Hall Farm Solar Farm, Suffolk: Geophysical Survey Report

OPDENERGY

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Executive Summary

Cura Terrae were instructed by OPDENERGY to undertake an archaeological geophysical survey at Hall Farm, Suffolk. The survey produced good results throughout and has identified several anomalies that have been interpreted as being of an uncertain origin.

Several, unrecorded boundary ditches of likely medieval to post-medieval origin have been identified aligned broadly parallel to further recorded boundary features illustrated in historical Ordnance Survey (OS) maps (1830's – 1880's) and (1888 – 1915). Anomalies indicating areas of disturbed ground are also noted within Field 6 and correspond to the positions of two former ponds illustrated on historical OS maps of the same provenance.

The remaining anomalies are limited to responses caused by modern activity such as agricultural trends, modern land drains as well as numerous ferrous 'spikes' located sporadically throughout the Site and have likely been caused by modern and or agricultural waste within the subsoil.

1. Introduction

1.1 Project Background

1.1.1 Cura Terrae were instructed by OPDENERGY to undertake an archaeological geophysical survey as part of a planning application (DC/25/2109/FUL) for the development of land at Hall Farm, Suffolk (hereafter 'the Site').

1.1.2 The Site is centred on National Grid Reference (NGR) 639251 286064 (TM 39251 86064) (Figure 1).

1.2 Location, Topography and Geology

1.2.1 The Site is c. 51.6 ha in size, comprised of seven fields, and is situated approximately 4.2 km southwest of the village of Beccles in the county of Suffolk.

1.2.2 The survey area is bounded by trees, hedgerows and fencing on all sides. The Site is surrounded by further agricultural fields on all sides, with an area of woodland to the southeast.

1.2.3 The Site is flat and is recorded at approximately 38 m above Ordnance Datum (aOD) to the south, and slopes down from approximately 35 m aOD in the in the centre of the Site.

1.2.4 The underlying bedrock of the Site is recorded as Sand of the Crag Group. Superficial deposits of Lowestoft Formation Diamicton are also noted across much of the survey area, with an intrusion of Head in the approximate centre of the Site (British Geological Survey 2025).

2. Archaeological and Historical Background

2.1 Introduction

2.1.1 Below is a summary of archaeological and heritage data compiled from a Historic Environment Desk-Based Assessment (Cura Terrae 2025). This document used findings within the Suffolk Historic Environment Record (SHER) within an approximate 1 km search radius of the Site. While not exhaustive, this section aims to present a summary of findings considered relevant to the interpretation of the geophysical survey data collected.

2.1.2 The SHER records a total of three previous archaeological investigations within the study area. Of these recorded archaeological investigations none were undertaken within the Site. The interventions included two building surveys and one archaeological monitoring watching brief.

2.2 Summary

Prehistoric

2.2.1 Despite the different coastline, human activity has been present in the wider area since prehistoric times. The first evidence of human activity in the British Isles, dating to c. 700,000 years ago, has been found relatively recently at two separate sites on the East Anglian coast with finds at Happisburgh Norfolk and Pakefield in Suffolk (Waveney District Council 2014).

2.2.2 The prehistoric activity within the study area is represented by a two findspots of possible Neolithic and later prehistoric date. One of these was found within the Site, located in the larger southwestern field on the western side. A saddle quern was found here whilst farming and field walking in 1988 and has been given a tenuous date of Later Prehistoric, approximately 4000 BC to 42 AD. Saddle querns consist of two stones, one upper and one lower, and is evidence for possible prehistoric activity within or near to the Site. Within this period, communities began to grow their own crops and keep livestock rather than rely on hunting and gathering their food, and the quern stone was a crucial part in the process of crops for food. The find shows the potential for prehistoric finds within the Site but may also indicate some disturbance of possible archaeological remains through post-medieval and modern agricultural processes.

2.2.3 Approximately 360 m north of the Site the SHER records the findspot for a finely flaked flint chisel 15.5 cm long made from polished axe that is of possible Neolithic date.

Romano-British

2.2.4 The water line is different to what it would have been during the prehistoric and Romano-British period with a tidal river that is much wider compared to today. This is the most likely reason for a lack of evidence for more permanent settlement prior to the early medieval period (Waveney District Council 2014).

2.2.5 There is limited evidence for activity during the Roman period within the study area, with are only two records found on the SHER for pottery fragments that have been found. One findspot is a Puddingstone quern that was found in the same location within the Site the saddle quern mentioned above.

2.2.6 Puddingstone is found in Hertfordshire and is a conglomerate siliceous concretion consisting of rounded flint pebbles and cobbles set in a matric of fine sand and silica cement (Lovell and Tubb, 2006). Not only is the stone not local to the Site and would have had to travel some distance to get to where it was found.

2.2.7 The other findspot can be found c. 500 m north of the Site, near to St Andrew's Hall Barn. The SHER records show that a scatter of Roman pottery sherds were found here, but no further information is provided.

Medieval

2.2.8 During the early medieval period there is suggestion for more permanent settlement within the region, with a Bailey fortification is referred to guarding the Waveney River estuary against Norse raiding parties during the Saxon period (Waveney District Council 2014).

2.2.9 There is an increase in activity dating to the medieval period in the wider landscape of the Site found in the SHER records. Within the site and the same location as the prehistoric saddle quern (2) and the Romano-British puddingstone quern, there is a record for the findspot of two mortar fragments and some pottery sherds also found in 1988. One fragment is limestone whilst the other is Purbeck, as well as some pottery sherds. To the north of the Site, on the other side of School Road there is a findspot for a medieval twisted unglazed jug handle that was found on the field surface.

2.2.10 Approximately 600 m to the east of the Site is deserted village of Redisham (which is mentioned in the Domesday Survey of 1086 and records the tenant-in-chief as Robert Bigot and a population of six households composed of two villagers, two freeman and two smallholders. The survey also suggests that the surrounding area was used for agricultural and pastoral purposes, with a lord's plough team, 0.5 men's plough team, and four woodland pigs (Palmer & Powell-Smith 2016).

2.2.11 To the north of the deserted village of Redisham are the recorded remains of Church of St James (9). The church was formerly the parish church of Little Redisham parish. All that remains are the 16 Hall Solar Farm – Historic Environment Desk-Based Assessment lower courses of the west wall

and a fragment of the north wall which stands to a height of 1 m and the churchyard ditch which is visible as an earthwork. The fragments of the remaining wall are of flint rubble with no architectural details preserved. The church or chapel was a small building and composed of in its original state a nave and chancel only, without either aisle or tower. Three skeletons associated with the church were disturbed by a tree blown over in October 1987.

2.2.12 Located west of the Site, c. 480 m, there is a small square moat at Corner Farm (7). The moat is marked on a 1957 OS map and a pair of semi-detached nineteenth century cottages stand at its centre. The moat is water filled and was constructed for drainage. It is likely to be contemporary with the cottages.

2.2.13 The remaining records found on the SHER for the medieval period are Greens or Commons that are visible on Hodskinson's Map of Suffolk 1783. Three of which are Little Common, Peardyke Common (12) Holden's/Godfrey's Common and are located c. 1 km north west of the Site. The last of which is Backs Green which is found 1 km to the south of the Site.

Post-Medieval

2.2.14 Throughout the eighteenth century the nearby market town of Beccles steadily expanded and consolidated its role as the principal market centre for the area inland from Lowestoft, with commerce based chiefly upon wool, corn, malt, and leather, with trade in meat and cattle becoming an increasing factor (Waveney District Council 2014).

2.2.15 This growth of Beccles influenced the growth of agricultural surrounding landscape of the Site, with increasing use of the land for arable and pasture. This is reflected in the number of farmsteads that can be found within the study area dating to the post-medieval period an unnamed field barn. All of these farmsteads and the unnamed barn are identified by being visible on the first edition OS map.

2.2.16 Four of these farmsteads have listed buildings, The Grade II listed buildings of St Andrews Hall (NHLE 1352632) and a barn immediately northwest of St Andrews Hall (NHLE 1183361) are located c. 540 m to the north of Site. St Andrew's Hall is a farmstead laid in a regular E-plan with the farmhouse detached and set away from the yard. The farmstead sits alongside a private track in an isolated location and currently survives intact with conversion for residential use.

2.2.17 The Grade II listed building for Red House Farm (NHLE 1183299) is located c. 420 m to the southwest of Site and is a farmstead laid out in a regular U-plan with additional detached elements. The farmhouse is set away from the yard and sits alongside a private track in a loose farmstead cluster. There has been significant loss of working buildings with large scale additional infrastructure on site.

2.2.18 To the east of the Site c. 500 m is the Grade II listed building Redisham Hall (NHLE 1182824) which is a brick house built in 1823 for John Garden, with additions of a ballroom and garden terrace in

17 Hall Solar Farm – Historic Environment Desk-Based Assessment 1905. The hall lies within a large parkland, identified on the local list for East Suffolk. The parkland was laid out when the hall was constructed in the early nineteenth century but retains features from the earlier hall and gardens. Archaeological monitoring for groundworks was undertaken here in 2014. A flint and mortar wall, a well, a soakaway, and a pit of later post medieval date were identified here. To the south of Redisham Hall is the ancient woodlands of Gorse Thick or Manor Thicket.

2.2.19 There are a number of undated cropmarks and an enclosure recorded on the SHER; however, they are all likely to be of a post-medieval date.

2.2.20 The cropmarks found to the south of the Site near the Great Wood, are running in an east by west orientation, and two in a north by south orientation. The east by west cropmarks look like they appear in a herringbone shape and are likely post-medieval to modern land drains as the land here is low lying and may be a water meadow.

2.2.21 One of the east to west cropmarks, as well as the two north by south cropmarks, appear to be former field boundaries that can be observed on the historical map Suffolk Sheet XVIII.NW published in 1883. The first change to one of boundaries is seen in the historical map TM3885-TM3985 published in 1970 where one of the north by south boundaries disappears in order to combine two fields into one, which is then followed by the other north by south boundary that no longer appears in the subsequent map TM38NE published in 1973. The east by west field boundary remains unchanged, so its removal is likely to be recent.

2.2.22 To the immediate west of the Site, the SHER also records further cropmarks in an east by west orientation which may also relate to land drains and general water management for the field but are close to the scatter of finds found in 1988. One of the cropmarks is in a northeast by southwest orientation and another in a north by south orientation with both matching former field boundaries that can be observed on the historical map Suffolk Sheet XVIII.NW that was published in 1883. These boundaries no longer appear in the historic map TM38NE published in 1973, as the fields are likely conglomerated together.

2.2.23 The SHER also records a rectangular enclosure and rectangular cropmarks to the south of the Site c. 730 and 1 km, respectively. The rectangular enclosure is in a southwest by northeast orientation and is near the site of Brook Farm. The rectangular cropmarks is in a northwest by southeast orientation and could be the site of a former farmstead.

Modern

2.2.24 There is only one record from of twentieth century date in the SHER within the study area. Approximately 600 m to the north of the Site east of Lemans Farm is the record for a probable Second World War searchlight site used for anti-aircraft purposes. Two circular embankments and nearby huts are visible on Google Earth® 1945 imagery.

3. Geophysical Survey Methodology

3.1.1 All survey work was completed to appropriate standards, as outlined by existing guidance (CIfA 2020a; 2020b; 2020c, 2022; and Schmidt *et al*. 2015).

3.1.2 This geophysical survey was completed using a Sensys FMG650/3 system. Readings were recorded at a resolution of 0.01 nT and data collected with a traverse interval of 1 m and a sample interval of 0.25 m.

3.1.3 Data was collected by traversing the survey area in 4 m increments using a quadbike-towed non-magnetic cart system to achieve the best possible results.

3.1.4 Real Time Kinematic (RTK) differential GPS equipment (Carlson BRX7 GNSS Smart Antenna) was used to accurately determine the position of the survey equipment and survey monitor data.

3.1.5 The data processing was undertaken using TerraSurveyor64 software and consisted of a 'DeStripe' process. This process determines the average of the datapoints in each track, and subtracts that value from all the datapoints along each survey track.

3.1.6 Illustrations were created using QGIS software. Interpretation of identified anomalies was achieved through analysis of anomaly patterning and increases in magnetic response and was aided by examining the available supporting information, including but not limited to Greyscale plots, Colourscale plots and XY Trace plots. The interpretations follow Cura Terrae colour coding and categorisations of anomalies and attempt, where possible, to suggest the nature of buried features.

3.1.7 Further details of geophysical survey methodology can be found in Appendix A.

4. Mitigating Factors

4.1.1 The results of geophysical survey may not reveal all potential archaeology within a survey area, and geological, agricultural, and modern features may limit the detection of weaker archaeological responses.

4.1.2 At the time of survey, the Site conditions were dry and firm underfoot. However, Field 3 was not surveyed due to dense, overgrown vegetation.

4.1.3 A small swath of geological variation is noted in the centre of Field 7. This has not affected the dataset with the field.

4.1.4 Field boundaries comprised hedgerows and fences. Where necessary, a 2 m buffer was observed along metal fences although some interference is still noted at the survey periphery. The buffer was observed to minimise the effects or magnetic interference on the survey and to help to reduce as far as is reasonably practicable any non-detection of potential buried features.

5. Results and Interpretation

5.1.1 Anomalies found within the survey data are listed in Table 1 and illustrated on Figures 3, 5, 7, 9, 11 and 13.

Table 1: Survey Anomalies

Anomaly Number	Anomaly Type	Description	Interpretation
1. (Field 1, Figure 1)	Uncertain Trends	Weak, positive, linear anomaly located in the northeast corner of Field 1. Measures 93 m long on a northwest to southeast orientation.	The morphology of this anomaly may indicate the remains of a former, unrecorded, boundary ditch. The anomaly is on parallel alignment to former boundary (10) which may suggest an earlier phase of unrecorded land division. However, it is plausible it is the result of a more recent land drain.
2a. (Fields 1 and 2, Figure 5)	Uncertain Trends	Weak, positive, linear anomaly located in the southern portions of Field 1 and 2. Measures 361 m long on a broadly east to west alignment.	This anomaly is likely the remains of a former boundary ditch. Furthermore, it runs parallel to former boundary (12) denoting an earlier phase of unrecorded land division.
2b. (Field 2, Figure 5)	Uncertain Trends	Weak, positive, linear anomaly in the northeast corner of Field 2. Measures 28 m long on a broadly east to west alignment.	This anomaly may be indicative of a former, unrecorded, boundary ditch associated with former boundary (12). However, it is also plausible it is the result of a more recent land drain.

Anomaly Number	Anomaly Type	Description	Interpretation
2c. (Field 2, Figure 5)	Uncertain Trends	Two, weak, positive linear anomalies located in the northeast of Field 2. Measuring between 19 m to 29 m long.	These anomalies may represent, former, unrecorded, boundary ditch features associated with former boundary (12). However, their weak response within the dataset precludes an accurate interpretation. The anomaly may also indicate a land drain.
3a. (Field 4, Figure 5)	Uncertain Trends	Positive, curvilinear, anomaly located in the northeast corner of Field 4. Measures 30 m long on a broadly northwest to south alignment.	This anomaly may be indicative of a former, unrecorded, boundary ditch. Its isolated location within the dataset precludes and accurate interpretation. The anomaly may also indicate a land drain.
3b. (Field 4, Figure 5)	Uncertain Trends	Weakly positive, linear anomaly in the south of Field 4, measures 31 m long on a northwest to southeast orientation.	This anomaly may represent a former, unrecorded, boundary ditch and may be the remains of a possible extension of the southern portion of (2c). The anomaly may also indicate a land drain.
4a. (Field 6, Figure 7)	Uncertain Trends	Positive, linear anomaly in the northwest corner of Field 6. Measures 88 m in length on a broadly east to west orientation.	This anomaly likely represents a former boundary ditch feature. Furthermore, it is on a parallel alignment to former boundary (15) inferring an earlier phase of unrecorded land division - of probable medieval to post-medieval provenance. The anomaly also continues further eastward (4b).

Anomaly Number	Anomaly Type	Description	Interpretation
4b. (Field 6, Figure 7)	Uncertain Trends	Positive, linear anomaly in the northern portion of Field 6, measures 130 m in length on a broadly east to west orientation, with a 9 m linear extension protruding the northern extent.	This anomaly likely represents a former boundary ditch feature and a probable extension of (4a). However, the anomaly may also indicate a land drain.
5. (Field 7, Figure 9)	Uncertain Trends	Weak, positive, linear anomaly located in the centre of Field 7. Measures 214 m long, on a broadly north to south orientation with a 9 m, linear extension of the eastern extent.	This anomaly likely represents a former boundary ditch feature. Furthermore, it is on a parallel alignment to former boundary (18) inferring an earlier phase of unrecorded land division of probable medieval to post-medieval provenance. However, the anomaly may also indicate a land drain.
6. (Field 6, Figure 9)	Uncertain Trends	Positive, curvilinear anomaly located in the centre of Field 6. Measures 60 m long.	This anomaly is likely associated with a former pond feature illustrated on historical OS maps (1830's - 1880's) and (1888 -1915). It is also plausible that the anomaly has been caused by modern agricultural activity.
7. (Field 6, Figures 7 and 9)	Increased Magnetic Response	Two, amorphous, dipolar anomalies located in the centre of Field 6.	This anomaly corresponds to a former pond illustrated on historical OS maps (1830's - 1880's) and (1888 -1915). The dipolar response has likely been caused by redeposited materials when the feature was filled in.

Anomaly Number	Anomaly Type	Description	Interpretation
8. (Field 6, Figure 7)	Increased Magnetic Response	Amorphous, dipolar anomaly located in the southern portion of Field 6.	This anomaly corresponds to a former pond illustrated on historical OS maps (1930's 1880's) and (1888-1915). The dipolar response has likely been caused by redeposited materials when the feature was filled in.
10 - 19. (Fields 1, 2, 6 and 7, All Figures)	Former Boundary	Several, linear and rectilinear anomalies of varying response located throughout the Site.	These anomalies correspond to former boundary features illustrated on historical OS maps (1830's-1880's) and (1888-1915).
20. (Field 6, Figure 7)	Agricultural Trend	Weak, negative, curvilinear anomaly located in the northwest corner of Field 6. Measures 132 m long on a broadly east to west alignment.	This anomaly has likely been caused by modern agricultural vehicles along the headland of the field.
NA (Field 7, Figures 11 and 13)	Geology	Singular, amorphous area of varying magnetic responses located in the southern portion of Field 7.	This anomaly represents localised variations within the underlying geology and corresponds mapped changes on the British Geological Survey.
NA (Field 5, Figure 7)	Ferrous Disturbance	Small, highly magnetic, amorphous anomaly located by the western boundary of Field 5.	This anomaly have likely been caused by proximity to metal fencing other ferrous materials beyond the survey extent.

Anomaly Number	Anomaly Type	Description	Interpretation
NA (Fields 1, 2 and 6, Figures 3, 5, 7, 9 and 13)	Land Drains	Several, linear anomalies of varying response. Located in Fields 1, 2 and 6.	These anomalies represent modern, agricultural land drains.
NA (All Fields, Figures 5, 7, 9 and 13)	Ferrous 'Spike'	Numerous, small, dipolar anomalies located sporadically throughout the Site.	These anomalies have likely been caused by, modern and or agricultural waste within the subsoil.

6. Discussion

6.1.1 The geophysical survey produced good results throughout and has noted a several anomalies that have been interpreted as being of uncertain origin. These anomalies are all likely to indicate features dating from the medieval or more likely, post-medieval period. Despite a propensity of features in the wider landscape dating to the Prehistoric and Romano British period, no anomalies identified by this survey can be confidently interpreted to date to these periods, although an earlier origin cannot be entirely ruled out based on the results of this geophysical survey alone.

6.1.2 A series of former, unrecorded boundary ditches are noted within Fields 1, 6 and 7. These anomalies are positive and linear, and are aligned broadly parallel to recorded boundary features illustrated on historical OS maps (1830's – 1880s) and (1888 – 1915) and so may denote a different phase of land division within the historical landscape. Such features are likely to be medieval to post-medieval in provenance. Several, isolated, linear anomalies may also denote the remains of unrecorded boundaries ditches, however; their isolated positions preclude a more accurate interpretation.

6.1.3 Two areas of increased magnetic response are noted within Field 6 and correspond to former pond features recorded on historical OS maps (1830's – 1880s) and (1888 – 1915). Further features indicating historical land division also correspond to historical maps of the same origin.

6.1.4 The remaining anomalies are limited to responses caused by modern activity such as agricultural trends (20), modern land drains and numerous ferrous "spikes" located sporadically throughout the Site and have likely been caused by modern and or agricultural waste within the subsoil.

7. Curation and Storage

7.1.1 The archive will be prepared in accordance with national guidelines (CIfA 2020b). The integrity of the primary field record will be preserved. Security copies will be maintained where appropriate. Digital records of the geophysical survey and its collected data will be held by Cura Terrae

7.1.2 An OASIS form has been created on the results of the works under the following reference number (curaterr1-537243). Following approval of the report, a pdf version of the final version will be submitted within three months to the Archaeology Data Service via the OASIS form.

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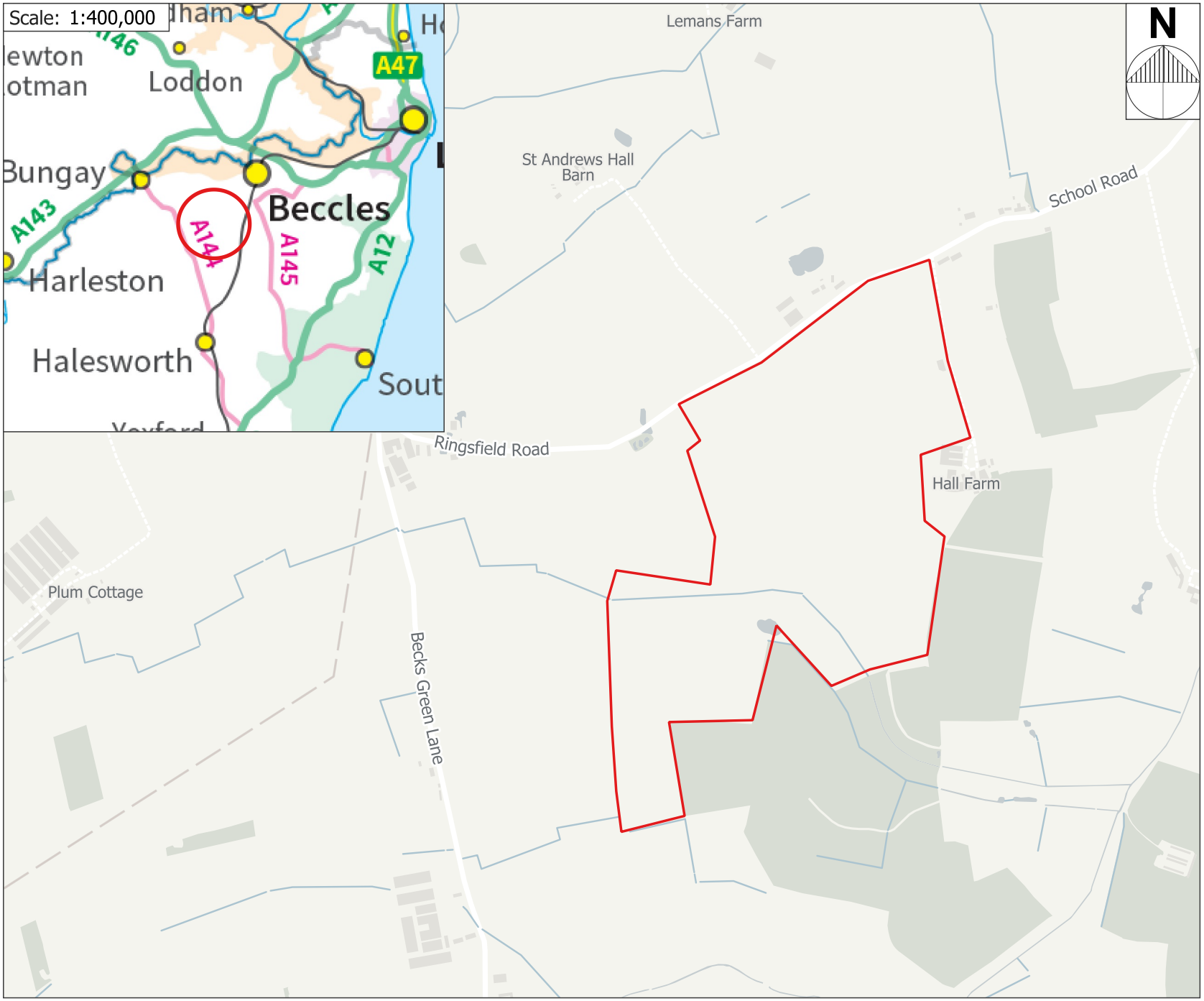


Cura Terrae

Key

Site Boundary

0 100 200 300 400 500 m

OPDENERGY
Hall Farm Solar Farm, Suffolk

Figure 1
Site Location

A	12.09.25	PFP	-
Rev	Date	Drawn by	Checked by

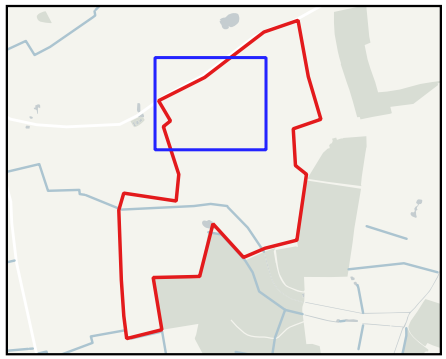
Site centred on:	TM 39384 86056

October 2025 | Scale: 1:12,000 @A4 | Drg.Ref: 25356 - GEO - 1 - A

CuraTerrae

Key

- Site Boundary
- Survey Extent



0 10 20 30 40 50 m

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Hall Farm Solar Farm, Suffolk

Figure 2
Greyscale Plot - Field 1 (North) and Field 2 (North West)

A	12.09.25	PFP	-
Rev	Date	Drawn by	Checked by

Site centred on:	TM 39384 86056

October 2025 | Scale: 1:2,000 @A4 | Drg.Ref: 25356 - GEO - 2 - A

CuraTerrae

Key

- Site Boundary
- Survey Extent
- Former Boundary
- Land Drain
- Uncertain Trend
- Increased Magnetic Response

0 10 20 30 40 50 m

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Hall Farm Solar Farm, Suffolk

Figure 3
Interpretation Plot - Field 1 (North) and Field 2 (North West)

A	12.09.25	PFP	-
Rev	Date	Drawn by	Checked by

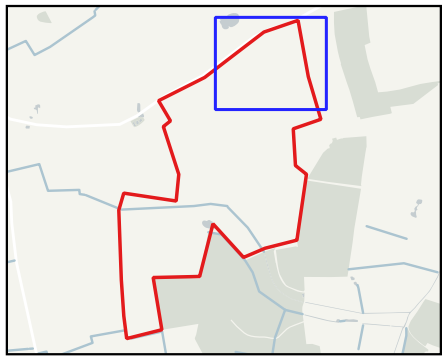
Site centred on:	TM 39384 86056

October 2025 | Scale: 1:2,000 @A4 | Drg.Ref: 25356 - GEO - 3 - A

CuraTerrae

Key

- Site Boundary
- Survey Extent



0 10 20 30 40 50 m

OPDENERGY
Hall Farm Solar Farm, Suffolk

Figure 4
Greyscale Plot - Field 2 (North), Field 3 (North), and Field 4

A	12.09.25	PFP	-
Rev	Date	Drawn by	Checked by

Site centred on:	TM 39384 86056

October 2025 | Scale: 1:2,000 @A4 | Drg.Ref: 25356 - GEO - 4 - A

CuraTerrae

Key

- Site Boundary
- Survey Extent
- Former Boundary
- Land Drain
- Ferrous Spike
- Uncertain Trend
- Increased Magnetic Response

0 10 20 30 40 50 m

OPDENERGY
Hall Farm Solar Farm, Suffolk

Figure 5
Interpretation Plot - Field 2 (North), Field 3 (North), and Field 4

A	12.09.25	PFP	-
Rev	Date	Drawn by	Checked by

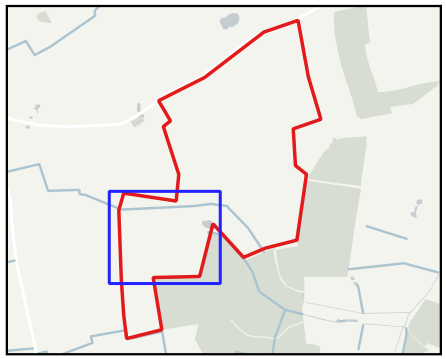
Site centred on:	TM 39384 86056

October 2025 | Scale: 1:2,000 @A4 | Drg.Ref: 25356 - GEO - 5 - A

CuraTerrae

Key

- Site Boundary
- Survey Extent



0 10 20 30 40 50 m

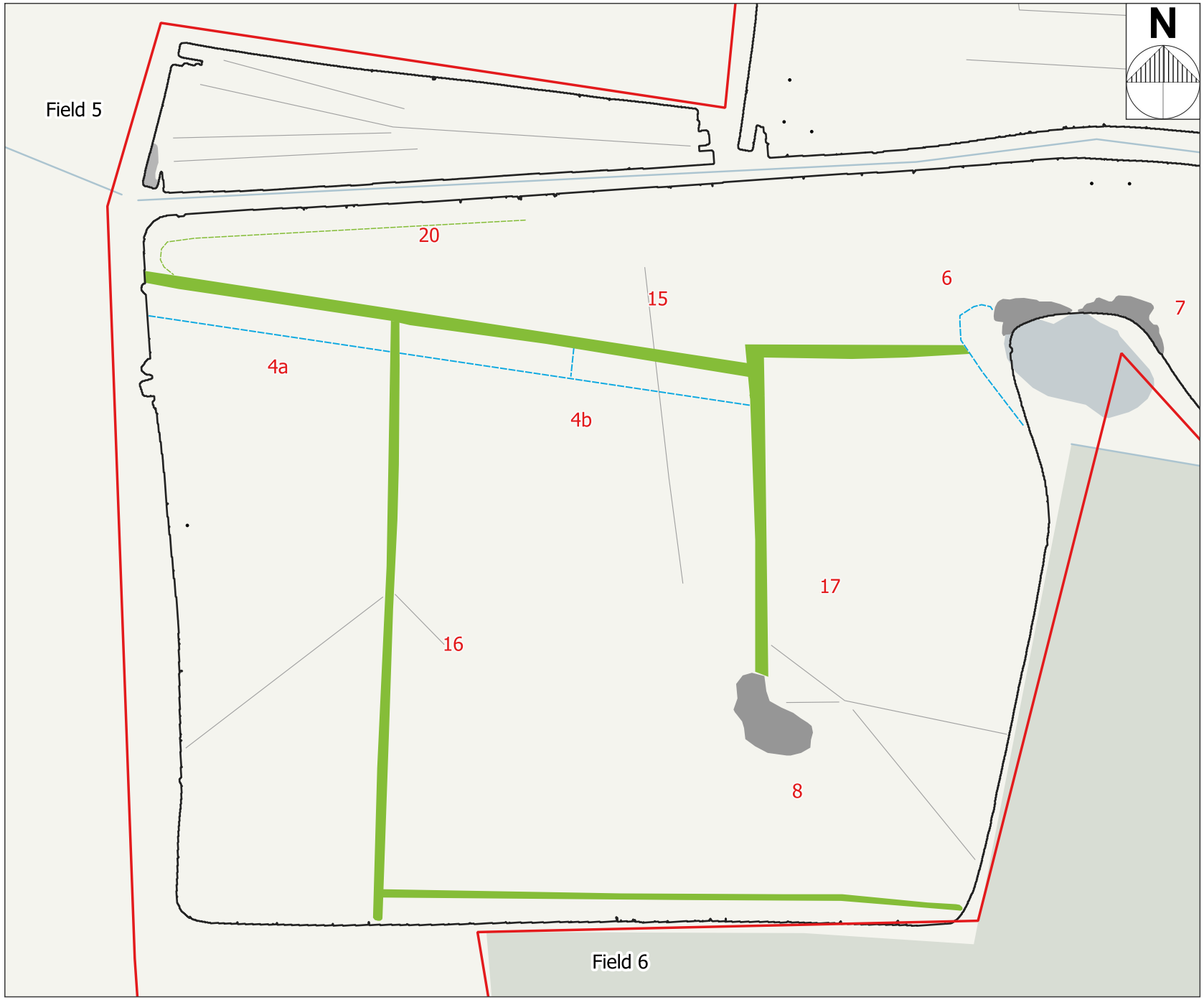
OPDENERGY
Hall Farm Solar Farm, Suffolk

Figure 6
Greyscale Plot - Field 5 and Field 6 (West)

A	12.09.25	PFP	-
Rev	Date	Drawn by	Checked by

Site centred on:	TM 39384 86056

October 2025 | Scale: 1:2,000 @A4 | Drg.Ref: 25356 - GEO - 6 - A



CuraTerrae

Key

- Site Boundary
- Survey Extent
- Former Boundary
- Agricultural Trend
- Uncertain Trend
- Land Drain
- Ferrous Spike
- Ferrous Disturbance
- Increased Magnetic Response

0 10 20 30 40 50 m

OPDENERGY
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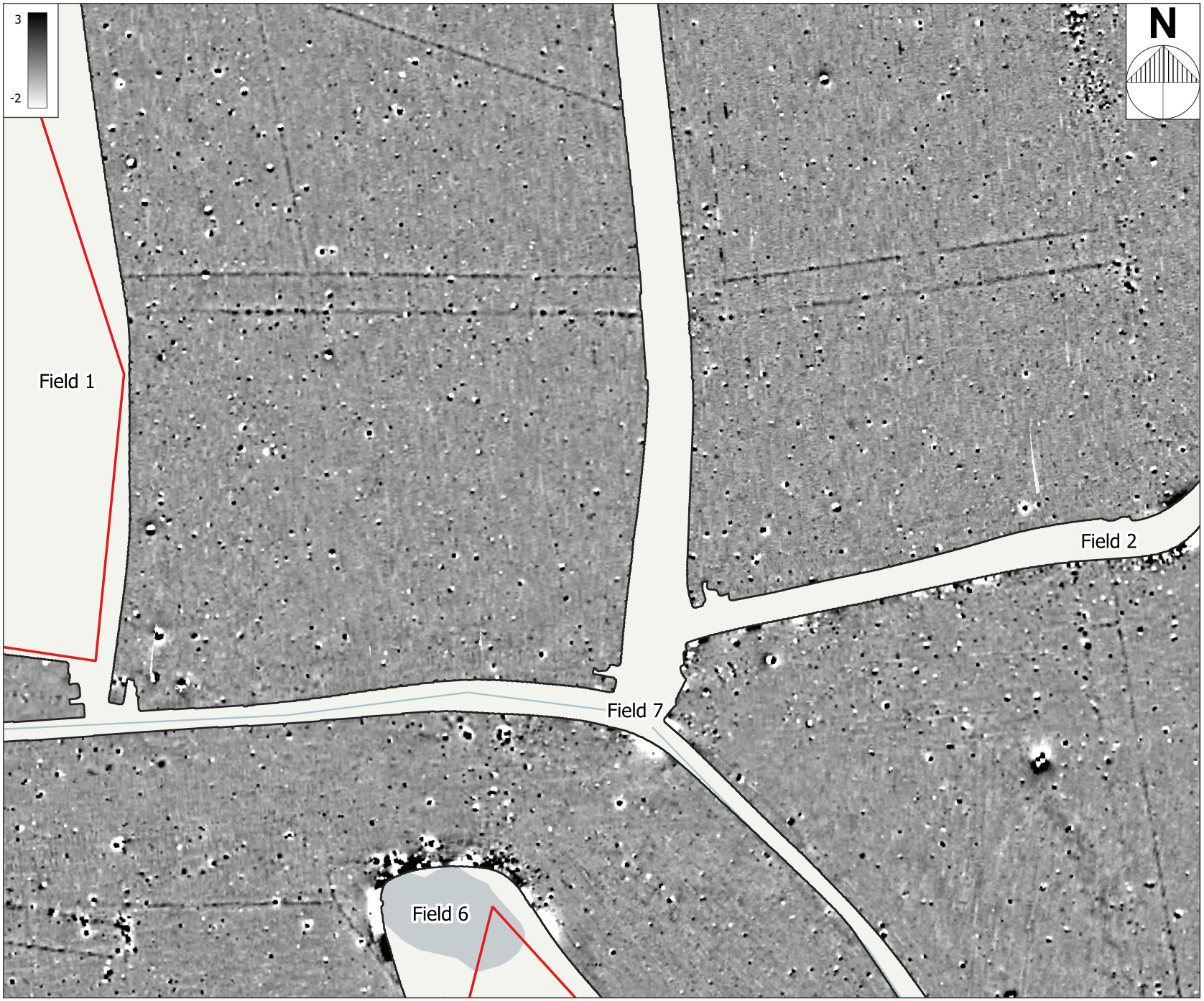
Figure 7
Interpretation Plot - Field 5 and Field 6 (West)

A	12.09.25	PFP	-
Rev	Date	Drawn by	Checked by

Site centred on:	TM 39384 86056

October 2025 | Scale: 1:2,000 @A4 | Drg.Ref: 25356 - GEO - 7 - A

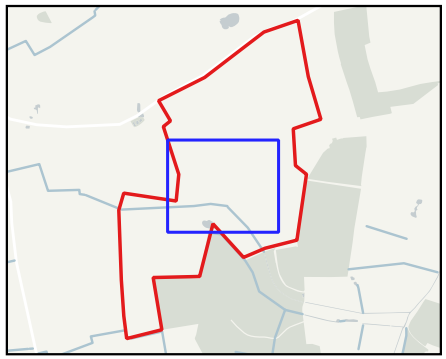


CuraTerrae

Key

Site Boundary

Survey Extent



0 10 20 30 40 50 m

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Figure 8

Greyscale Plot - Field 1 (South), Field 2 (South West), Field 6 (North East), and Field 7 (North West)

A	12.09.25	PFP	-
Rev	Date	Drawn by	Checked by

Site centred on:	TM 39384 86056

October 2025 | Scale: 1:2,000 @A4 | Drg.Ref: 25356 - GEO - 8 - A

Cura Terrae

Key

- Site Boundary
- Survey Extent
- Former Boundary
- Uncertain Trend
- Land Drain
- Ferrous Spike
- Increased Magnetic Response
- Geology

0 10 20 30 40 50 m

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Figure 9

Interpretation Plot - Field 1 (South), Field 2 (South West), Field 6 (North East), and Field 7 (North West)

A	12.09.25	PFP	-
Rev	Date	Drawn by	Checked by

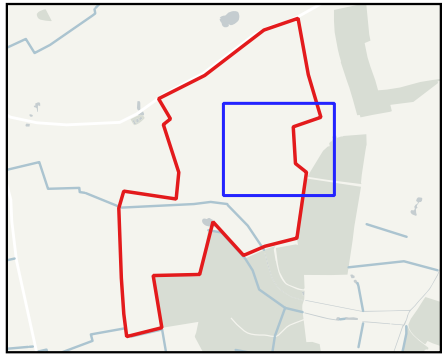
Site centred on:	TM 39384 86056

October 2025 | Scale: 1:2,000 @A4 | Drg.Ref: 25356 - GEO - 9 - A

CuraTerrae

Key

- Site Boundary
- Survey Extent



0 10 20 30 40 50 m

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Figure 10
Greyscale Plot - Field 2 and 3 (South), and Field 7 (North East)

A	12.09.25	PFP	-
Rev	Date	Drawn by	Checked by

Site centred on:	TM 39384 86056

October 2025 | Scale: 1:2,000 @A4 | Drg.Ref: 25356 - GEO - 10 - A

CuraTerrae

Key

- Site Boundary
- Survey Extent
- Former Boundary
- Land Drain
- Uncertain Trend

0 10 20 30 40 50 m

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Figure 11
Interpretation Plot - Field 2 and 3 (South), and Field 7 (North East)

A	12.09.25	PFP	-
Rev	Date	Drawn by	Checked by

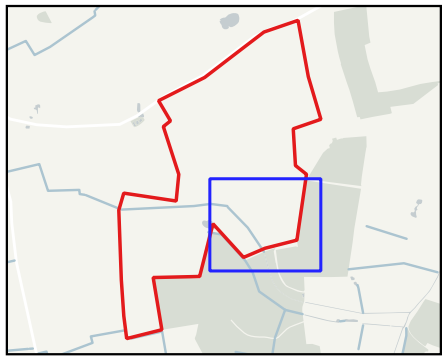
Site centred on:	TM 39384 86056

October 2025 | Scale: 1:2,000 @A4 | Drg.Ref: 25356 - GEO - 11 - A

CuraTerrae

Key

- Site Boundary
- Survey Extent



0 10 20 30 40 50 m

OPDENERGY
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Figure 12
Greyscale Plot - Field 6 (East) and Field 7 (South)

A	12.09.25	PFP	-
Rev	Date	Drawn by	Checked by

Site centred on:	TM 39384 86056

October 2025 | Scale: 1:2,000 @A4 | Drg.Ref: 25356 - GEO - 12 - A

CuraTerrae

Key

- Site Boundary
- Survey Extent
- Former Boundary
- Land Drain
- Ferrous Spike
- Uncertain Trend
- Increased Magnetic Response
- Geology

0 10 20 30 40 50 m

OPDENERGY

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Figure 13
Interpretation Plot - Field 6 (East) and Field 7 (South)

A	12.09.25	PFP	-
Rev	Date	Drawn by	Checked by

Site centred on:	TM 39384 86056

October 2025 | Scale: 1:2,000 @A4 | Drg.Ref: 25356 - GEO - 13 - A

Cura Terrae

Key

- Site Boundary
- Survey Extent

0 70 140 210 280 350 m

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Hall Farm Solar Farm, Suffolk

Figure 14
Greyscale Plot - Overview

A	12.09.25	PFP	-
Rev	Date	Drawn by	Checked by

Site centred on:	TM 39384 86056

October 2025 | Scale: 1:7,500 @A4 | Drg.Ref: 25356 - GEO - 14 - A

Curaterrae

Key

- Site Boundary
- Survey Extent
- Former Boundary
- Agricultural Trend
- Uncertain Trend
- Land Drain
- Ferrous Spike
- Ferrous Disturbance
- Increased Magnetic Response
- Geology

0 70 140 210 280 350 m

OPDENERGY
Hall Farm Solar Farm, Suffolk

Figure 14
Greyscale Plot - Overview

A	12.09.25	PFP	-
Rev	Date	Drawn by	Checked by

Site centred on:	TM 39384 86056

October 2025 | Scale: 1:7,500 @A4 | Drg.Ref: 25356 - GEO - 14 - A

Appendix A: Technical Information

Gradiometer Survey

Magnetic surveys measure distortions of variable strength in the earth's magnetic field caused by magnetic fields associated with buried features (Gaffney and Gater 2003, 36) that have either remnant or induced magnetic properties (Aspinal *et al*. 2008, 21–26). Human activity and inhabitation often alter the magnetic properties of materials (Aspinal *et al*. 2008, 21) resulting in the ability for numerous archaeological features to be detected through magnetic surveys.

Intensive burning or heating can also result in materials attaining a thermoremanent magnetisation; examples of which include kilns, ovens, heaths, and brick structures (Aspinal *et al*. 2008, 27; Gaffney and Gater, 2003, 37). However, there is also no way to always confidently assert from the results of Gradiometer surveys alone, whether burned material is in situ or has been redeposited within, for example, a refuse pit.

When topsoil-rich with iron oxides, fills a man-made depression in the subsoil, it creates an infilled feature, such as a pit or ditch, with a higher magnetic susceptibility compared to the surrounding soil (Aspinal *et al*. 2008, 37–41; Gaffney and Gater 2003, 22– 26). Magnetic surveys can also detect features with a lower magnetically susceptibility than the surrounding soil, an example of which is a stone wall.

Limitations

Poor results can be due to several factors including, but not limited to, short lived archaeological occupation and land use, or sites with minimal cut or built features. Results can also be limited in areas where the natural geology is of a similar composition to the fills of cut archaeological features such as ditches, or where soils are naturally deficient in iron compounds. Poor results can also be caused by areas with soils overlying naturally magnetically enhanced geological deposits, which can produce strong or variable responses limiting the detection of earlier archaeological features.

Overlying layers, such as demolition rubble or layers of made ground such as during landscaping works, can also limit the detection of earlier archaeological features. The presence of above ground structures within, or in the near vicinity of, the survey area as well as underground services containing ferrous material such as pipelines or electricity cables can distort survey results, further limiting the detection of earlier archaeological features.

Particularly uneven or locally variable elevation in topography can increase the data processing required, and/or distort results beyond the capabilities of processing. It is also possible in areas containing dramatic topographical changes that natural weathering, such as hill wash, often in combination with intensive modern ploughing or other natural geological deposits, will reduce the topsoil on slopes and towards the peaks of hills and possibly destroy or truncate potential archaeological features as a result.

Conversely features at the bottom of slopes may be covered by a greater layer of topsoil or other deposits, and so if buried features are present, they appear faint or are entirely limited in their detection.

Over-processing of data can also obscure, remove or artificially enhance or create anomalies, especially if there are on the same orientation as the direction of data collection. Consequently, where possible, attempts are made to ensure data is not collected on the same orientation as known potential features and that data quality is sufficient to minimise the required data processing.

Instrumentation

Sensys FGM650/3

The FGM650/ is a single axis, vertical component fluxgate gradiometer with an analogue output. It outputs a voltage as an equivalent of the magnetic flux density. Each sensor contains two fluxgate sensors with a vertical separation of 0.65 m. Each of the fluxgate sensors has a dynamic range of +/ 75,000 nT and the gradiometer data have a range of +/- 8,000 nT. The sensitivity of the gradiometer is 0.6V/µT, the noise below 40pT.

The analogue data are converted into a digit by a 24 bit digitizer. Practically, a resolution of 0.15 to 0.2 nT can be reached in a moved system. The sensor is calibrated before it leaves the factory, a daily calibration is not needed. Instead, the data will be compensated during the post-processing.

This system records four or five lines of data on each traverse, with traverses walked in a zig-zag pattern until all the survey area is covered.

Appendix B: Data Visualisation and Further Information

Visualisation

The survey data collected was used to produce a series of images to demonstrate the results of surveys. These are outlined below:

- Greyscale plot – This method visualises the survey data as a shaded drawing, with highest readings showing as black, running through different shades to lowest showing as white. Plotting parameters can be adjusted to aid interpretation of geophysical survey data.
- XY Trace plot – This is an alternative method of data visualisation, plotting the magnitude of responses on a scaled XY trace. The stronger the response, the sharper the rise in the trace. This type of plot can be used to differentiate the origin of an anomaly and is best used in conjunction with an alternative method of interpretation.
- Interpretation plot – Through detailed analysis, anomalies have been interpreted and possible features identified. Interpretation drawings are used to show potential features and to reinforce and clarify the written interpretation of the data. Anomalies have been characterised using the terminology detailed in the following section and have been assigned colour coding, which is outlined in keys on figures associated with this report.

Magnetic Anomalies

Different anomalies can represent different features created by human occupation, agricultural or modern activity, or natural pedological and/or geological changes in the substrata.

Anomalies interpreted as 'stronger' are considered more likely to be of the interpreted characterisation; whereas a 'weaker' categorisation represents a more tentative interpretation applied to those anomalies with lesser increases in magnetic response or if the anomaly has incomplete patterning or irregular form. The strength and size of anomalies can vary depending on the magnetic properties of the feature, the magnetic susceptibility of the soil, the depth at which the feature is buried, and the state of preservation.

Terminology

- Anomaly - Any outstanding high or low magnetic response forming a particular shape or covering a specific area within the survey results.
- Feature - A man-made or naturally created object, material or deposit that has been detected through the site investigation works and has sufficient characteristics or supporting evidence for positive identification.

- Magnetic Susceptibility - The ability of a buried feature to be magnetically induced when a magnetic field is applied.
- Magnetic Response - The strength of the changes in magnetic values caused by a buried feature with either a greater or lesser ability to be magnetised compared with the soil around it. Anomalies are considered to either have strong/weak or positive/negative response. The strength of magnetic response (along with patterning) can be essential in determining the nature of a buried feature, but it should be noted that the size or strength of the magnetic response does not always correlate with the size of the buried feature.
- Morphology - The shape or form of an individual anomaly.
- Thermoremanence - The affect caused when a material has been magnetically altered through a process of heating. Thermoremanent magnetisation occurs when an object or material is heated passed the Curie Point and acquires a permanent magnetisation that is associated with the magnetic field that they cooled within (Gaffney and Gater 2003, 37).

Characterisation of Anomalies & Interpretation Categories

Archaeological or Historical Anomalies

- Archaeology – Linear, rectilinear, or curvilinear anomalies with a positive and/or negative magnetic response, composed of a patterning or shape that is suggestive of a buried archaeological feature. These are often indicative of structural remains or infilled cut features such as ditches. The strength of the anomaly signal can be suggestive of the properties of the feature. Negative linear anomalies represent upstanding or infilled features that are less magnetically susceptible than background readings, for example structures such as a ditch-bank, or a cut ditch containing a fill composed of a non-igneous stone material. Bipolar linear anomalies considered to be of an archaeological nature are indicative of material with a high magnetic susceptibility, such as a brick wall. Isolated anomalies or anomalies with a more amorphous form possibly represent infilled features or thermomagnetic features such as areas of heating/burning of an archaeological origin. Unless associated with conclusively identified archaeological remains, such as linear anomalies, absolute identification of positive responses can be problematic as it is often not possible to decipher if they are of an archaeological, modern, or agricultural origin. Consequently, isolated positive responses such as those indicating pit-features, are not always shown within the Interpretation plot(s) unless composed of a broad form or belonging to a series of isolated positive responses. Bipolar responses considered likely to be of an archaeological origin are also interpreted as isolated anomaly (archaeology). These are considered to relate to material with a very strong magnetic susceptibility or thermoremanent magnetisation.
- Possible archaeology – This categorisation is applied where anomalies are weaker or more diffuse in response, resulting in a less certain origin. It is possible that these belong to archaeological features but given their weaker responses or incomplete patterning it is equally plausible that they relate to other sources, such as agricultural features or natural soil formations or geological variations.
- Former Boundary - Linear anomalies, sub/irregular-rectilinear anomalies either with positive or negative magnetic responses, that correspond with the location of former field boundaries, ponds or buildings recorded on historic maps, Aerial photos, and/or LiDAR coverage of the site.

- Ridge and Furrow - Broadly spaced linear anomalies or trends that are likely to be indicative of earlier forms of agricultural practice, such as ridge and furrow. These often correspond with the location of earthworks visible on the ground during the survey, or can be identified on aerial or LiDAR survey imagery.

Strongly Magnetic / Bipolar / Dipolar

- Modern Service – Highly magnetic, typically dipolar linear anomalies with a stronger area of variably decreasing ferrous response depending on the vicinity of the survey instrumentation to the buried or extant feature.
- Increased magnetic response – Isolated bipolar responses of a typically modern nature that are likely to relate to buried ferrous material, building debris, or objects, such as magnetically enhanced agricultural debris. If a trend is noted in the alignment or spacing of isolated bipolar responses, it is possible that they are indicative of ferrous fittings or connectors used on buried non-magnetic buried utilities, although occasionally an archaeological origin cannot be ruled out. Also, areas of increased magnetic response denote areas of disturbance containing a high concentration of dipolar or bipolar responses. These are generally considered to be caused by modern debris in the topsoil, including agricultural 'green waste.' It is also possible that the disturbance is in part also caused by isolated archaeological material or geological or pedological changes in the substrata.
- Ferrous disturbance - Areas of magnetic disturbance, often along the edges of survey areas, or surrounding Modern Services caused by highly ferrous material such as standing metal structures like fencing and buildings. Modern Agricultural Anomalies.

Modern Agricultural

- Agricultural Trend - Ploughing trend tends to be regularly spaced linear anomalies, often with a narrower spacing, that conform with ploughing regime at the time of survey, or a recent regime recorded on aerial photos of the site. The response and distribution of land drains varies depending on the composition of the land drain and associated ditch or channel. Consequently, land drains can be composed of weak / strong positive / negative magnetic responses and are identified as a product of either their variance in magnetic values or positioning compared with regularly spaced linear anomalies considered to relate to modern ploughing. Land drains can be located within former agricultural regimes, such as ridge and furrow.
- Land drain – Weakly positive, and/or dipolar, regularly broadly spaced linear trends in a typically parallel or 'herringbone' formation. These are generally modern in origin, although earlier post-medieval ceramic drains are often plausible but cannot be determined.
- Uncertain Trend – Generally positive, although sometimes negative, isolated, and weak linear or curvilinear trends. This category is applied where multiple origins can be asserted to a barely detected anomaly.