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**LAND OFF  
WIMBLINGTON ROAD,  
DODDINGTON,  
CAMBRIDGESHIRE  
(DOWR13)**

**GEOPHYSICAL SURVEY**

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**Work undertaken for**  
Larkfleet Homes Ltd

**October 2013**

**Report produced by**  
Neil Jefferson BSc (Hons)

**Cambridgeshire County Event No:** ECB 4064  
**OASIS Ref:** archaeol1-161843  
**National Grid Reference:** TL 40515 90840

APS Report No: 125/13

**ARCHAEOLOGICAL  
PROJECT  
SERVICES**

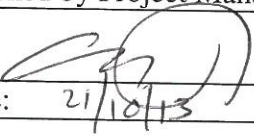
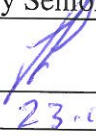




## Quality Control

**GEOPHYSICAL SURVEY  
LAND OFF  
WIMBLINGTON ROAD,  
DODDINGTON  
(DOWR13)**

Project Coordinator	Gary Taylor
Site Staff	Neil Jefferson, Jonathon Smith
Survey processing and report	Neil Jefferson

Checked by Project Manager	Approved by Senior Archaeologist
 Gary Taylor	 Tom Lane
Date: 21/10/13	Date: 23.10.13



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## 1. SUMMARY

*Detailed magnetic gradiometer survey was undertaken for Larkfleet Homes Ltd in connection with proposed development on land off Wimblington Road, Doddington, Cambridgeshire. The survey totalled c. 0.8ha.*

*The survey recorded several pit type anomalies which were dispersed and the interpretation is uncertain.*

*It also recorded a service and an alignment of iron spikes which probably indicated a removed fenced boundary.*

## 2. INTRODUCTION

### 2.1 Definition of an Evaluation

Geophysical survey is a non-intrusive method of archaeological evaluation. Evaluation is defined as ‘*a limited programme of non-intrusive and/or intrusive fieldwork which determines the presence or absence of archaeological features, structures, deposits, artefacts or ecofacts within a specified area or site. If such archaeological remains are present Field Evaluation defines their character and extent, quality and preservation, and it enables an assessment of their worth in a local, regional, national or international context as appropriate*’ (IfA 2008).

### 2.2 Background

Archaeological Project Services was commissioned by Larkfleet Homes Ltd to undertake detailed magnetometer survey totalling some 1ha on land off Wimblington Road, Doddington, Cambridgeshire. Due to ground conditions on site the area was reduced to 0.8ha. The survey was in advance of proposed development of the area and was carried

out on the 17<sup>th</sup> of October 2013.

### 2.3 Topography and Geology

Doddington is located 6km southwest of March and 17km northwest of Ely in the county of Cambridgeshire. The investigation site is in the east of the village, on the south side of Wimblington Road, at National Grid Reference TL 40515 90840.

The site lies at about 1m OD on flat ground. The drift geology consists of sands and gravels overlying the solid geology of Ampthill Clay Formation mudstone (Hodge *et al.* 1984, 13).

## 3. GEOPHYSICAL SURVEY

### 3.1 Methods

Location and layout of the survey area is shown in Figure 3. The area contained long grass and patches of brambles. Due to the brambles, the area was reduced from 1ha to 0.8ha. The long grass affected the walking and stability of the equipment making the ground condition for survey poor, but acceptable. Weather was generally overcast and damp.

Survey was undertaken in accordance with English Heritage (2008) and IfA (2011) guidelines and codes of conduct.

The magnetic survey was carried out using a dual sensor Grad601-2 Magnetic Gradiometer manufactured by Bartington Instruments Ltd. This records subtle changes in the magnetic field resulting from differing features in the soil. Changes as small as 0.2 nanoTesla (nT) in an overall field strength of c. 49,000nT can be accurately detected using this instrumentation, although in practice instrument interference and soil noise can

limit sensitivity.

The mapping of anomalies in a systematic manner allows interpretation of the type of material present beneath the surface. Strong magnetic anomalies are generated by buried iron-based objects or by kilns or hearths, usually resulting in a bipolar (positive/negative) response. More subtle positive anomalies representing pits and ditches can be seen where these contain more topsoil which is normally richer in magnetic iron oxides and provides a contrast with the natural subsoil (but this can vary depending on the nature of the underlying deposits). A negative anomaly may result from upcast bank material. Wall foundations can also show as negative anomalies where the stone is less magnetic than the surrounding soil or as stronger positive and negative anomalies if of brick, but are not always responsive to the technique. It should be noted that not all features will be responsive and absence of anomalies does not necessarily indicate absence of archaeological features.

Magnetometers measure changes in the Earth's magnetic field. With two sensors configured as a gradiometer the recorded values indicate the difference between two magnetic measurements separated by a fixed distance. The Grad601-2 consists of two high stability fluxgate gradiometers suspended on a single frame with a 1m separation between the sensing elements giving a strong response to deep anomalies.

#### *Sampling interval and data capture*

Readings were taken at 0.25m centres along traverses 1m apart. This equates to 3600 sampling points in a full 30m x 30m grid. The Grad 601 has a typical depth of penetration of 0.5m to 1.0m although a greater range is possible where strongly magnetic objects have been buried in the site.

Readings are logged consecutively into the data logger which is downloaded daily either into a portable computer whilst on site or directly to the office computer. At the end of each job, data is transferred to the office for processing and presentation.

#### *Processing and presentation of results*

Processing is performed using specialist ArcheoSurveyor software. This can emphasise various aspects contained within the data but which are often not easily seen in the raw data. Basic processing of the magnetic data involves flattening the background levels with respect to adjacent traverses and adjacent grids (Destripe or zero mean traverse). Despiking is also performed to reduce the effect of the anomalies resulting from small iron objects often found on agricultural land. Further processing can then be carried out which may include low pass filtering to reduce 'noise' in the data and hence emphasise the archaeological or man-made anomalies.

The following are the processing techniques carried out on the processed gradiometer data used in this report:

1. DeStripe (sets the background mean of each traverse within a grid to zero and is useful for removing striping effects)
2. Despike (useful for display and allows further processing functions to be carried out more effectively by removing extreme data values)  
Parameters: X radius = 1; Y radius = 1; Threshold = 3SD; Spike replacement = mean
3. Clip (excludes extreme values allowing better representation of detail in the mid range): -2.5 to 2.5nT.



### 3.2 Results

The presentation of the data for the site involves a print-out of the raw or minimally processed data as greyscale and trace plots (Figs 4 and 5; clipped for display but otherwise unprocessed), together with greyscale plots of the processed data (Fig 6). Magnetic anomalies have been identified and plotted onto an interpretative drawing (Fig. 7) and are described below.

#### *Discrete positive anomalies*

Examples of the discrete positive anomalies are highlighted and possibly represent pit features. However, the majority of the pits are somewhat isolated, the responses are not strong, and these are difficult to interpret on the basis of form alone. It is also possible that the larger pit-like anomalies may represent geological features.

#### *Iron spikes (discrete bipolar anomalies)*

Iron items within the topsoil give a distinctive localised bipolar (strong positive with associated strong negative) response. Such items usually derive from relatively recent management or agricultural use of the land – broken or discarded pieces of agricultural machinery or other modern debris. The alignment of iron spikes to the west probably represents a removed modern fence or boundary.

#### *Modern/magnetic disturbance*

Strong bipolar responses aligned north-south occurred towards the east of the site and probably represent a modern service.

### 4. DISCUSSION

A number of discrete positive responses might represent isolated pit features or geological features but these are not strong and would be difficult to interpret on the

basis of form alone.

The alignment of iron spikes probably represents a removed modern fence or boundary.

### 5. ACKNOWLEDGEMENTS

Archaeological Project Services wishes to acknowledge Larkfleet Homes Ltd who commissioned the project; Gary Taylor and Tom Lane (APS) edited the report.

### 6. PERSONNEL

Project coordinator: Gary Taylor  
 Geophysical Survey: Neil Jefferson, Jonathon Smith  
 Survey processing and reporting: Neil Jefferson

### 7. BIBLIOGRAPHY

Clark, A., 1996 *Seeing Beneath the Soil*, London, 2<sup>nd</sup> edn.

English Heritage, 2008 *Geophysical Survey in Archaeological Field Evaluation*.

Hodge, CAH, Burton, RGO, Corbett, WM, Evans, R, and Seale, RS, 1984 *Soils and their use in Eastern England*, Soil Survey of England and Wales 13

IfA, 2008 *Standard and Guidance for Field Evaluation*.

IfA, 2011 *Standard and Guidance for Geophysical Survey*.

### 8. ABBREVIATIONS

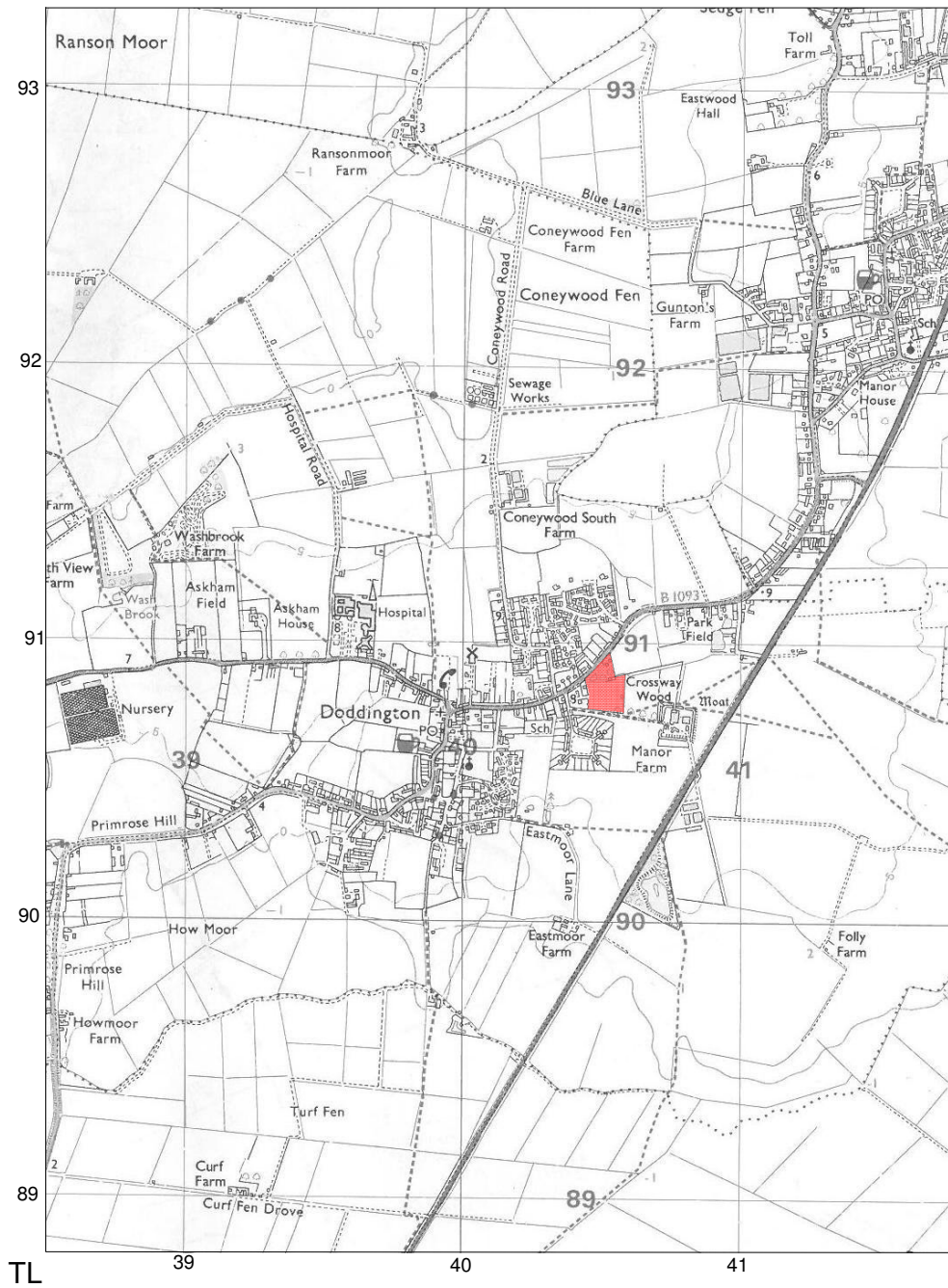
BGS British Geological Survey

IfA Institute for Archaeologists



Figure 1 General location map





 Site Location



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Archaeological Project Services		
Project Name: Wimblington Road, Doddington, (DOWR13)		
Scale 1:25000	Drawn by:NMJ	Report No:125/13

Figure 2: Site Location Map



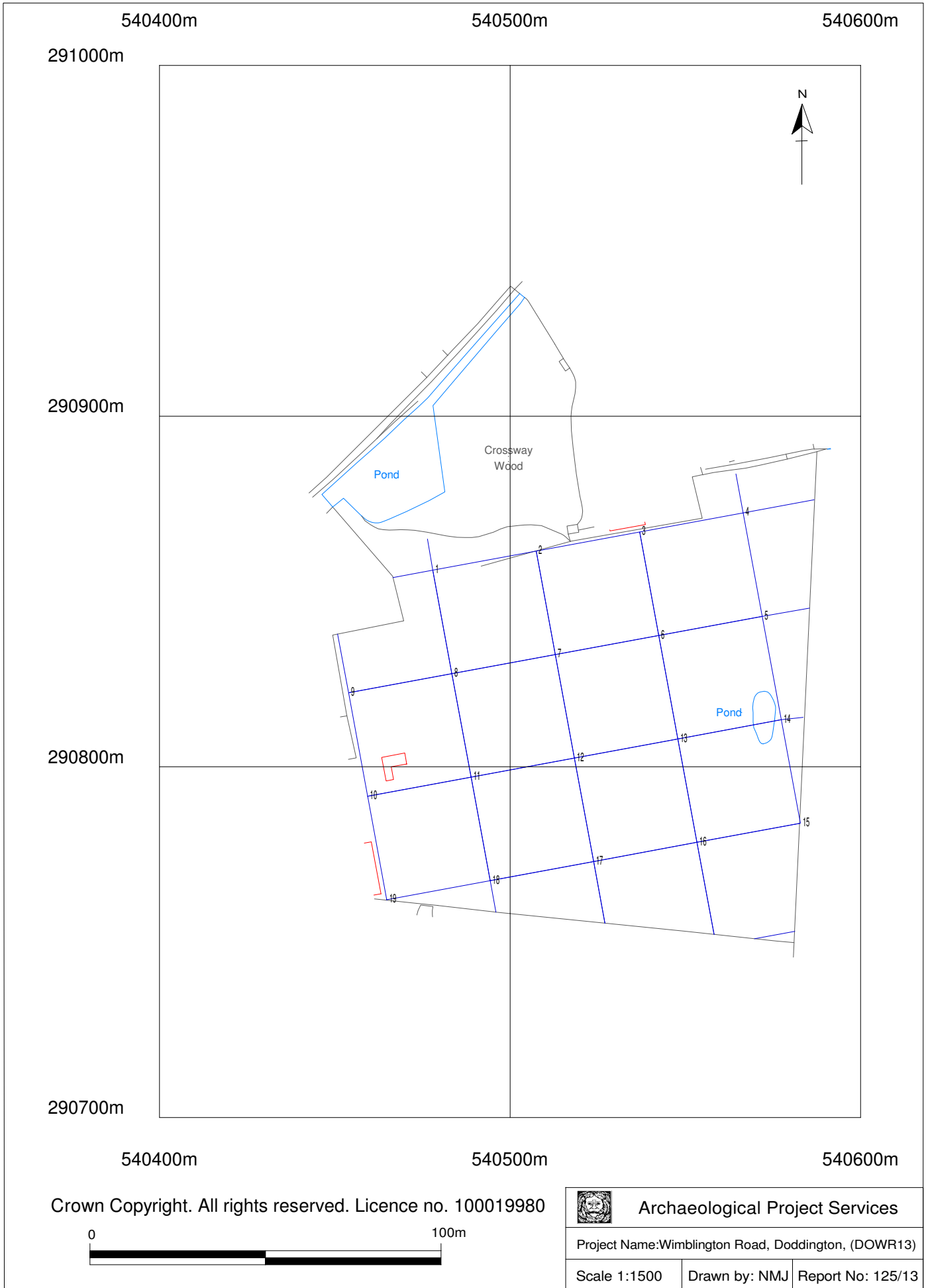
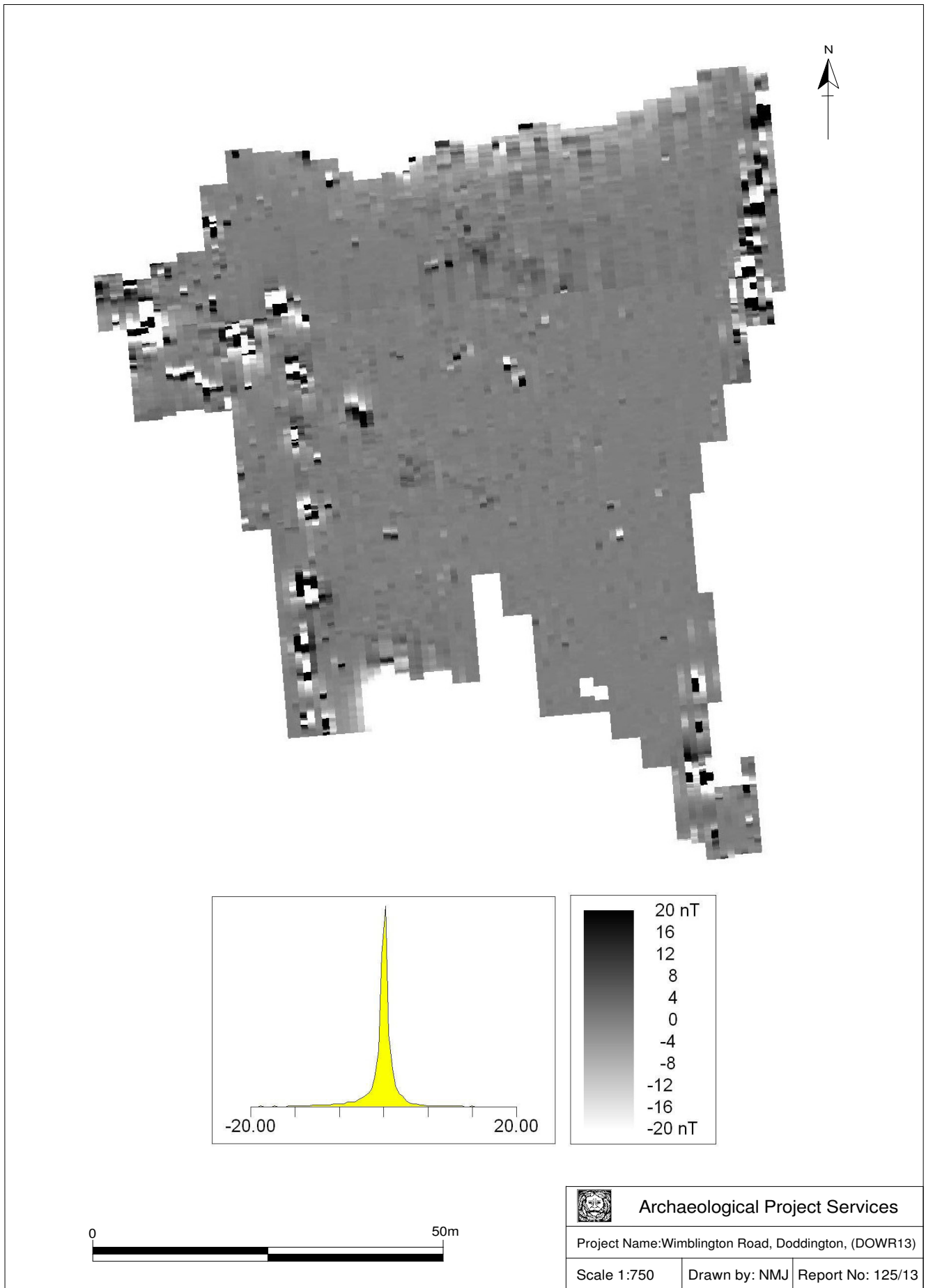


Figure 3, Location and layout of survey area








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Scale 1:750	Drawn by: NMJ	Report No: 125/13

Figure 4, Minimally processed data greyscale plot



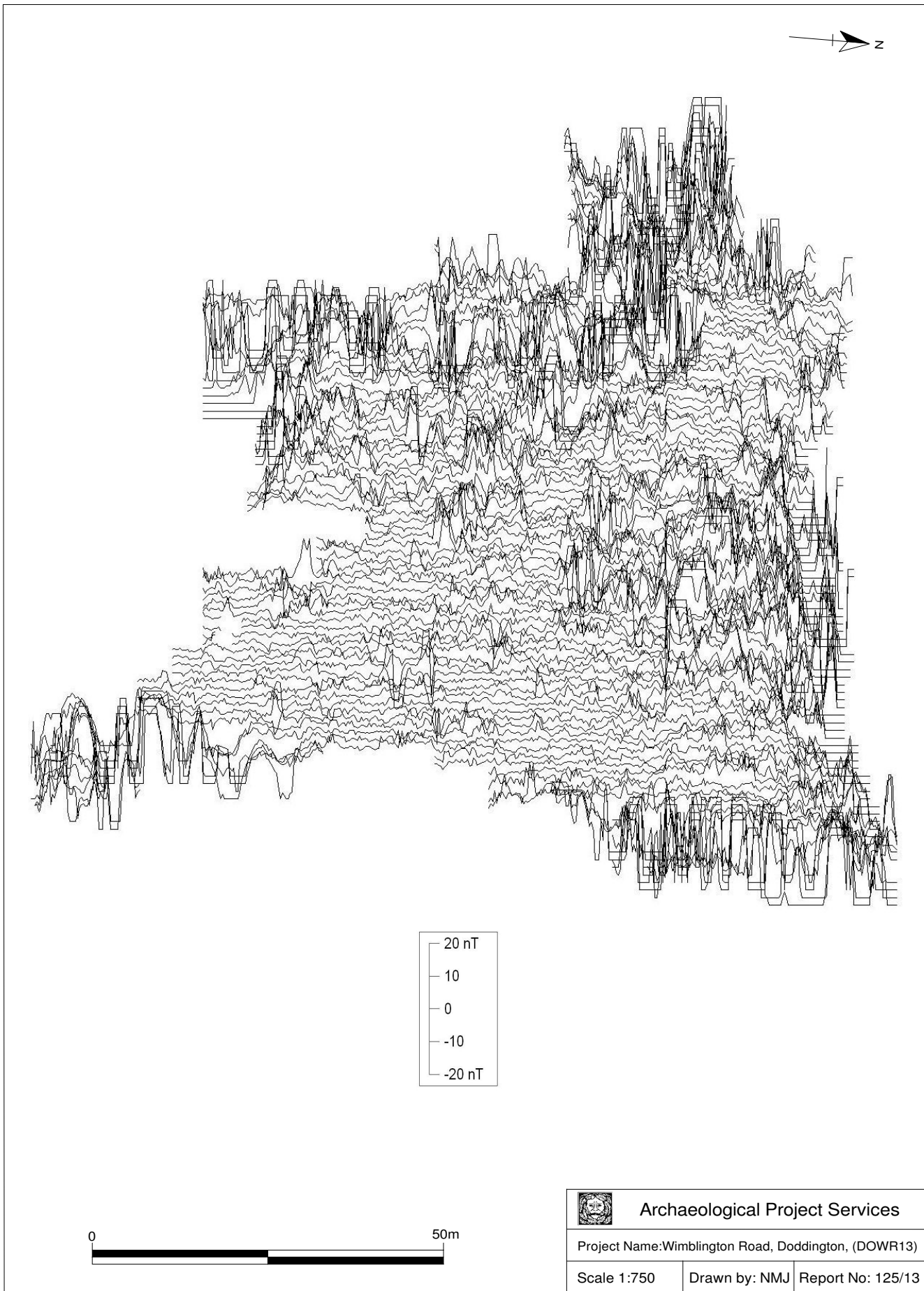



Figure 5, Minimally processed data trace plot

 <b>Archaeological Project Services</b>		
Project Name: Wimblington Road, Doddington, (DOWR13)		
Scale 1:750	Drawn by: NMJ	Report No: 125/13



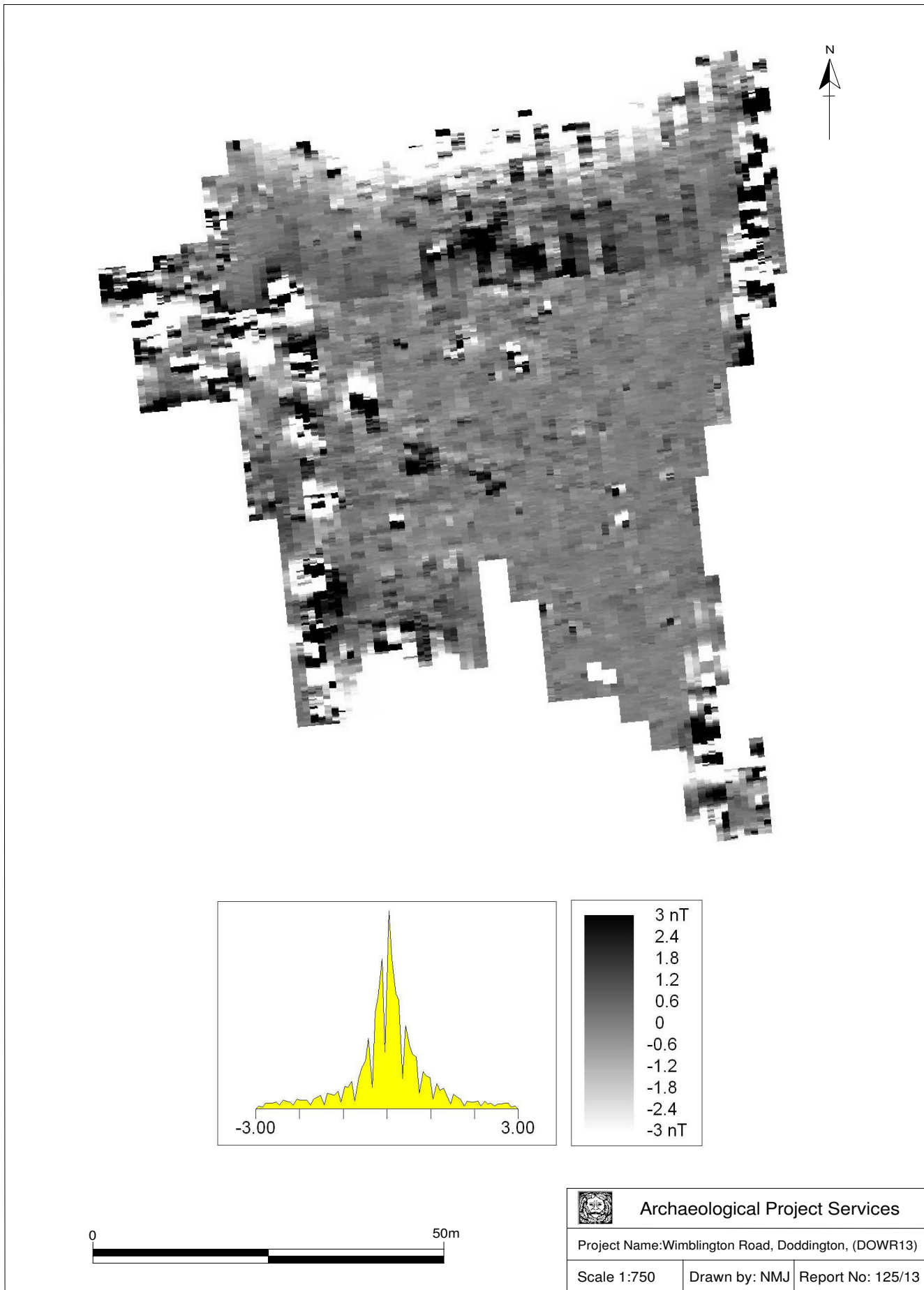


Figure 6, processed data greyscale plot



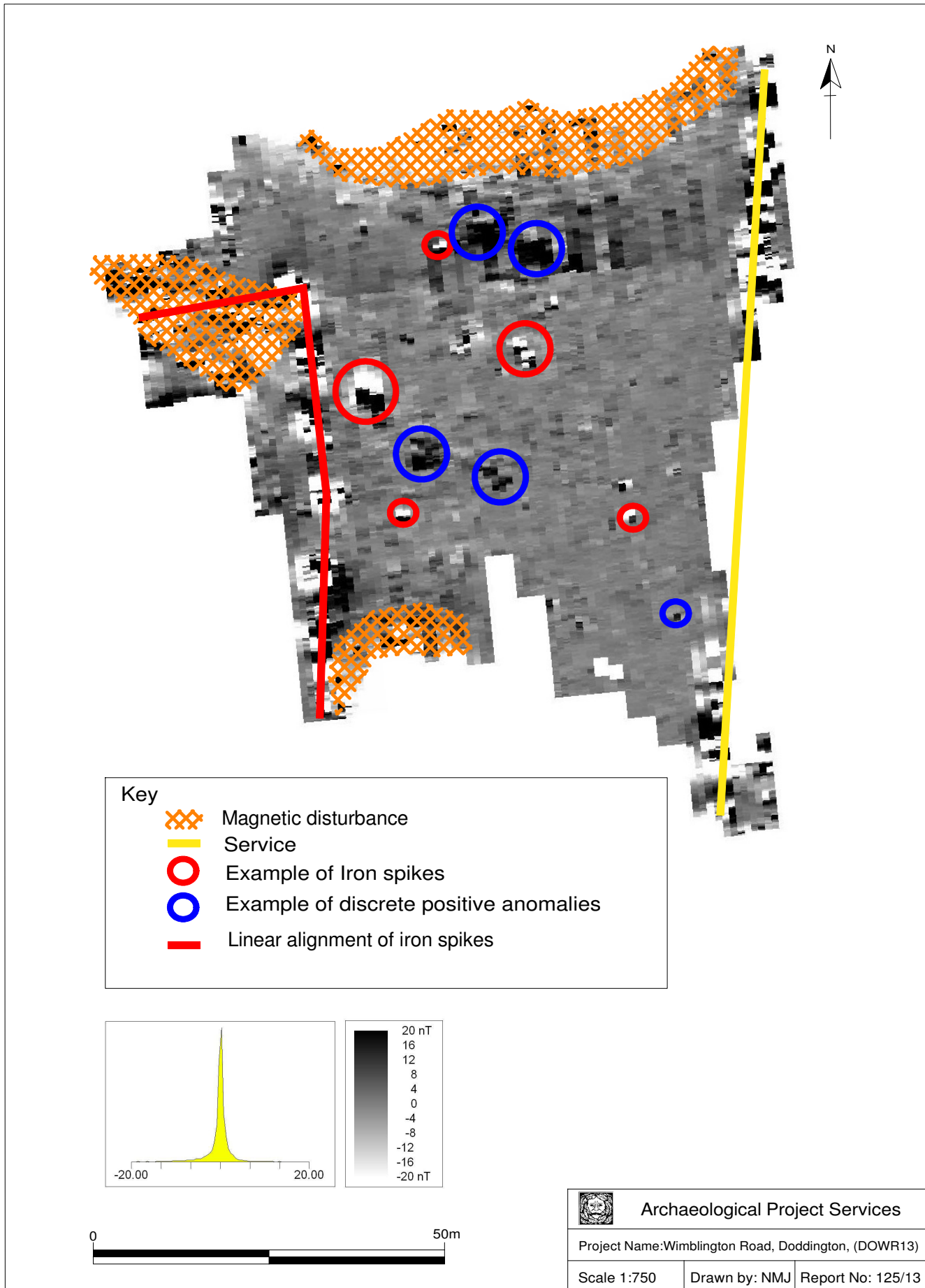


Figure 7, Interpretative plot





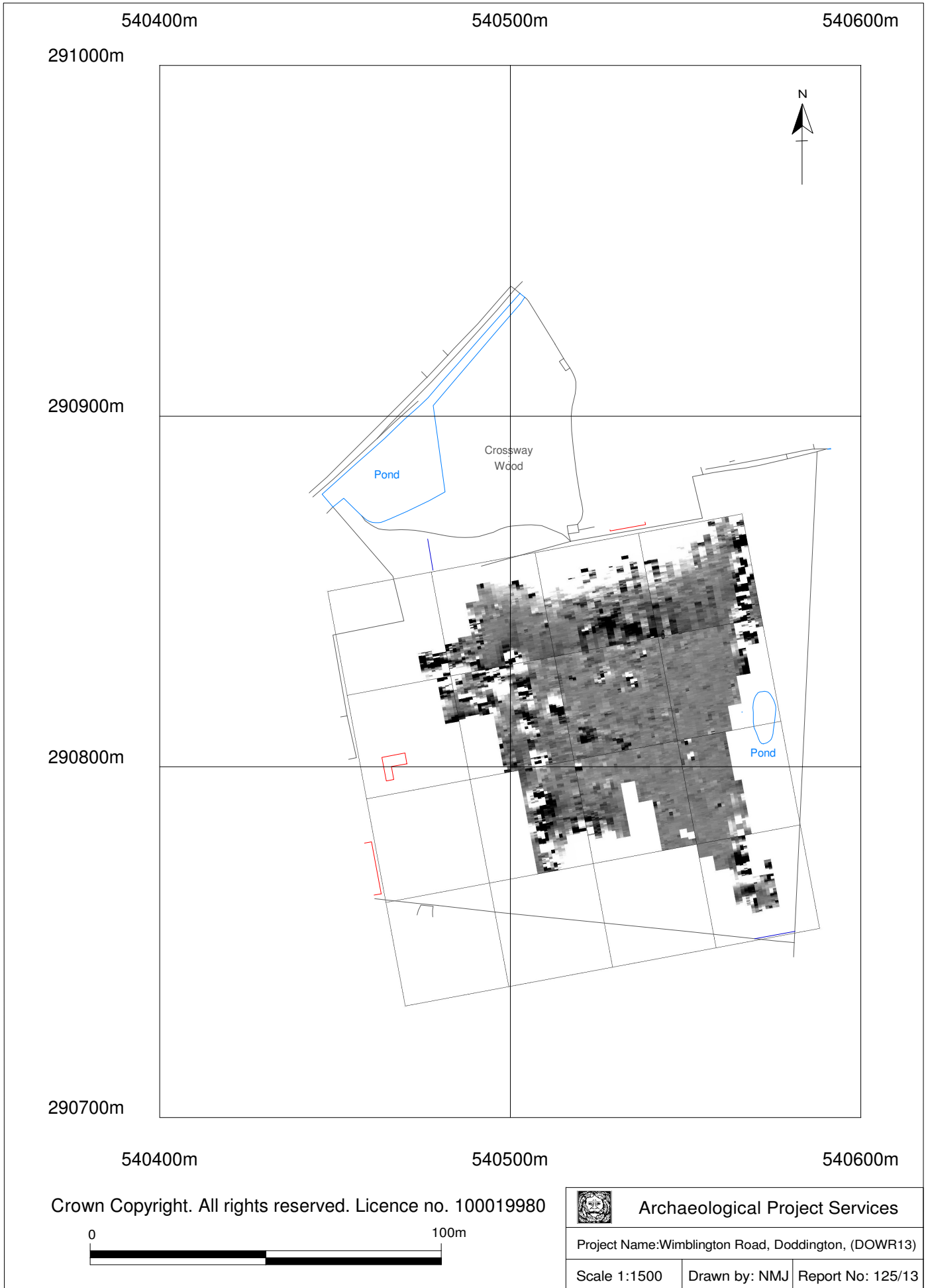


Figure 8, Processed data greyscale plot overlaid on map



## Appendix 1 THE ARCHIVE

The archive consists of:

- 1 Daily record sheets
- 1 Report text and illustrations
- Digital data

File names	DOWR13-01.xgd DOWR13-02.xgd DOWR13-03.xgd DOWR13-04.xgd DOWR13-05.xgd DOWR13-06.xgd	DOWR13-07.xgd DOWR13-08.xgd DOWR13-09.xgd DOWR13-10.xgd DOWR13-11.xgd DOWR13-12.xgd
Explanation of codes used in file names	xgd files are magnetometer grids, named with site code and number in the order surveyed. xcp files are composites containing record of all the data and processes used to produce the end product	
Description of file formats	All files are in plain text xml format with header data defining survey and processing parameters	
List of codes used in files	D indicates a "dummy" value within the composite data	
Hardware, software and operating systems	ArcheoSurveyor 2.5.15 running under Windows XP Service Pack 3	
Date of last modification	18/10/13	
Indications of known areas of weakness in data		

All primary records are currently kept at:

Archaeological Project Services, The Old School, Cameron Street, Heckington, Sleaford, Lincolnshire NG34 9RW

Site Code: DOWR13

Cambridgeshire County Event No: ECB 4064

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## Printable version

**OASIS ID: archaeol1-161843**

### Project details

Project name	GEOPHYSICAL SURVEY ON LAND OFF WIMBLINGTON ROAD, DODDINGTON, CAMBRIDGESHIRE (DOWR13)
Short description of the project	Detailed magnetic gradiometer survey was undertaken for Larkfleet Homes Ltd in connection with proposed development on land off Wimblington Road, Doddington, Cambridgeshire. The survey totalled c. 0.8ha. The survey recorded several pit type anomalies which were dispersed and the interpretation is uncertain. It also recorded a service and an alignment of iron spikes which probably indicated a removed fenced boundary.
Project dates	Start: 18-10-2013 End: 19-10-2013
Previous/future work	Yes / Not known
Any associated project reference codes	ECB4064 - HER event no.
Any associated project reference codes	DOWR13 - Sitecode
Type of project	Field evaluation
Site status	None
Current Land use	Other 13 - Waste ground
Monument type	PIT-TYPE ANOMALIES Uncertain
Significant Finds	NONE None
Methods & techniques	"Geophysical Survey"
Development type	Urban residential (e.g. flats, houses, etc.)
Prompt	Direction from Local Planning Authority - PPG16
Position in the planning process	Not known / Not recorded
Solid geology	AMPTHILL AND KIMMERIDGE CLAY
Drift geology	SAND AND GRAVEL OF UNCERTAIN AGE OR ORIGIN

Techniques      Magnetometry

### Project location

Country              England  
 Site location        CAMBRIDGESHIRE FENLAND DODDINGTON LAND OFF WIMBLINGTON ROAD  
 Study area           1.00 Hectares  
 Site coordinates    TL 40515 90840 52 0 52 29 49 N 000 04 12 E Point

### Project creators

Name of Organisation      Archaeological Project Services  
 Project brief originator    None  
 Project design originator   Gary Taylor  
 Project director/manager   Gary Taylor  
 Project supervisor        Neil Jefferson  
 Type of sponsor/funding body      Developer

### Project archives

Physical Archive Exists?      No  
 Digital Archive recipient      Cambridgeshire County Store  
 Digital Contents                "Survey"  
 Digital Media available        "Geophysics","Survey"  
 Paper Archive recipient        Cambridgeshire County Store  
 Paper Contents                 "Survey"  
 Paper Media available         "Correspondence","Map","Miscellaneous Material","Plan","Report","Survey "

### Project bibliography 1

Publication type                Grey literature (unpublished document/manuscript)  
 Title                                LAND OFF WIMBLINGTON ROAD, DODDINGTON, CAMBRIDGESHIRE (DOWR13) GEOPHYSICAL SURVEY  
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