HS2

Balfour Beatty

HS2 Phase 2a Early Environmental Works

Site 054 - Geophysics Survey Report

Heritage Non-intrusive Survey Reports Group 016

Document no: 2EE02-BAF-EV-REP-WS06-000019

Revision	Author	Reviewed by	Approved by	Date approved	Reason for revision
C01	R Bishop	Sam Harrison	Alistair Webb	31/10/2022	1st Issue

Methodology	Project Plan Site Code
Gradiometer (Magnetometer) Survey	2a20DWDHMG

Security classification: OFFICIAL

Contents

List of Figures

1 Executive Summary

1.1.1 This document comprises a Final Report for a non-intrusive geophysical survey on the route of the proposed Phase 2a of High Speed Two (HS2) covering land proposed for development or likely to be impacted during the scheme as part of the Early Environmental Works (EEW) package. This report contains the results of a magnetometer survey undertaken on 27th and 28th April 2022 at Site 54 within Group 016.

1.1.2 The aim of the survey is to establish the presence/absence, extent and character of detectable archaeological remains within the proposed route of HS2 Phase 2a. The scope of the surveys is dependent upon securing access to the land and for the areas to be suitable for survey.

1.1.3 EEW Group 016 is situated between Baldwin's Gate and the southeast of Madeley, Staffordshire, centred on NGR 379384 341806. The whole parcel consists of an irregularly shaped parcel approximately 36.54 hectares in size, however, the area determined for magnetometer survey consists of three separate parcels adjacent to Whitmore Wood, the largest (C.10.2hectares), is situated to the north-east, and the two smaller (C.5.7ha and 3.2ha respectively) parcels are adjacent to the south-west of the woodland.

1.1.4 All suitable areas within the site were surveyed, with areas of maize crop and bird cover in the two southern parcels being unsuitable for survey, and the total area surveyed approximately 19.1ha in size.

1.1.5 Proposed works entail the planting of hedgerows, the retention, enhancement and protection of existing hedgerow, grassland creation works, ancient woodland mitigation planting, four ecological mitigation ponds, woodland understory planting, and the construction of a bat barn, bird / bat boxes, herpetofauna hibernacula and an artificial badger sett.

1.1.6 The survey has identified anomalies indicative of the agricultural use of the parcel, most notably modern field drains, and cultivation techniques. One field boundary, as seen on historical mapping, is identified in the center of the northern parcel, while a second is recorded in the center of the most south-westerly parcel.

1.1.7 Discrete low magnitude anomalies are recorded in the two southern parcels and are ascribed an interpretation of 'uncertain' as their exact origin is unclear.

1.1.8 High magnitude responses near or adjacent to existing field boundaries are caused by the presence of highly magnetic material either within the boundaries or as a spread of sub-surface material. Further high magnitude responses are recorded adjacent to the modern high voltage pylon in the center of the northern parcel. A high magnitude linear response identified within the most southwesterly parcel records a former field boundary, however the magnetic response is significantly higher than that of a typical boundary, which may suggest a change of use such as a farm track.

1.1.9 Occasional, discrete, low magnitude and dipolar 'spike' anomalies are of natural and modern causes respectively.

1.1.10 High magnitude responses near or adjacent to existing field boundaries are caused by the presence of highly magnetic material either within the boundaries or as a spread of sub-surface material.

1.1.11 Occasional, discrete, low magnitude and dipolar 'spike' anomalies are of natural and modern causes respectively.

1.1.12 The Site sits in an area of low archaeological potential outside of a RAZ and with little evidence to suggest a different conclusion.

2 Introduction

2.1 Project Background

2.1.1 HS2 is a new railway network proposed by the Government to provide a new link between London, the West Midlands, the East Midlands, South Yorkshire, Leeds and Manchester. HS2 Phase 2a comprises approximately 36 miles of railway starting at Fradley at its southern end and connects with the West Coast Main Line (WCML), south of Crewe, to allow HS2 services to join the existing network and call at Crewe Station.

2.1.2 The overall framework within which archaeological work will be undertaken is set out in the draft Environmental Minimum Requirements (EMR) for HS2 Phase 2a. Accordingly, the nominated undertaker or any contractors will be required to implement certain control measures in relation to archaeology before construction work begins.

2.1.3 The works have been undertaken in accordance with Written Scheme of Investigation (WSI, HS2 2019) and conform with current best practice and guidance for geophysical surveys as outlined in the Chartered Institute for Archaeologists' (CIfA) Standard and Guidance for archaeological geophysical survey (CIfA 2014) and European Archaeologiae Consilium Guidelines for the use of Geophysics in Archaeology (EAC 2016).

2.1.4 The selection of areas required for geophysical survey included as part of this Early Environmental Works (EEW) package are set out in location specific Written Scheme of Investigations (WSIs) based on Groups containing individual sites. HS2 Ltd has provided each EEW site along the Phase 2a route with a unique identifier Site Code.

2.1.5 Within EEW Group 016 (HS2 2021) the Site Code for geophysical survey is:
• Site 54: 2a20DWDHMG

2.2 Scope of Document

2.2.1 This report presents a brief description of the methodology followed by the detailed survey results and the archaeological interpretation of the geophysical data.

2.3 The Site

1.1.1 EEW Group 016 is situated between Baldwin's Gate and the southeast of Madeley, Staffordshire, centred on NGR 379384 341806. The whole parcel consists of an irregularly shaped parcel approximately 36.54 hectares in size, however, the area determined for magnetometer survey consists of three separate parcels adjacent to Whitmore Wood, the largest (C.10.2hectares), is situated to the north-east, and the two smaller (C.5.7ha and 3.2ha respectively) parcels are adjacent to the south-west of the woodland.

2.3.1 The survey area was mixed pasture and arable land usage at the time of survey, with maize crop and bird cover determining some areas in the south-west unsuitable for survey.

2.3.2 EEW Group 16 lies within an agricultural landscape which also features Whitmore Woods, which little change occurring upon the sites since the production of the mid-19th century Tithe and Estate mapping. The known assets from the Environmental Statement reflect this with a 19th century farm and area of ridge and furrow recorded.

2.3.3 Site 54 is split between three fields, all adjacent to Whitmore Wood, the largest (C.10.2hectares), is situated to the north-east, and the two smaller (C.5.7ha and 3.2ha respectively) parcels are adjacent to the south-west of the woodland. The northern parcel sloped downwards from approximately 146m AOD in the south-east to approximately 130m AOD in the north-west. The two southern parcels slope down from approximately 164m AOD in the east, to approximately 130m AOD in the west.

2.3.4 The solid geology across the Site is recorded as mudstone, sandstone and conglomerate of the Salop Formation. No overlying superficial deposits are recorded over most of the site, however, small pockets of till, diamicton are recorded in the northern parcel (BGS 2022).

2.3.5 The soils covering the northern parcel are classified in the Soilscape 18 Association, described as slowly permeable acid but base-rich loams and clays. The soils covering the southern parcels are classified in the Soilscape 8 Association, described as slightly acid loams and clays with impeded drainage (Cranfield University 2022).

2.3.6 Magnetometer survey can generally be recommended over any sedimentary geologies however the average responses of surveys over sandstones and mudstones are generally poor but results can be variable depending on the nature and depth of the overlying deposits if present (English Heritage 2008; Table 4). It remains that magnetometry was the most appropriate geophysical technique for evaluating the Site taking account of the limitations noted in Section 4.3 below.

3 Archaeological Background

3.1 Summary of the archaeological resource

3.1.1 The following archaeological background summarises details from the Location Specific Written Scheme of Investigation (LSWSI, HS2 2021) together with information from publicly available online resources and other in-house resources.

3.1.2 The Recognised Archaeological Zones (RAZ) represent a high-level indication of likely concentrations of archaeological remains across the Phase 2a route. The location and spatial extent of RAZs has been determined using HS2 Environmental Statement (ES) Cultural Heritage information and subsequent survey data.

3.1.3 Site 54 lies outside of any RAZ's.

3.1.4 Recorded features in Site 54 are focused around Whitmore Wood. Earthworks representing blocks of low value ridge and furrow were identified by the ES (WHM014).

3.1.5 The HER contains an entry which places the northern land parcel of Site 54 within the south-eastern corner of the Nethersthey Park Deer Park (MST1219). The deer park is noted as being a short-lived deer park which was extant in the late 14th century.

3.1.6 The Whitmore Enclosure Map from 1846 and the Whitmore Tithe Map from 1859 show Site 54 to be relatively comparable to that seen today, though with some variation to boundaries of the woodlands. The former road linking Dab Green to Madeley can also be seen as passing through the central area of the site. Nineteenth century OS maps show the site as it remains today, with no features of heritage interest.

3.1.7 Geophysical survey work has been undertaken to the south of Site 54, which is partially included within the survey land parcels.

3.1.8 Geophysical survey site CA4-2607 lies to the immediate south of Site 54. It recorded four features:

4-2607-001: two potential pit-like archaeological features;
4-2607-002: natural anomalies, likely caused by the build-up of magnetically susceptible sands and gravels; and
4-2607-003 & 4-2607-004: modern utility pipe.

3.1.9 Geophysical survey site CA4-2659 lies adjacent to and partially including the central area of Site 54. The following features were identified as a result of the survey:

3.1.10 Features of potential archaeological interest:
4-2659-002 – interpreted as ridge and furrow, likely from the post-medieval period;
4-2659-003 – two small curvilinear anomalies which may be natural, but may be fragmented remains of small enclosures or ring ditches;
– a small cluster of anomalies which may include a small enclosure or ring ditch with pit-like

features, or may be natural or modern; and
4-2659-005 – an undefined potential archaeological feature, though may related to nearby utilities or modern activity.

3.1.11 Agricultural features:
& 4-2659-007 - features which appears to correspond to former field boundaries present in 1st edition Ordnance Survey mapping of 1880;
4-2659-008 – a former field boundary
– 4-2659-018 (4-2659-014 & 4-2659-016 are within Site 54) & 4-2659-031 – land drains

3.1.12 Additional geophysical surveys (E1-711, site 114803) have been advised as being undertaken in the area in which Site 54 lies. However, the data is not available at the time of the preparation of the LS-WSI.

3.1.13 LiDAR / remote sensing survey data identified features within Site 54, which comprise:

LiDAR 3033: Medieval to post-medieval blocks of north-south aligned ridge and furrow, and possible former field boundary;
LiDAR 3035: Undated ditches, possibly representing former field boundaries; and
LiDAR 3037: Undated north-south aligned ridge features that may represent either ridge and furrow or indications of woodland management.

1 Methodology

1.2 Magnetometry

Magnetic survey methods rely on the ability of a variety of instruments to measure very small magnetic fields associated with buried archaeological remains. A feature such as a ditch, pit or kiln can act like a small magnet, or series of magnets, that produce distortions (anomalies) in the earth's magnetic field. In mapping these slight variations, detailed plans of sites can be obtained as buried features often produce reasonably characteristic anomaly shapes and strengths (Gaffney and Gater 2003). Further information on soil magnetism and the interpretation of magnetic anomalies is provided in Annex 1 and Annex 2 respectively.

1.3 Aims and Objectives

1.3.25 The aims of the survey comprise the following:

1.3.25.1 To determine, as far as is reasonably possible, the nature of the detectable archaeological resource within a specified area using appropriate methods and practices; and

1.3.25.2 To inform either the scope and nature of any further archaeological work that may be required; or the formation of a mitigation strategy (to offset the impact of the

development on the archaeological resource); or a management strategy.

1.3.26 In order to achieve the above aims, the objectives of the geophysical survey are:

1.3.26.1 To conduct a geophysical survey covering as much of the specified area as possible, allowing for on-site obstructions;

1.3.26.2 To clarify the presence/absence of anomalies of archaeological potential; and

1.3.26.3 Where possible, to determine the general nature of any anomalies of archaeological potential.

1.4 Assumptions and limitations

Magnetometry is the most widely used geophysical survey technique in archaeology as it can quickly evaluate large areas and, under favourable conditions, identify a wide range of archaeological features including infilled cut features such as large pits, gullies and ditches, hearths, and areas of burning and kilns and brick structures. It is therefore good at locating settlements of all periods, prehistoric field systems and enclosures and areas of industrial or modern activity, amongst others. It is less successful in identifying smaller features such as post-holes and small pits (except when using a non-standard sampling interval), unenclosed (prehistoric) settlement sites and graves/burial grounds. Magnetometry has the potential to rapidly confirm the presence/absence of a wide range of potential archaeological remains within the site and was thus chosen as the most appropriate technique in this instance.

1.5 Fieldwork Methodology

1.5.25 The survey was undertaken using four Bartington Grad601 sensors mounted at 1m intervals (1m traverse interval) onto a rigid carrying frame. The system was programmed to take readings at a frequency of 10Hz (allowing for a 10-15cm sample interval) on roaming traverses (swaths) 4m apart (Figure 1). These readings were stored on an external weatherproof laptop and later downloaded for processing and interpretation. The system was linked to a Trimble R8s Real Time Kinetic (RTK) differential Global Positioning System (dGPS) outputting in NMEA mode to ensure a high positional accuracy for each data point, in accordance with EAC guidelines (EAC 2016).

1.5.26 Unenclosed areas were surveyed using the co-ordinates of the pre-determined Site boundary visible as an outline on the MLGrad601 software during data collection.

1.5.27 MLGrad601 (Geomar Software Inc.) software was used to collect the data.

1.6 Data processing

1.6.25 Data collected using RTK GPS-based methods cannot be produced without minimal processing of the data. The minimally processed data has been interpolated to project the data onto a regular grid and de-striped to correct for slight variations in instrument calibration drift and any other artificial data.

1.6.26 A high pass filter has been applied to the greyscale plots to remove low frequency anomalies

(relating to survey tracks and modern agricultural features) to maximise the clarity and interpretability of the archaeological anomalies.

1.6.27 The data has also been clipped to remove extreme values and to improve data contrast.

1.6.28 MultiGrad601 (Geomar Software Inc.) software was used to export the survey data files.

1.6.29 Terrasurveyor V3.0.37.0 (DWConsulting) software was used to process and export graphical plots the data.

2 Geophysical Survey Results and Interpretation

2.2 Gradiometer survey results and interpretation

2.2.25 The magnetometer survey was carried out on the 7th and 8th of February 2022, with a second mobilization on 27th and 28th April 2022. All the suitable areas required for magnetometer survey within the Site were surveyed amounting to 19.1ha.

2.2.26 Fully processed (greyscale) data, minimally processed data (XY trace plot) and interpretative plans are presented at a scale of 1:2,000 in Figures 2 – 10 inclusive.

2.2.27 The magnetic background is relatively variable across the site containing many discrete, low magnitude anomalies of natural origin, as well as small bands or sinuous low magnitude deposits.

2.2.28 Magnetically enhanced linear anomalies in the south of the eastern parcel identify field drains. Magnetic disturbance caused by fences is recorded at the periphery of the individual parcels. Linear anomalies consistent with modern and post-medieval cultivation techniques are present within the western parcel.

3 Discussion

6.1 The survey has identified anomalies indicative of the agricultural use of the parcel, most notably modern field drains, and cultivation techniques. One field boundary, as seen on historical mapping, is identified in the center of the northern parcel, while a second is recorded in the center of the most south-westerly parcel.

6.2 Discrete low magnitude anomalies are recorded in the two southern parcels and are ascribed an interpretation of 'uncertain' as their exact origin is unclear.

6.3 High magnitude responses near or adjacent to existing field boundaries are caused by the presence of highly magnetic material either within the boundaries or as a spread of sub-surface material. Further high magnitude responses are recorded adjacent to the modern high voltage pylon in the center of the northern parcel. A high magnitude linear response identified within the most southwesterly parcel records a former field boundary, however the magnetic response is significantly higher than that of a typical boundary, which may suggest a change of use such as a farm track.

6.4 Occasional, discrete, low magnitude and dipolar 'spike' anomalies are of natural and modern causes respectively.

6.5 High magnitude responses near or adjacent to existing field boundaries are caused by the presence of highly magnetic material either within the boundaries or as a spread of sub-surface material.

6.6 Occasional, discrete, low magnitude and dipolar 'spike' anomalies are of natural and modern causes respectively.

6.7 The Site sits in an area of low archaeological potential outside of a RAZ and with little evidence to suggest a different conclusion.

References

Bibliography

British Geological Survey (BGS) 2022 Geology of Britain 3D http://www.bgs.ac.uk/ accessed 1st August 2022

Chartered Institute for Archaeologists (CIfA) 2014 Standard and guidance for archaeological geophysical survey (Reading) https://www.archaeologists.net/sites/default/files/CIfAS%26GGeophysics_3.pdf accessed 1st August 2022

Cranfield University 2020 Cranfield Soil and Agrifood Institute Soilscapes http://www.landis.org.uk/soilscapes/ accessed 1st August 2022

English Heritage 2008 Geophysical Survey in Archaeological Field Evaluation

Europae Archaeologia Consillium (EAC) 2016 EAC Guidelines for the Use of Geophysics in Archaeology: Question to Ask and Points to Consider (Namur, Belgium) https://www.europae-archaeologiae-consilium.org/eac-guidlines accessed 1st August 2022

Gaffney C & Gater J 2003 Revealing the Buried Past: Geophysics for Archaeologists Stroud

HS2 Ltd, 2017a High Speed Rail (West Midlands-Crewe). Environmental Statement. Volume 5: Technical appendices. Route-wide geoarchaeology desk study report. (CH-006-000). Available at: https://www.gov.uk/government/collections/hs2-phase-2a-environmental-statement#volume-5:-environmental-reports-and-maps-by-community-area

HS2 Ltd, 2017b High Speed Rail (West Midlands-Crewe). Environmental Statement. Volume 5: Technical appendices. Environment Impact Assessment Scope and Methodology Report (CT-001-001). Available at: https://www.gov.uk/government/publications/scope-and-methodology-report-for-hs2-phase-2a

HS2 Ltd, 2017c High Speed Two Phase 2a (West Midlands-Crewe). Background Information and Data. CA4: Whitmore Heath to Madeley. Cultural heritage survey reports. (BID-CH-004-004). Available at: https://www.gov.uk/government/collections/hs2-phase-2a-environmental-statement#volume-5:-environmental-reports-and-maps-by-community-area

HS2 2019 HS2 Phase 2a Written Scheme of Investigation for EI-711 Surveys Package 1: Magnetometry (HS2-HS2-EV-MST-A000001)

HS2, 2021, Phase 2a LS-WSI: EEW Group 016, EEW Sites 53, 54 & 81 (HS2 Document no: 2EE01-BAF-PRO-A000-000006, Revision: 05)

Annex 1: Magnetometer survey

Magnetic susceptibility and soil magnetism

Iron makes up about 6% of the earth's crust and is mostly present in soils and rocks as minerals such as maghaemite and haematite. These minerals have a weak, measurable magnetic property termed magnetic susceptibility. Human activities can redistribute these minerals and change (enhance) others into more magnetic forms so that by measuring the magnetic susceptibility of the topsoil, areas where human occupation or settlement has occurred can be identified by virtue of the attendant increase (enhancement) in magnetic susceptibility. If the enhanced material subsequently comes to fill features, such as ditches or pits, localised isolated and linear magnetic anomalies can result whose presence can be detected by a magnetometer (fluxgate gradiometer).

In general, it is the contrast between the magnetic susceptibility of deposits filling cut features, such as ditches or pits, and the magnetic susceptibility of the topsoil, subsoil and rock, into which these features have been cut, which causes the most recognisable responses. This is primarily because there is a tendency for magnetic ferrous compounds to become concentrated in the topsoil, thereby making it more magnetic than the subsoil or the bedrock. Linear features cut into the subsoil or geology, such as ditches, that have been silted up or have been backfilled with topsoil will therefore usually produce a positive magnetic response relative to the background soil levels. Discrete feature, such as pits, can also be detected.

The magnetic susceptibility of a soil can also be enhanced by the application of heat. This effect can lead to the detection of features such as hearths, kilns, or areas of burning.

Annex 2: Geophysical Interpretation

Most anomalies are termed 'positive'. This means that they have a positive magnetic value relative to the magnetic background on any given site. However, some features can manifest themselves as 'negative' anomalies that, conversely, means that the response is negative relative to the mean magnetic background.

Where it is not possible to give a probable cause of an observed anomaly a '?' is appended. It should be noted that anomalies interpreted as modern in origin might be caused by features that are present in the topsoil or upper layers of the subsoil. Removal of soil to an archaeological or natural layer can therefore remove the feature causing the anomaly.

The types of response mentioned above can be divided into five main categories that are used in the graphical interpretation of the magnetic data:

Isolated dipolar anomalies (iron spikes)

These responses are typically caused by ferrous material either on the surface or in the topsoil. They cause a rapid variation in the magnetic response giving a characteristic 'spiky' trace. Although ferrous archaeological artefacts could produce this type of response, unless there is supporting evidence for an archaeological interpretation, little emphasis is normally given to such anomalies, as modern ferrous objects are common on rural sites, often being introduced into the soil during manuring.

Areas of magnetic disturbance

These responses can have several causes often being associated with burnt material, such as slag waste or brick rubble or other strongly magnetised/fired material. Ferrous structures such as pylons, mesh or barbed wire fencing and buried pipes can also cause the same disturbed response. A modern origin is usually assumed unless there is other supporting information.

Lightning-induced remnant magnetisation (LIRM)

LIRM anomalies are thought to be caused in the near surface soil horizons by the flow of an electrical current associated with lightning strikes. These observed anomalies have a strong bipolar signal which decreases with distance from the spike point and often appear as linear or radial in shape.

Linear trend

This is usually a weak or broad linear anomaly of unknown cause or date. These anomalies are often caused by agricultural activity, either ploughing or land drains being a common cause.

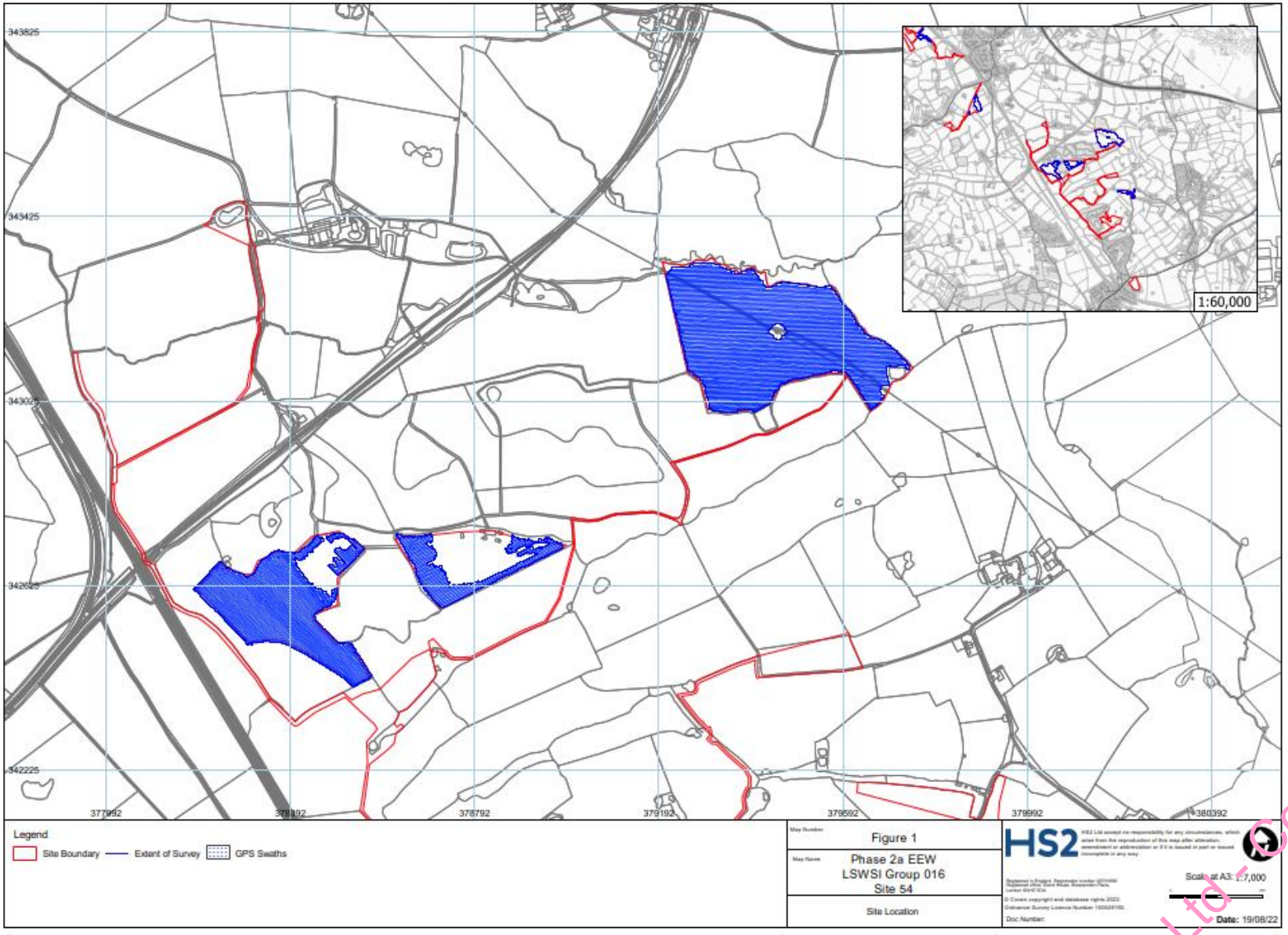
Areas of magnetic enhancement/positive isolated anomalies

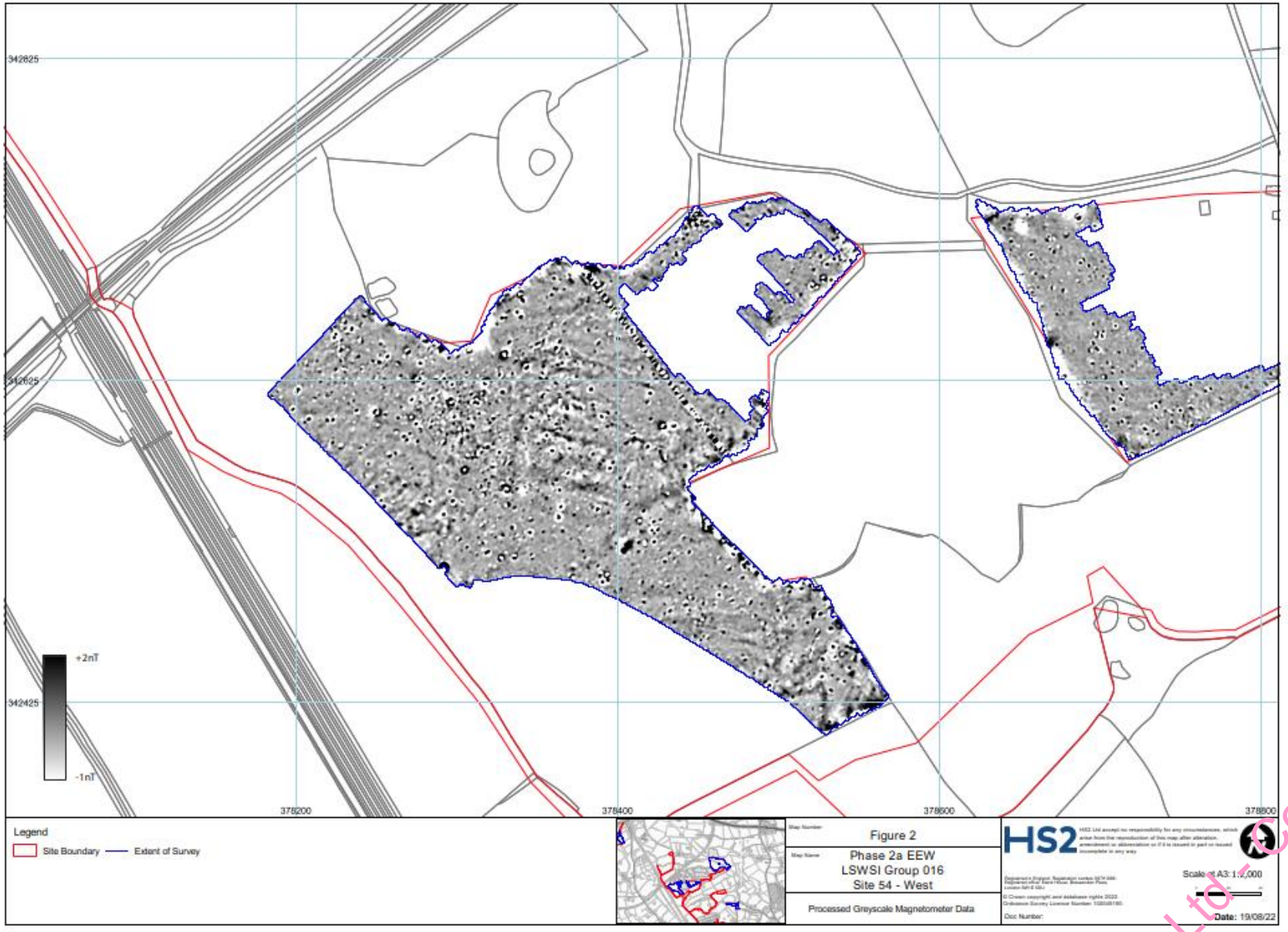
Areas of enhanced response are characterised by a general increase in the magnetic background over a localised area whilst discrete anomalies are manifest by an increased response (sometimes only visible on an XY trace plot) on two or three successive traces. In neither instance is there the intense dipolar response characteristic exhibited by an area of magnetic disturbance or of an 'iron spike' anomaly (see above). These

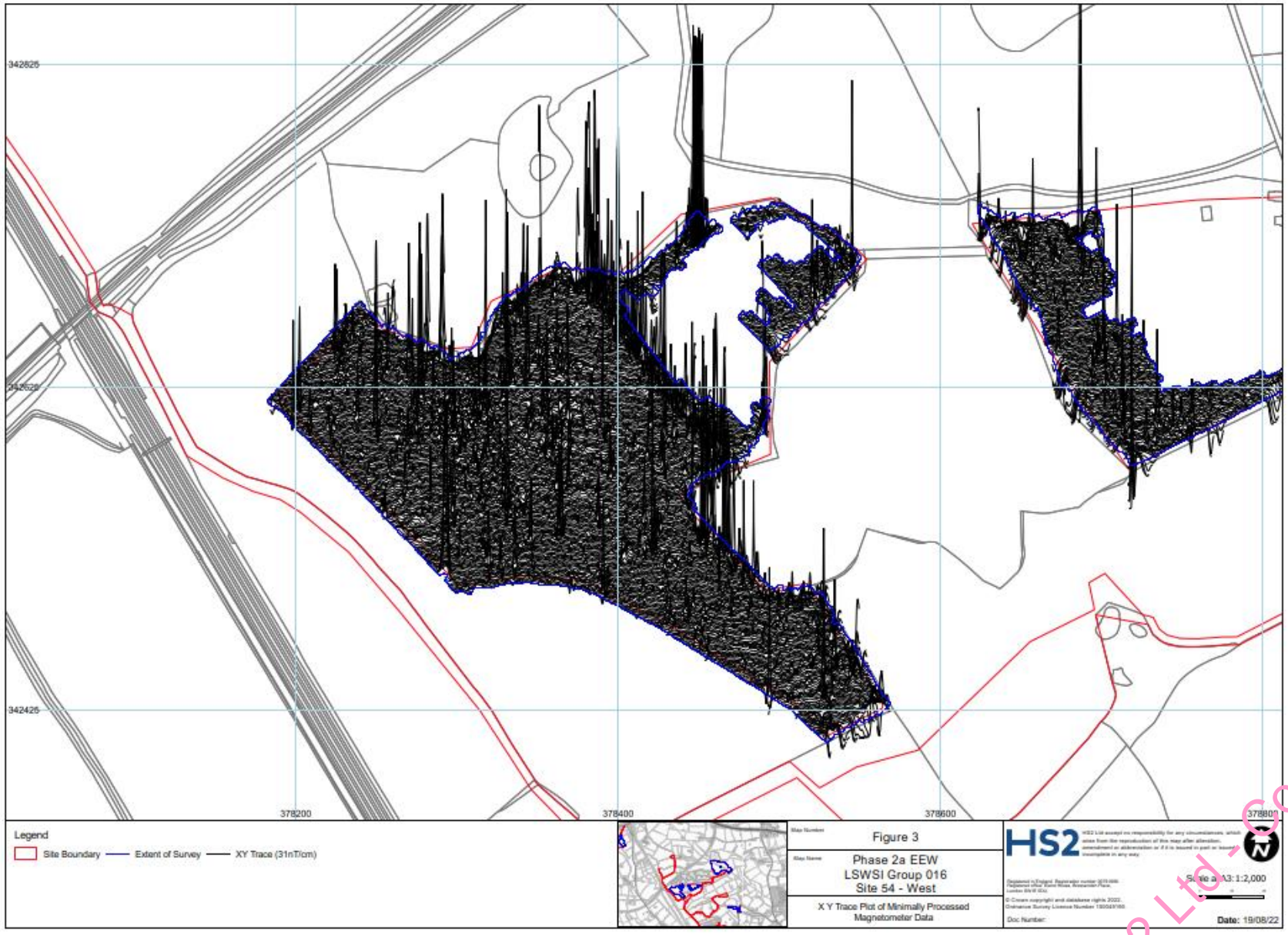
anomalies can be caused by infilled discrete archaeological features such as pits or post-holes or by kilns. They can also be caused by pedological variations or by natural infilled features on certain geologies. Ferrous material in the subsoil can also give a similar response. It can often therefore be very difficult to establish an anthropogenic origin without intrusive investigation or other supporting information.

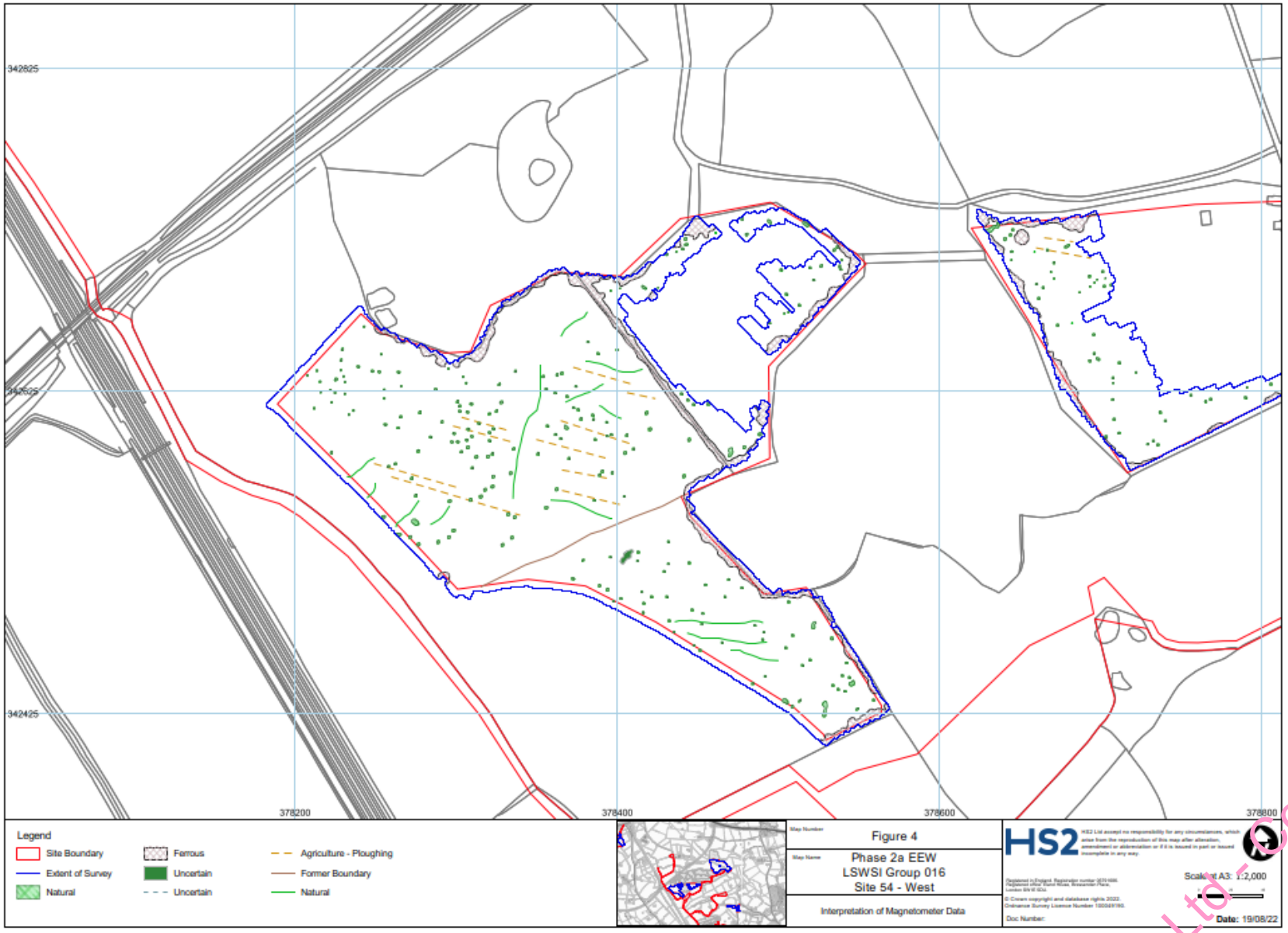
Linear and curvilinear anomalies

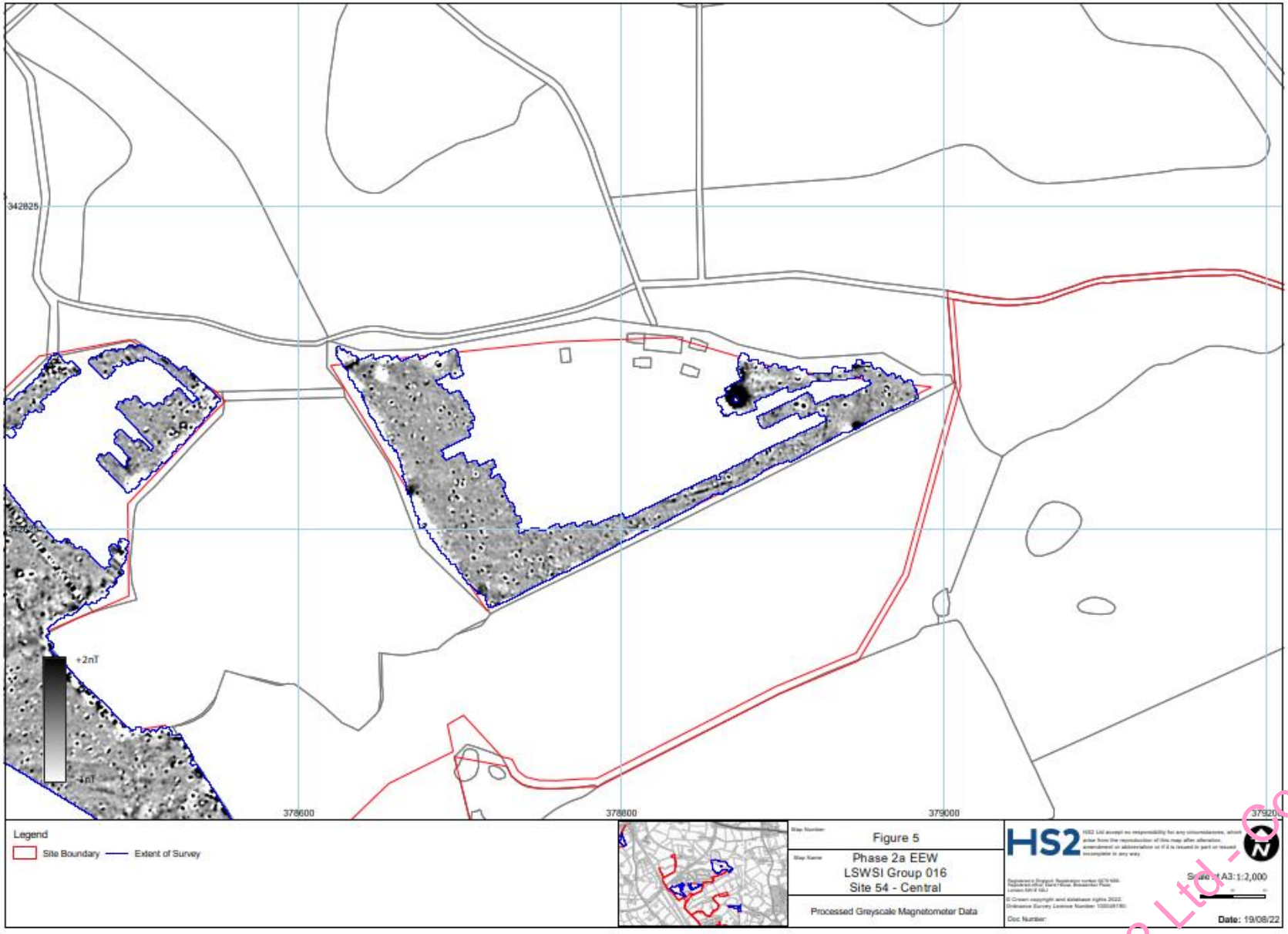
Such anomalies have a variety of origins. They may be caused by agricultural practice (recent ploughing trends, earlier ridge and furrow regimes or land drains), natural geomorphological features such as palaeochannels or by infilled archaeological ditches.

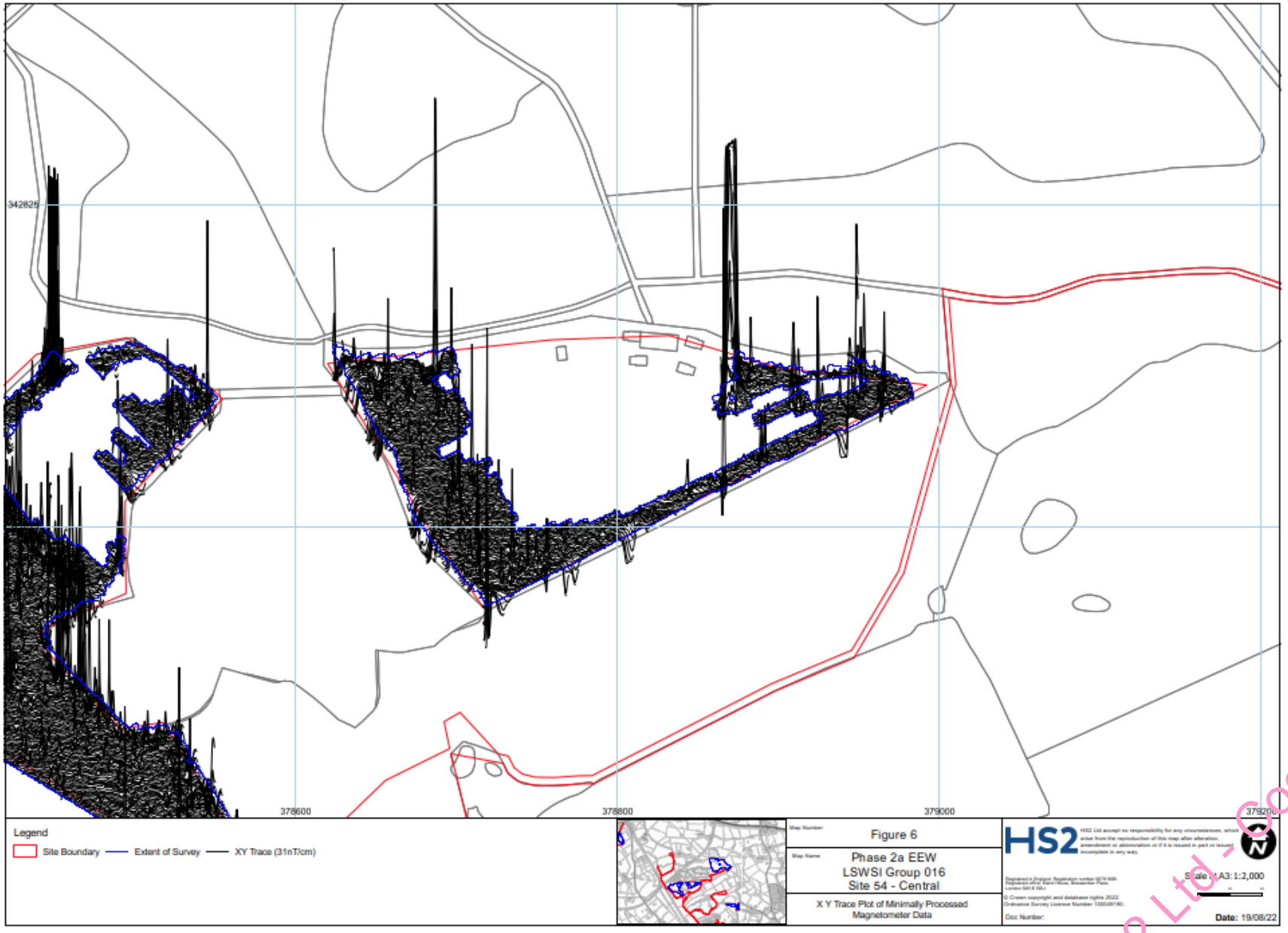


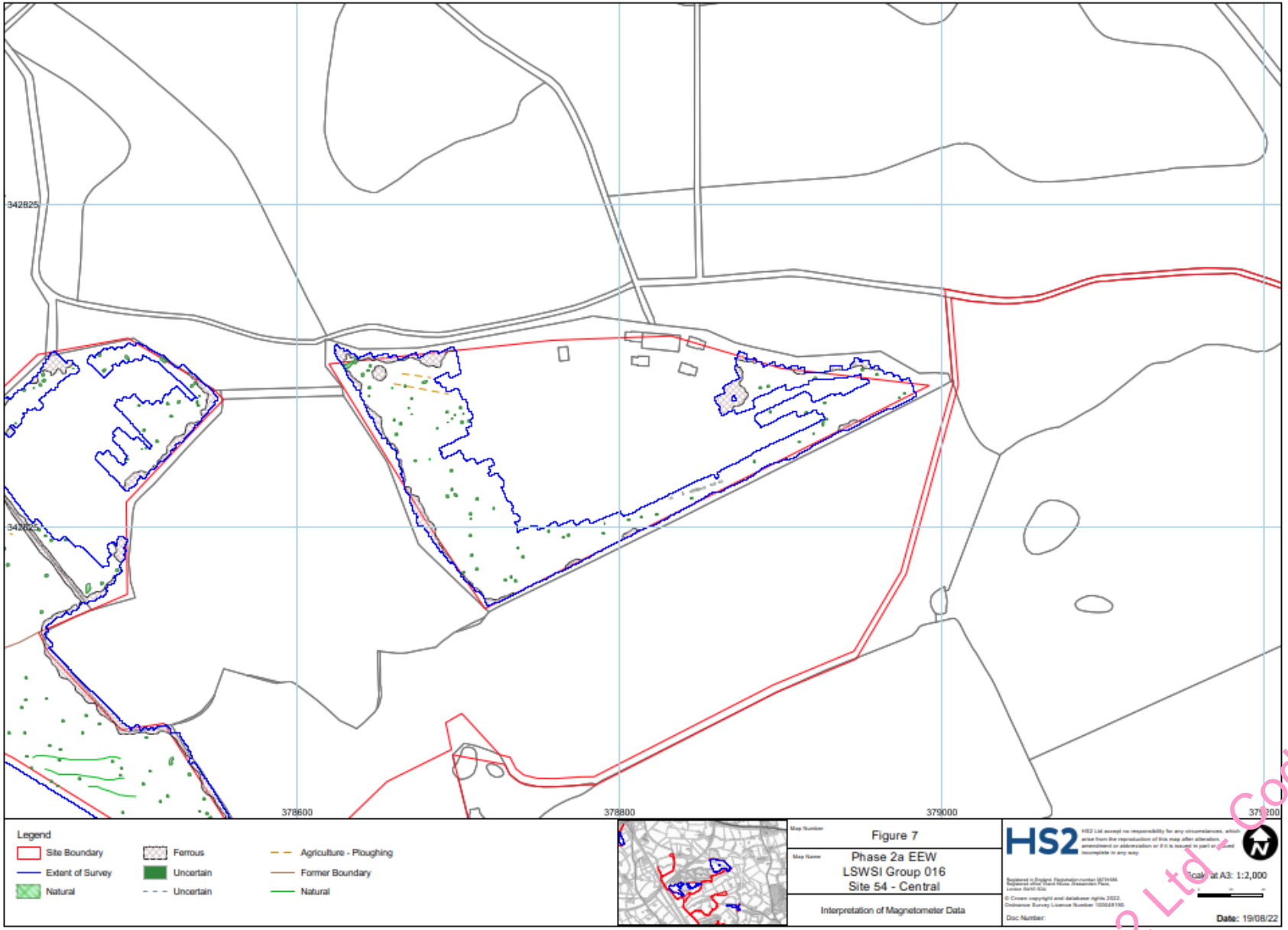


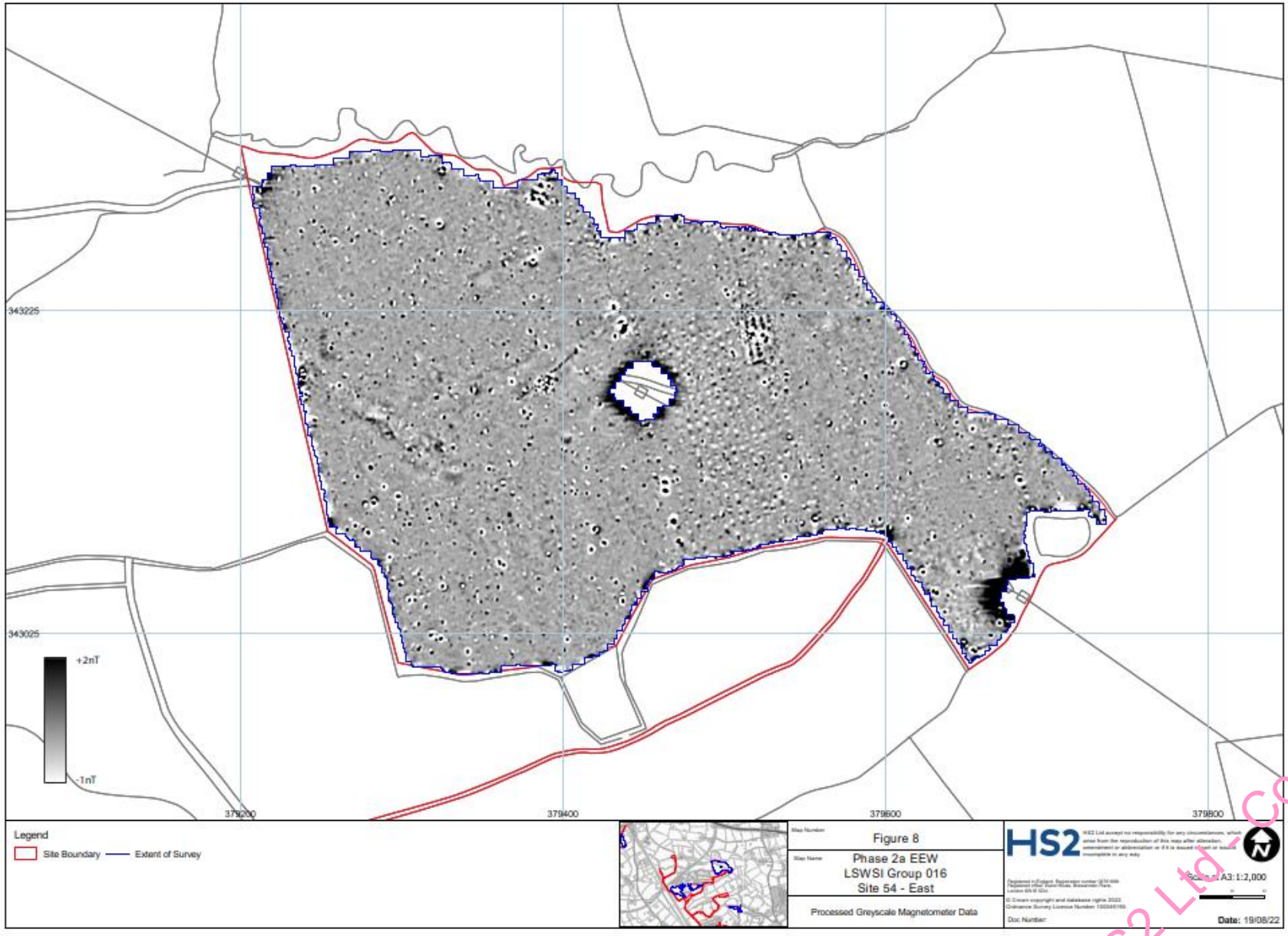


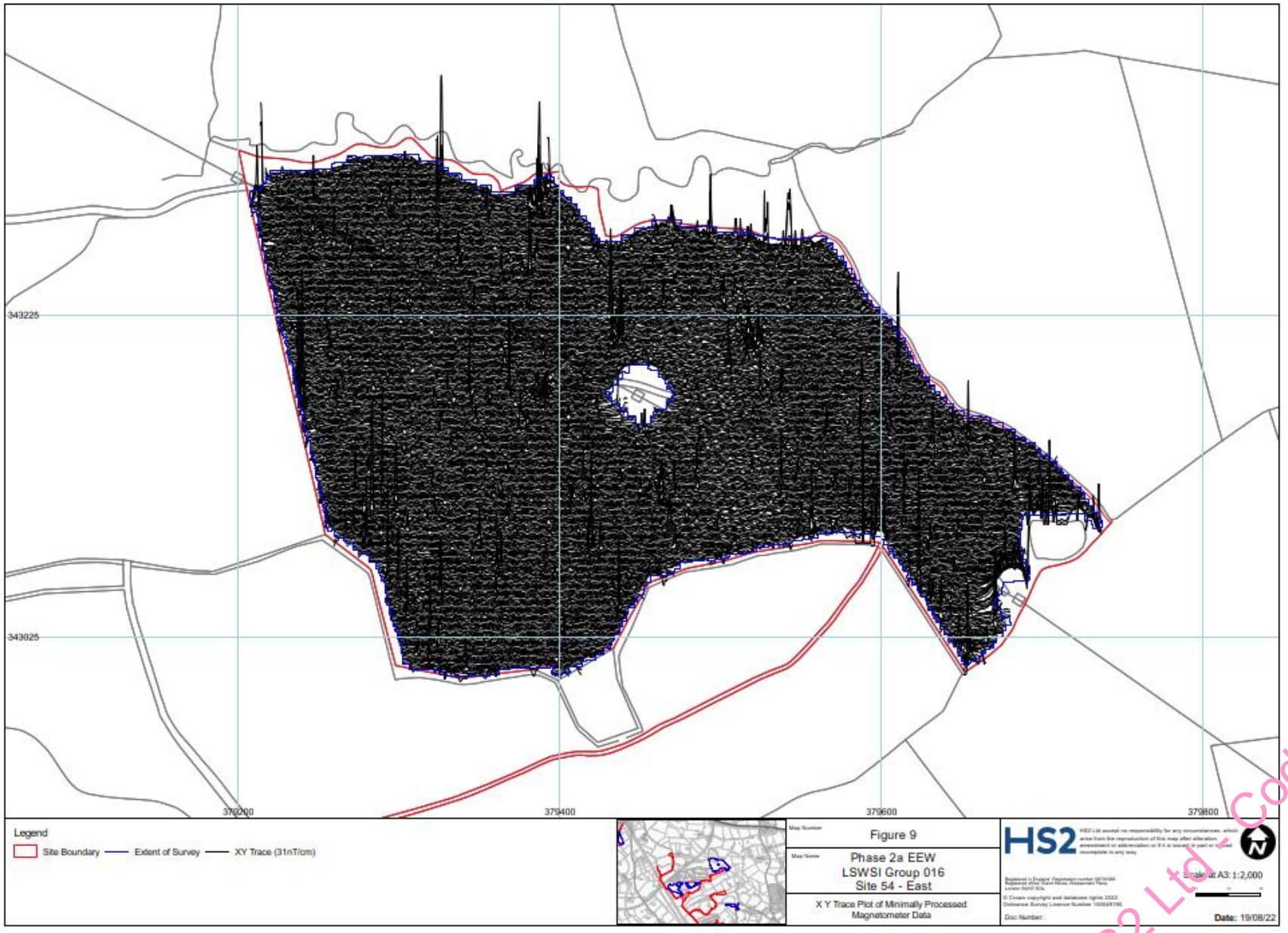


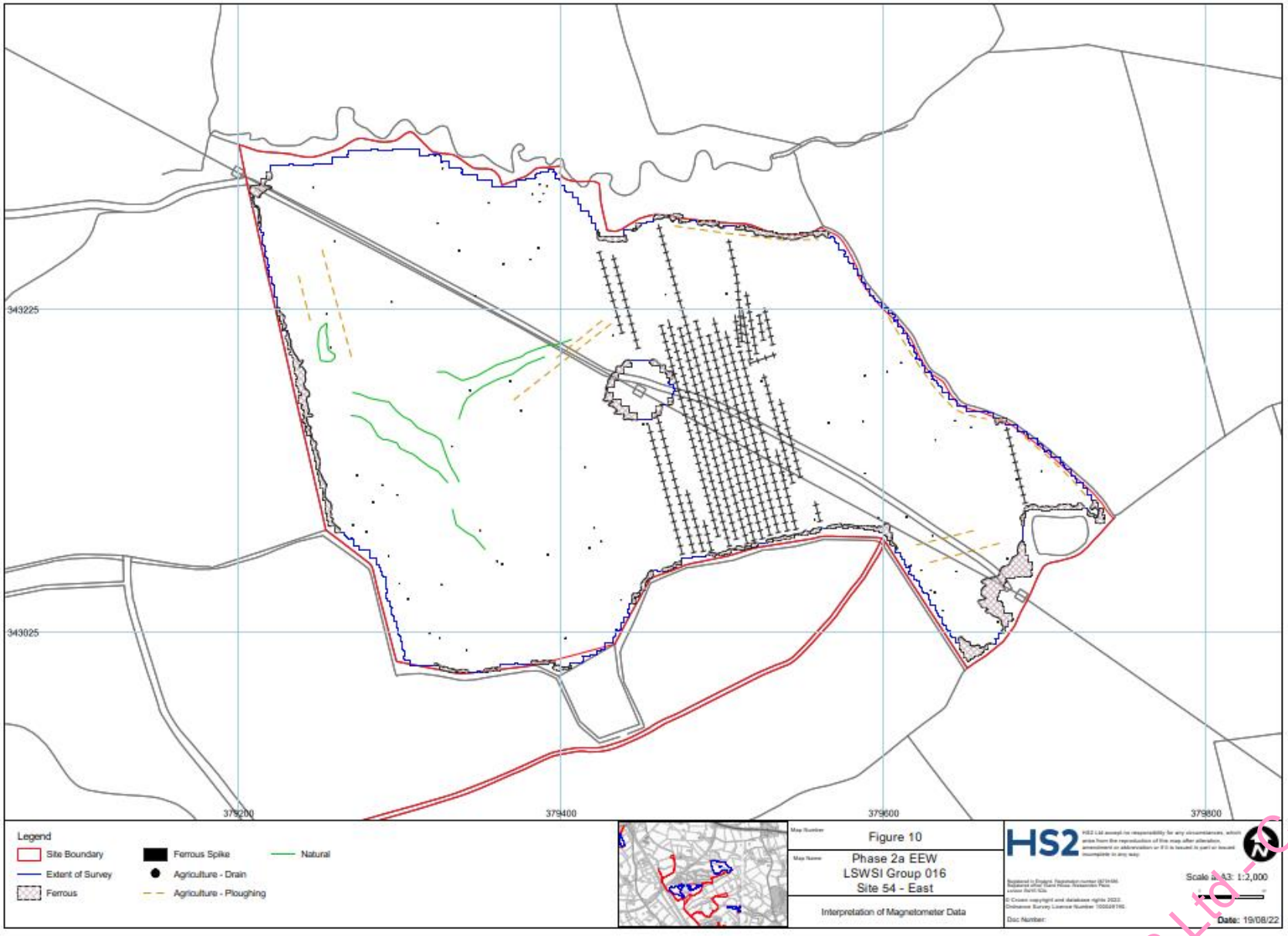












Annex 3: OASIS Form

Project Details:

Project name	Geophysical Survey at Group 016 Site 54
Type of project	Geophysical Survey, MAGNETOMETRY SURVEY
Project description	The survey was undertaken using four Bartington Grad601 sensors mounted at 1m intervals (1m traverse interval) onto a rigid carrying frame. The system was programmed to take readings at a frequency of 10Hz (allowing for a 10-15cm sample interval) on roaming traverses (swaths) 4m apart. These readings were stored on an external weatherproof laptop and later downloaded for processing and interpretation. The system was linked to a Trimble R8s Real Time Kinetic (RTK) differential Global Positioning System (dGPS) outputting in NMEA mode to ensure a high positional accuracy for each data point, in accordance with EAC guidelines (EAC 2016). The survey has identified anomalies indicative of the agricultural use of the parcel, most notably modern field drains, and cultivation techniques. One field boundary, as seen on historical mapping, is identified in the center of the northern parcel, while a second is recorded in the center of the most south-westerly parcel. Discrete low magnitude anomalies are recorded in the two southern parcels and are ascribed an interpretation of 'uncertain' as their exact origin is unclear. High magnitude responses near or adjacent to existing field boundaries are caused by the presence of highly magnetic material either within the boundaries or as a spread of sub-surface material. Further high magnitude responses are recorded adjacent to the modern high voltage pylon in the center of the northern parcel. A high magnitude linear response identified within the most south-westerly parcel records a former field boundary, however the magnetic response is significantly higher than that of a typical boundary, which

		may suggest a change of use such as a farm track. Occasional, discrete, low magnitude and dipolar 'spike' anomalies are of natural and modern causes respectively. High magnitude responses near or adjacent to existing field boundaries are caused by the presence of highly magnetic material either within the boundaries or as a spread of sub-surface material. Occasional, discrete, low magnitude and dipolar 'spike' anomalies are of natural and modern causes respectively. The Site sits in an area of low archaeological potential outside of a RAZ and with little evidence to suggest a different conclusion.			
Project dates		**Start:** 27-Apr-2022		**End:** 28-Apr-2022	
Previous work		N/A			
Future work		N/A			
Project Code:	Group 016 Site 54	**HER event no.**			

		NMR no.		**OASIS form ID:**	hs2headl1-509472
		SM no.			
Planning Application Ref.					
Site Status	None				
Land use	Arable and Pasture				
Monument type	N/A		**Period**	N/A	

Project Location:

Site Address	situated between Baldwin's Gate and the southeast of Madeley, Staffordshire			**Postcode**	
County	Staffordshire	**District**	Newcastle-under-Lyme	**Parish**	Madeley, Whitmore
Study Area	19.1ha	**Height OD**	Between 130 and 164m Above Ordnance Datum	**NGR**	SJ 78390 42590 SJ 78774 42669 SJ 79432 43164

Project Creators:

Name of Organisation	HS2 Headland Archaeology (UK) Ltd		
Project brief originator	HS2	**Project design originator**	HS2
Project Manager	Alistair Webb	**Project Supervisor**	Matt Berry
Sponsor or funding body	Balfour Beatty	**Type of Sponsor**	Client

Project Archive and Bibliography:

Physical archive	N/A	**Digital Archive**	Geophysical survey and report	**Paper Archive**	N/A
Report title	Phase 2a Heritage Non-intrusive Surveys Report: Group 016 Site 54 Geophysics survey report			**Date**	31/10/2022
Author	Headland Archaeology	**Description**	PDF/A	**Report ref.**	