

**A Detailed Magnetometer Survey
on Land at Bank Farm
Ashord, Kent**

NGR: 604932 137375

**ASE Project No: 6470
OASIS ID: archaeol6-173798**

ASE Report No: 2014085

By Chris Russel

March 2014

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Abstract

Archaeology South East was commissioned by URS Environment and Natural Resources to undertake a detailed fluxgate gradiometer survey of land at Bank Farm, Ashford, Kent. The survey took place between 10th February and the 28th of February 2014. The survey areas covered approximately 37.5 hectares of arable land bounded by wire fences and hedgerows.

Evidence of potential archaeological features was confined to the north-east of the survey area on the higher ground. Possible archaeological features were chiefly represented by discrete and linear moderate positive anomalies representative of cut features with some of the dipolar features noted in the results having the potential to show areas of burning. Other anomalies identified were consistent with the responses expected from geological or modern agricultural activity. Areas of magnetic disturbance may mask underlying features with weaker magnetic signals.

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1.0 INTRODUCTION

1.1 Site background

Archaeology South-East was commissioned by URS Environment and Natural Resources to undertake a magnetometry survey on land at Bank Farm, Aldington near Ashford, Kent (centred NGR: 604932 137375; Fig 1).

1.2 Geology and topography

1.2.1 The British Geological Survey records the site geology as Weald Clay Formation Mudstone in the south and Atherfield Clay Formation Sandstone and Mudstone to the north. Superficial geology is not mapped (BGS. 2013).

1.2.2 The surveys took place over open farmland to the north-west of the village of Aldington and to the south of Bank Road. Two small strips of woodland occupy the centre of the site.

1.3 Aims of the geophysical investigation

1.3.1 The aims of the archaeological investigation were set out in the Written Scheme of Investigation (ASE 2014):

- 'To obtain a better understanding of the archaeological potential of the site. This work will allow informed decisions to be made as to the need, nature and scope of any further mitigation that may be needed at the site'.

1.4 Scope of report

1.4.1 The scope of this document is to report on the findings of the survey. The geophysics survey was carried out by Chris Russel and John Cook with the on site assistance of John Hirst, Steve Price and Ian Hogg. The project was managed by Paul Mason (fieldwork), Jim Stevenson and Dan Swift (post fieldwork).

2.0 Archaeological Background

Prehistoric

- 2.1 Finds of Mesolithic flint are recorded to the immediate north-west of Bank Farm, in the vicinity of The Mount.
- 2.2 A number of Iron Age coins have been found by metal detectorists in the wider vicinity of the proposed development area.

Roman

- 2.3 Bank Road, which forms the northern boundary of the proposed development area, respects the line of the Maidstone to Dover Roman Road.
- 2.4 The Mount, a small earthen mound to the immediate north-east of Bank Farm, has been tentatively dated to the Roman period by association with the road.
- 2.5 In the 1930s the remnants of a Roman building with hypocaust system were found to the south-east of the proposed development area, near Poulton Wood.
- 2.6 Roman coins dating to the late 3rd / early 4th centuries have been found to the south-east of the proposed development area in Aldington village.

Medieval and Post-Medieval

- 2.7 A number of the farmsteads in the vicinity of the site have their origins in the later medieval period.
- 2.8 A trial trench excavated by Ashford and Area Archaeological Group close to The Mount revealed hundreds of sherds of 15th century pottery.
- 2.9 A number of medieval finds, including pottery and metalwork, have been found in the wider vicinity of the site.
- 2.10 Bank Farm itself dates from the 17th century.
- 2.11 The First Edition Ordnance Survey map (1871/72) depicts a quarry on the northern periphery of the proposed development area, next to Bank Road. It appears to have been in-filled by the time of the 1898 Survey.

3.0 SURVEY METHODOLOGY

3.1 Geophysical survey

3.1.1 A fluxgate gradiometer (magnetometry) survey was undertaken in the area depicted in Figure 2

3.1.2 The fieldwork was undertaken between the 10th and the 28th of February 2014. The weather during the survey was a mixture of strong winds and heavy rain interspersed with sunny and breezy conditions. Due to the exceptionally heavy rain parts of the site were heavily waterlogged.

3.2 Applied geophysical instrumentation

3.2.1 The Fluxgate Gradiometer employed was the Bartington Instrumentation Grad 601-2. The Grad 601-2 has an internal memory and a data logger that store the survey data. This data is downloaded into a PC and is then processed in a suitable software package.

3.2.2 30m x 30m grids were set out using a GPS (see below). Each grid was surveyed with 1m traverses; samples were taken every 0.25m.

3.2.3 Data was collected along north-south traverses in a zigzag pattern beginning in the south-west corner of each grid.

3.3 Instrumentation used for setting out the survey grid

3.3.1 The survey grid for the site was geo-referenced using a Topcon GRS 1. The GPS receiver collects satellite data to determine its position and uses the mobile phone networks to receive corrections, transmitting them to the RTK Rover via Bluetooth to provide a sub centimetre Ordnance Survey position and height. Each surveyed grid point has an Ordnance Survey position; therefore the geophysical survey can be directly referenced to the Ordnance Survey National Grid.

3.5 Data processing

3.5.1 All of the geophysical data processing was carried out using TerraSurveyor published by DW Consulting. Minimally processed data was produced using the following schedule of processing. Due to the very high positive readings of some of the magnetic disturbance the values were replaced with a dummy value so as to avoid detrimentally affecting the dataset when further processed. The first process carried out upon the data was to apply a DESPIKE to the data set which removes the random 'iron spikes' that occur within fluxgate gradiometer survey data. A ZERO MEAN TRAVERSE was then applied to survey data. This removes stripe effects within grids and ensures that the survey grid edges match. Figures 3,5,7,9 and 11 display the processed survey data.

3.6 Data presentation

- 3.6.1 Data is presented using images exported from TerraSurveyor into Autocad software and inserted into the geo-referenced site grid. Data is presented as processed data greyscale plots and raw data and trace plots are included on the Appended CD.

4.0 SURVEY RESULTS

4.1 Geophysical Survey

Survey limitations

Physical obstructions encountered on site included trees, scrub, fences and farm equipment. In addition some areas either contained standing water or were heavily waterlogged. These latter areas were omitted on health and safety grounds. Obstructions for each area are noted in the results. In addition, the effectiveness of magnetometer surveys depends on a contrast between the absolute magnetic susceptibility of the topsoil to the underlying subsoil (Clark 1996). Features may also be difficult to detect where there has been significant primary silting and development of significant overburden. Areas where physical obstructions form a barrier to survey, or a health and safety issue, have been omitted.

4.2 Introduction to results

The results should be read in conjunction with the figures at the end of this report. The types of features likely to be identified are discussed below.

Positive Magnetic Anomalies

Positive anomalies generally represent cut features that have been in-filled with magnetically enhanced material.

Negative Magnetic anomalies

Negative anomalies generally represent buried features such as banks that have a lower magnetic signature in comparison to the background geology

Magnetic Disturbance

Magnetic disturbance is generally associated with interference caused by modern ferrous features such as fences and service pipes or cables.

Magnetic Debris

Low amplitude magnetic debris consists of a number of dipolar responses spread over an area and is indicative of ground disturbance.

Dipolar Anomalies

Dipolar anomalies are positive anomalies with an associated negative response. These anomalies are usually associated with discrete ferrous objects or may represent buried kilns or ovens.

Bipolar Anomalies

Bipolar anomalies consist of alternating responses of positive and negative magnetic signatures. Interpretation will depend on the strength of these responses; modern pipelines and cables typically produce strong bipolar responses.

Thermoremanence

Thermoremanence is most commonly encountered through the magnetizing of clay through the firing process although stones and soils can also acquire

thermoremanence.

4.3 Interpretation of fluxgate gradiometer (magnetometry) results

(Figures 4, 6, 8, 10 and 12)

The survey has been divided into 5 areas based on the individual fields within the survey area. Portions of the survey grid omitted are noted below.

Field 1

(Figures 3 & 4)

- 4.3.1 Field 1 was situated in the extreme west of the survey area in an area currently under cultivation for wheat.
- 4.3.2 A number of anomalies suggest some evidence for archaeological activity in Field 1.
- 4.3.3 Three discrete moderate positive anomalies are noted in Field 1. Features 1A, 1B and 1C are sub-circular in nature.
- 4.3.4 Evidence of modern agricultural activity is evident in the results for Field 1 in the form of plough marks and land drains.

Field 2

(Figure 5 & 6)

- 4.3.5 Field 2 was situated in the south of the survey area adjacent to Field 1 and was under arable cultivation. Marginal parts of the field were heavily waterlogged and were omitted from survey for the reasons noted above. The central part of Field 2 also contained a plantation of oak trees and could not be surveyed. Lastly, the north-eastern portion of the survey grid in Field 2 contained a large pile of manure which was given a wide berth on grounds of health and safety.
- 4.3.6 Evidence of possible archaeological features was limited chiefly to a number of linear moderate positive anomalies and three dipolar features. Linear anomalies 2A and 2B can be seen in the north of the field and 2C shows a pair of parallel linear anomalies. It should be noted that 2A strongly mirrors the plough marks and may be the result of modern agricultural activity. There is a single discrete positive anomaly noted at 2G which has the potential to be archaeological in origin.
- 4.3.7 The three dipolar anomalies noted at 2D-2F may represent areas of burning such as kilns or fire pits but may equally depict near surface ferrous objects.

Field 3

(Figures 7 & 8)

- 4.3.8 Field 3 was the smallest of the five fields surveyed and was situated in the north of the survey area. It was under arable cultivation at time of survey. Unfortunately parts of the south and east of the field were so heavily waterlogged that they could not be surveyed.
- 4.3.8 Two cruciform arrangements of positive linear anomalies are visible in this field at 3B and 3C and there is a single linear anomaly at 3D. These anomalies have the potential to represent archaeological cut features such as ditches or pits. There is a pair of positive anomalies at 3F and a single similar feature at 3G which have the potential to be archaeological in origin.
- 4.3.9 An area of magnetic debris is noted in the north-west of the field at 3E which may be the result of fairly modern activity.

Field 4

(Figures 9 & 10)

- 4.3.10 Field 4 was the largest single area surveyed, consisting of an enclosure currently under cultivation for wheat and sloping to the south. The south of the field contained a small copse of mixed deciduous woodland which could not be surveyed. The south-eastern extent of the field was heavily waterlogged and was omitted from the survey as was a small area in the west of the field close to the access into Field 3. Field 4 contained by far the largest concentration of anomalies noted within the survey.
- 4.3.11 Two roughly semi-circular anomalies were noted in the north of the field at 4O and 4L. These appear to respect the line of Bank Road which runs just to the north of the field boundary. The anomaly 4L looks to enclose a cluster of moderate, positive discrete responses and group of similar features can be seen in the west at 4A.
- 4.3.12 Two parallel linear positive anomalies are noted at 4B and 4C in the south-west. 4B appears to continue into Field 3. To the north of this group is an angular linear response noted at 4D.
- 4.3.13 Further to the south-east are a group of three large positive discrete anomalies at 4E, 4G and 4H. In close association is a curvilinear anomaly at 4F. These features and those noted above have the potential to relate to archaeological features such as pits and ditches although a geological explanation for these results should not be ruled out.
- 4.3.14 In the south-east of Field 4 are two curvilinear responses at 4I and 4J. These have a weaker magnetic response and they appear to mirror the natural contours of the field. A geological explanation for these features would be plausible although they retain a degree of archaeological potential.
- 4.3.15 Lastly several strong dipolar response are noted in Field 4 at 4K, 4M, 4N,

4P and 4Q. These may represent areas of burning such as kilns although they may equally show near surface metallic objects, a number of which were noted in the field by the survey team.

Field 5

(Figures 11 & 12)

- 4.4.20 Field 5 was the eastern-most of the five surveyed field and the closest to the farm complex at Bank Farm. Areas around the margins of the field were waterlogged, especially in the west and south-east, and could not be surveyed. There was a storage area in the south-east of Field 5 containing farm machinery and general farm supplies which could also not be surveyed. Unfortunately the electromagnetic field generated by the modern farm structures appears to have had an adverse effect on the survey data collected in the area although there are several anomalies which are visible in the results.
- 4.4.21 There is a moderate linear anomaly shown at 5A in the west of the field which appears to mirror or respect the existing field boundaries. Two shorter linear features are noted at 5D and 5I which again show strong correlation with the present field boundaries.
- 4.4.22 In the north of Field 5 is a group of discrete moderate positive anomalies (5B-5H) which may represent in-filled cut features.
- 4.4.23 There is a scatter of magnetic debris in the far east of Field 5 which, given the proximity to the modern farm, are most likely recent in origin.

5.0 CONCLUSIONS

5.1 Discussion

Fields 1 & 2

- 5.1.1 These low lying field in the south and west of the survey area yielded the lowest number of anomalies with the potential to relate to buried archaeology and plough marks and land drains were also visible within the results. This may be because the focus of activity in the past was on higher, better drained areas of the site although it could also be the case that the geology in the south of the site is less receptive to investigation using magnetometry. The survey team noted concentrations of apparently medieval pottery during the survey of Field 1.
- 5.1.2 The parallel double linear shown at 2C has the strongest potential to represent buried archaeology and some of the dipolar anomalies noted in this field may be thermoremnant in nature. The feature shown at 2G may be a cut feature such as a pit.

Fields 3 & 4

- 5.1.3 These fields in the north of the survey area yielded the greatest number of anomalies with the potential to represent archaeology. The linear anomalies in Field 3 appear to form enclosures and some possibly extend into Field 4. Some of the discrete anomalies in Field 3 may show cut features such as pits.
- 5.1.4 The two semi-circular positive anomalies in Field 4 (4O & 4L) also have good potential, especially given their proximity to Bank Road which is on the line of the Roman Maidstone to Dover road. The feature 4L encloses a series of discrete positive anomalies also with good potential.
- 5.1.5 The anomaly noted at 4D is angular in nature and has the potential to be archaeological in nature. The remaining features in the south of the field respect to contour lines of the field and may be geological although an archaeological origin for these anomalies should not be ruled out. The dipolar anomalies in the north of the field may be thermoremnant although a number of large metallic objects were noted here by the survey team and these would give a similar response.

Field 5

- 5.1.6 The angular linear feature shown at 5A has the greatest potential to be archaeological in nature. This feature does mirror the current field boundary and may therefore be relatively recent in origin. The group of discrete anomalies in the north of the field is also worthy of note. It should be noted that Field 5 is the closest to the modern Bank Farm complex and as such has probably been subject to the greatest amount of modern disturbance. This is highlighted by the fact that Field 5 contained wooden pylons carrying overhead electricity cables.

5.2 Summary

- 5.2.1 Evidence of archaeological features was successfully detected throughout the magnetic survey, particularly in the north of the survey area. Possible archaeological features were mostly represented by discrete and linear positive anomalies representative of cut features. Other anomalies identified consisted of possible geological and agricultural activity. Areas of magnetic disturbance may mask underlying features with a weaker magnetic signature. As noted above the paucity of anomalies from the south and west may be caused by a less responsive geology in these areas.
- 5.2.2 In general the linear anomalies identified within the survey are ephemeral. This may be due to the features themselves being ephemeral, overburden between the magnetometer and the feature, the result of more recent agricultural activity, infilling of natural features or a combination of these. For this reason the archaeological geophysics should be tested by invasive techniques (e.g. targeted trial trenching carried out post determination as a planning condition) to assess the nature of the recorded anomalies.

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ACKNOWLEDGEMENTS

Archaeology South–East would like to thank URS Environment and Natural Resources for commissioning the survey.

HER Summary

Site Code	ABF 14					
Identification Name and Address	Land at Bank Farm , Ashford					
County, District &/or Borough	Kent					
OS Grid Refs.	604932 137375					
Geology	Clay With Flints					
Arch. South-East Project Number	6470					
Type of Fieldwork					Survey	
Type of Site	Green Field					
Dates of Fieldwork				10/02/14 – 28/02/14		
Sponsor/Client	URS					
Project Manager	Paul Mason					
Project Supervisor	Chris Russel					
Period Summary						
<p>Summary</p> <p><i>Archaeology South East was commissioned by URS Environment and Natural Resources to undertake a detailed fluxgate gradiometer survey of land at Bank Farm, Ashford, Kent. The survey took place between 10th February and the 28th of February 2014. The survey areas covered approximately 37.5 hectares of arable land bounded by wire fences and hedgerows.</i></p> <p><i>Evidence of potential archaeological features was confined to the north-east of the survey area on the higher ground. Possible archaeological features were chiefly represented by discrete and linear moderate positive anomalies representative of cut features with some of the dipolar features noted in the results having the potential to show areas of burning. Other anomalies identified were consistent with the responses expected from geological or modern agricultural activity. Areas of magnetic disturbance may mask underlying features with weaker magnetic signals.</i></p>						

OASIS FORM

OASIS ID: archaeol6-173798

Project details

Project name	deetailed Magnetometer Survey on Land at Bank Farm, Ashford, Kent
Short description of the project	<p>Archaeology South East was commissioned by URS Environment and Natural Resources to undertake a detailed fluxgate gradiometer survey of land at Bank Farm, Ashford, Kent. The survey took place between 10th February and the 28th of February 2014. The survey areas covered approximately 37.5 hectares of arable land bounded by wire fences and hedgerows.</p> <p>Evidence of potential archaeological features was confined to the north-east of the survey area on the higher ground. Possible archaeological features were chiefly represented by discrete and linear moderate positive anomalies representative of cut features with some of the dipolar features noted in the results having the potential to show areas of burning. Other anomalies identified were consistent with the responses expected from geological or modern agricultural activity. Areas of magnetic disturbance may mask underlying features with weaker magnetic signals.</p>
Project dates	Start: 10-02-2014 End: 28-02-2014
Previous/future work	Not known / Not known
Any associated project reference codes	6470 - Contracting Unit No.
Any associated project reference codes	ABF 14 - Sitecode
Type of project	Recording project
Site status	None
Current Land use	Cultivated Land 4 - Character Undetermined
Monument type	UNKNOWN Uncertain
Significant Finds	NONE None
Investigation type	"Geophysical Survey"
Solid geology (other)	Atherfield Clay/Weald Clay
Drift geology	Unknown
Techniques	Magnetometry

Project location

Country	England
Site location	KENT ASHFORD ALDINGTON Bank Farm, Ashford
Postcode	TN25 7DF
Study area	37.50 Hectares
Site coordinates	TR 604932 137375 50.8635749453 1.70239212586 50 51 48 N 001 42 08 E Point

Project creators

Name of Organisation	Archaeology South East
Project brief originator	URS
Project design originator	ASE
Project director/manager	Paul Mason
Project supervisor	Chris Russel
Type of sponsor/funding body	Developer

Project archives

Physical Archive Exists?	No
Physical Archive recipient	n/a
Digital Archive recipient	Unknown
Digital Contents	"Survey"
Digital Media available	"Geophysics"
Paper Archive recipient	URS
Paper Contents	"other"
Paper Media available	"Report"

Project bibliography 1

Grey literature (unpublished document/manuscript)

Publication type

Title A Detailed Magnetometer Survey on Land at Bank Farm,
Ashford, Kent

Author(s)/Editor(s) Russel,C

Other bibliographic details Report Number 2014085

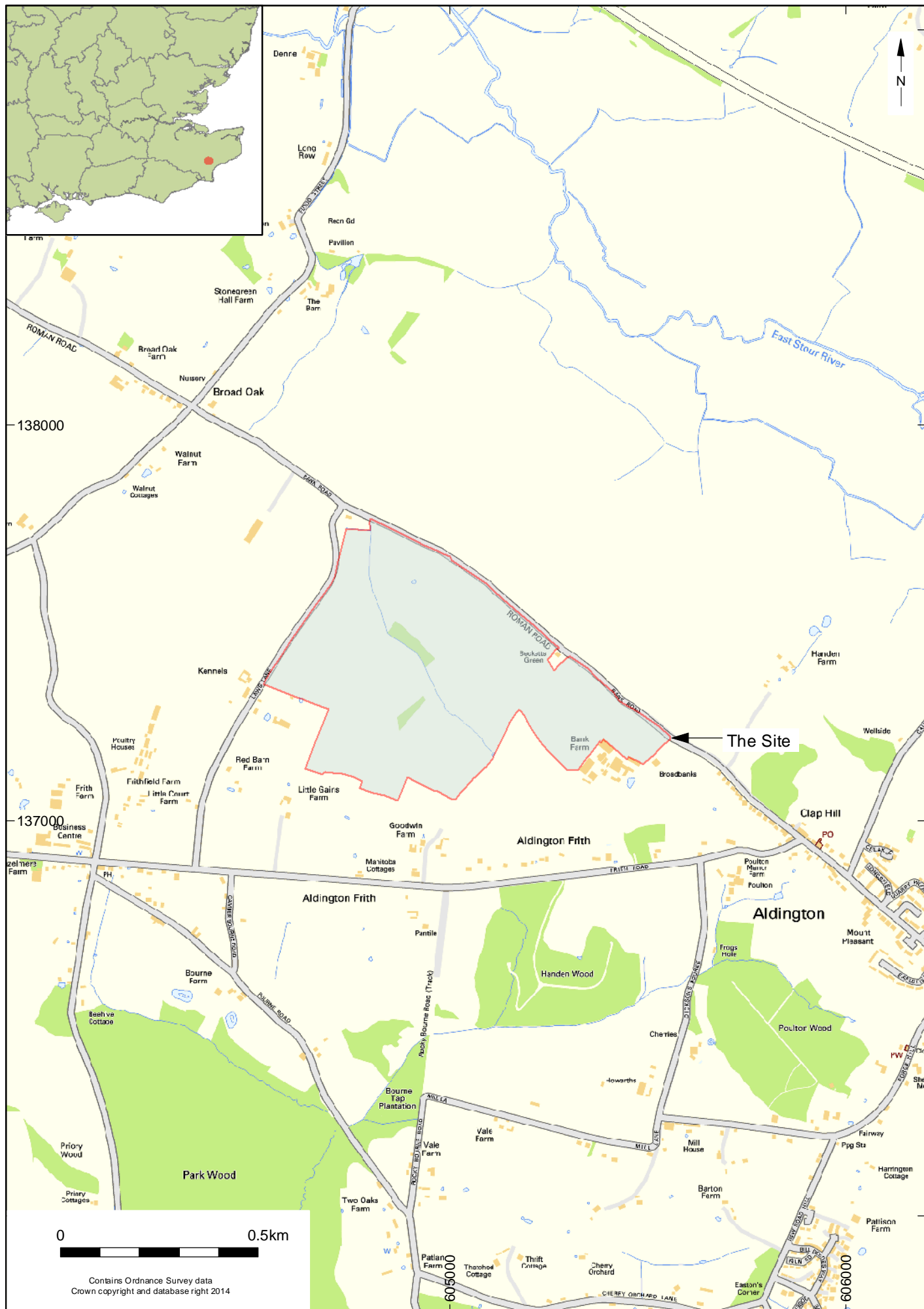
Date 2014

Issuer or publisher ASE

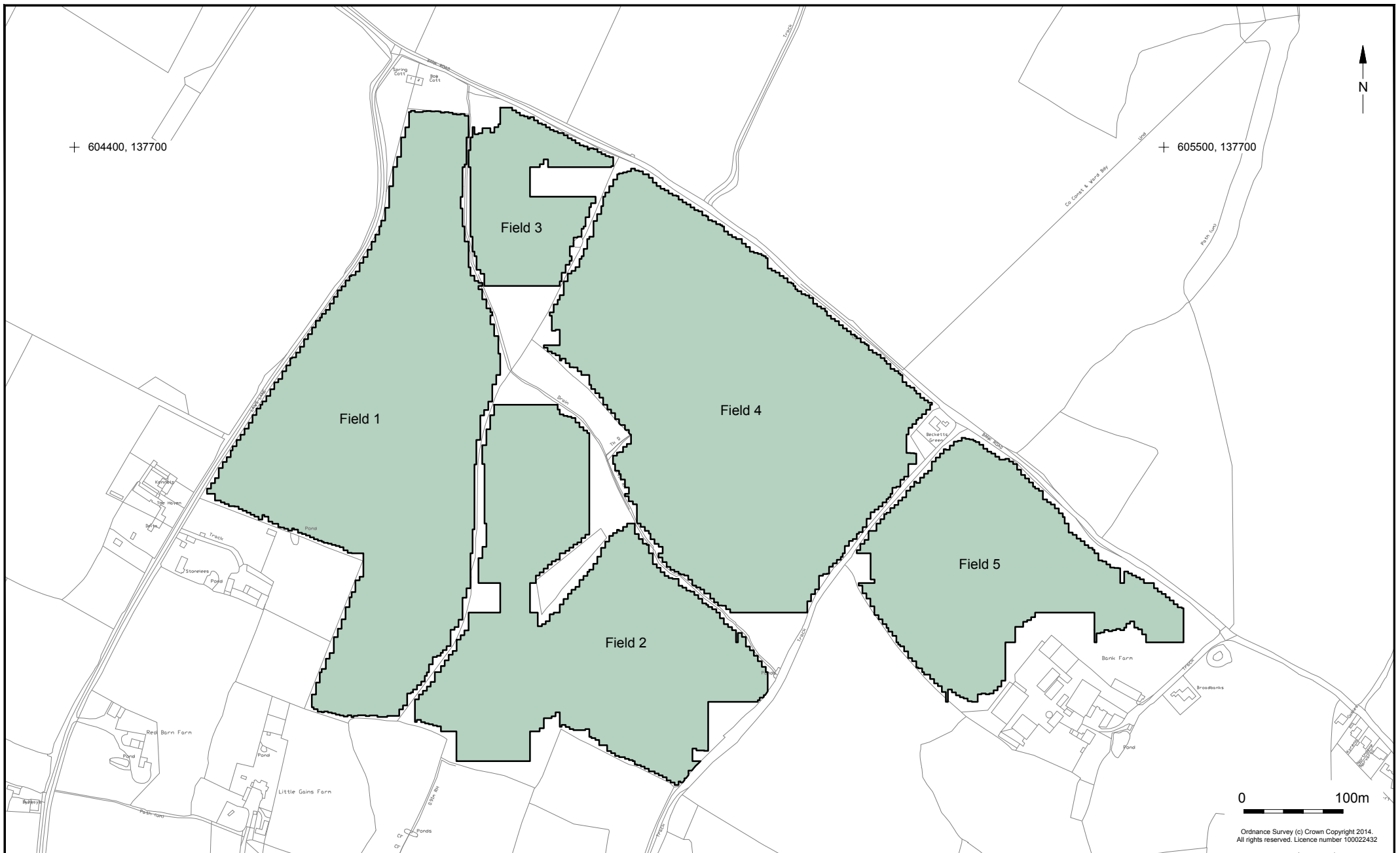
Place of issue or publication Portslade

Entered by Chris Russel (c.russel@ucl.ac.uk)

Entered on 10 March 2014



© Archaeology South-East		Bank Farm, Ashford	Fig. 1
Project Ref: 6470	March 2014	Site location	
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March 2014

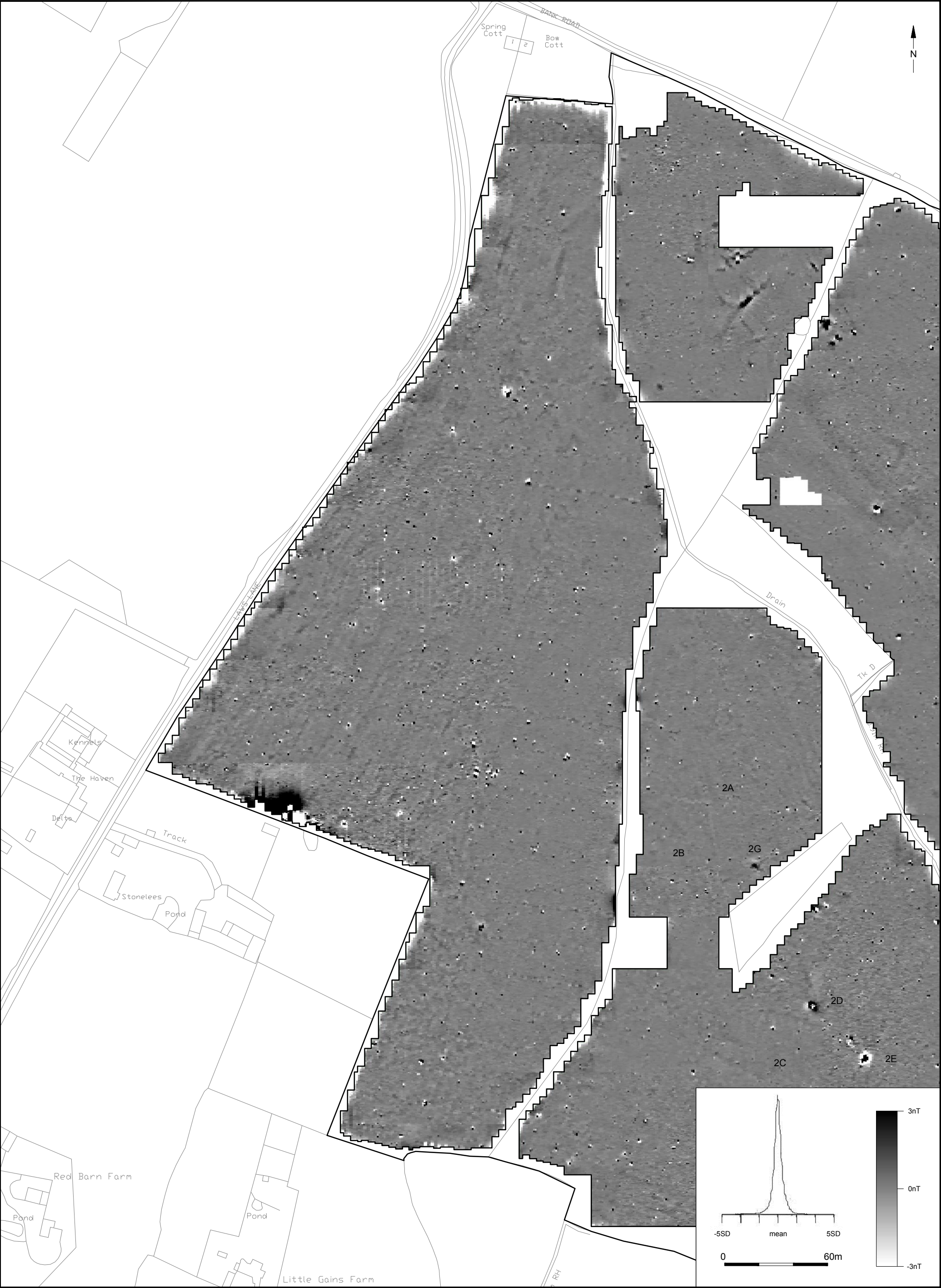
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Bank Farm, Ashford

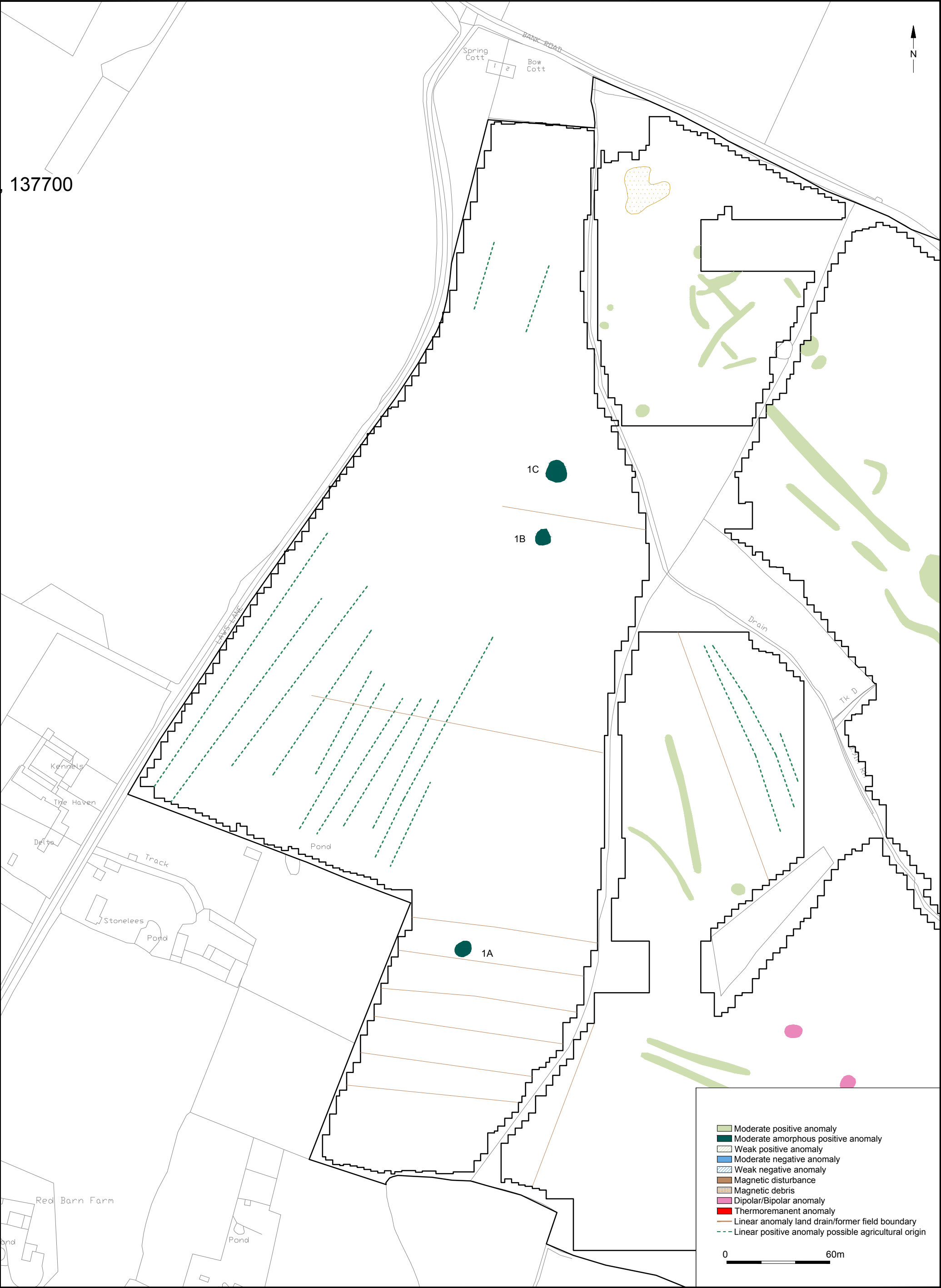
Plan of geophysics areas

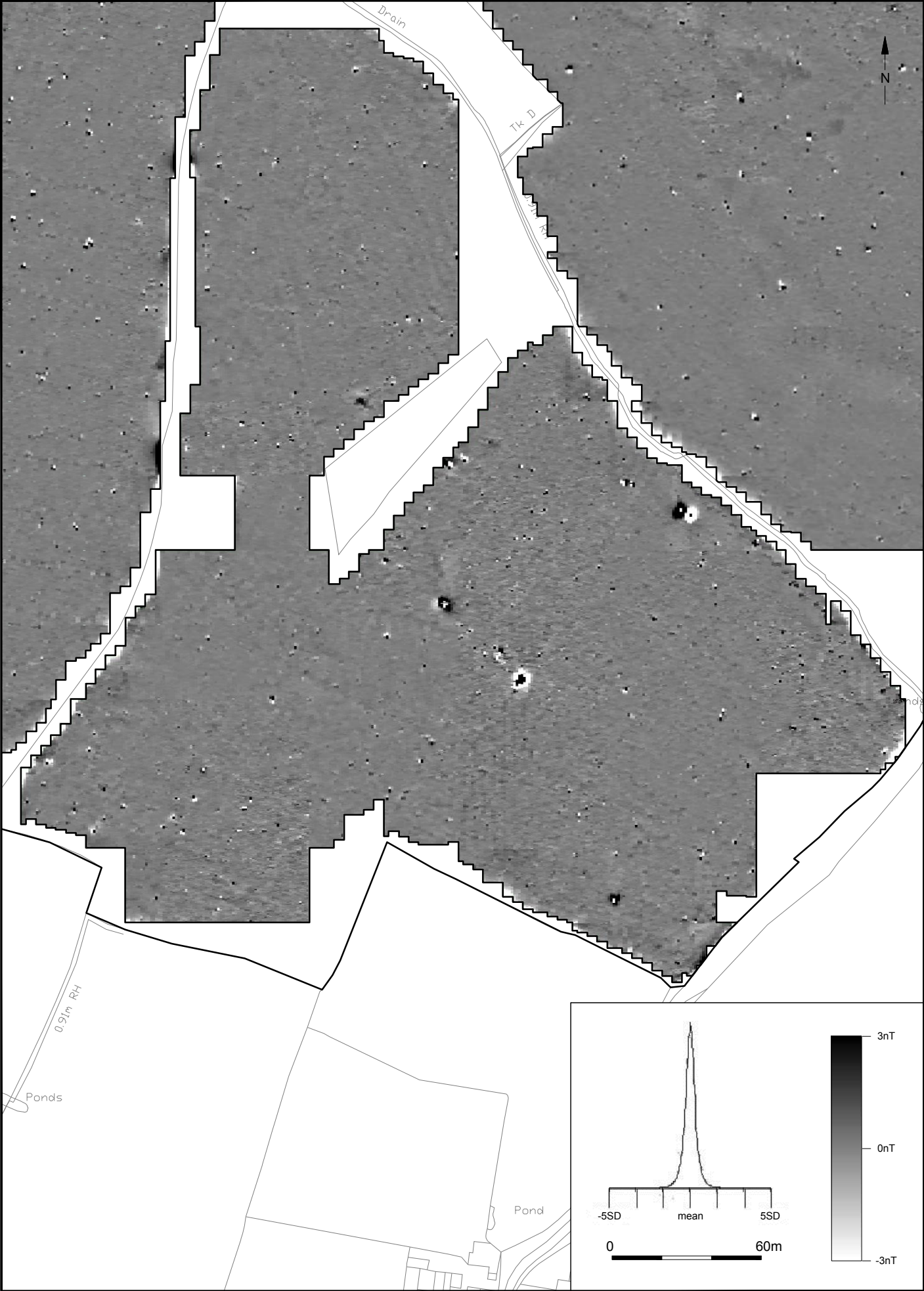
Fig. 2

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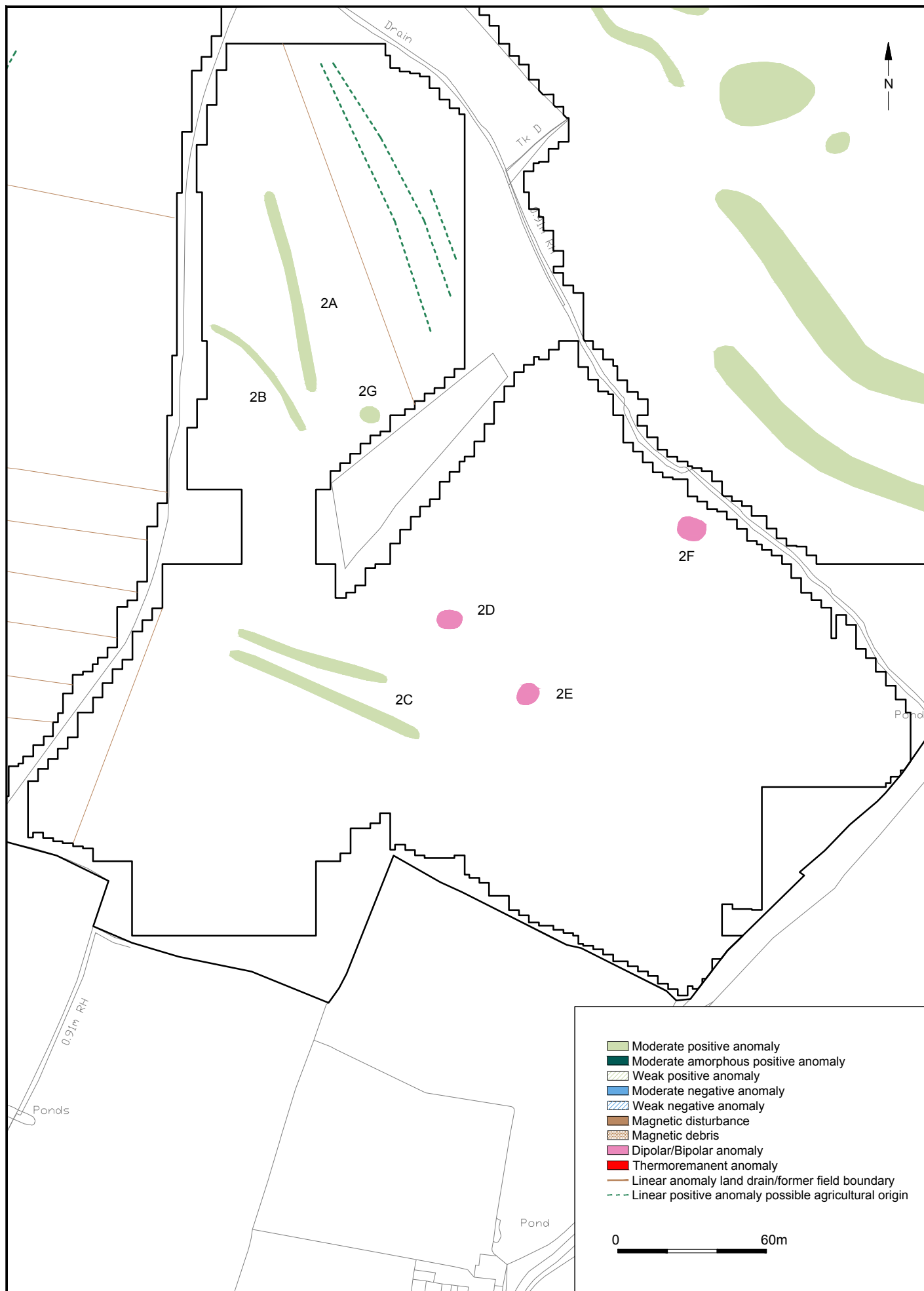


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Report Ref: 2014085	Drawn by: JLR		





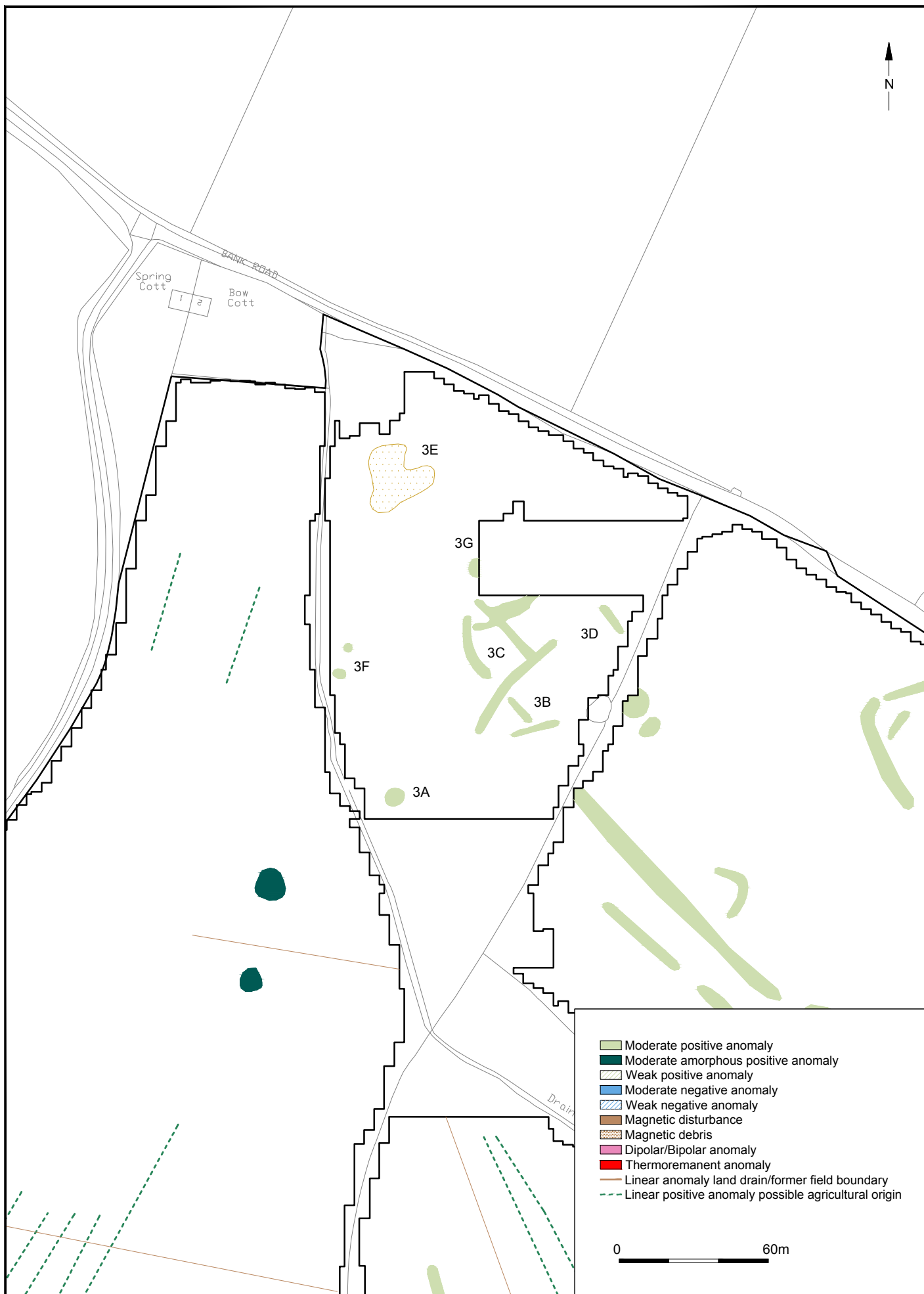
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Project Ref: 6470	March 2014	Field 2 processed data	
Report Ref: 2014085	Drawn by: JLR		



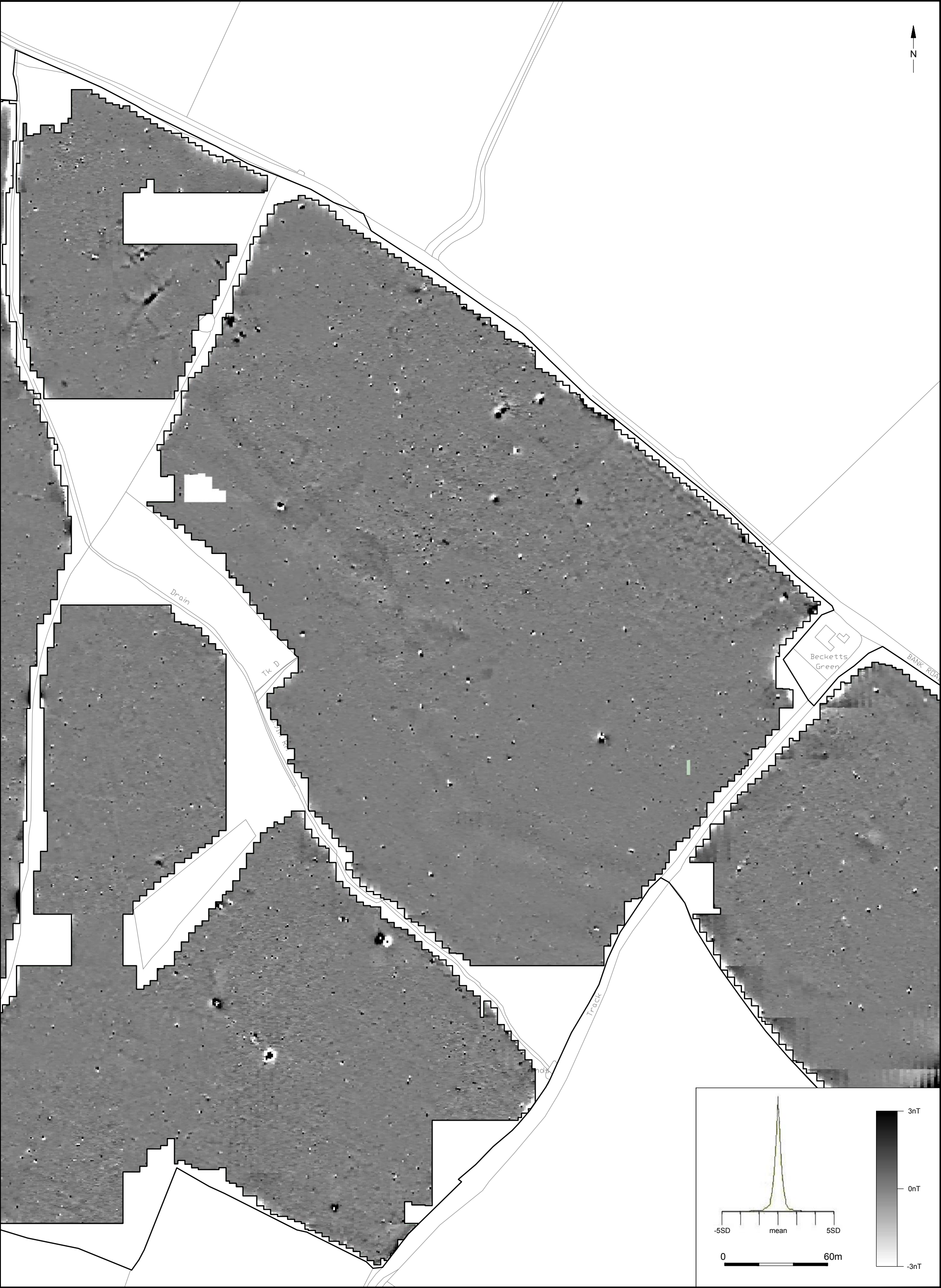
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Project Ref: 6470	March 2014	Field 2 interpretation	
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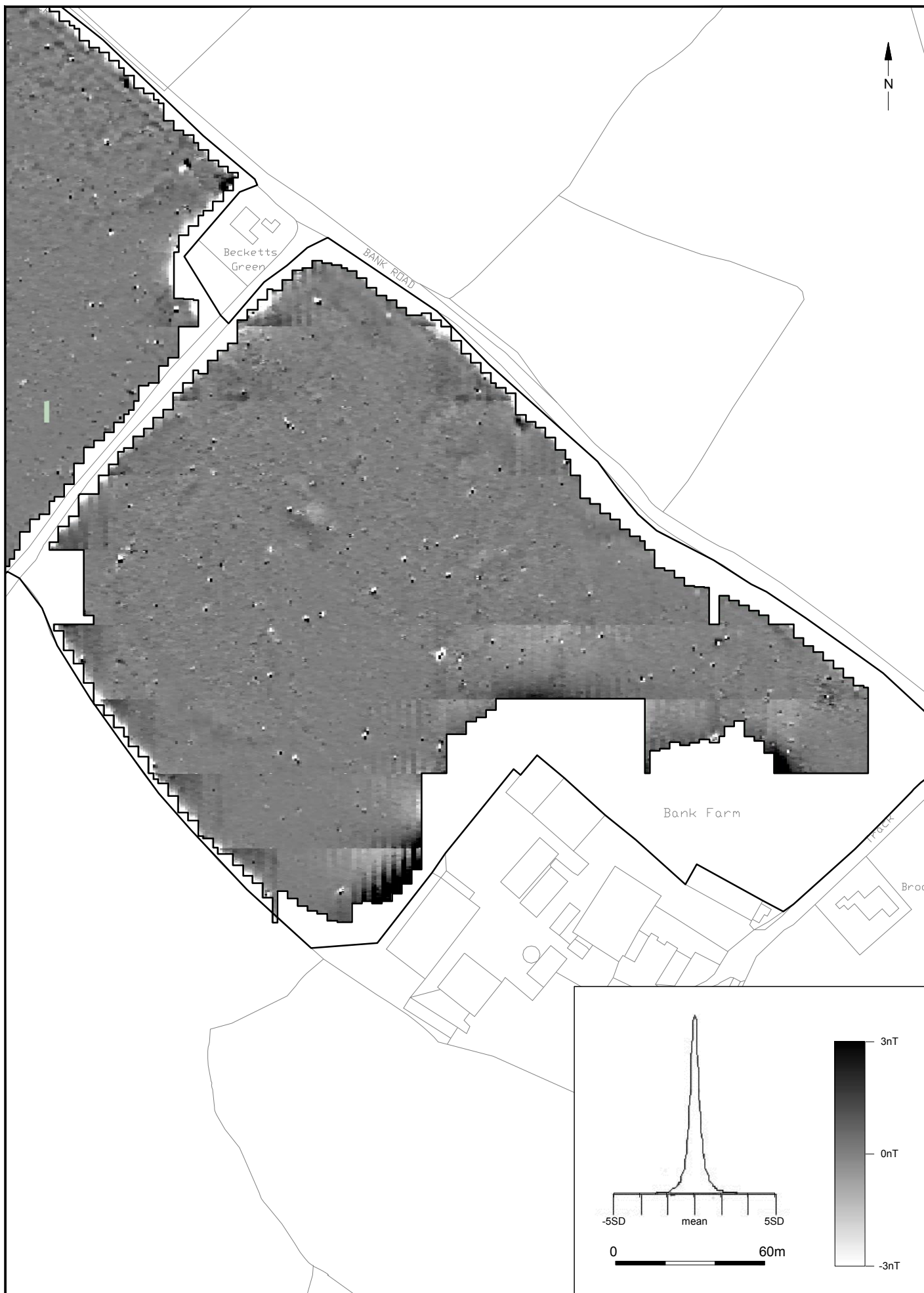
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Project Ref: 6470	March 2014	Field 3 processed data	
Report Ref: 2014085	Drawn by: JLR		



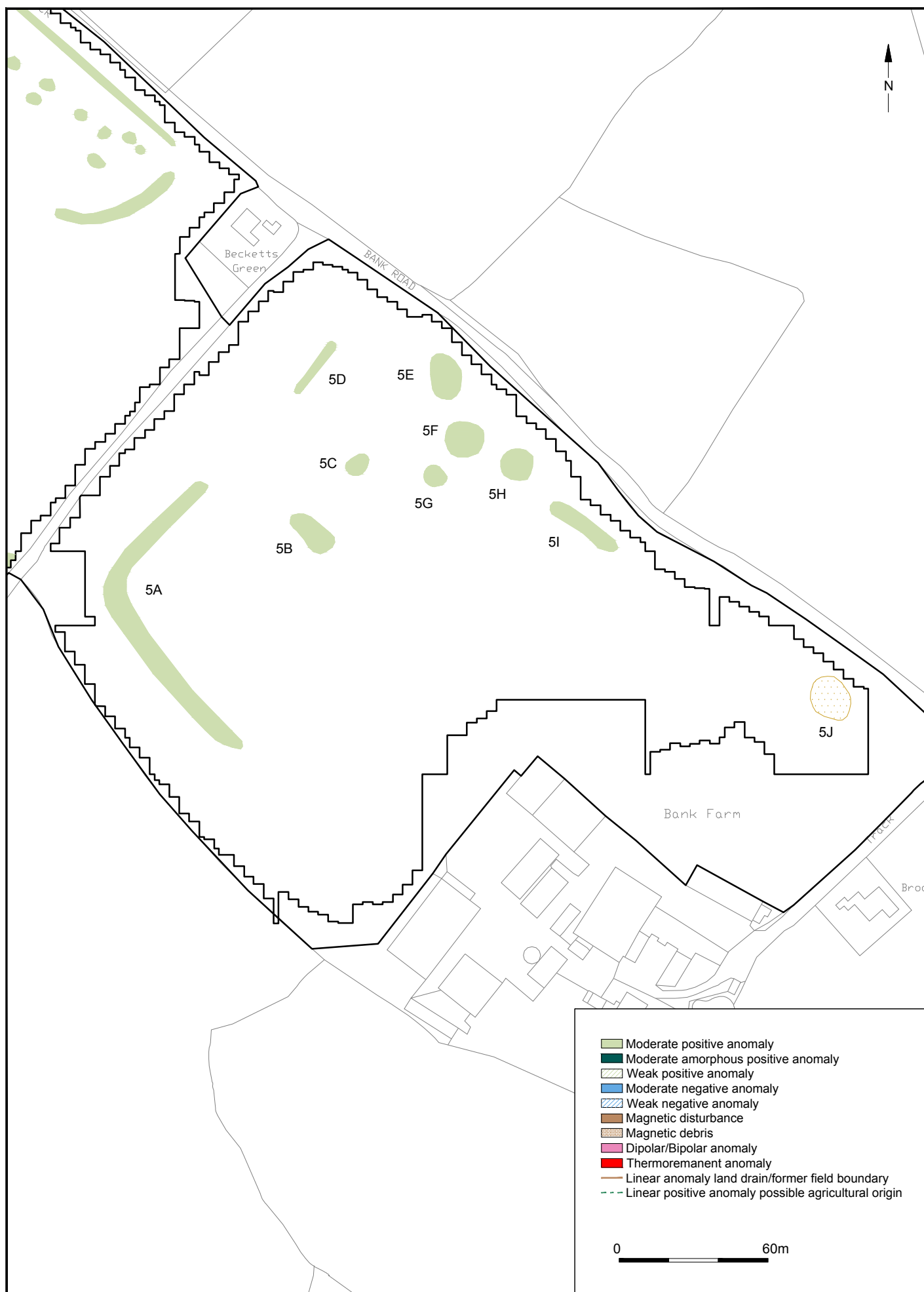
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Report Ref: 2014085	Drawn by: JLR		



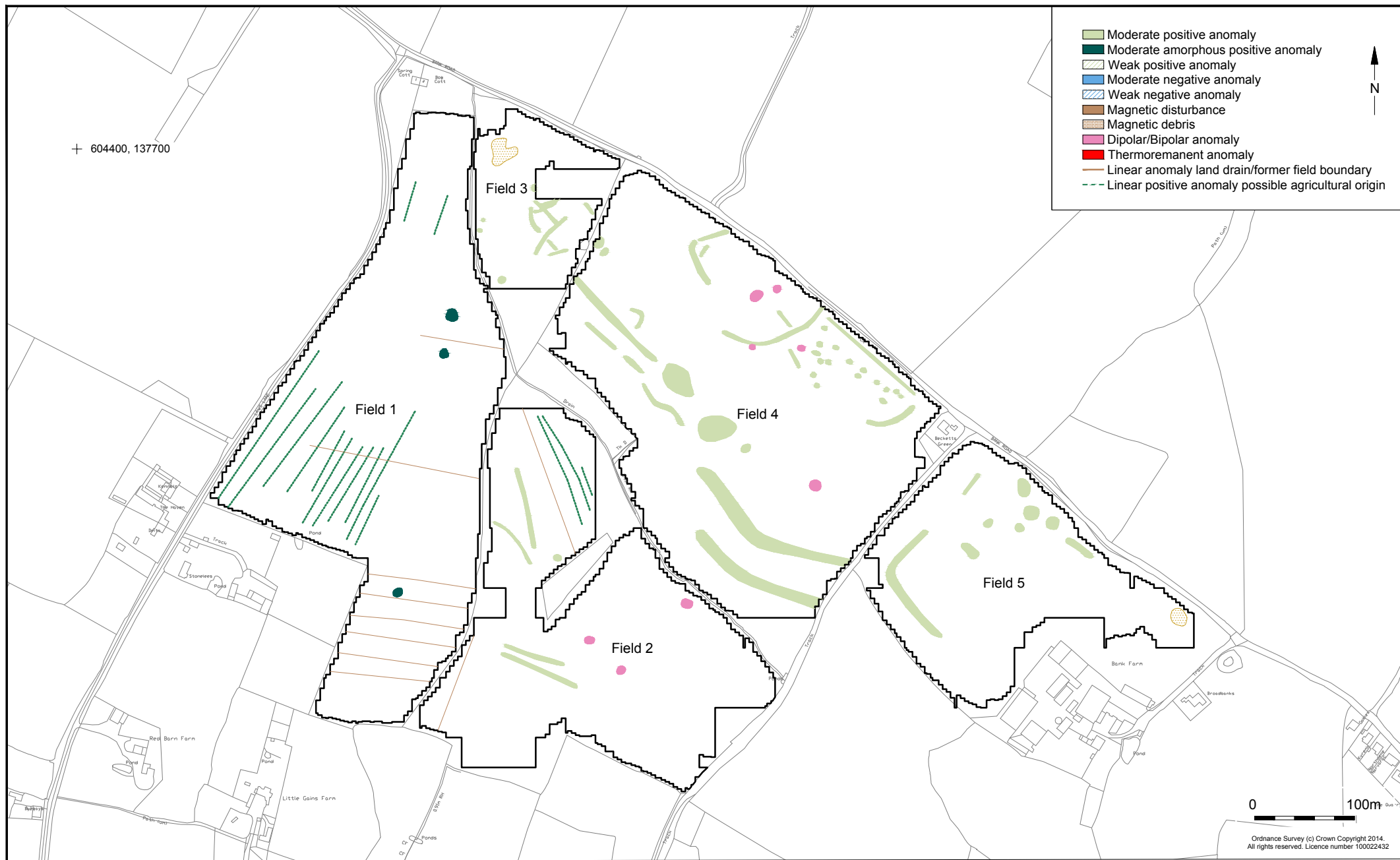




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Bank Farm, Ashford

Interpretation (overall)

Fig. 13

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