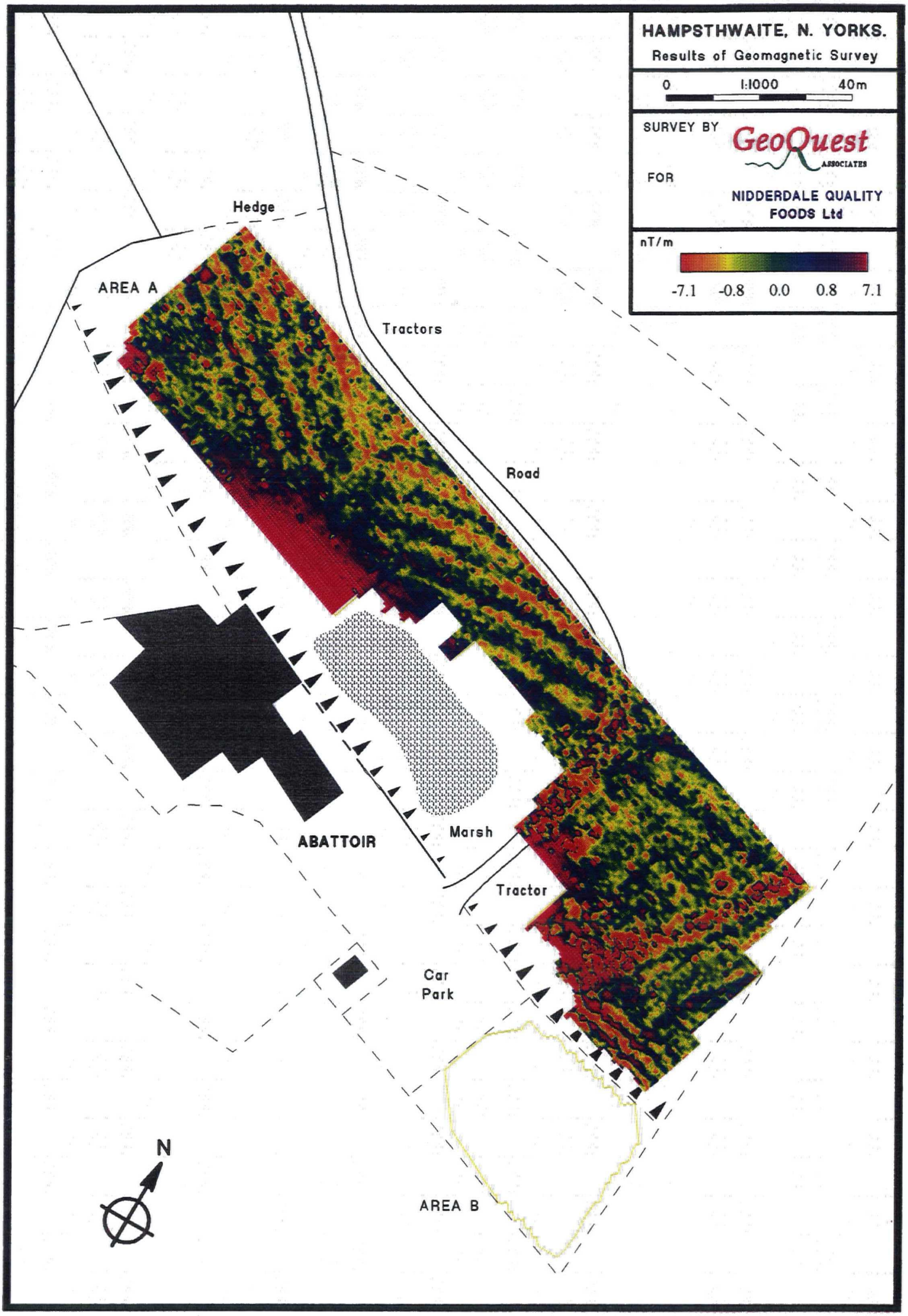

HAMPSTHWAITE, N. YORKS.
Results of Geomagnetic Survey
0 1:1000 40m
SURVEY BY GeoQuest ASSOCIATES
FOR NIDDERDALE QUALITY FOODS Ltd
nT/m
-7.1 -0.8 0.0 0.8 7.1
Hedge
AREA A
Tractors
Road
ABATTOIR
Marsh
Tractor
Car Park
AREA B
N

FIGURE 3

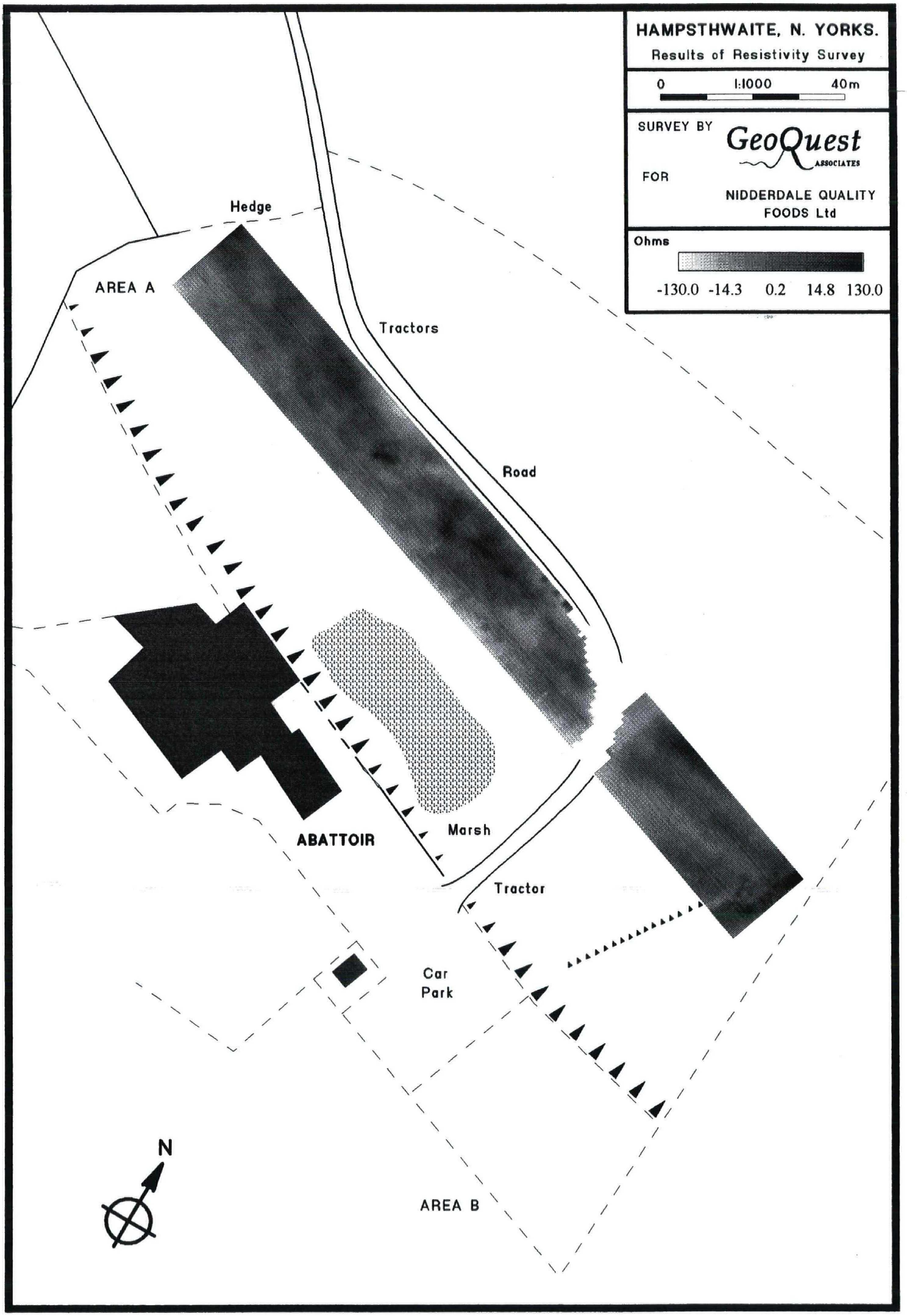

HAMPSTHWAITE, N. YORKS.
Results of Resistivity Survey
0
1:1000
40m
SURVEY BY
GeoQuest
ASSOCIATES
FOR
NIDDERDALE QUALITY FOODS Ltd
Ohms
-130.0 -14.3 0.2 14.8 130.0
Hedge
AREA A
Tractors
Road
Marsh
ABATTOIR
Tractor
Car Park
N
AREA B

FIGURE 4

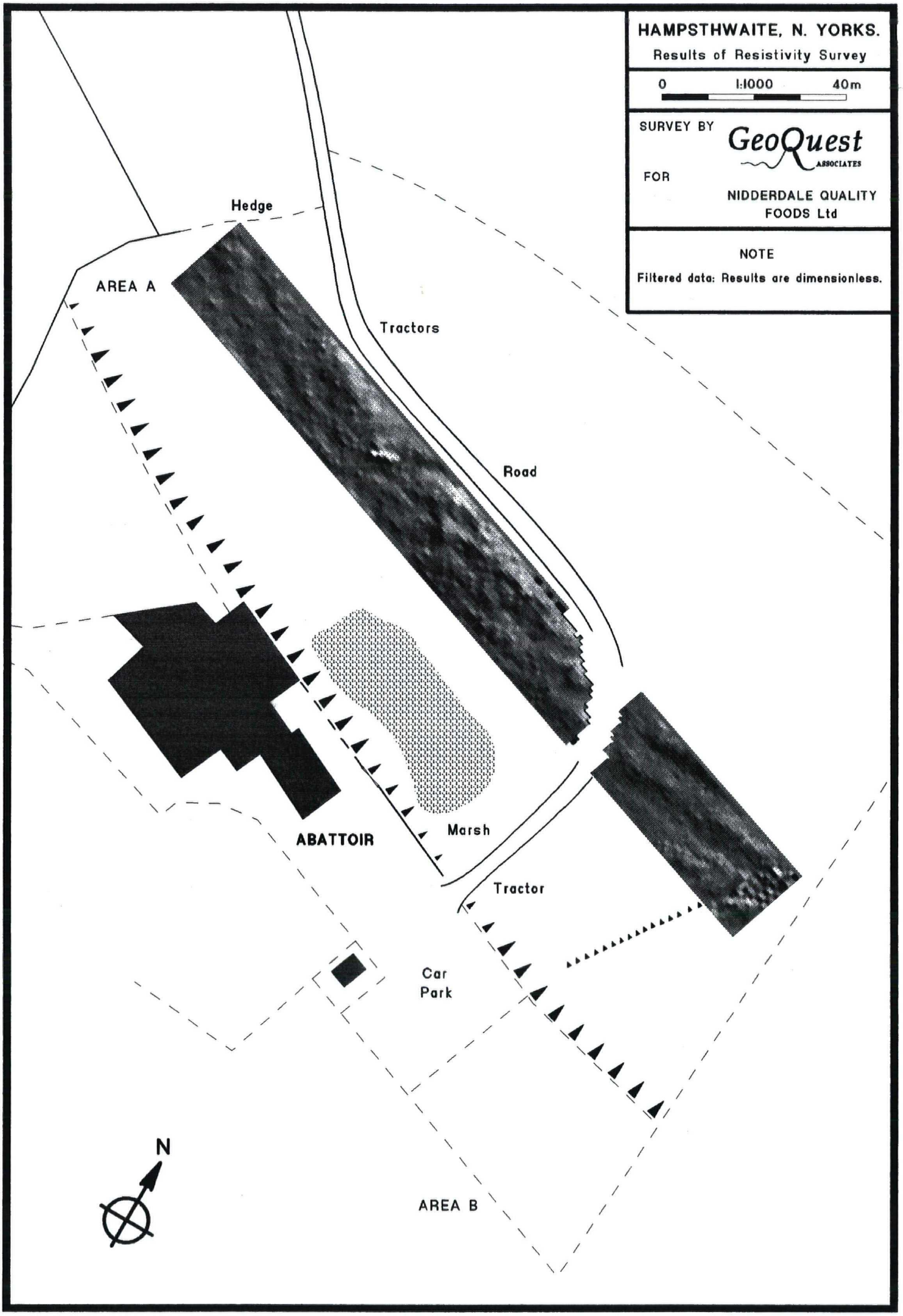

HAMPSTHWAITE, N. YORKS.
Results of Resistivity Survey
0
1:1000
40m
SURVEY BY
GeoQuest
ASSOCIATES
FOR
NIDDERDALE QUALITY FOODS Ltd
NOTE
Filtered data: Results are dimensionless.
Hedge
AREA A
Tractors
Road
ABATTOIR
Marsh
Tractor
Car Park
AREA B
N

FIGURE 5

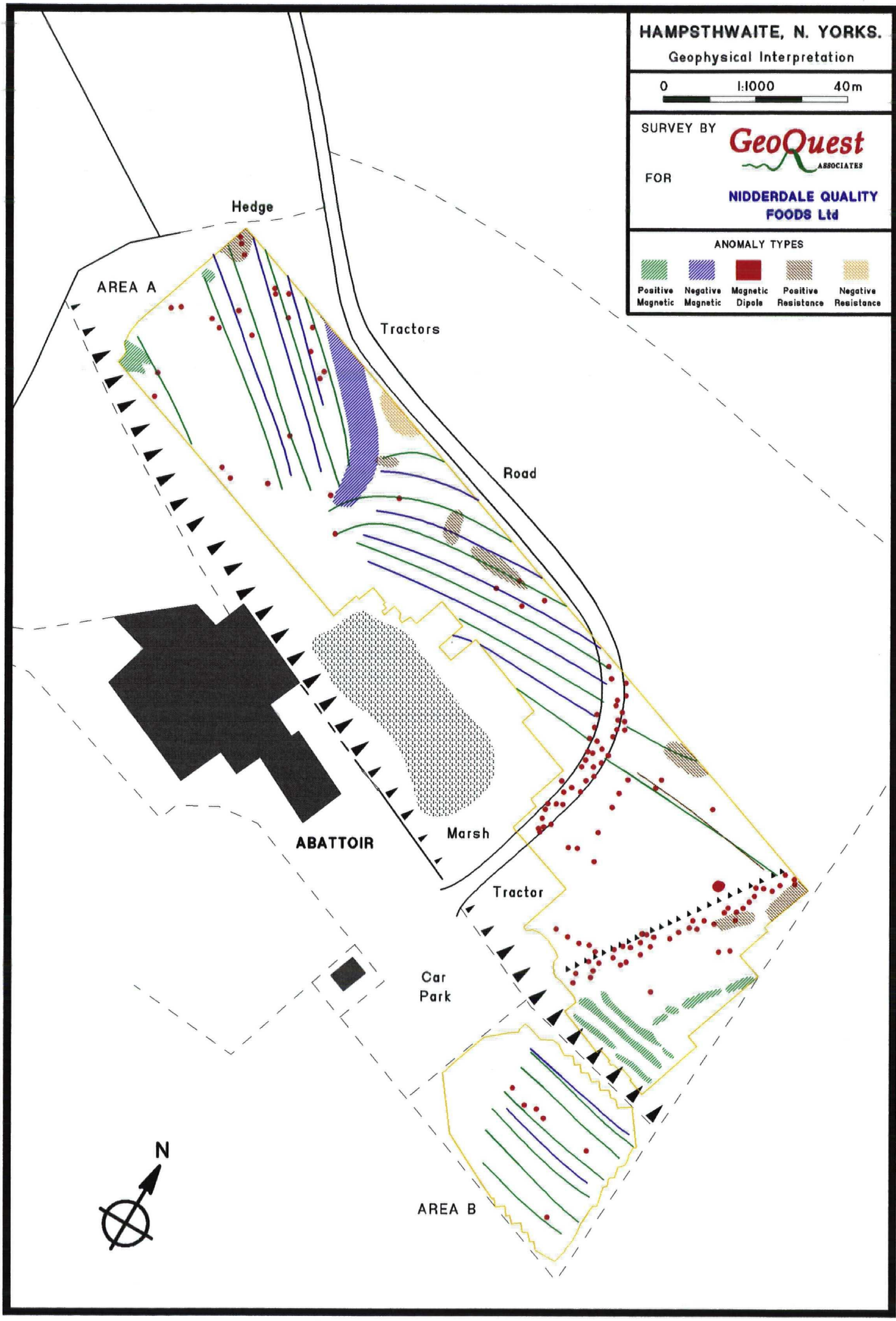

HAMPSTHWAITE, N. YORKS.
Geophysical Interpretation
0
1:1000
40m
SURVEY BY
GeoQuest
ASSOCIATES
FOR
NIDDERDALE QUALITY FOODS Ltd
ANOMALY TYPES
Positive Magnetic
Negative Magnetic
Magnetic Dipole
Positive Resistance
Negative Resistance
Hedge
AREA A
Tractors
Road
ABATTOIR
Marsh
Tractor
Car Park
AREA B
N

FIGURE 6

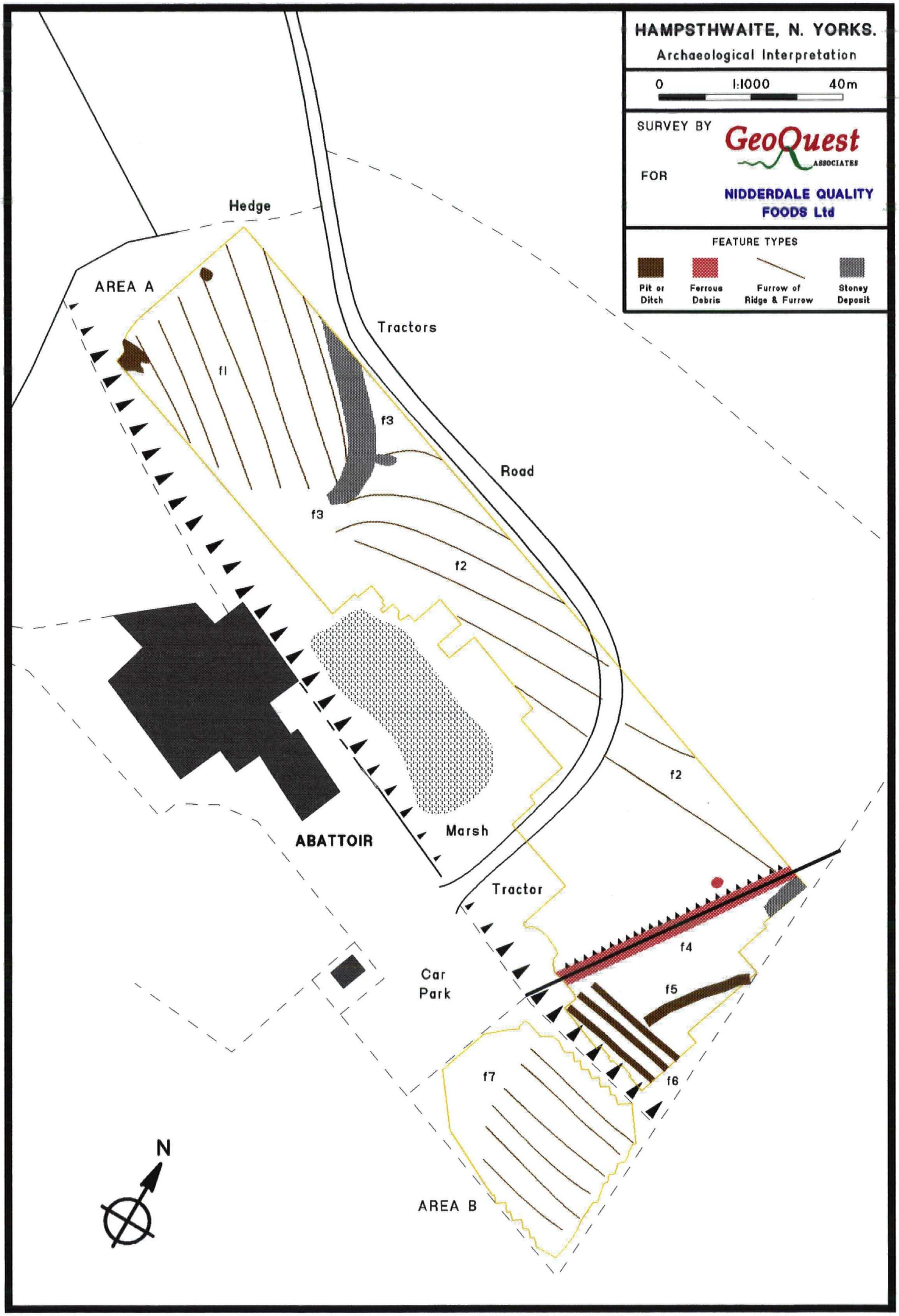

HAMPSTHWAITE, N. YORKS.
Archaeological Interpretation
0
1:1000
40m
SURVEY BY
GeoQuest
ASSOCIATES
FOR
NIDDERDALE QUALITY FOODS Ltd
FEATURE TYPES
Pit or Ditch
Ferrous Debris
Furrow of Ridge & Furrow
Stoney Deposit
Hedge
AREA A
Tractors
f1
f3
Road
f3
f2
f2
ABATTOIR
Marsh
Tractor
f4
Car Park
f5
f6
f7
N
AREA B

FIGURE 7

APPENDIX A

PRINCIPLES OF GEOMAGNETIC SURVEYING

Geomagnetic prospecting detects subsurface features in terms of the perturbations or 'anomalies' that they induce in the Earth's magnetic field. In contrast to resistivity, seismic or electromagnetic surveying, no energy is injected into the subsoil and hence this is one of a class of *passive* geophysical techniques that includes gravity and thermal surveying. In an archaeological setting two types of magnetic anomalies can be distinguished:

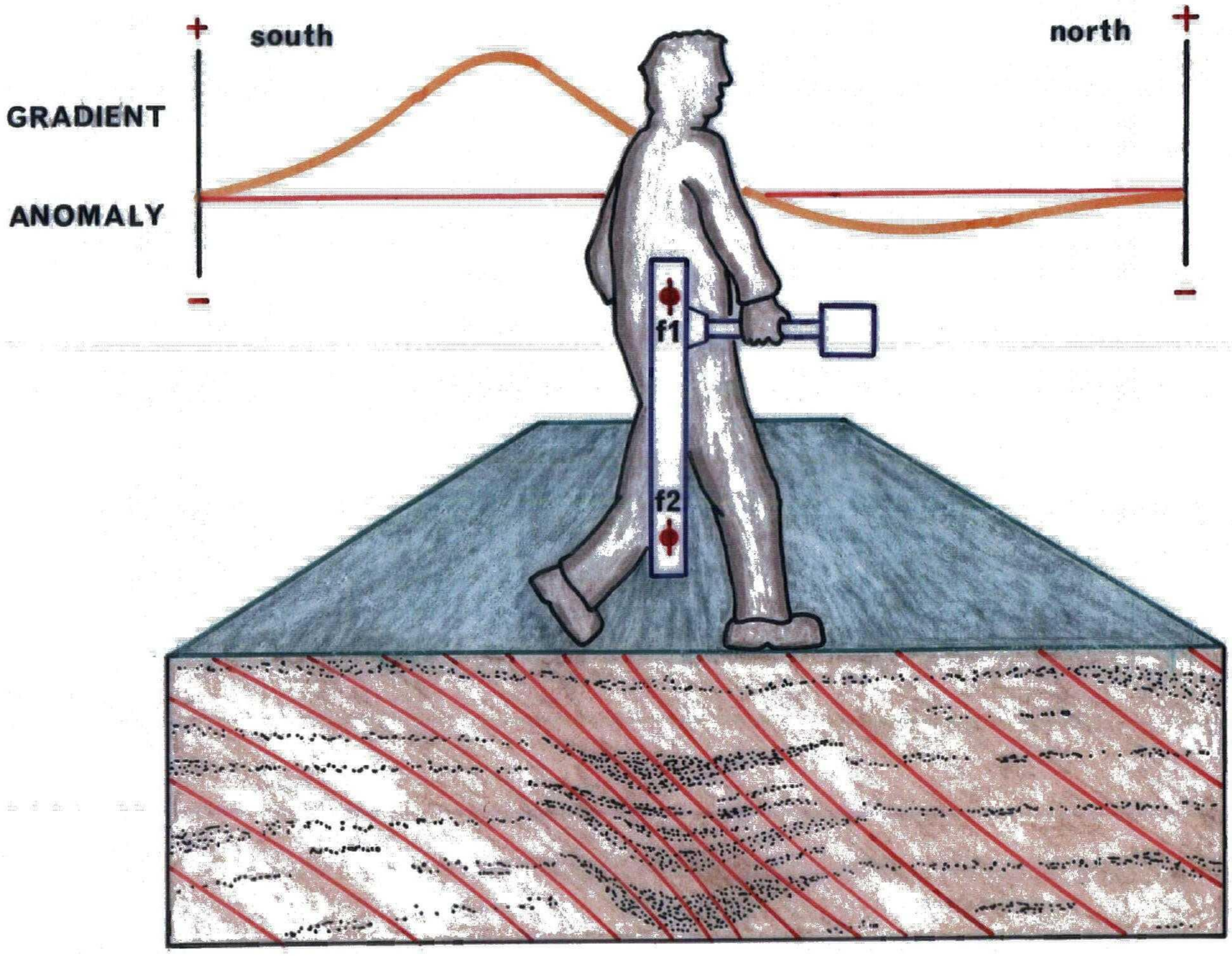
1 Anomalies arising from variations in *magnetic susceptibility* which will modulate the component of magnetisation *induced* in the subsurface by the Earth's magnetic field. For most archaeological sites, this is the dominant factor giving rise to geomagnetic anomalies. In general, susceptibility is relatively weak in sediments, such as sandstones and enhanced in igneous rocks and soils, especially those which have been burnt or stratified with organic material.

2 Anomalies due to large, *permanently magnetised* structures. Such permanent magnetisation or 'remanence' arises when earth materials are heated to above ~600°C and cooled in the geomagnetic field. Thus kilns and hearths are often detected as strong permanent magnets causing highly localised anomalies that dominate effects due to background susceptibility variations. Remanence can result from other physical and chemical processes but these give rise to anomalies that are usually unimportant for geophysical prospecting.

There are several approaches towards the practical measurement of geomagnetic anomalies. In this study measurements were made using a Geoscan FM36 fluxgate gradiometer which records the change with height in the vertical component of the Earth's magnetic field, as shown overleaf. This method has the advantage of being insensitive to diurnal variations while the Geoscan instrument also benefits from an integrated data logger. Note that in mid northern latitudes the magnetic anomaly will be asymmetric with the main peak displaced to the south of the archaeological feature. Thus, a ditch filled with a soil of enhanced susceptibility, for example, will generate a positive anomaly to the south, mirrored by a weak negative anomaly north of the feature. When portrayed as an area map of grey tones this gives rise to a 'shadowing' or pseudo relief effect which must be borne in mind when making an archaeological interpretation.

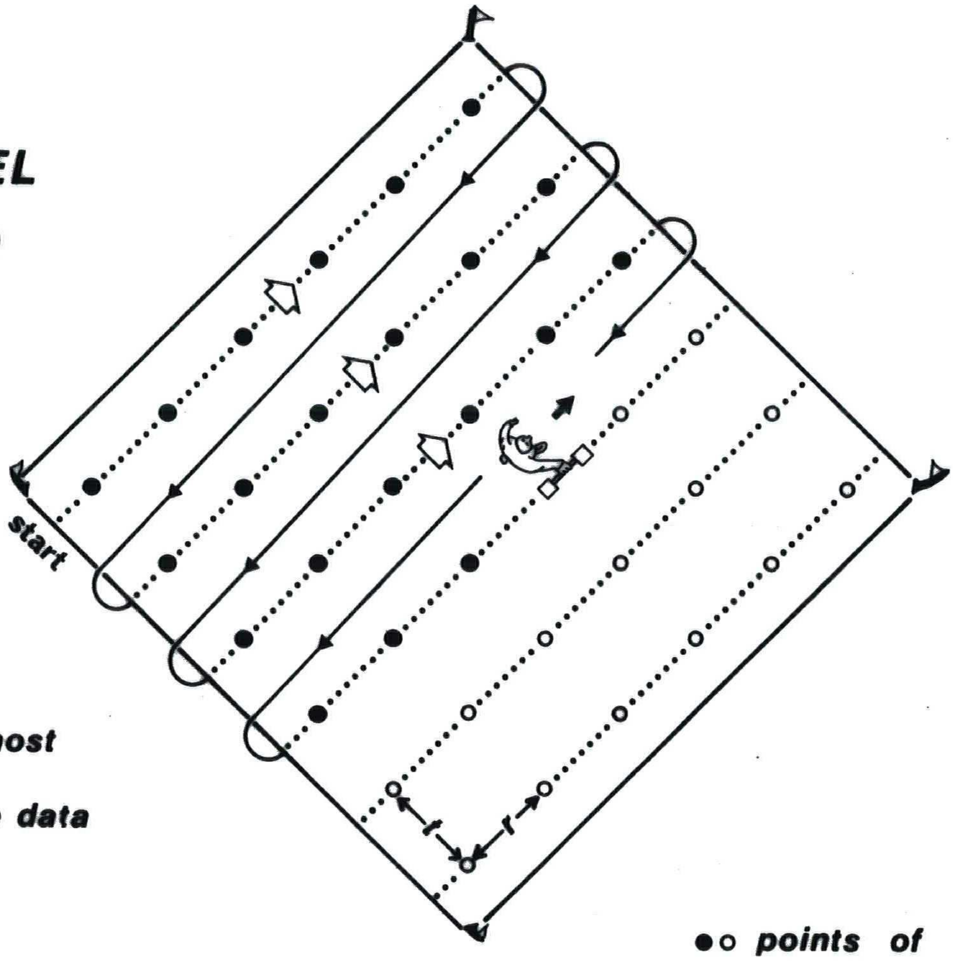
Two techniques can be used to survey gridded areas using the fluxgate magnetometer. In the parallel method the instrument is used to scan the area along traverses which are always in the same direction. This method minimises 'heading errors' due to operator and instrument magnetisation but is time consuming. The alternative zig-zag method is significantly faster and suitable for areas where anomalies are large compared to these and other sources of error.

MAGNETIC SURVEYING



SURVEY SCHEMES

PARALLEL METHOD



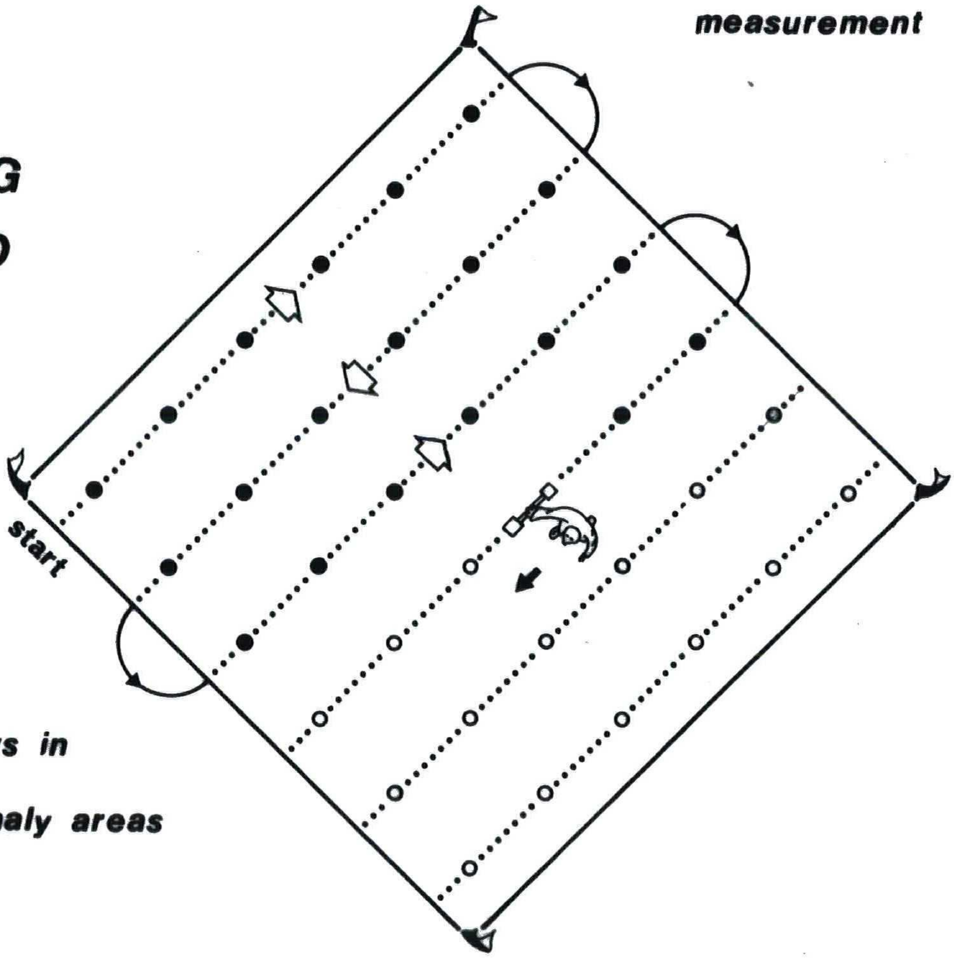
slower but

minimises most

errors in the data

●○ points of measurement

ZIG-ZAG METHOD



suitable for

rapid surveys in

strong anomaly areas