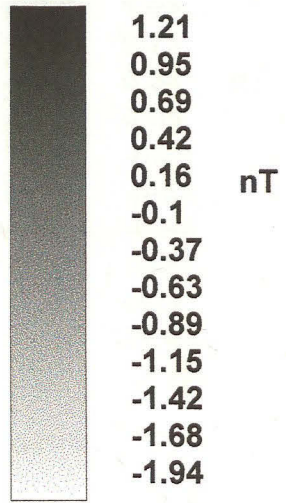
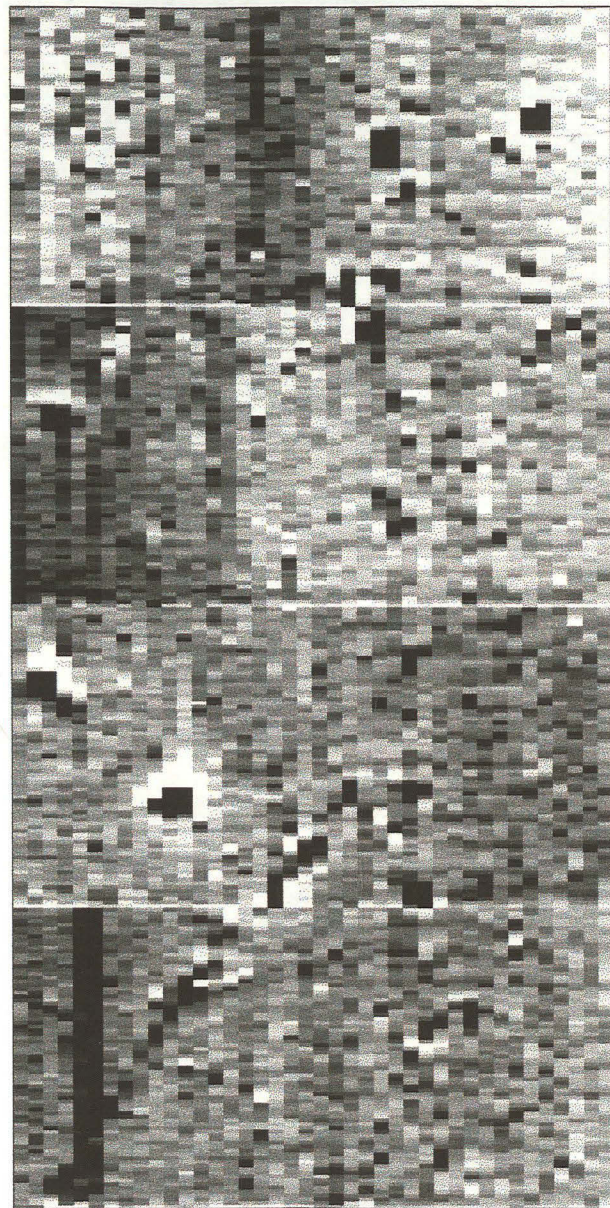


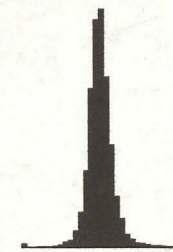
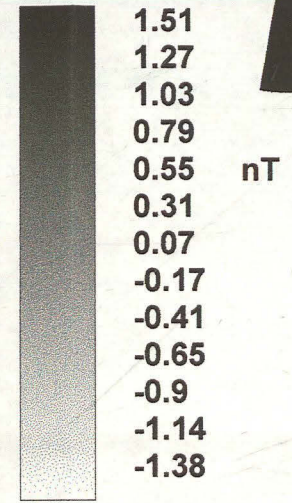
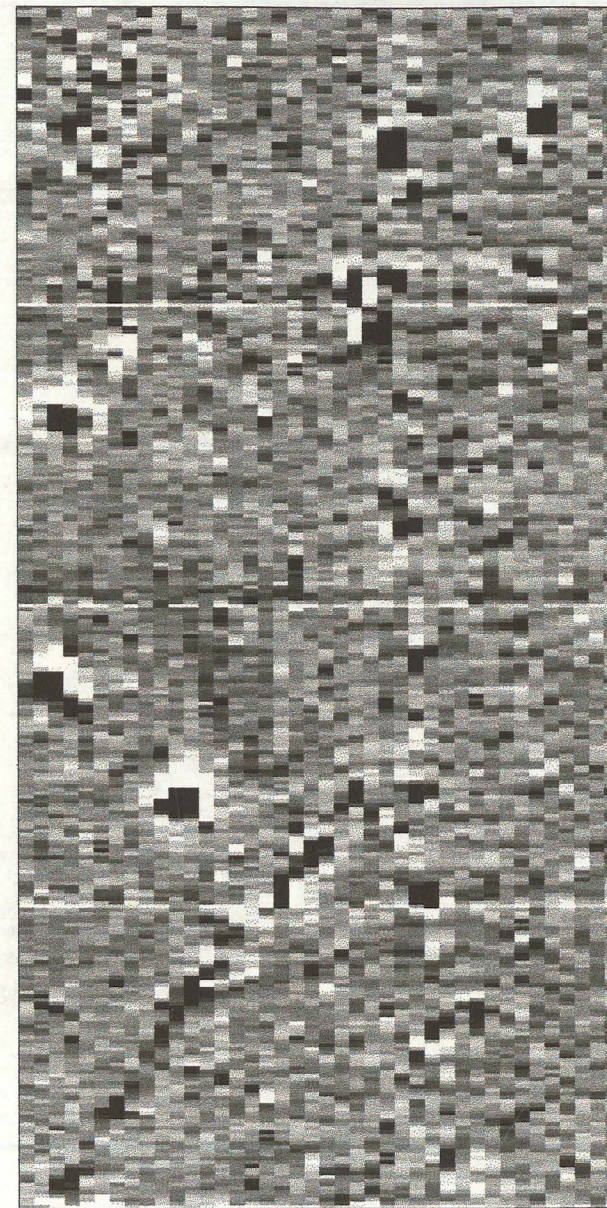
Fig 7

5r Raw Data-Shade Plot



20m

5r Processed Data-Shade Plot

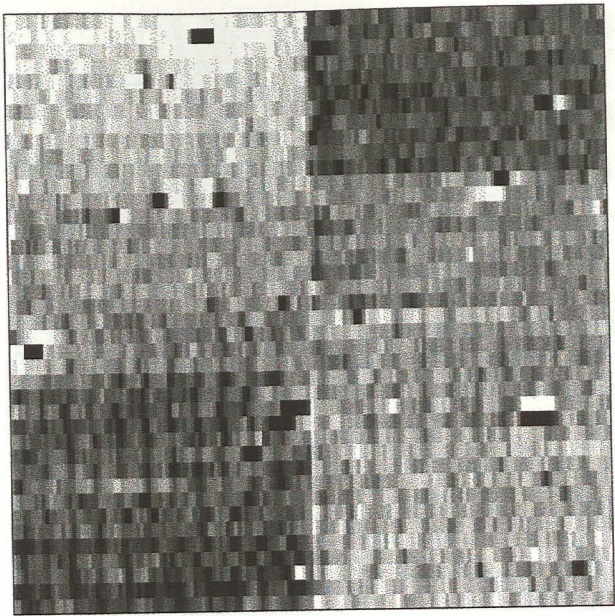


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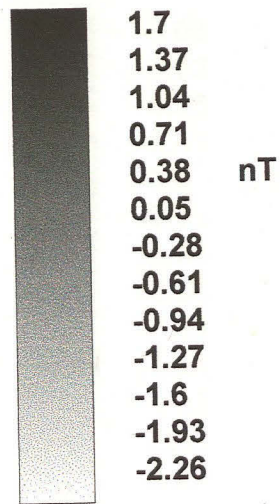


Fig 8

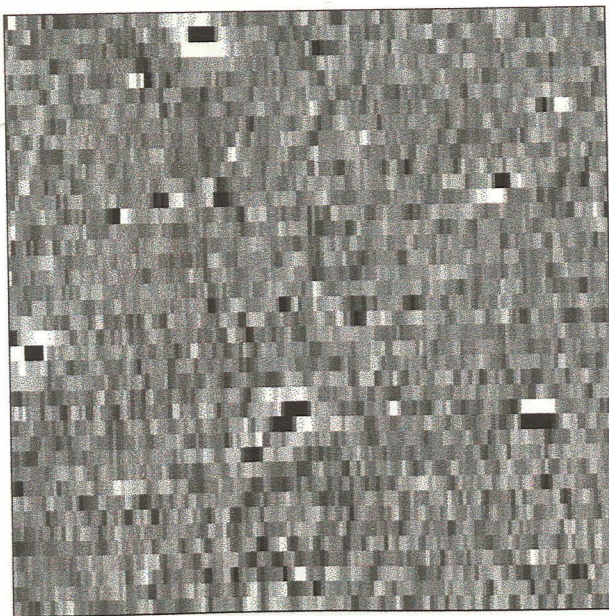
6r Raw Data-Shade Plot



20m



6r Processed Data-Shade Plot



20m

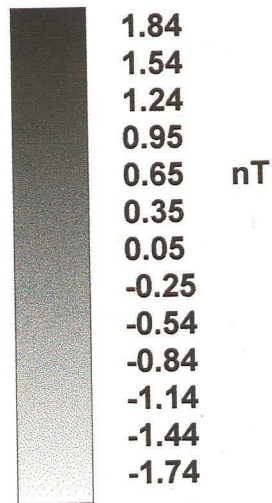
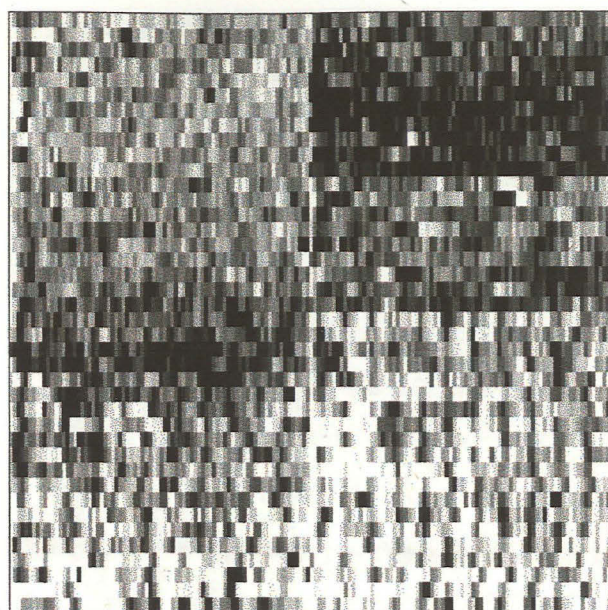
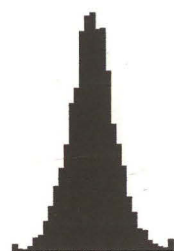
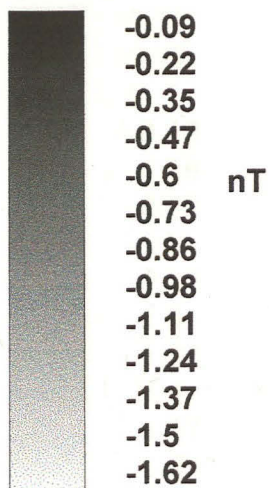


Fig 9

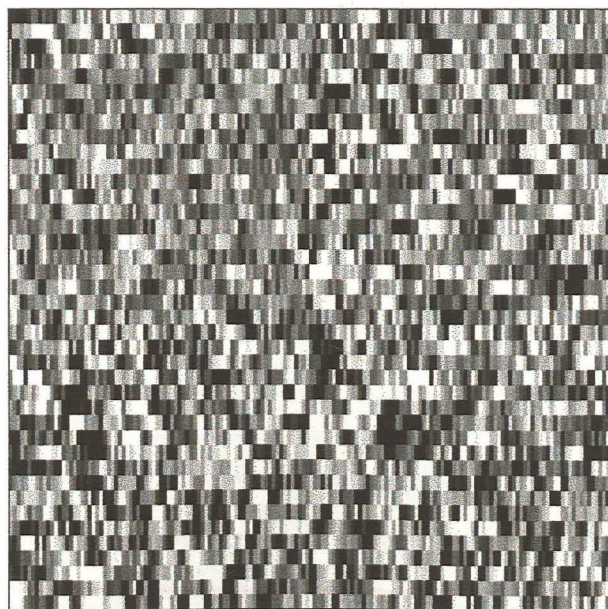
7r Raw Data-Shade Plot



20m



7r Processed Data-Shade Plot



20m

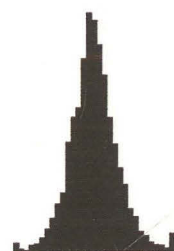
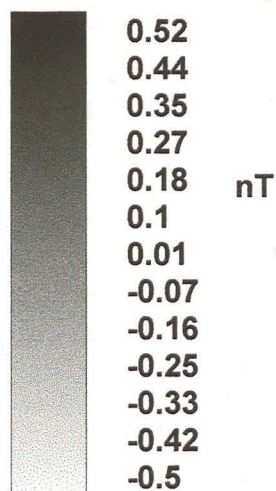
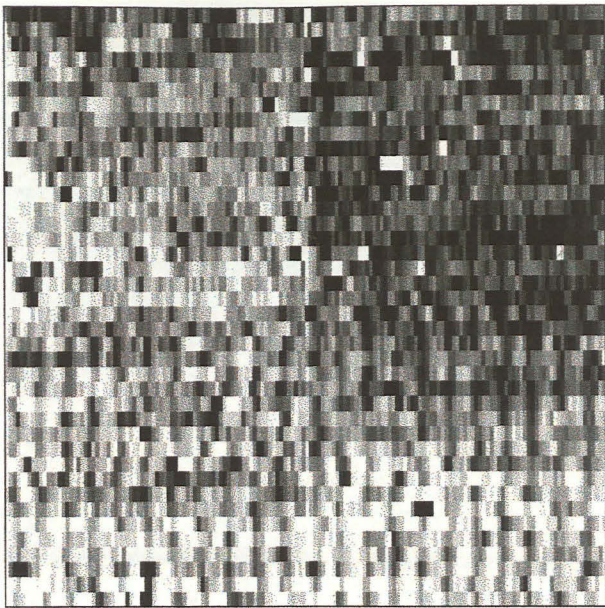


Fig 10

8r Raw Data-Shade Plot

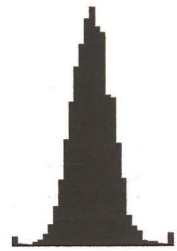


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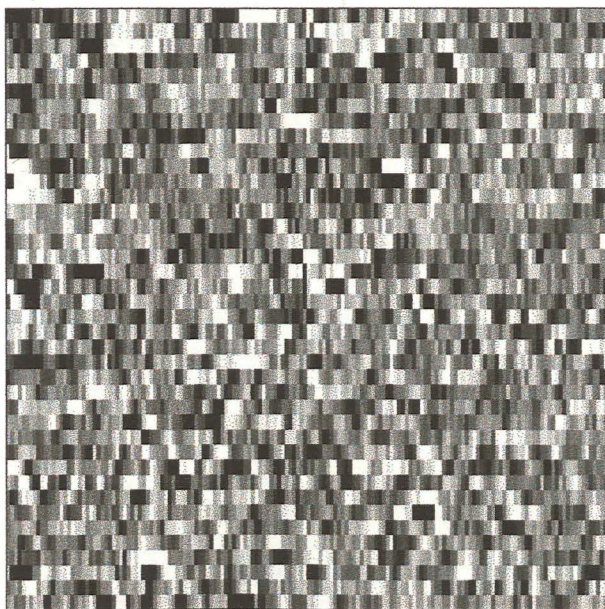


0.35
0.17
0
-0.18
-0.35
-0.53
-0.7
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-1.05
-1.22
-1.4
-1.57
-1.75

nT



8r Processed Data-Shade Plot



20m



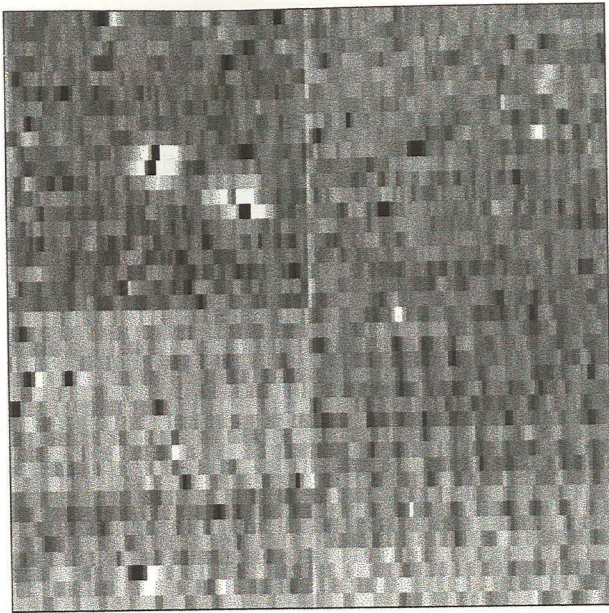
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0.66
0.53
0.4
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-0.77

nT

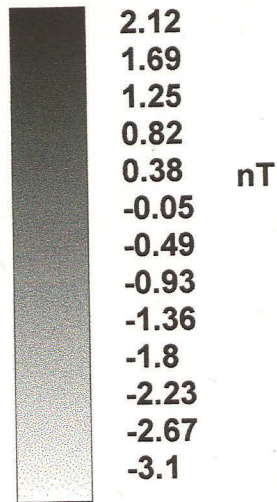


Fig 11

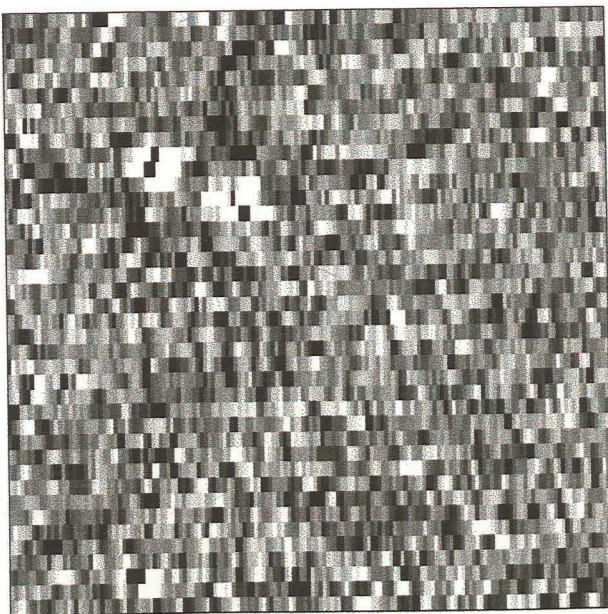
9r Raw Data-Shade Plot



20m



9r Processed Data-Shade Plot



20m

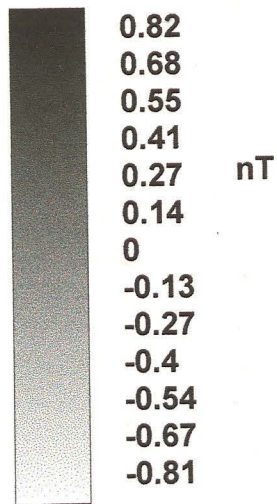
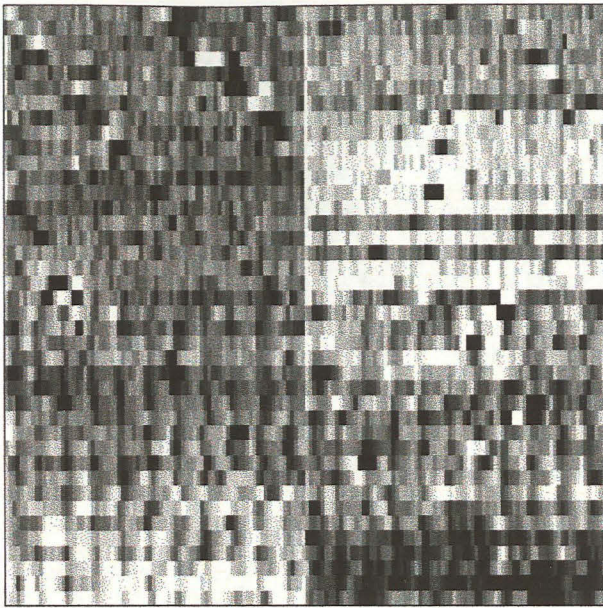
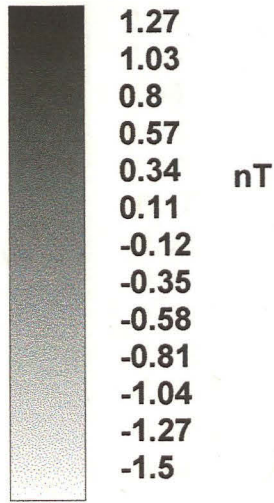


Fig 12

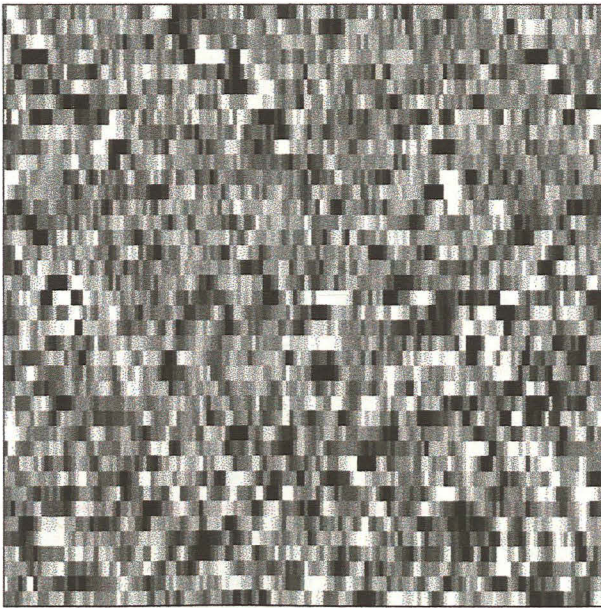
10r Raw Data-Shade Plot



20m



10r Processed Data-Shade Plot



20m

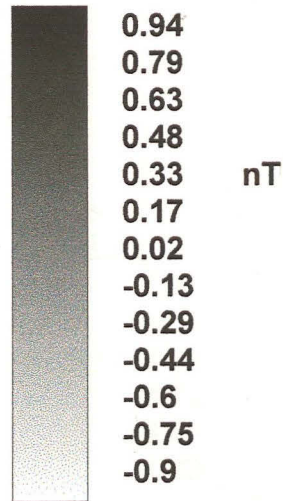
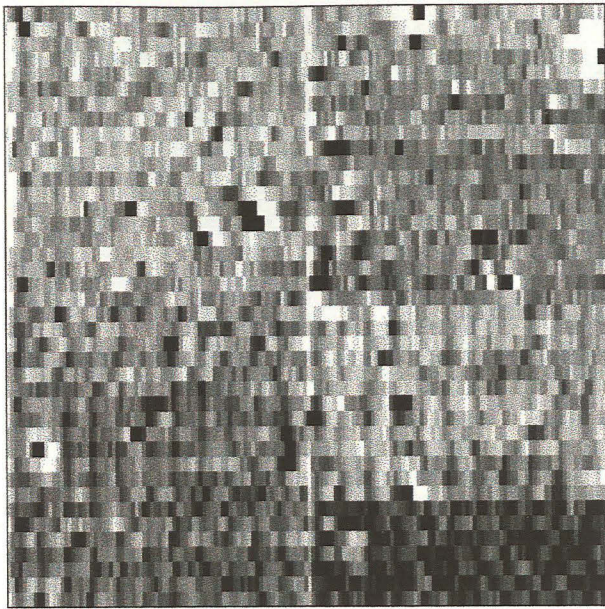
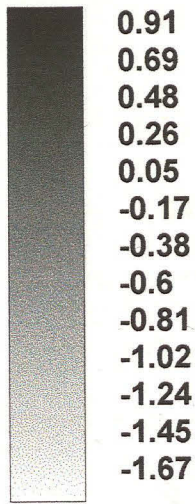


Fig 13

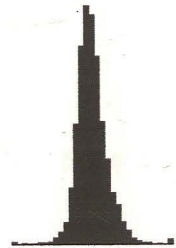
11r Raw Data-Shade Plot



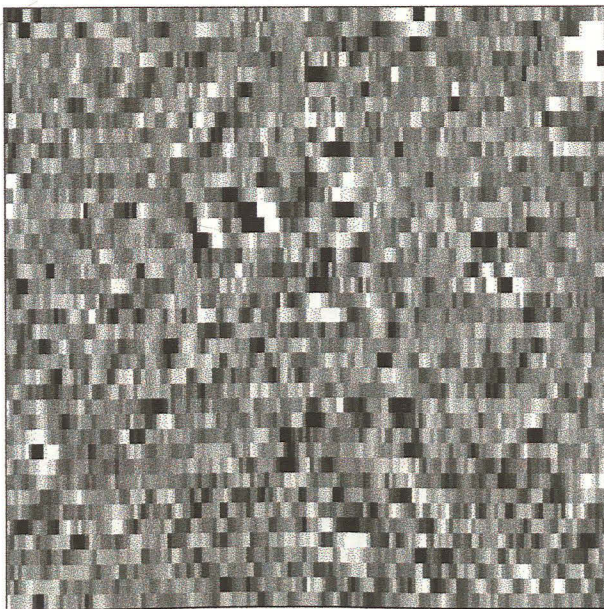
20m



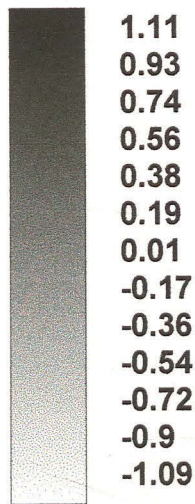
nT



11r Processed Data-Shade Plot



20m



nT

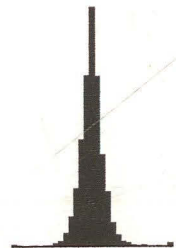
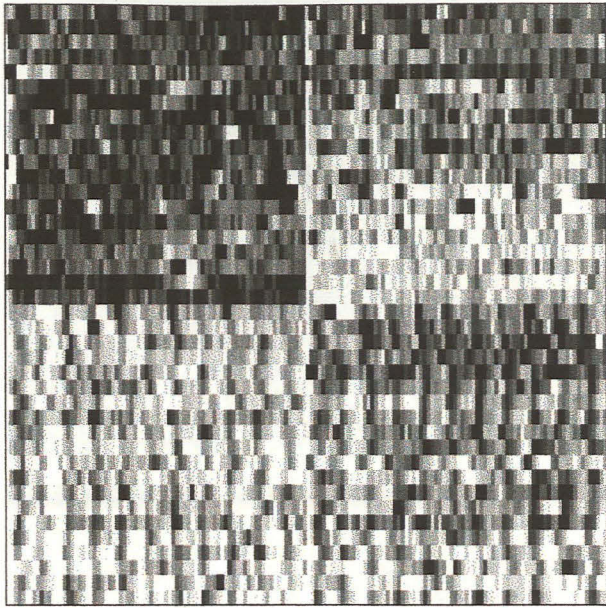
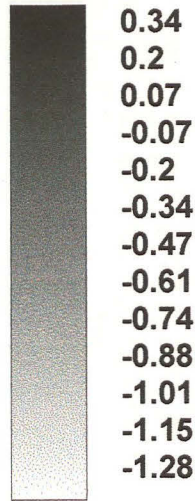


Fig 14

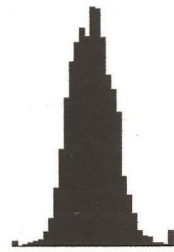
12r Raw Data-Shade Plot



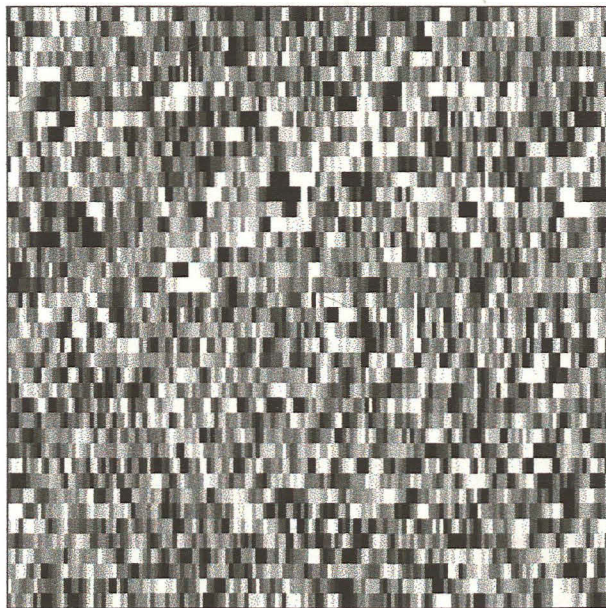
20m



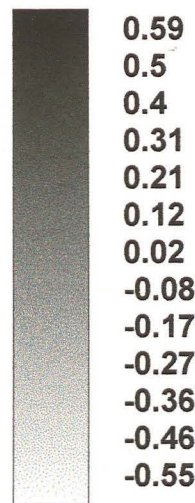
nT



12r Processed Data-Shade Plot



20m

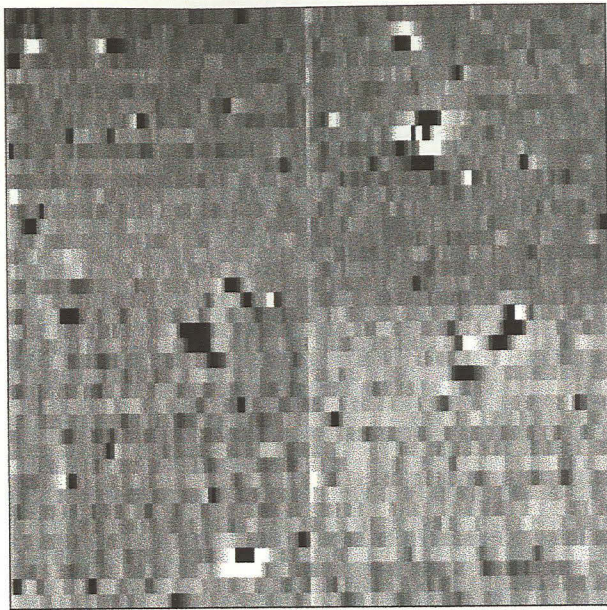


nT

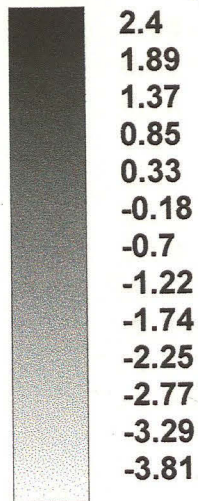


Fig 15

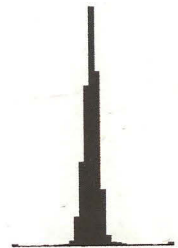
13r Raw Data-Shade Plot



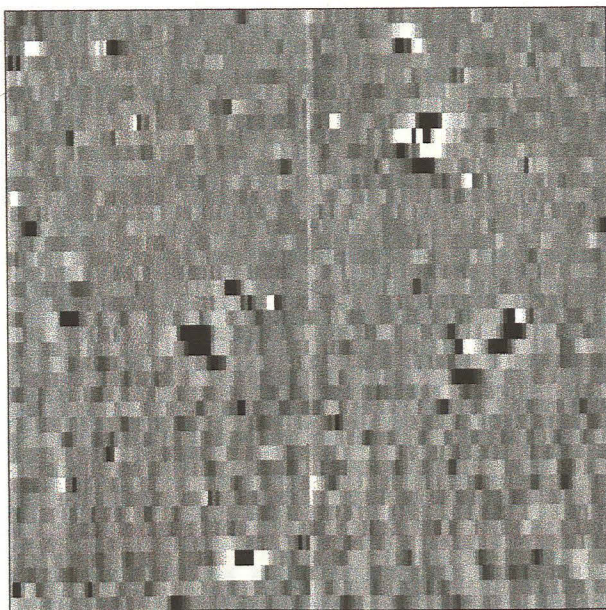
20m



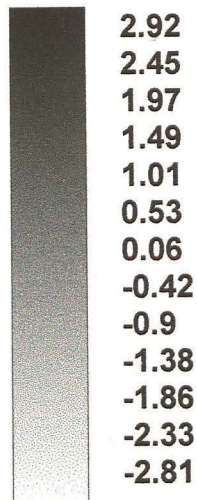
nT



13r Processed Data-Shade Plot



20m

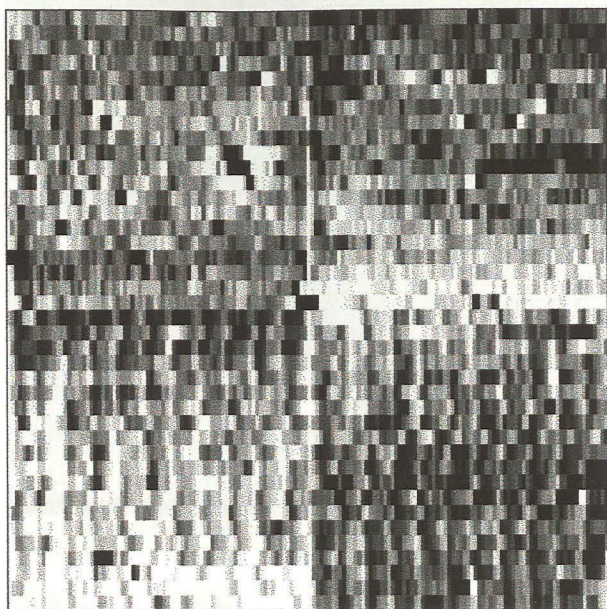


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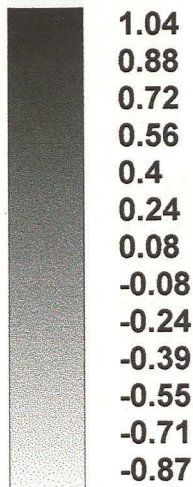


Fig 16

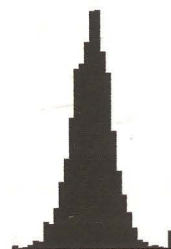
14r Raw Data-Shade Plot



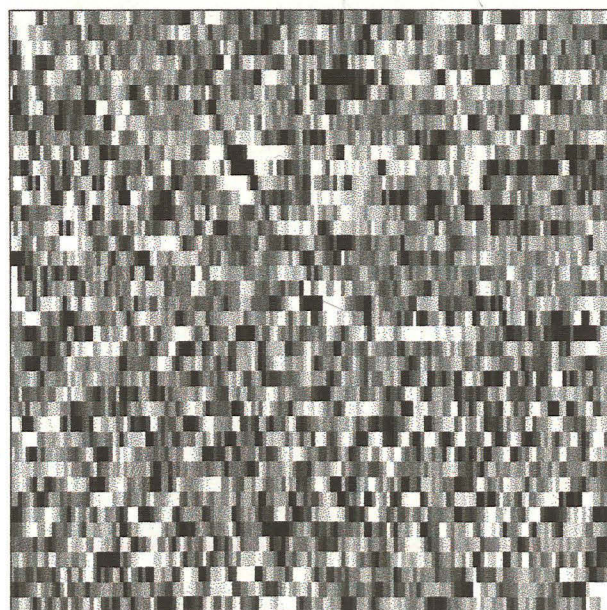
20m



nT



14r Processed Data-Shade Plot



20m



nT

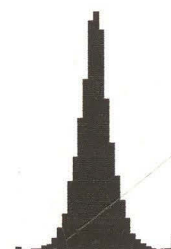
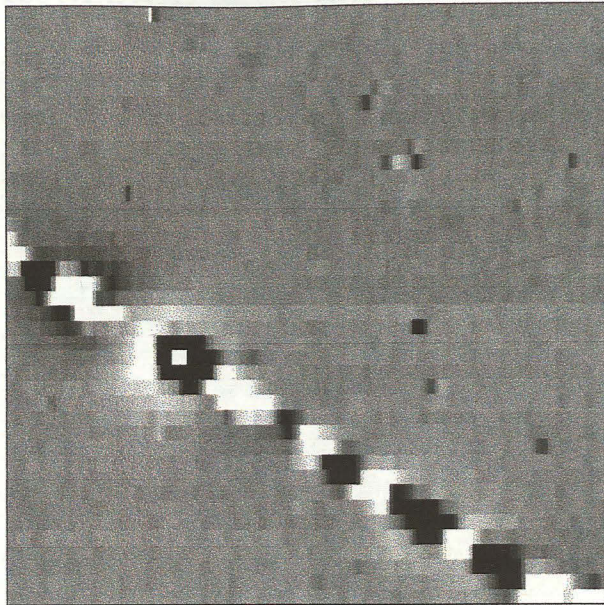
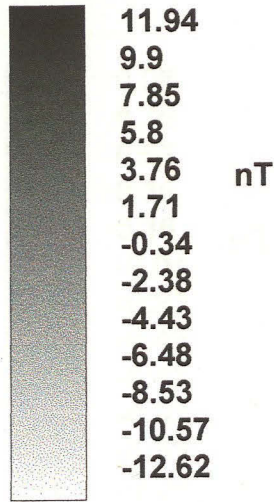


Fig 17

15r Raw Data-Shade Plot



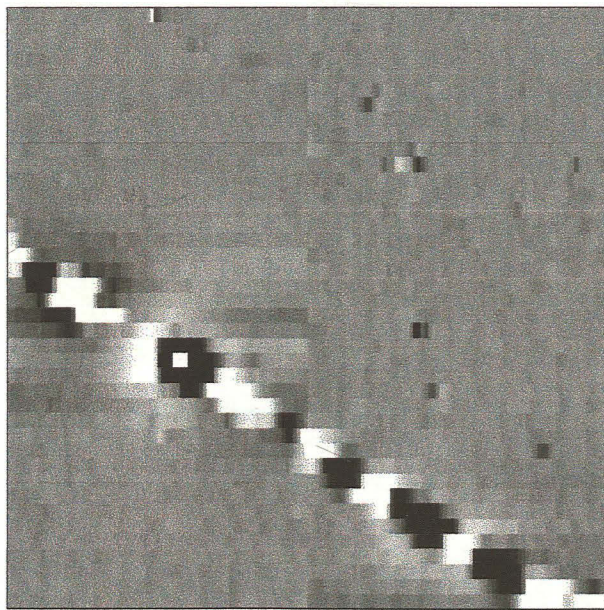
20m



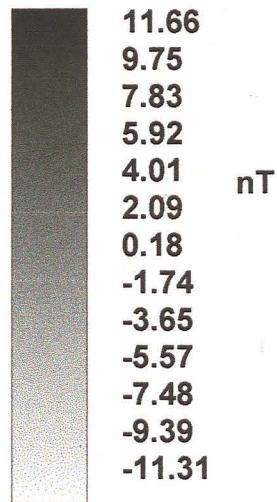
nT



15r Processed Data-Shade Plot



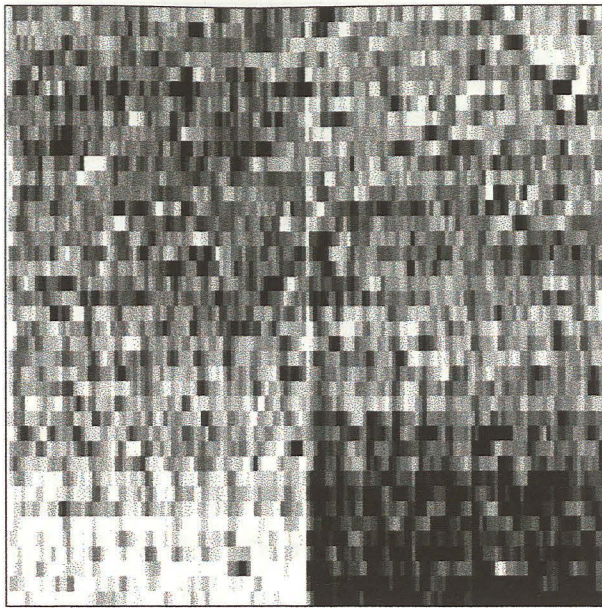
20m



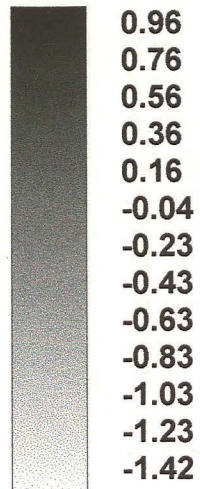
nT

Fig 18

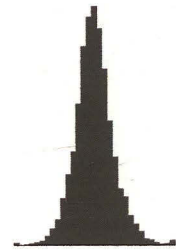
16r Raw Data-Shade Plot



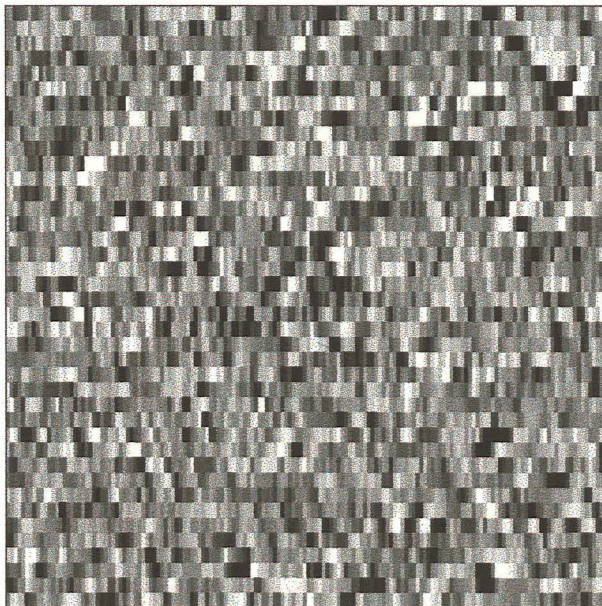
20m



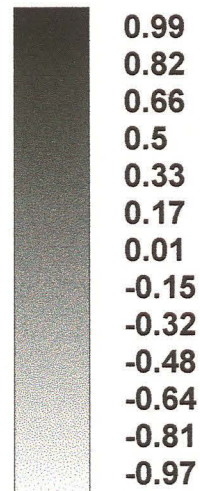
nT



16r Processed Data-Shade Plot



20m



nT

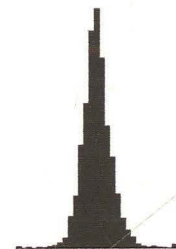
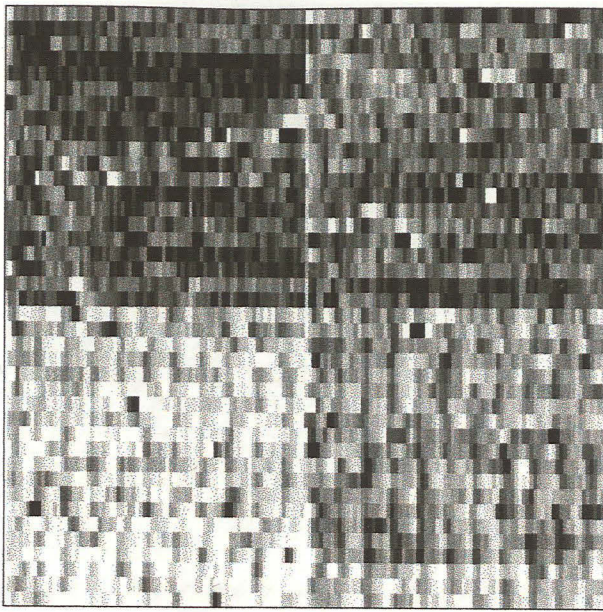
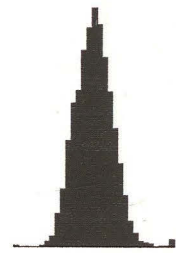
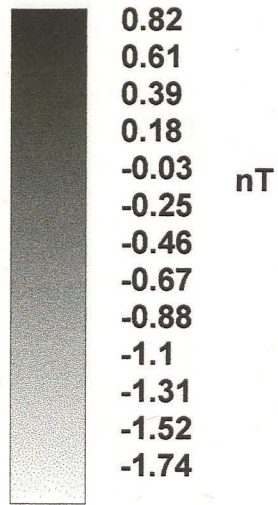


Fig 19

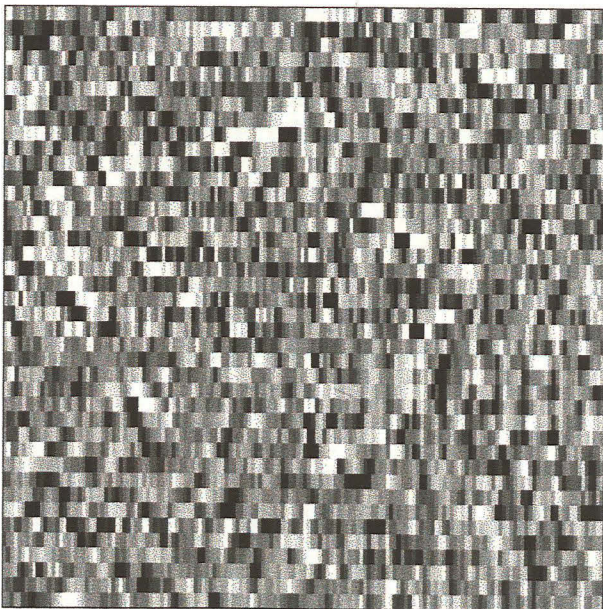
17r Raw Data-Shade Plot



20m



17r Processed Data-Shade Plot



20m

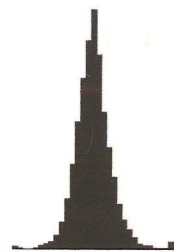
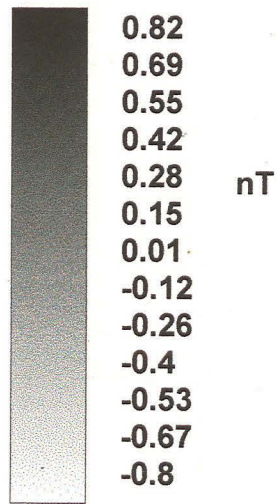
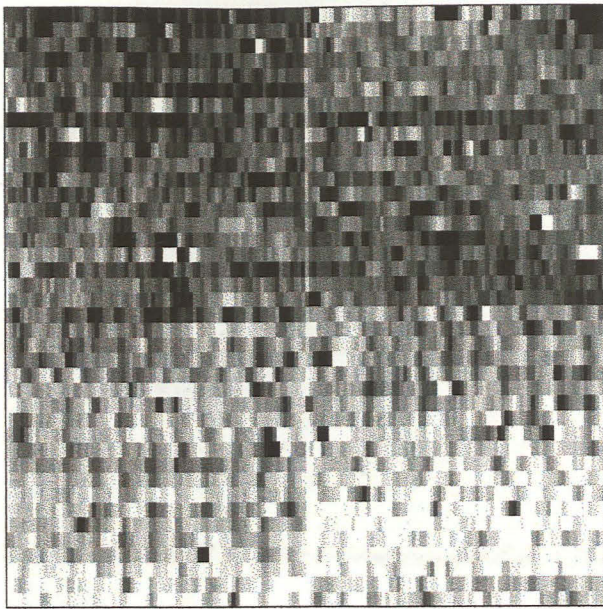


Fig 20

18r Raw Data-Shade Plot



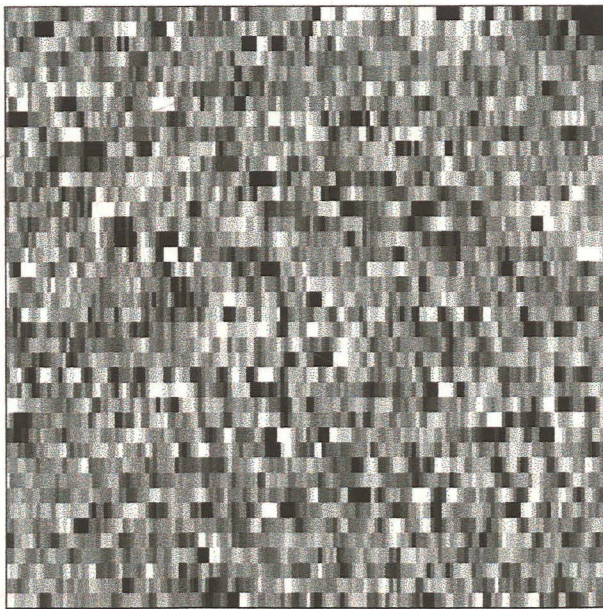
20m



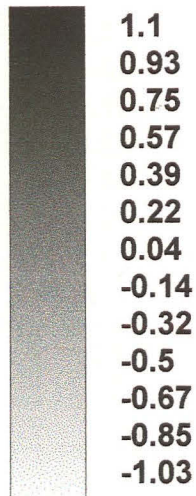
nT



18r Processed Data-Shade Plot



20m



nT

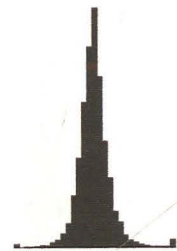
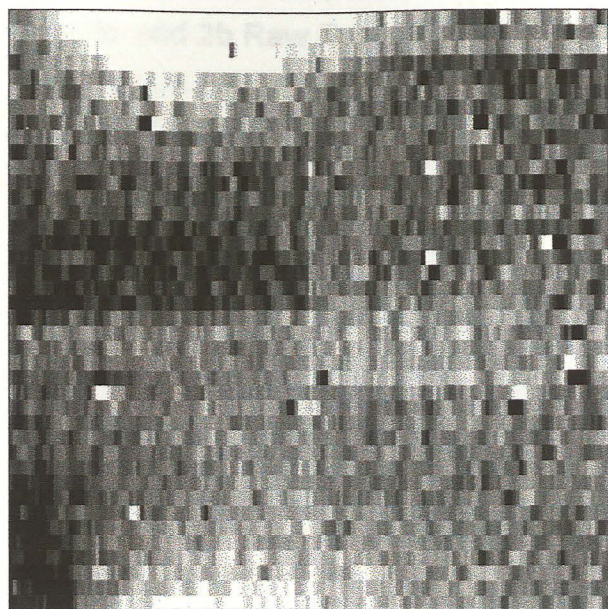
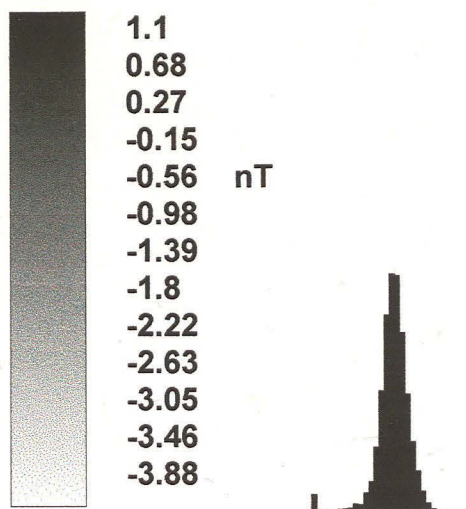


Fig 21

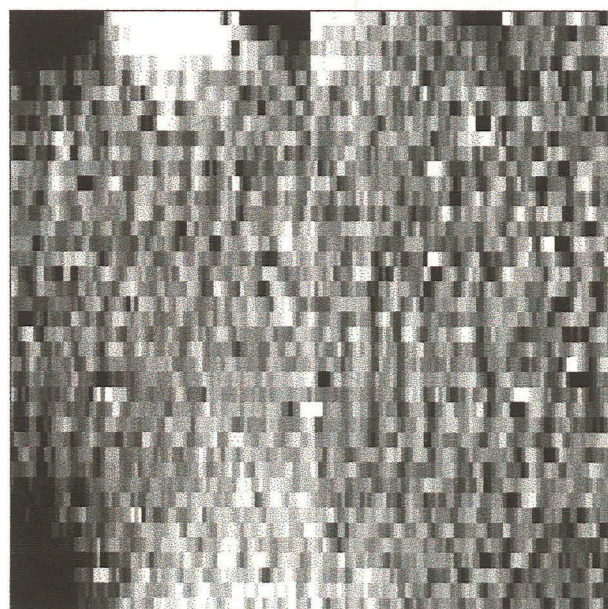
1b Raw Data-Shade Plot



20m



1b Processed Data-Shade Plot



20m

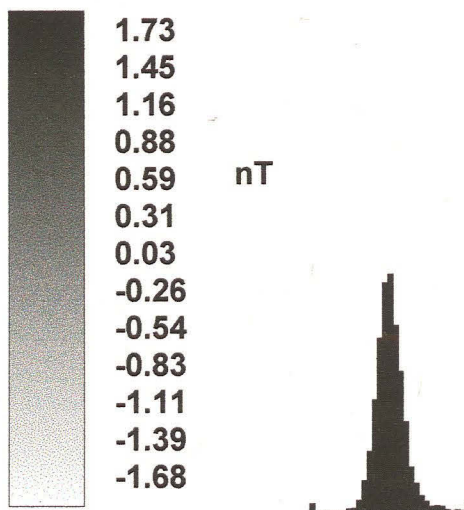
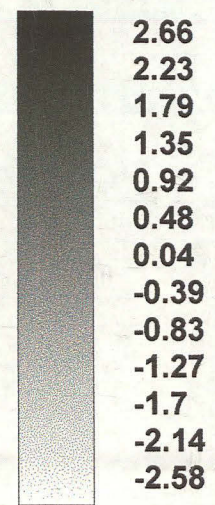
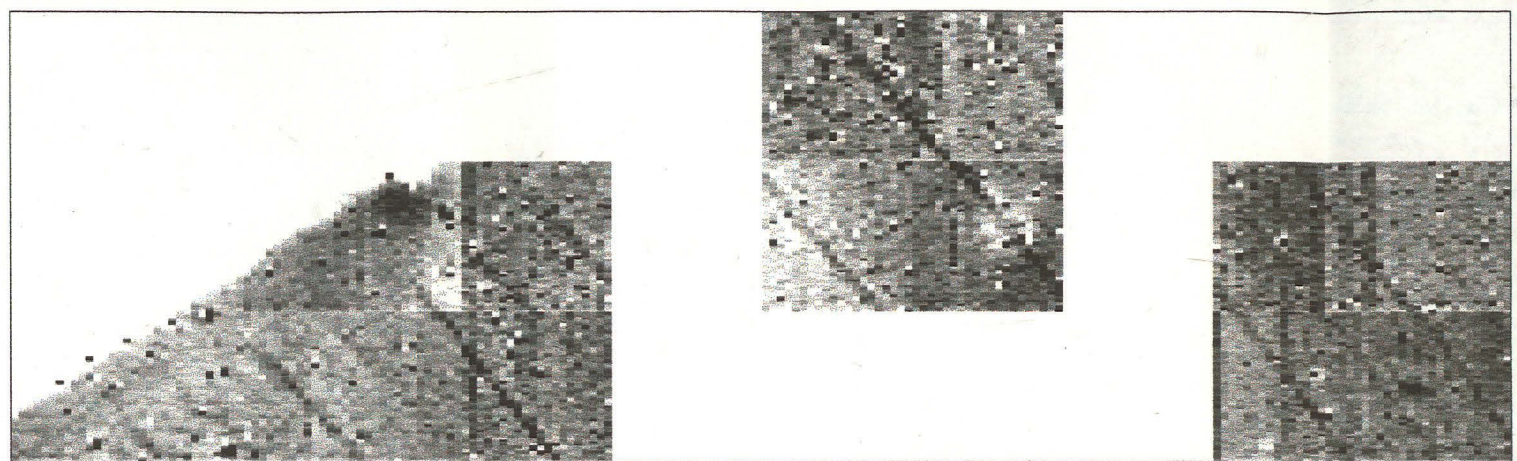
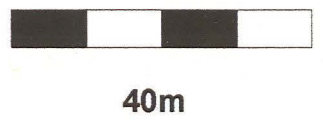
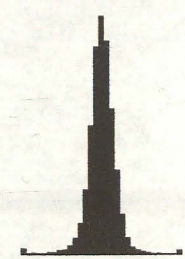


Fig 22

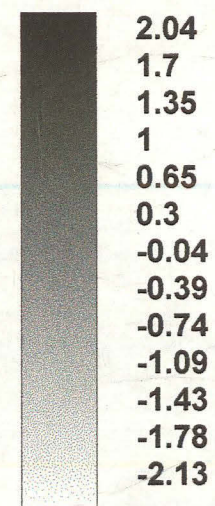
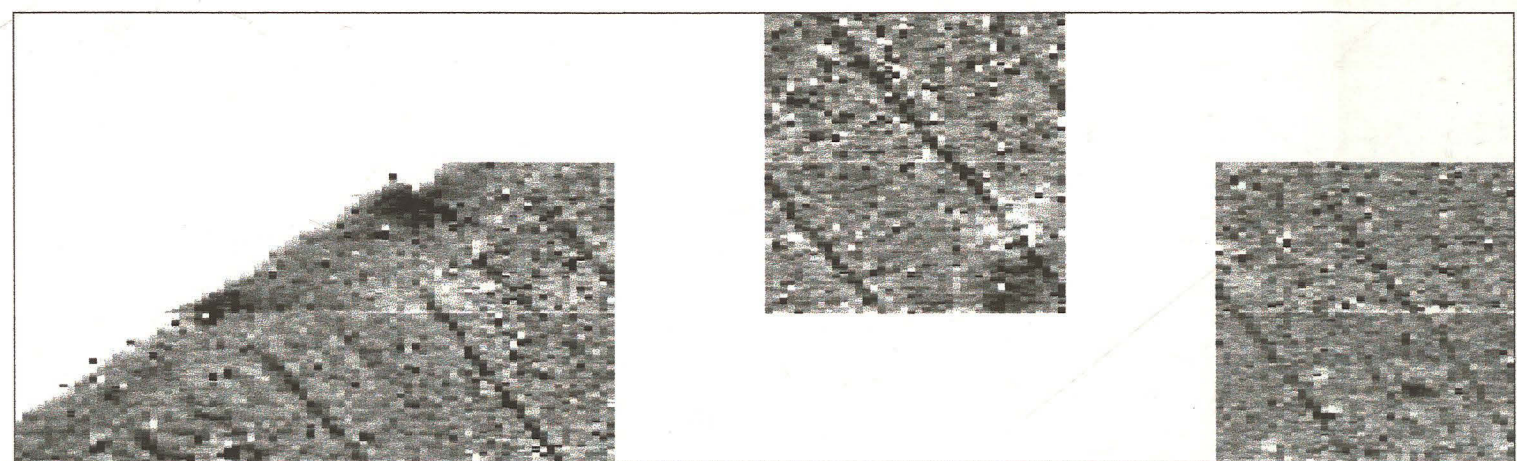
4b, 3b, and 2b Raw Data-Shade Plot



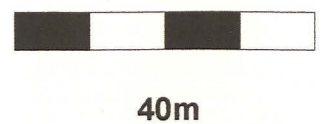
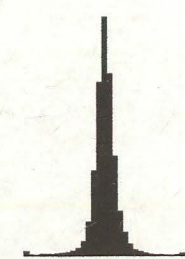
nT



4b, 3b and 2b Processed Data-Shade Plot



nT





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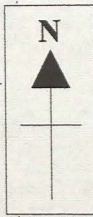
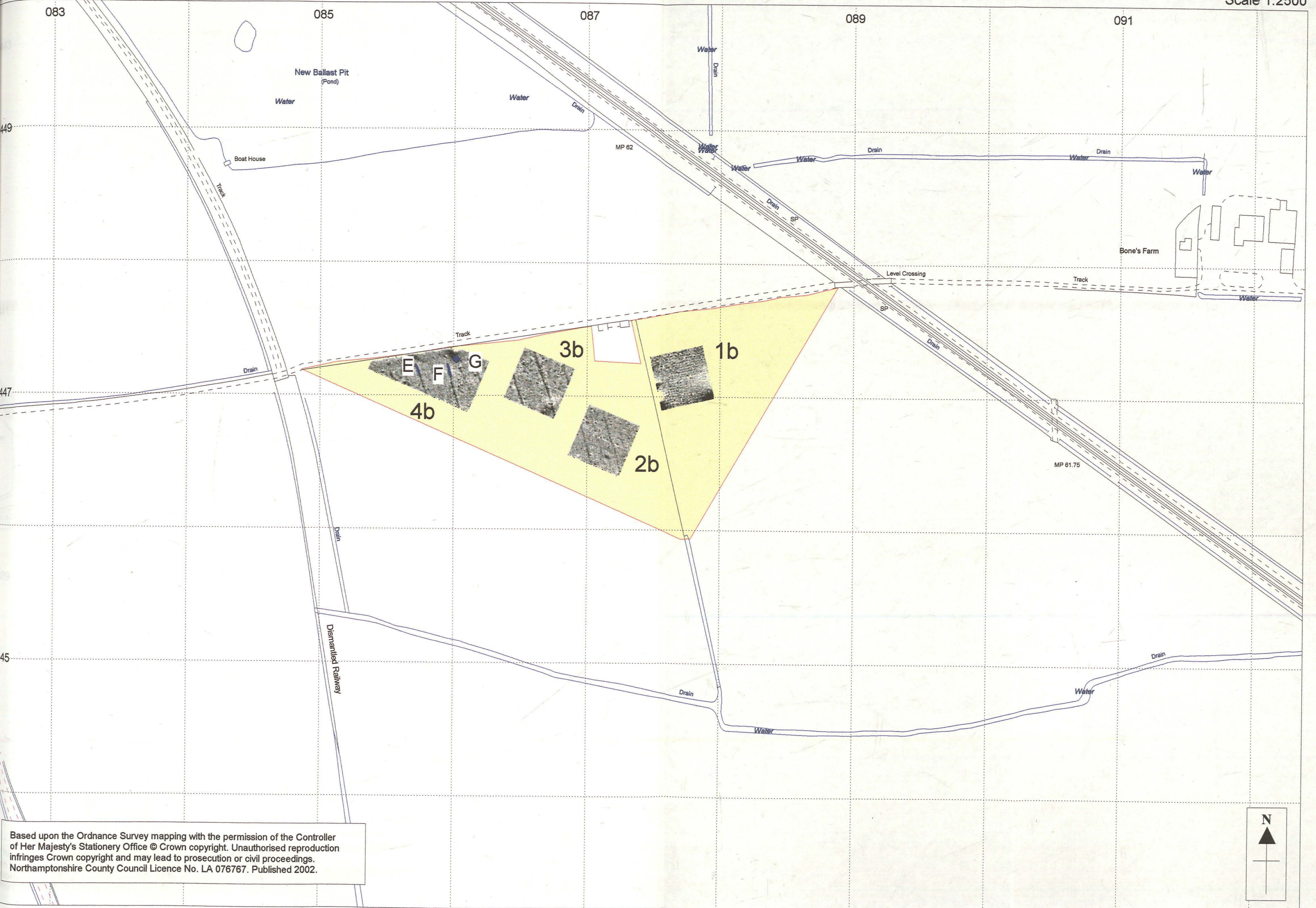


Fig24



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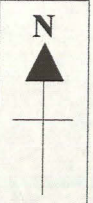


Fig25



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Beacon Hill

Key

- ◆ Isolated Anomaly
- - - Gas Pipeline
- Field Drain
- Survey Area

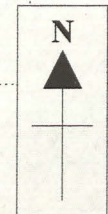
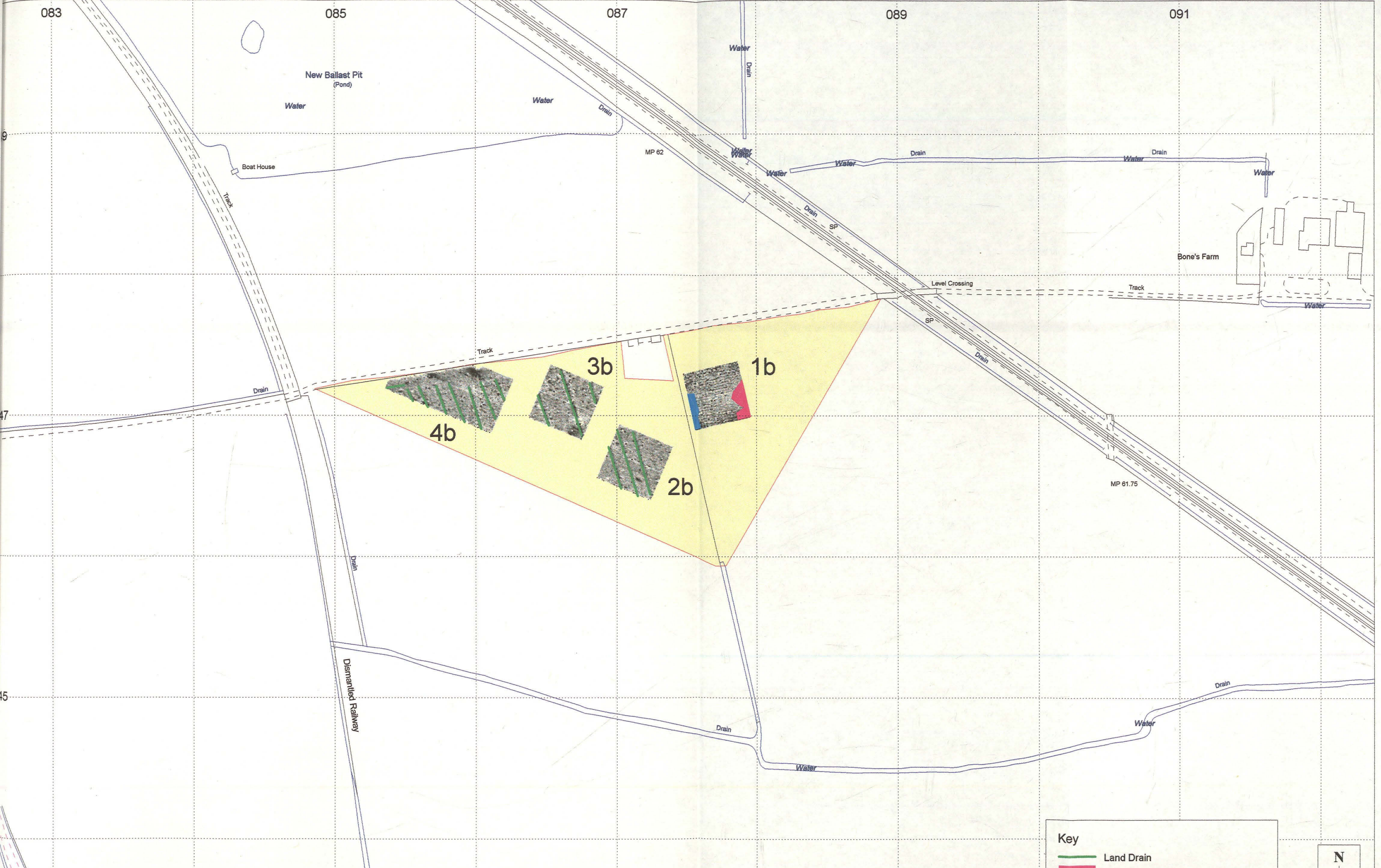
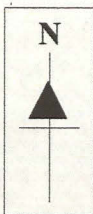


Fig26



Key

- Land Drain
- Interference from Gas Pipeline
- Interference from Electricity Pylon
- Survey Area



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Fig27