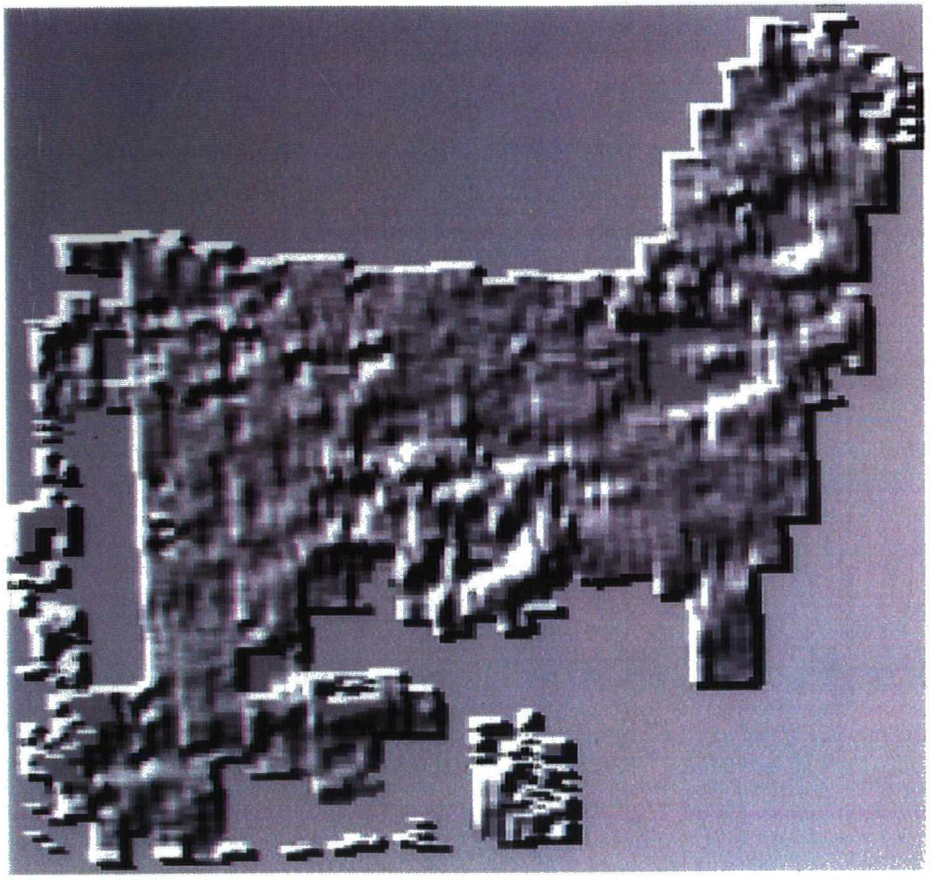
The Landscape Research Centre



Report on a Fluxgate Gradiometer Survey carried out at Burnside Cottage, Sherburn, North Yorkshire June 2003

Summary

The Landscape Research Centre (LRC Ltd) carried out a fluxgate gradiometer survey on behalf of Mr T. Mellor, of Burnside Cottage, Sherburn, North Yorkshire, just to the north of the cottage and south of St Hilda's Church. The surveyed area is centred around National Grid Reference SE 96003/77369. . Interpretation of the results is constrained by the limited area that was available for survey, the presence of modern garden planting and recent features including a series of reinforced concrete stanchion bases; however six distinct magnetic anomalies were detected

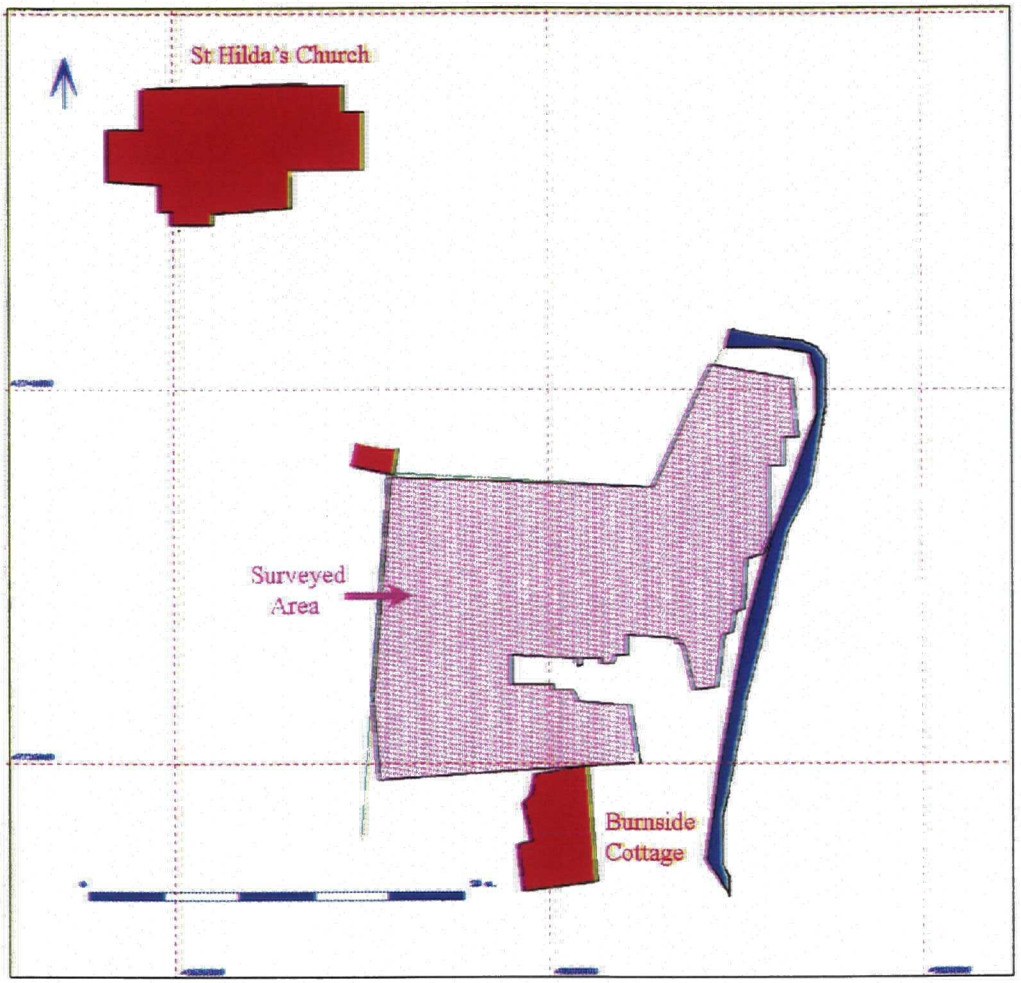


Figure 1 Plan showing the location of the gradiometer survey. East Beck flows along the length of the eastern boundary. The main village of Sherburn is located to the west of the area, with St Hilda's Church to the north.

Methodology

The survey was conducted using a *Bartington* fluxgate gradiometer (model *Grad*-601). The zig-zag traverse method of survey was used. The survey was conducted by taking readings every 25cm along the north-south axis and every metre along the east-west axis (thus 3600 readings for each 30m grid). The sensitivity of the machine was set to detect magnetic variation in the order of 0.1 nanoTesla. The data has been processed and presented using the program G-Sys (an in-house developed Geographic Database Management program which can also display, process and integrate digitised plans and images). This report was produced using Microsoft Word 2000 and Adobe Photoshop 7 for further image manipulation.

The survey was carried out on 24th June, 2003. The area surveyed was mostly garden lawn, although a number of obstacles were encountered. These included trees and bushes which had to be dummy-logged (i.e. left out of the surveyed area), as well as some concrete stanchions in a north-south line and concrete flags in the south-eastern corner of the area. A number of small humps and bumps were visible, some of which relate directly to detected magnetic anomalies. The surveyors were James Lyall, Maria Beck and David Stott, all of the LRC. The total area surveyed was 0.172 of a hectare.

Figure 2 A digital photograph looking south towards Burnside Cottage. Note the slight depression in front of the bushes

The survey area was bounded on the south by the cottage, on the west by a metal garden fence, on the north by St Hilda's Churchyard boundary wall, and on the east by East Beck. The survey data has been geo-referenced, to allow a correlation of the geophysical anomalies with any archaeological features detected.

Gradiometer Results and Interpretation

The survey results will be discussed using anomaly numbers. The term anomaly is used to describe something which differs from the norm, and in the case of magnetic prospection, these are the areas of lighter and darker greys (in the greyscale image), which equate to positive and negative magnetic areas. These anomalies may relate to archaeological features, geological features or modern activity. The results of the survey are displayed in two ways, both as a greyscale image and as an interpretive plan. In all, 6 major anomalies were detected, with a number of smaller anomalies or dipoles (shown by a strong black/white signal on the greyscale image), indicating the location of iron beneath the ground. These iron objects are likely to be of a relatively recent origin (for instance horseshoes, nails etc), and are not individually digitised.

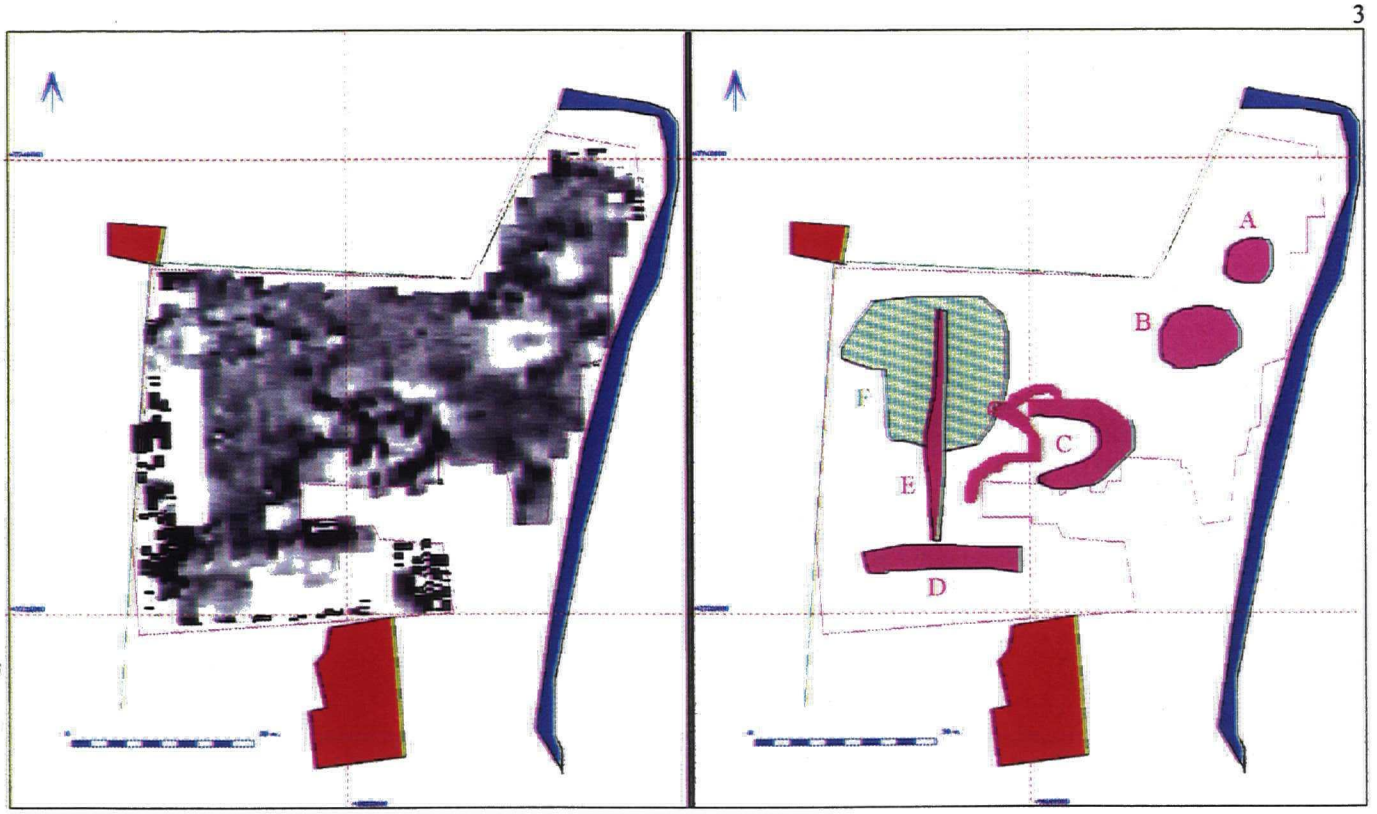


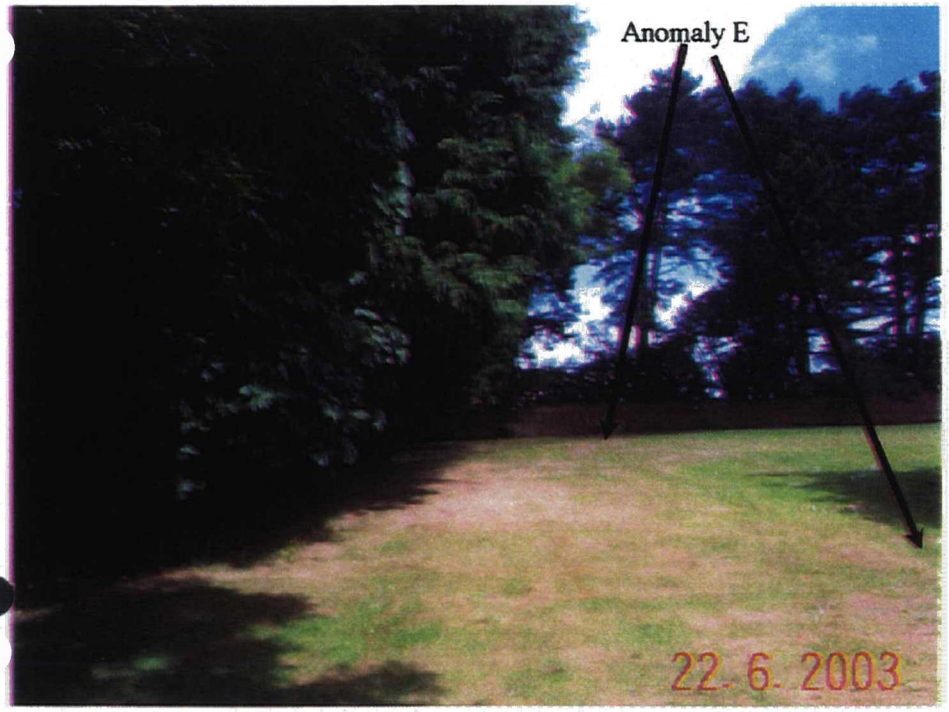
Figure 3 A greyscale image and interpretive plan of the survey data

Anomalies A and B were located in the north-eastern part of the area. Both have very strong positive magnetic signatures. Whilst this might indicate a modern origin for these anomalies, it is also possible that they are features of greater antiquity.

Anomaly C is what appears to be a complex set of features, roughly semi-circular in shape, located just to the north of a line of bushes. A small depression is visible on the ground in this area. It is the only negative magnetic feature detected in the survey area, and this may indicate some form of structural remains. If this anomaly derives from structural remains then it is just possible that the semi-circular feature could relate to an apse of an early church.

Figure 4 A digital photograph looking east towards East Beck, showing the location of Anomaly C

Anomaly D is a linear, east-west aligned feature, approximately 2.5 metres in width. Its magnetic signature could indicate that this is a ditch of some description. A slightly raised area was visible on the ground in this vicinity. Its alignment appears to mirror that of the current church wall to the north and the anomaly derive from an earlier Churchyard precinct boundary defied by a bank and associated ditch.



Anomaly E is a weak, north-south aligned linear anomaly, and can be equated with the edge of a shallow depression just to the east of a tree line.

Figure 5 A digital photograph looking north towards the boundary wall of St Hilda's Churchyard, showing the location of Anomaly E

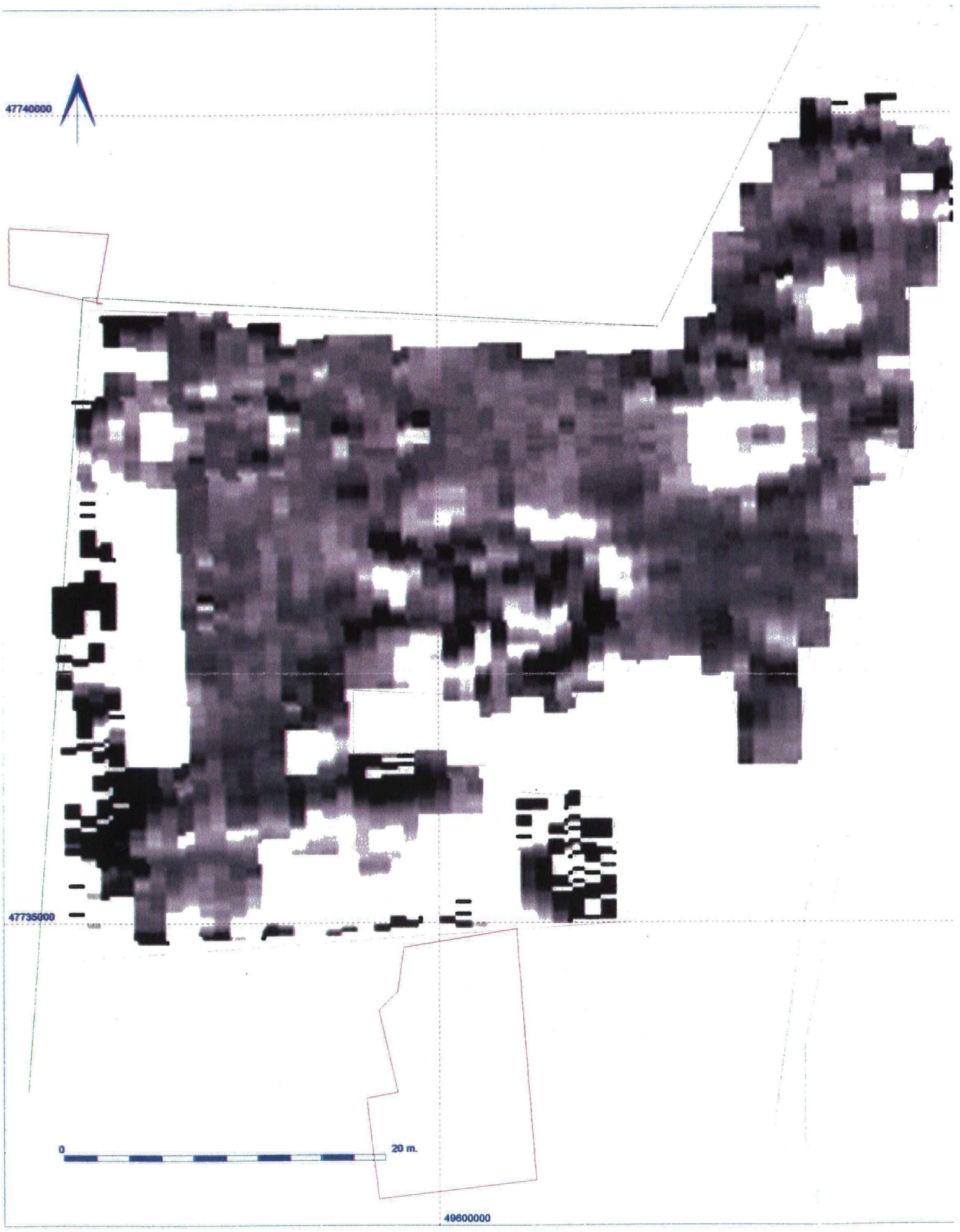
Anomaly F, located just to the south of the boundary wall of St Hilda's Church, and bisected by a line of trees, is a faint, weakly positive magnetic feature. It appears to be roughly circular in shape, but its exact nature is difficult to determine due to the proximity of the stronger anomalies to the south-east and the west.

Conclusions

In conclusion, other geophysical surveys carried out to the west of Sherburn have demonstrated that the underlying geology generally provides a good substrate for magnetic forms of geophysical prospection. However, the proximity of a number of modern obstacles (the reinforced concrete stanchions, the concrete flagstones in the south-east, the cottage itself to the south and the metal boundary fence in the west) and the limited contiguous area available for survey make the interpretation of the more subtle anomalies identified somewhat difficult.

Situated in close proximity to St Hilda's Church, the area is clearly of archaeological interest, the dedication of the church to an Anglo-Saxon saint and the presence of Late Saxon carved masonry in the church indicate that Sherburn is likely to have supported a Late Saxon monastic complex. It is possible that some of the anomalies identified in the survey relate to this activity although it is impossible to provide a categorical interpretation from the survey alone. Whatever the source of the various anomalies they do indicate past activity and thus redevelopment in this area should be approached with caution. As indicated prior to undertaking the survey construction using a raised raft causing minimal subsurface impact would be the preferred option, with archaeological excavation of the service trenches situated to avoid anomaly C in particular.

James Lyall
Maria Beck
Dominic Powlesland
The Landscape Research Centre Ltd.


47740000
47735000
0
20 m.
49600000