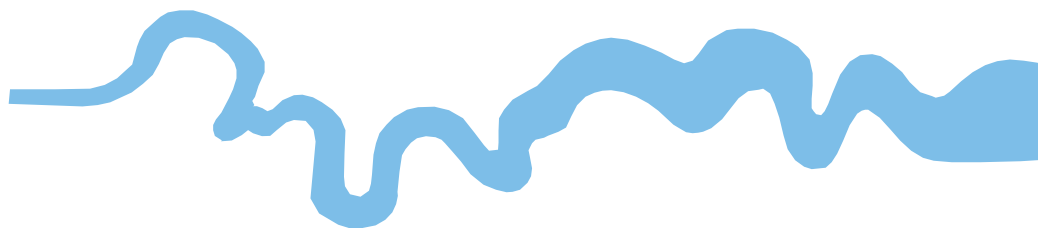


T V A S



SOUTH

**Land east of Keymer Road (Persimmon site) (Field 7),
Burgess Hill, West Sussex**

Geophysical Survey (magnetic)

by Ellie Martin

**Site Code: KRB 23/92
(TQ 3222 1773)**

Land east of Keymer Road (Persimmon site) (Field 7), Burgess Hill, West Sussex

Geophysical Survey (Magnetic) Report

For Persimmon Homes

by Ellie Martin

TVAS South

Site Code KRB 23/92

October 2025

Summary

Site name: Land east of Keymer Road (Persimmon site) (Field 7), Burgess Hill, West Sussex

Grid reference: TQ 3222 1773

Site activity: Magnetometer survey

Date and duration of project: 6th October 2025

Project coordinator: Tim Dawson

Site supervisor: Ellie Martin

Site code: KRB 23/92

Area of site: c.2.4ha

Summary of results: Geophysical survey was carried out at the site and recorded several magnetic anomalies. Most were caused by nearby ferromagnetic objects, such as fencing and metal debris. Groups of parallel linear anomalies may indicate field drains.

Location of archive: The archive is presently held at Thames Valley Archaeological Services, Reading in accordance with TVAS digital archiving policies.

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www.tvas.co.uk/reports/reports.asp.*

Report edited/checked by: Steve Ford✓ 28.10.25 Tim Dawson✓ 28.10.25
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Land east of Keymer Road (Persimmon site) (Field 7), Burgess Hill, West Sussex A Geophysical Survey (Magnetic)

by Ellie Martin

Report 23/92j

Introduction

This report documents the results of a geophysical survey (magnetic) carried out at Keymer Road, Burgess Hill, West Sussex (TQ 3222 1773). The work was commissioned by Mark Hendy on behalf of Persimmon Homes, Persimmon House, Knoll Road, Camberley, Surrey, GU15 3TQ.

Planning permission (DM/22/3049) has been granted by Mid Sussex District Council for the construction of 260 dwellings and associated infrastructure on the 15.2ha site east of Keymer Road, Burgess Hill. The site is divided between two house-builders, Thakeham Homes and Persimmon Homes (as Charles Church Developments Ltd). This survey dealt with Field 7, a 2.4ha field managed by Persimmon Homes. This is subject to a condition which requires the implementation of a geophysical survey prior to development or preliminary groundworks. This is in accordance with the Ministry of Housing, Communities and Local Government's *National Planning Policy Framework* (NPPF 2024), and the District's policies on archaeology. The field investigation was carried out to a specification approved by Mark Baister, Historic Environment Consultant for the Mid Sussex District Council. The fieldwork was undertaken by Ellie Martin and Luke O'Callaghan on 6th October 2025, and the site code is KRB 23/92.

The archive is presently held at Thames Valley Archaeological Services, Reading in accordance with TVAS digital archiving policies.

Location, topography and geology

The site is located to the south of Burgess Hill, a town on the eastern edge of West Sussex and just east of the South Downs National Park. Although this survey dealt only with Field 7, Field 5 (to the west) and Field 6 (to the north) were both previously surveyed and were under active development at the time of this survey. The south and east sides of the site were also under heavy construction traffic, and the field was bounded by Heras fencing on all sides. The land sits at approximately 50m above Ordinate Datum. The underlying geology is Head deposits overlying Weald Clay, both which typically give an average magnetic response.

Site history and archaeological background

A full archaeological background can be found in the desk-based assessment (Redclift 2022). To summarise, there are no known archaeological assets within the site area; however, a few archaeological deposits have been recorded in the vicinity. These include Prehistoric and Roman remains identified during an archaeological watching brief on the Ditchling to Wivelsfield Green pipeline as well as a Bronze Age axe recorded to the south. An Archaeological Notification Area lies c.920m to the west of the proposal site, covering the route of a Roman road. The site itself was likely located within the informal parkland of the medieval 'Frekeberge' estate. As such, it would have been occupied by woodland or agricultural land at this time, although there is no above-ground evidence to support this. Late post-medieval mapping shows the site as three fields beyond the southern limits of Burgess Hill with the surrounding land gradually being consumed by the expansion of the town through the 19th and 20th centuries.

A geophysical survey (magnetic) was undertaken of the Thakeham Homes site in April 2023 (Beaverstock 2023a) which identified a small number of magnetic anomalies of possible archaeological origin as well as at least two phases of probable furrows. The anomalies of interest were both located in the site's north-western field and consisted of an L-shaped linear feature and three sections of a curvilinear feature, likely to be a previous field boundary ditch and a possible enclosure respectively. Subsequent trial trench evaluation of the Thakeham Homes site (Matus 2023) identified a single undated archaeological feature in addition to a number of furrows and, as such, concluded that this area of the site is of low archaeological potential. Further geophysical survey has been undertaken in Fields 5 and 6 within the Persimmon site (Beaverstock 2023b; Beaverstock and Cicu 2024, Beaverstock 2024), which did not identify any magnetic anomalies suggestive of buried archaeological features. Subsequent trenching of Field 5 (Jansen 2024a; Jansen 2024b; Cicu 2024) succeeded in identifying only two undated gullies in the western half of the field while trenching in Field 6 (Learey 2025) uncovered nothing of archaeological interest.

Methodology

Sample interval

Data collection involved the traversing of the survey area along straight and parallel lines using two cart-mounted Bartington Grad601-2 fluxgate gradiometers. Even coverage was achieved with the use of regularly spaced markers at the ends of traverses and the real-time positional trace plot. Readings were taken at 0.13m intervals along traverses 1m apart, providing an appropriate methodology balancing cost and time with

resolution. Traverses were walked at an alternating zig-zag pattern along an east-west orientation across the survey area, with some small sections done at a north-south orientation due to site layout and obstructions. The entire survey area had been previously been subject to ecological clearance and, as such, there were several areas of hedgerow stumps that could not be surveyed due to the uneven terrain they created for the equipment. The ground had been raked over and then smoothed so there were also multiple large spoil heaps left in the field, and areas of fenced-off protected vegetation. The northwest corner of the field where an attenuation pond is proposed was fenced off and inaccessible. These sections were omitted from the survey. Metal construction debris across the site, such as pipes and fencing pieces, were moved when possible but have impacted the quality of the data. Conditions during the survey were dry and bright (Pl. 1-4).

The Grad 601-2 has a typical depth of penetration of 0.5m to 1.0m. This would be increased if strongly magnetic objects have been buried in the site. Under normal operating conditions it can be expected to identify buried features >0.5m in diameter. Features which can be detected include disturbed soil, such as the fill of a ditch, structures that have been heated to high temperatures (magnetic thermoremnance) and objects made from ferro-magnetic materials. The strength of the magnetic field is measured in nano Tesla (nT), equivalent to 10^{-9} Tesla, the SI unit of magnetic flux density.

Equipment

The purpose of the survey was to identify geophysical anomalies that may be archaeological in origin in order to inform a targeted archaeological investigation of the site prior to development. The survey and report generally follow the recommendations and standards set out by both European Archaeological Council (EAC 2015) and the Chartered Institute for Archaeologists (2002, 2020).

Magnetometry was chosen as a survey method as it offers the most rapid ground coverage and responds to a wide range of anomalies caused by past human activity. These properties make it ideal for the fast yet detailed surveying of an area.

The detailed magnetometry survey was carried out using two dual sensor Bartington Instruments Grad 601-2 fluxgate gradiometers mounted upon a Bartington non-magnetic cart. A two-wheeled lightweight structure pushed by hand, the cart consisted a bank of four vertically-mounted Bartington Grad601-2 magnetic sensor tubes at 1m apart and a Trimble R2 Receiver, centimetre edition GPS. Readings were collected by two Bartington Grad601-2 loggers and collated using MLgrad601 software on a Fusion 5 10" FWIN232 PRO N5 Tablet PC running Windows 11 mounted at the rear of the cart. This enables readings to be taken of both the

general background magnetic field and any localised anomalies with the difference being plotted as either positive or negative buried features. All sensors are calibrated to cancel out the local magnetic field and react only to anomalies above or below this base line. On this basis, strong magnetic anomalies such as burnt features (kilns and hearths) will give a high response as will buried ferrous objects. More subtle anomalies such as pits and ditches can be seen from their infilling soils containing higher proportions of humic material, rich in ferrous oxides, compared to the undisturbed subsoil. This will stand out in relation to the background magnetic readings and appear in plan following the course of a linear feature or within a discrete area.

The Trimble R2 Receiver, centimetre edition GPS system with centimetre real-time accuracy was used to tie the cart traverses into the Ordnance Survey national grid. This unit offers both real-time correction and post-survey processing; enabling a high level of accuracy to be obtained both in the field and in the final post-processed data.

Data gathered in the field was processed using the TerraSurveyor64 software package. This allows the survey data to be collated and manipulated to enhance the visibility of anomalies, particularly those likely to be of archaeological origin. The table below lists the processes applied to this survey, full survey and data information is recorded in Appendix 1.

Process	Effect
Clip from -1.80 to 2.20 nT	Enhance the contrast of the image to improve the appearance of possible archaeological anomalies.
De-stripe: median, all sensors	Removes the striping effect caused by differences in sensor calibration, enhancing the visibility of potential archaeological anomalies.
De-spike: threshold 1, window size 3×3	Compresses outlying magnetic points caused by interference of metal objects within the survey area.

The raw data plot is presented as a greyscale plot shown in relation to the site (Fig. 2) with the processed data then presented as a two following figures (Figs. 3 and 4), followed by a fifth plan to present the abstraction and interpretation of the magnetic anomalies (Fig. 5). Anomalies are shown as colour-coded lines, points and polygons.

The greyscale plot of the processed data is exported from TerraSurveyor64 in a georeferenced portable network graphics (.PNG) format, a raster image format chosen for its lossless data compression and support for transparent pixels, enabling it to easily be overlaid onto an existing site plan. The data plot is combined with grid and site plans in QGIS and exported again in .PNG format in order to present them in figure templates in Adobe InDesign CS5.5, creating .INDD file formats. Once the figures are finalised they are exported in .PDF format for inclusion within the finished report. Mean nano Tesla (nT) readings will be represented by $\bar{x}$.

Results

There were various magnetic anomalies recorded across the site area (Figs. 2-4), though none that have been interpreted as having archaeological relevance. There was significant magnetic disturbance from the metal Heras fencing around the boundary and through the middle of the site [Fig 5: 1], as well as some disturbance from metal equipment and scrap throughout the site [2, 3]. A number of groups of between 1 and 4 parallel linear positive anomalies run diagonally through the site, primarily within the main southern section [4] and one sole line in the smaller northern section [5]. These range in length from approximately 15 to 50m long and likely represent buried field drains.

Conclusion

Geophysical survey was successfully completed over the majority of the proposed development area, but 0.8ha of the 2.4ha site were inaccessible due to various obstructions in the field, including vegetation and fencing. None of the recorded anomalies were interpreted to have archaeological significance; most anomalies were disturbances caused by nearby metal, such as fencing and machinery. Several groups of parallel linear anomalies likely indicate field drains.

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Appendix 1. Survey and data information

Programme:

Name: TerraSurveyor64
Version: 4.0.18.1

Raw data

Name: Persimmon F7 A
Path: S:\Geophysics\ArcheoSurveyor projects\Keymer Road,
Burgess Hill (KRB23-92)\Comps\

SURVEY

Desc: Imported as Composite from: Persimmon F7 A.xyz
InstDesign: MLgrad Import
InstType: Magnetometer
SurveyDate: 07/10/2025
AssembleDate: Not set
ProcessDate: Not set
Surveyors:
Assemblers:
Comments:
Units:
UTM Zone: 30U
SouthWest corner: 0.00 0.00
NorthWest corner: 0.00 156.10
NorthEast corner: 178.75 156.10
SouthEast corner: 178.75 0.00
Surveyed Area: 1.5887 ha
Survey Extent: 2.8239 ha
GPS Datum: WGS-84
Map Coordinate System: DDD
Survey Type: GPS
Average point interval : 0.16m
Interval & Radius : 0.15m 1m
Source GPS totals: Trackgroups:1 Tracks:1520, Points:405808

Base layer Stats

Max: 98.50
Min: -99.90
Std Dev: 25.83
Mean: 4.60
Median: 0.00

Name Extent (Left,Right,Bottom,Top)
0 177.75 0 155

Minimally processed data

Top layer Stats
Max: 10.00
Min: -10.00
Std Dev: 4.54
Mean: 0.16
Median: 0.00

DeStripe

Mode Track
Method Median
Orientation Along
MaintainMean ✖
ThresholdType None
ThresholdMin 2.00
ThresholdMax 2.00
Sectors 5
WindowLength 0
WindowWidth 0

Clip

Min -10.00
Max 10.00
SelectSD 0.00

Processed data

Top layer Stats
Max: 2.20
Min: -1.80
Std Dev: 1.36
Mean: 0.09
Median: 0.00

DeStripe

Mode Track
Method Median
Orientation Along
MaintainMean ✖
ThresholdType None
ThresholdMin 2.00
ThresholdMax 2.00
Sectors 5
WindowLength 0
WindowWidth 0

Clip

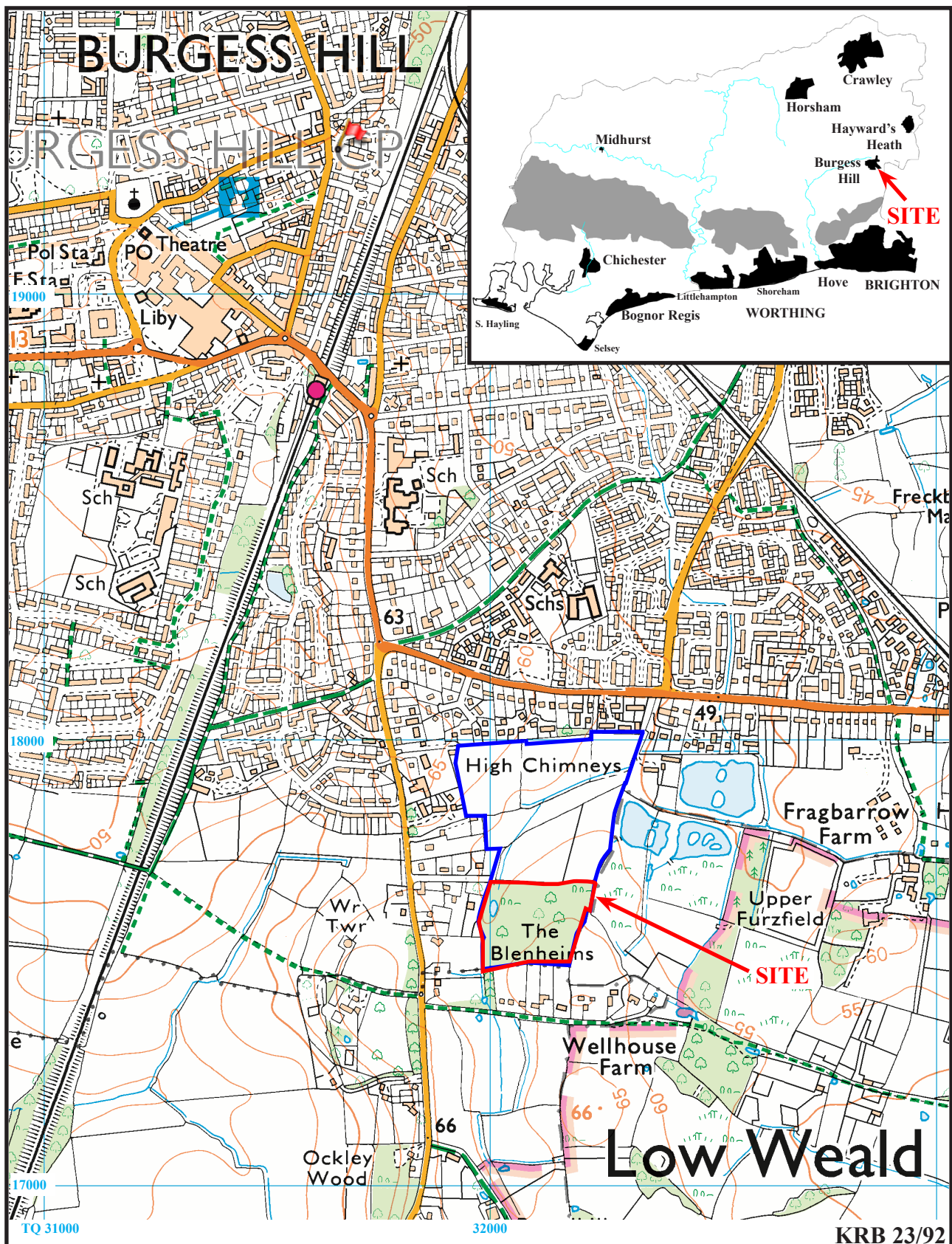
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Max 10.00
SelectSD 0.00

Hi/Lo

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WeightingMode Median
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ReplaceCenterWith Threshold

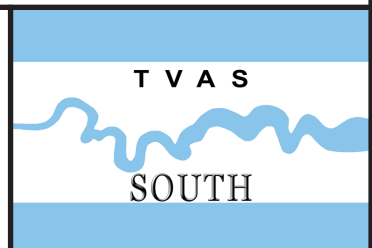
Clip

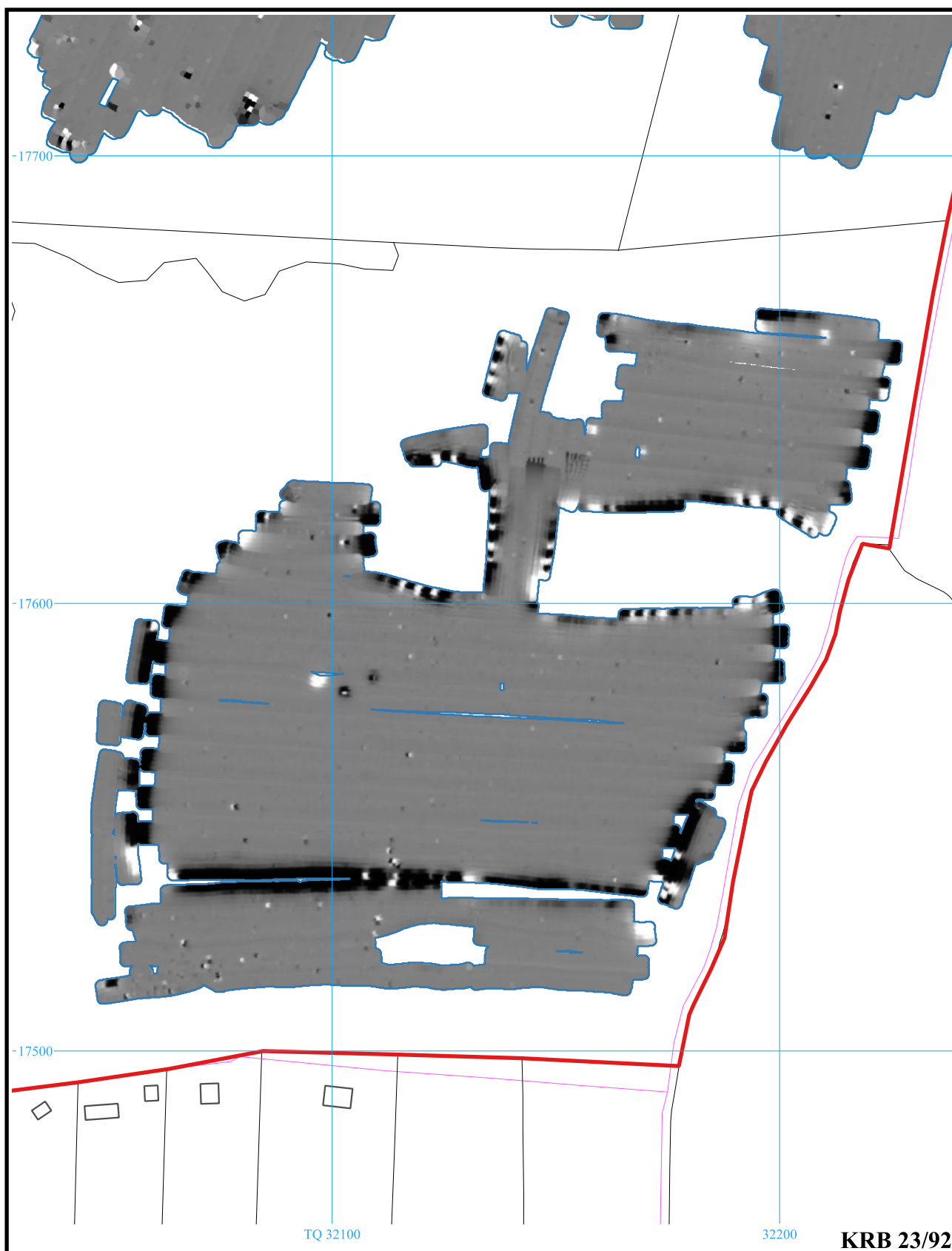
Min -1.80
Max 2.20
SelectSD 0.00



Land East of Keymer Road (Persimmon site) (Field 7),
Burgess Hill, West Sussex, 2025
Geophysical Survey (Magnetic)
Figure 1. Location of site within Burgess Hill and West Sussex.

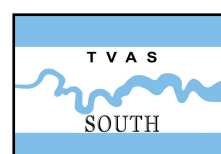
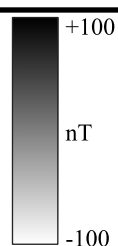
Reproduced under licence from Ordnance Survey Explorer Digital mapping at 1:12500
Crown Copyright reserved

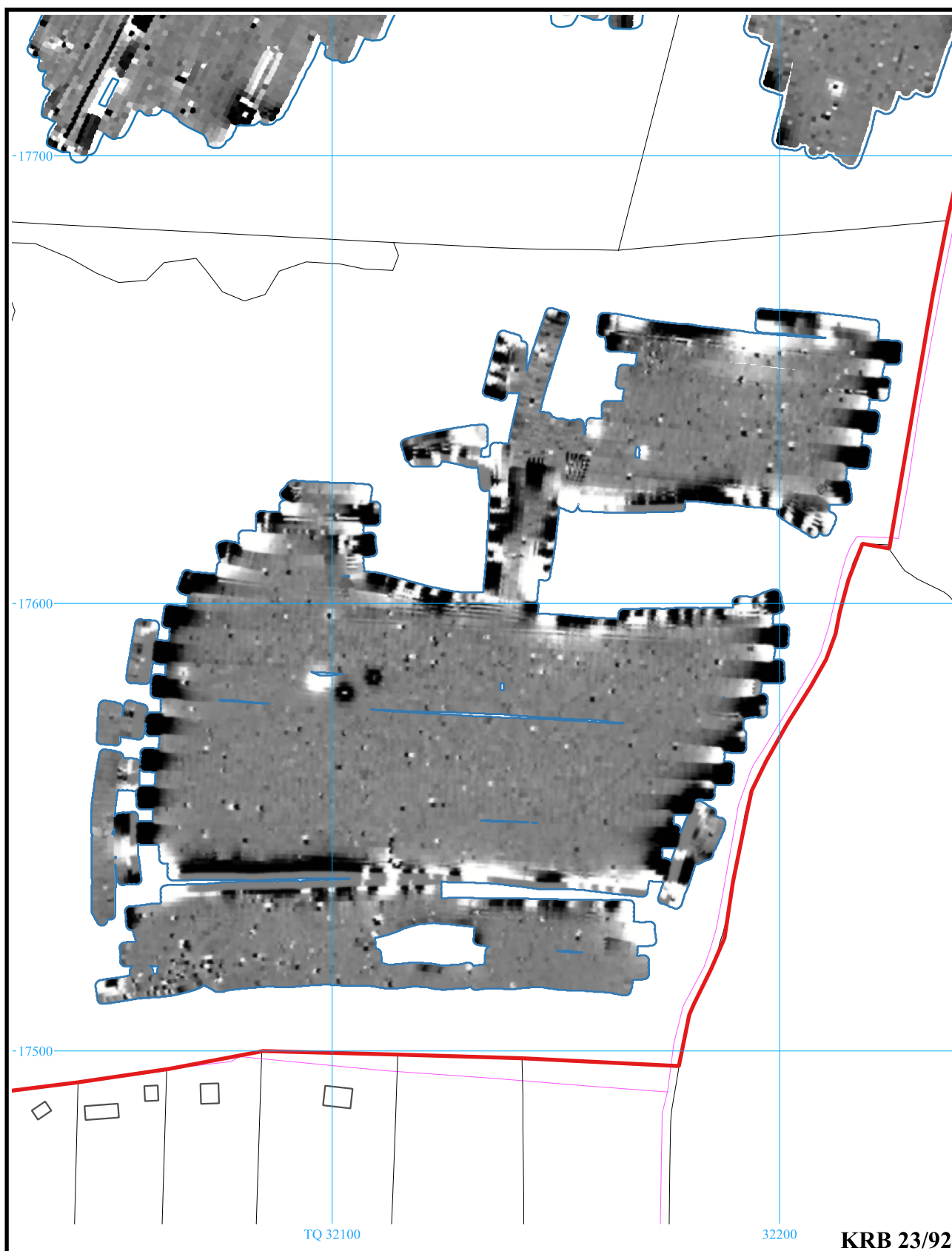




**Land east of Keymer Road (Persimmon site) (Field 7),
Burgess Hill, West Sussex, 2025
Geophysical Survey (Magnetic)**
Figure 2. Raw survey data plot.

0 10 20 30 40 50 m

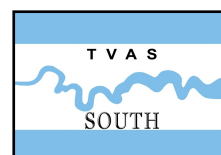
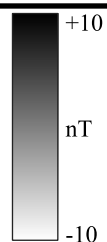


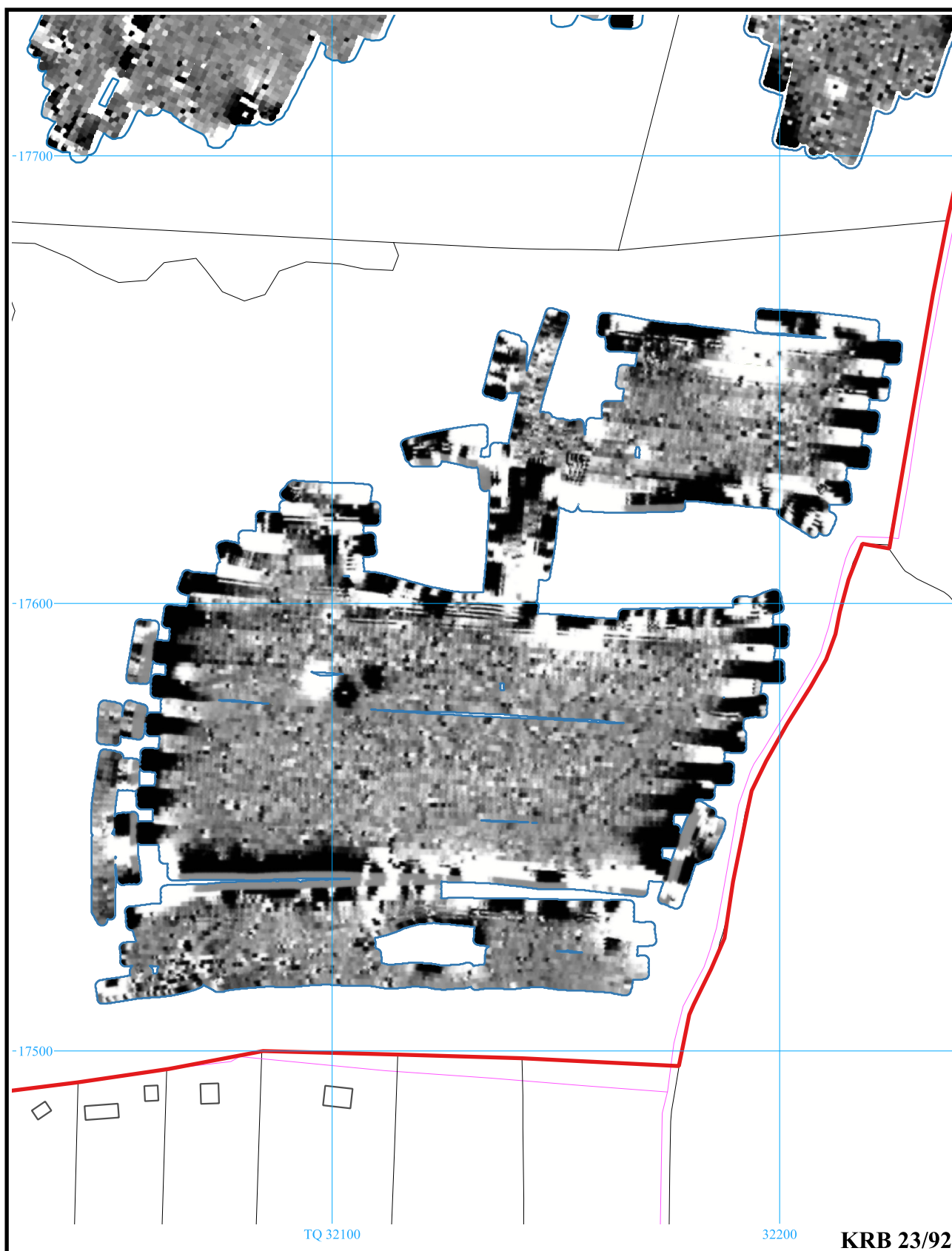


**Land east of Keymer Road (Persimmon site) (Field 7),
Burgess Hill, West Sussex, 2025
Geophysical Survey (Magnetic)**

Figure 3. Minimally processed survey data plot.

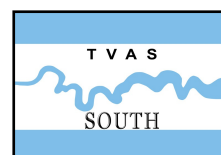
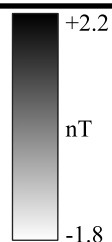
0 10 20 30 40 50 m





**Land east of Keymer Road (Persimmon site) (Field 7),
Burgess Hill, West Sussex, 2025
Geophysical Survey (Magnetic)**
Figure 4. Processed survey data plot.

0 10 20 30 40 50 m



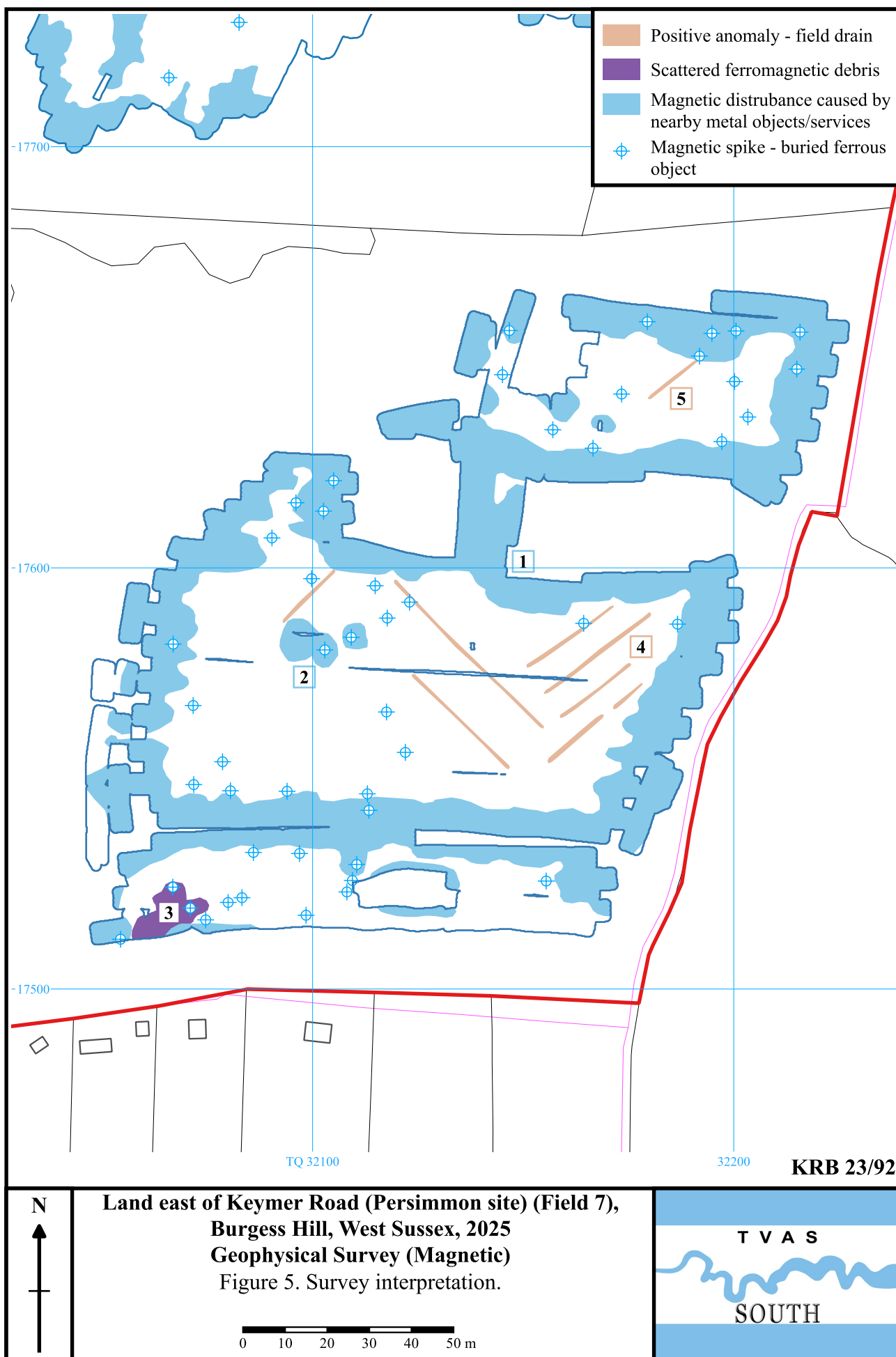




Plate 1. Survey area, looking north from the south side of the site



Plate 2. Survey area, looking north from the center of the site



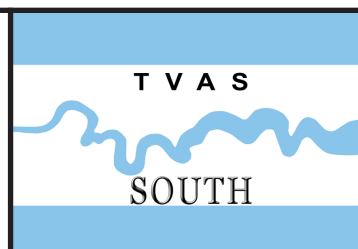
Plate 3. Survey area, looking south from the northwest corner



Plate 4. Survey area, unsurveyable section, looking east from the centre of the northern boundary

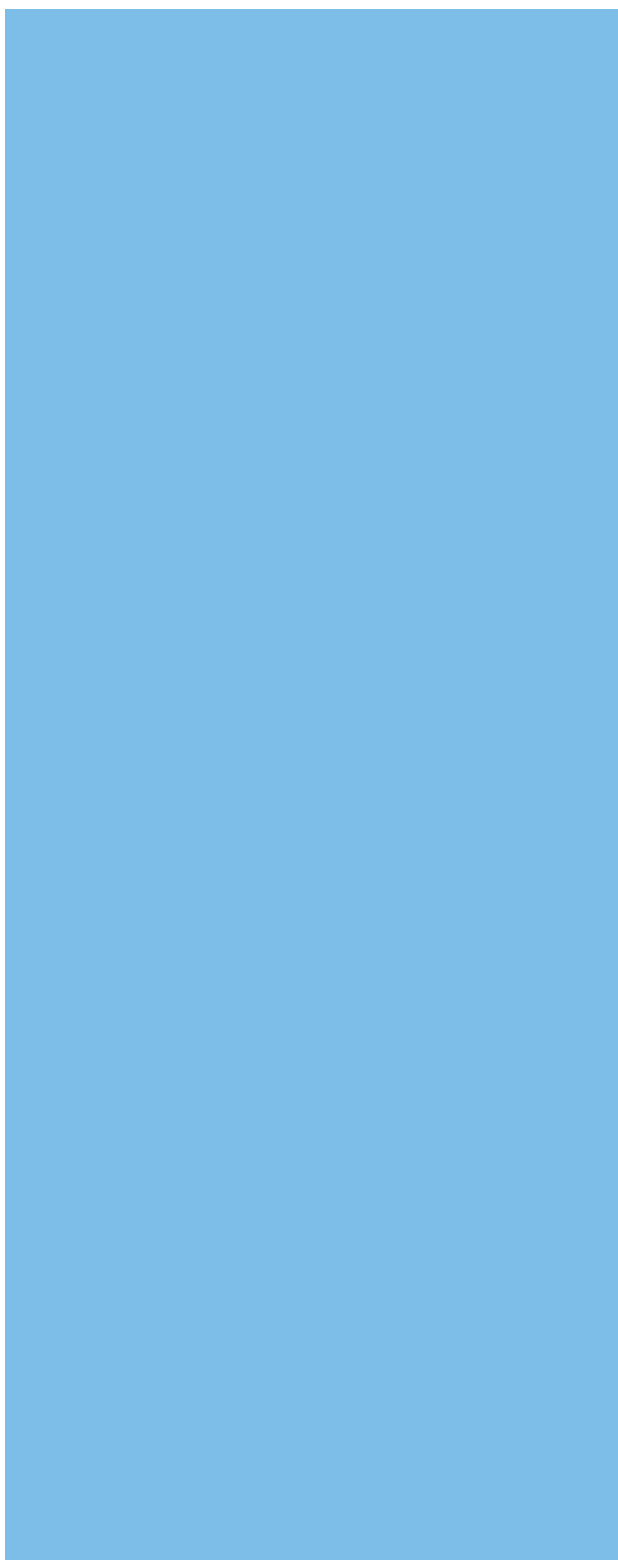
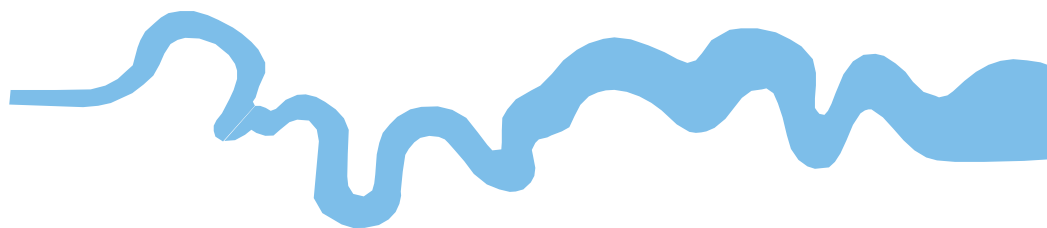
KRB 23/92

**Land East of Keymer Road (Persimmon site) (Field 7),
Burgess Hill, West Sussex, 2023
Geophysical Survey (Magnetic)
Plates 1 - 4.**



TIME CHART

	Calendar Years
Modern _____	AD 1901
Victorian _____	AD 1837
Post Medieval _____	AD 1500
Medieval _____	AD 1066
Saxon _____	AD 410
Roman _____	AD 43 AD 0 BC
Iron Age _____	750 BC
Bronze Age: Late _____	1300 BC
Bronze Age: Middle _____	1700 BC
Bronze Age: Early _____	2100 BC
Neolithic: Late	3300 BC
Neolithic: Early	4300 BC
Mesolithic: Late	6000 BC
Mesolithic: Early	10000 BC
Palaeolithic: Upper	30000 BC
Palaeolithic: Middle	70000 BC
Palaeolithic: Lower	2,000,000 BC
↓	↓



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