

**Detailed Magnetometer Survey  
Land at Ebbsfleet Green, Swanscombe, Kent**

**NGR: 561792 172142 to 561125 172964  
(TQ 61792 72142 TO TQ 61125 72964)**

**SAM No: 1005140**



**November 2017**

**Detailed Magnetometer Survey  
Land at Ebbsfleet Green, Swanscombe, Kent**

**NGR: 561792 172142 to 561125 172964  
(TQ 61792 72142 TO TQ 61125 72964)**

**Site Code: EBB17  
OASIS ID: archaeol6-302361  
ASE Project No: 170376  
ASE Report No: 2017499**

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<b>Date of Issue:</b>	<b>November 2017</b>		
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## **Abstract**

*Archaeology South-East (ASE), the contracting division of The Centre for Applied Archaeology at the Institute of Archaeology, University College London (UCL), was commissioned by Southern Water to undertake a geophysical survey on Land at Ebbsfleet Green, Swanscombe, Kent, NGR 561792 172142 to 561125 172964. The work was undertaken between Wednesday 15th and Tuesday 21st November 2017.*

*Evidence for possible archaeological features was represented by strong positive and moderate negative anomalies. These anomalies may represent banks and ditches or structural remains and correspond to marks observed on Google Earth historical imagery dated 1960 that appear to enclose a low promontory with a linear anomaly approaching from the north that may indicate a road or trackway. Weak positive linear anomalies are noted across the site and may relate to ditches. These anomalies could be caused by former plough activity. Although, if this is the case then it would indicate a previous orientation to the modern field arrangement.*

## **Statement of Indemnity**

*Geophysical survey is the collection of data that relate to subtle variations in the form and nature of soil and which relies on there being a measurable difference between buried archaeological features and the natural geology. Geophysical techniques do not specifically target archaeological features and anomalies noted in the interpretation do not necessarily relate to buried archaeological features. As a result, magnetic and earth resistance detail survey may not always detect sub-surface archaeological features. This is particularly true when considering earlier periods of human activity, for example those periods that are not characterised by sedentary social activity.*

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## **1.0 INTRODUCTION**

### **1.1 Site background**

- 1.1.1 Archaeology South-East (ASE) have been commissioned by Southern Water (hereafter 'the client') to undertake archaeological investigations, initially encompassing geophysical survey, on Land at Ebbsfleet Green, Swanscombe, Kent, (hereafter 'the site') centred on NGR 561792 172142 to 561125 172964; Figure 1.
- 1.1.2 The final design of the scheme is not yet defined, but it is anticipated to comprise both open cut and directionally drilled elements and will link into the new development at Ebbsfleet Green, formerly the site of the Northfleet West Sub-Station and the northern end of the scheme. This scheme falls within the necessary parameters of the General Permitted Development Order benefitting from Southern Water's Permitted Development rights as a Statutory Undertaker. It is understood that no element of the scheme is subject to planning consent although Scheduled Monument Consent (SMC) will be required for a section of the scheme where it crosses the Scheduled remains of the site of the Roman settlement and religious centre of Vagnicae (Figure 1).
- 1.1.3 Early consultation between ASE and Southern Water highlighted the scheme's archaeological potential and ASE were commissioned to produce a detailed desk-based assessment (DBA) (ASE 2016). ASE subsequently advised Southern Water that the risk of impacting remains of archaeological significance should be established ahead of construction by means of geophysical survey followed by intrusive fieldwork where warranted and in consultation with Historic England with regard to any potential impact within the Scheduled Monument.
- 1.1.4 A Written Scheme of Investigation (WSI) was prepared by ASE for a geophysical survey (ASE 2017) and a Section 42 licence obtained from Historic England.

### **1.2 Geology and topography**

- 1.2.1 According to the online British Geological Survey 1:50,000 mapping, the bedrock geology of the site consists of Thanet formation - sand. Superficial geology consists of a small area of head - clay, silt, sand and gravel deposits at the base of a dry valley (BGS 2017).
- 1.2.2 The survey was undertaken within a 60m wide linear area across approximately 10 hectares of arable and grassland to the south of the A2 (Figure 2).

### **1.3 Aims of geophysical investigation**

- 1.3.1 The geophysical survey comprised a detailed magnetometer survey within all accessible areas (as shown on Figure 2). The general aims of the geophysical survey were:
- To identify, insofar as possible, anomalies that may be of archaeological origin.

- To enable a strategy for further archaeological investigation to be developed in consultation with Southern Water, Historic England and the Kent County Council Archaeologist as appropriate.

#### **1.4 Scope of report**

- 1.4.1 This report details the findings of the survey. The project was conducted by John Cook with the assistance of Sophie Morrish and set out by Vasilis Tsamis. The project was managed by Neil Griffin (fieldwork) and Jim Stevenson (post-excavation).

## **2.0 ARCHAEOLOGICAL BACKGROUND**

### **2.1 Introduction**

2.1.1 The following information is derived from the DBA (ASE 2016) with due acknowledgement. The DBA should be referred to for a fuller account of the sites archaeological and historical background.

### **2.2 Prehistoric**

2.2.1 The results of the research carried out for the DBA have established that the northern part of the route crosses an area where unmapped Pleistocene deposits that can contain Palaeolithic remains are present and that such remains have been found within the wider study area. Previous specialist assessment has been undertaken in advance of development in the Ebbsfleet area (see ASE 2016 for further discussion). It is not definitively known if these deposits and associated artefacts would be impacted by the scheme.

2.2.2 The northern part of the scheme crosses through areas previously assessed as having low potential for Palaeolithic remains to be present. The potential of the southern part of the scheme as also considered low.

2.2.3 There are known heritage assets of later prehistoric date (Mesolithic to Middle Iron Age) within the study area. Bronze Age monuments have been recorded at the head of the valley to both the north and south of the A2. Accordingly, as yet unknown remains of these dates may be present. The potential of the scheme to cross as yet unknown heritage assets of this date considered to be low-moderate

### **2.3 Late Iron Age and Romano-British**

2.3.1 The results of the research carried out for the DBA established that there are significant heritage assets of Late Iron Age and Roman date within the study area; the settlement and religious complex at Springhead, which forms the core of the Scheduled Monument. The projected line of at least one of the roads to the settlement crosses the route. Roads around Roman settlements can act as foci for activity, particularly cemeteries. Accordingly, it is considered that there is potential for assets of Late Iron Age and Roman date to be present.

2.3.2 The potential of the scheme to impact as yet unknown heritage assets of this date is considered to be high.

### **2.4 Early Medieval**

2.4.1 Early-medieval remains have been found within the study area. This includes evidence of scattered settlement as well as chance finds and as such, it is considered that there is the potential for as yet unknown assets of this date to be present along the route.

2.4.2 The potential of the scheme to impact as yet unknown heritage assets of this date is considered to be low/moderate.

## **2.5 Medieval**

- 2.5.1 The site lay within an area of agricultural land during the medieval period so as yet unknown assets of this date may be present. However, if any remains of this date are present within the site they perhaps are most likely to relate to agricultural activities rather than settlement.
- 2.5.2 The potential of the scheme to impact as yet unknown heritage assets of this date is considered to be low.

## **2.6 Post-medieval**

- 2.6.1 The results of the research carried out for the DBA established that there are mapped post-medieval features crossing the route; grubbed up and/or infilled field boundaries and the former railway and associated infrastructure. Post-medieval and modern artefacts may also be present.
- 2.6.2 The potential of the scheme to impact heritage assets of this date is considered to be high.

## **2.6 The Archive**

- 2.6.1 The digital and paper archive derived from this project will be housed at Archaeology South-East's Sussex offices and will be combined with any further archive generated in the event of further fieldwork being required.



### **3.0 SURVEY METHODOLOGY**

#### **3.1 Geophysical survey**

3.1.1 A fluxgate gradiometer (magnetometry) survey was undertaken across approximately 7ha of land as depicted on Figure 2. The work was undertaken between Wednesday 15th and Tuesday 21st November 2017 during cold and breezy weather with the occasional shower.

#### **3.2 Applied geophysical instrumentation**

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

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

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

#### **3.3 Instrumentation used for setting out the survey grid**

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

#### **3.4 Data processing**

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

#### **3.5 Data presentation**

3.5.1 Data is presented using images exported from TerraSurveyor into AutoCAD software and inserted into the geo-referenced site grid. Data is presented as raw and processed data greyscale plots (Figures 3, 4, 6, 7, 9, 10, 12, 13, 15, 20).

## **4.0 GEOPHYSICAL SURVEY RESULTS**

### **4.1 Description of site**

- 4.1.1 The survey area consisted of a 60m wide linear scheme across approximately 10 hectares of arable and grassland to the south of the A2 (Figures 2, 19).

### **4.2 Survey limitations**

- 4.2.1 Physical obstructions encountered on site included areas of overgrown vegetation with hidden dips, wire fences, large dumps of manure/topsoil and ground disturbance. Obstructions for each area are noted in the results. In addition, the effectiveness of magnetometer surveys depends on a contrast between the absolute magnetic susceptibility of the topsoil to the underlying subsoil (Clark 1996). Features may also be difficult to detect where there has been significant primary silting and development of significant overburden. Areas where physical obstructions form a barrier to survey, or a health and safety issue, have been omitted. The site lies over Thanet formation - sand. The response to magnetometer survey is very variable over sands or gravels (English Heritage 2008). In addition, the Thanet formation – sand is highly variable in its make up (Entwisle, D. C. *et al.* 2013).

### **4.3 Introduction to results**

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

#### *Positive Magnetic Anomalies*

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

#### *Negative Magnetic Anomalies*

- 4.3.3 Negative anomalies generally represent buried features such as banks or compacted ground that have a lower magnetic signature in comparison to the background geology.

#### *Magnetic Disturbance*

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

#### *Magnetic Debris*

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

#### *Dipolar Anomalies*

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

### *Bipolar Anomalies*

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

### *Thermoremanence*

- 4.3.8 Thermoremanence is most commonly encountered through the magnetizing of clay through the firing process although stones and soils can also acquire thermoremanence.
- 4.3.9 Magnetism from ferromagnetic materials (iron) and from thermoremanence are forms of permanent magnetism and in most cases a magnetometer will not enable the separation of anomalies into the two categories. The interpretation of these anomalies into either category relies on field strength within an area. Magnetic anomalies due to iron normally rise and fall rapidly, forming a 'spike' in the data.

## **4.4 Interpretation of fluxgate gradiometer results** (Figures 3-16 and 22)

- 4.4.1 The interpretation of fluxgate gradiometer results should be read in conjunction with the figures at the end of the report. Specific examples of anomaly types may be numbered in the figures and text but not all anomalies are numbered. The proposed pipeline route is shown in relation to the interpretation on Figure 22.
- 4.4.2 Evidence of possible archaeological activity included the following described anomalies. The most obvious possible archaeological anomalies are the linear and discrete positive anomalies and likely to be due to cut features such as pits and ditches (moderate coloured light green, strong dark green). However Plough marks create linear anomalies that may be mistaken for ditches. Negative anomalies may indicate features such as banks or mounds (coloured blue). Negative anomalies may also relate to the negative part of the dipole of strong positive anomalies and therefore represent a form of magnetic disturbance.
- 4.4.3 Areas of magnetic debris may relate to a scattering of near surface ferrous material, demolished buildings, former field boundaries, ground disturbance or made ground (dotted brown).
- 4.4.4 Dipolar anomalies (pink dots) may relate to possible thermoremanent magnetic enhancement, such as kilns or furnaces, but are more likely due to near surface ferrous (iron) objects.
- 4.4.5 Services are noted running across the site (pink lines) along with other anomalies relating to utilities such as electricity tower bases and electricity boxes, often with associated magnetic disturbance. Areas of magnetic disturbance caused by large nearby metallic objects (shaded brown) may obscure any underlying archaeological features.

## **5.0 CONCLUSIONS**

### **5.1 Discussion**

- 5.1.1 The magnetometer survey did reveal a number of anomalies across the investigation site, discussed below. However, it should be noted that this technique does not allow for specific dating of features and may not detect certain features such as small post holes or magnetically inert features. In addition, magnetometry is a near surface technique and therefore areas of overburden may mask subtle features.
- 5.1.2 The strongest evidence for possible archaeological features was represented by strong positive and moderate negative anomalies (A1, Figure 8). These anomalies may represent banks and ditches or structural remains and correspond to marks observed on Google Earth historical imagery dated 1960 (Figures 17, 18) that appear to enclose a low promontory with a linear anomaly approaching from the north that may indicate a road or trackway. Though these anomalies may be the result of the natural geology the regular pattern and relative strength of the anomalies would indicate otherwise.
- 5.1.3 Weak positive linear anomalies (A2) are noted across the site (Figures 2, 16) and may relate to ditches. These anomalies could be caused by former plough activity. Although, if this is the case then it would indicate a previous orientation to the modern field arrangement.
- 5.1.4 Strong and moderate positive anomalies running in an east to west orientation (A3) correspond to a trackway dating to the late 20<sup>th</sup> century and a high voltage cable noted on the service plan (figures 5, 21).
- 5.1.5 Areas of magnetic debris (A4, Figure 16) are likely to be caused by ground disturbance or made ground such as that caused by a former building or areas of consolidation in field entrances and boundaries.
- 5.1.6 Dipolar anomalies (A5, Figures 8, 16) may indicate thermoremanent features such as kilns or furnaces. However, these anomalies are more likely to represent near surface ferrous (iron) objects.
- 5.1.7 Dipolar anomalies with corresponding magnetic disturbance, are noted in a number of locations, relate to large magnetic features such as field gates and electric boxes. A former electric tower base (A6, Figure 8) appears as four dipolar anomalies with magnetic disturbance.
- 5.1.8 Anomalies interpreted as being caused by services (A7) are observed in several locations across the site (Figures 7, 21).
- 5.1.9 With regards to the site-specific research aims, several possible archaeological features were encountered across the site. It is impossible to attach confident dates to these features based upon these survey results, but the site is situated in a landscape rich in Late Iron Age and Romano British sites, with both Springhead and the Roman road to the north.

## **Bibliography**

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<http://www.bgs.ac.uk/discoveringGeology/geologyOfBritain/viewer.html?src=topNav>

Accessed 27<sup>th</sup> November 2017

Clark, A. 1996 *Seeing Beneath the Soil*. (2<sup>nd</sup> edition). London: Routledge.

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Entwisle D C, Hobbs, P R N, Northmore, K J, Skipper, J, Raines, M R, Self, S J, Ellison, R A and Jones L D, 2013 *Engineering Geology of British Rocks and Soils - Lambeth Group OPEN REPORT OR/13/006* Keyworth: British Geological Survey

## **Acknowledgements**

Archaeology South-East would like to thank Southern Water for commissioning the survey.

## HER Summary

<b>HER enquiry number</b>	N/A				
<b>Site code</b>	EBB17				
<b>Project code</b>	170376				
<b>Planning reference</b>					
<b>Site address</b>	Land at Ebbsfleet Green, Swanscombe, Kent				
<b>District/Borough</b>	Kent				
<b>NGR (12 figures)</b>	561792 172142 to 561125 172964				
<b>Geology</b>	Thanet formation - sand				
<b>Fieldwork type</b>				<b>Survey</b>	
<b>Date of fieldwork</b>	15th to 21st November 2017				
<b>Sponsor/client</b>	Southern Water				
<b>Project manager</b>	Neil Griffin				
<b>Project supervisor</b>	John Cook				
<b>Period summary</b>					
<b>Project summary</b>	<p><i>Archaeology South-East (ASE), the contracting division of The Centre for Applied Archaeology at the Institute of Archaeology, University College London (UCL), was commissioned by Southern Water to undertake a geophysical survey on Land at Ebbsfleet Green, Swanscombe, Kent, NGR 561792 172142 to 561125 172964. The work was undertaken between Wednesday 15th and Tuesday 21st November 2017.</i></p> <p><i>Evidence for possible archaeological features was represented by strong positive and moderate negative anomalies. These anomalies may represent banks and ditches or structural remains and correspond to marks observed on Google Earth historical imagery dated 1960 that appear to enclose a low promontory with a linear anomaly approaching from the north that may indicate a road or trackway. Weak positive linear anomalies are noted across the site and may relate to ditches. These anomalies could be caused by former plough activity. Although, if this is the case then it would indicate a previous orientation to the modern field arrangement.</i></p>				
<b>Museum/Accession No.</b>	N/A				

**OASIS FORM**

**OASIS ID: archaeol6-302361**

Project details

Project name	Detailed Magnetometer Survey Land at Ebbsfleet Green
Short description of the project	Archaeology at the Institute of Archaeology, University College London (UCL), was commissioned by Southern Water to undertake a geophysical survey on Land at Ebbsfleet Green, Swanscombe, Kent, NGR 561792 172142 to 561125 172964. The work was undertaken between Wednesday 15th and Tuesday 21st November 2017. Evidence for possible archaeological features was represented by strong positive and moderate negative anomalies. These anomalies may represent banks and ditches or structural remains and correspond to marks observed on Google Earth historical imagery dated 1960 that appear to enclose a low promontory with a linear anomaly approaching from the north that may indicate a road or trackway. Weak positive linear anomalies are noted across the site and may relate to ditches. These anomalies could be caused by former plough activity. Although, if this is the case then it would indicate a previous orientation to the modern field arrangement.
Project dates	Start: 15-11-2017 End: 21-11-2017
Previous/future work	Not known / Not known
Any associated project reference codes	170376 - Contracting Unit No.
Any associated project reference codes	EBB17 - Sitecode
Any associated project reference codes	1005140 - SM No.
Type of project	Field evaluation
Site status	Scheduled Monument (SM)
Current Land use	Cultivated Land 2 - Operations to a depth less than 0.25m
Current Land use	Grassland Heathland 3 - Disturbed

Monument type	TOWN Roman
Monument type	ROAD Roman
Significant Finds	NONE None
Methods & techniques	"Geophysical Survey"
Development type	Pipelines/cables (e.g. gas, electric, telephone, TV cable, water, sewage, drainage etc.)
Prompt	Water Act 1989 and subsequent code of practice
Position in the planning process	Not known / Not recorded
Solid geology (other)	Thanet formation - sand
Drift geology (other)	Head - clay, silt, sand and gravel
Techniques	Magnetometry
Project location	
Country	England
Site location	KENT DARTFORD SWANSCOMBE AND GREENHITHE Land at Ebbsfleet Green, Swanscombe, Kent
Postcode	DA13 9LH
Study area	10 Hectares
Site coordinates	TQ 61792 72142 51.424632987082 0.327400813668 51 25 28 N 000 19 38 E Line
Site coordinates	TQ 61125 72964 51.43220944562 0.318188293875 51 25 55 N 000 19 05 E Line
Project creators	
Name of Organisation	Archaeology South East
Project brief originator	Archaeology South East
Project design originator	Southern Water
Project director/manager	Neil Griffin
Project supervisor	John Cook
Type of sponsor/funding body	Water Authority/Company



Name of sponsor/funding body	Southern Water
Project archives	
Physical Archive Exists?	No
Digital Archive recipient	ASE
Digital Contents	"Survey"
Digital Media available	"Geophysics","Images raster / digital photography","Text"
Paper Archive recipient	ASE
Paper Contents	"Survey"
Paper Media available	"Report","Unpublished Text"
Project bibliography	
1	
Publication type	Grey literature (unpublished document/manuscript)
Title	Detailed Magnetometer Survey Land at Ebbsfleet Green, Swanscombe, Kent
Author(s)/Editor(s)	Cook, J.
Other bibliographic details	Report number: 2017499
Date	2017
Issuer or publisher	ASE
Place of issue or publication	Portslade
Entered by	John Cook (john.cook@ucl.ac.uk)
Entered on	28 November 2017

**Enclosure:**

**Historic England Geophysical Survey Summary  
Questionnaire**

**Survey Details**

**Name of Site: EBBSFLEET GREEN**

**County: KENT**

**NGR Grid Reference** (Centre of survey to nearest 100m): 561193 172132

**Start Date: 15/11/2017**

**End Date: 21/11/2017**

**Geology at site** (Drift and Solid):

Thanet formation - sand. Superficial geology consists of a small area of head - clay, silt, sand and gravel deposits at the base of a dry valley.

**Known archaeological Sites/Monuments covered by the survey**

(Scheduled Monument No. or National Archaeological Record No. if known)

SM No: 1005140 (Springhead)

**Archaeological Sites/Monument types detected by survey**

(Type and Period if known. "?" where any doubt).

Possible ditches and banks. Period ?

Possible structural remains. Period ?

Agricultural. Period ?

Possible former trackway. Period ?

**Surveyor** (Organisation, if applicable, otherwise individual responsible for the survey):

Archaeology South-East (ASE)

**Name of Client, if any:**

Southern Water

**Purpose of Survey:**

To identify, insofar as possible, anomalies that may be of archaeological origin.

To enable a strategy for further archaeological investigation to be developed in consultation with Southern Water, Historic England and the Kent County Council Archaeologist as appropriate.

**Location of:**

**a) Primary archive, i.e. raw data, electronic archive etc:**

ASE server (maintained at University College London)

**b) Full Report:**

ASE server (maintained at University College London). Once approved by HE bound and digital copies will be disseminated to Historic England & KCC HER

## **Technical Details**

(Please fill out a separate sheet for each survey technique used)

**Type of Survey** (Use term from attached list or specify other):  
Magnetometer

**Area Surveyed, if applicable** (In hectares to one decimal place):  
c.7ha

**Traverse Separation, if regular:** 1m      **Reading/Sample Interval:** 0.25m

**Type, Make and model of Instrumentation:**  
Bartington Instrumentation Grad 601-2

**For Resistivity Survey:**

**Probe configuration:**

**Probe Spacing:**

**Land use at the time of the survey** (Use term/terms from the attached list or specify other):  
Mixture of scrub, crop (winter turnip) and grassland (pasture).

**Additional Remarks** (Please mention any other technical aspects of the survey that have not been covered by the above questions such as sampling strategy, non standard technique, problems with equipment etc.):

Presence of existing overhead pylons and bases of former pylons. Some of the proposed survey area (outside of limits of SM) excluded due to immovable constraints (e.g. overgrown vegetation with hidden dips, wire fences, large dumps of manure/topsoil and ground disturbance).

**List of terms for Survey Type**

Magnetometer (includes gradiometer)

Resistivity

Resistivity Profile

Magnetic Susceptibility

Electro-Magnetic Survey

Ground Penetrating Radar

Other (please specify)

**List of terms for Land Use:**

Arable

Grassland - Pasture

Grassland - Undifferentiated

Heathland

Moorland

Coastland - Inter-Tidal

Coastland - Above High Water

Allotment

Archaeological Excavation

Garden

Lawn

Orchard

Park

Playing Field

Built-Over

Churchyard

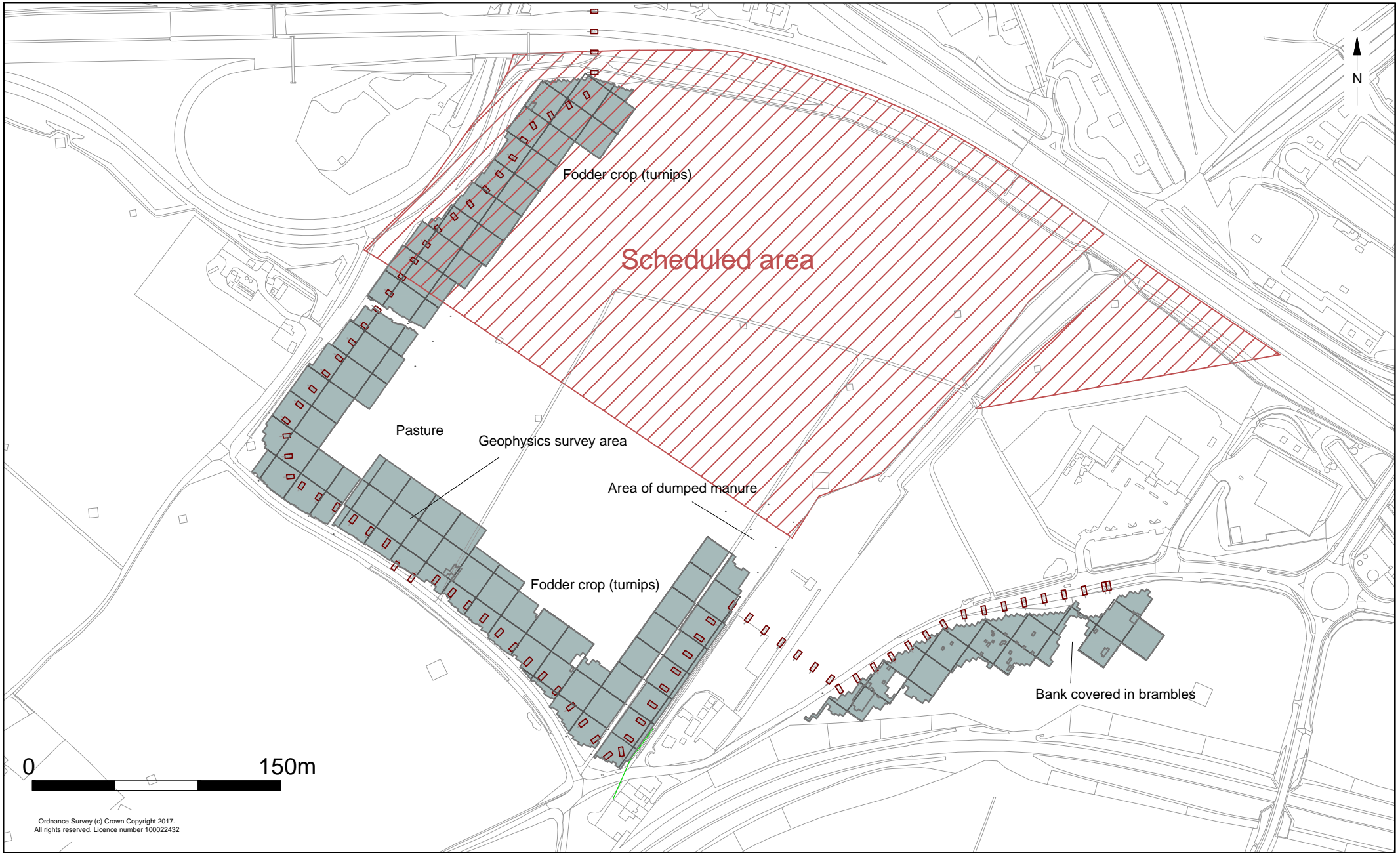
Waste Ground

Woodland

Other (please specify)

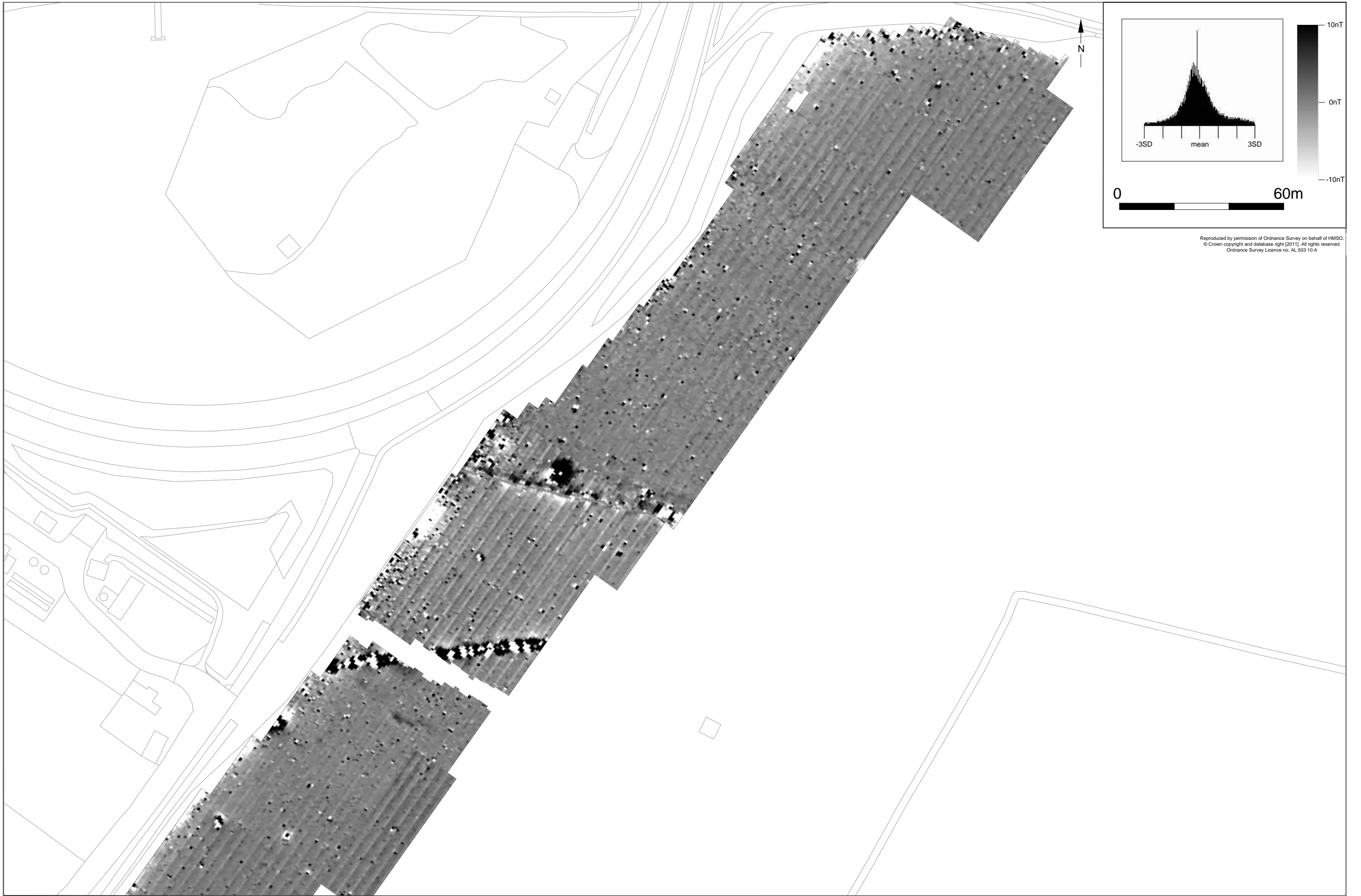


© Archaeology South-East		Land at Ebbsfleet Green, Swanscombe, Kent		Fig. 1
Project Ref: 170376	November 2017	Site location		
Report Ref: 2017499	Drawn by: JC			



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© Archaeology South-East		Land at Ebbsfleet Green, Swanscombe, Kent	Fig. 2
Project Ref: 170376	November 2017	Location of geophysics survey area	
Report Ref: 2017499	Drawn by: JC		



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Report Ref: 2017499	Drawn by: JC		





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© Archaeology South-East		Land at Ebbsfleet Green, Swanscombe, Kent	Fig. 4
Project Ref: 170376	November 2017	Processed data - chainage 420-840	
Report Ref: 2017499	Drawn by: JC		



■ Strong positive anomaly (Possible archaeology)  
 ■ Moderate positive anomaly (Possible archaeology)  
 ■ Weak positive anomaly (Possible archaeology)  
 ■ Moderate negative anomaly  
 ■ Magnetic debris  
 ■ Dipolar anomaly (Possible archaeology/Modern)  
 ■ Possible thermoremanent anomaly  
 --- Linear anomaly former field boundary or land drain  
 --- Linear anomaly agricultural activity  
 --- Possible service

0 60m

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© Archaeology South-East		Land at Ebbsfleet Green, Swanscombe, Kent	Fig. 5
Project Ref: 170376	November 2017	Interpretation - chainage 420-840	
Report Ref: 2017499	Drawn by: JC		



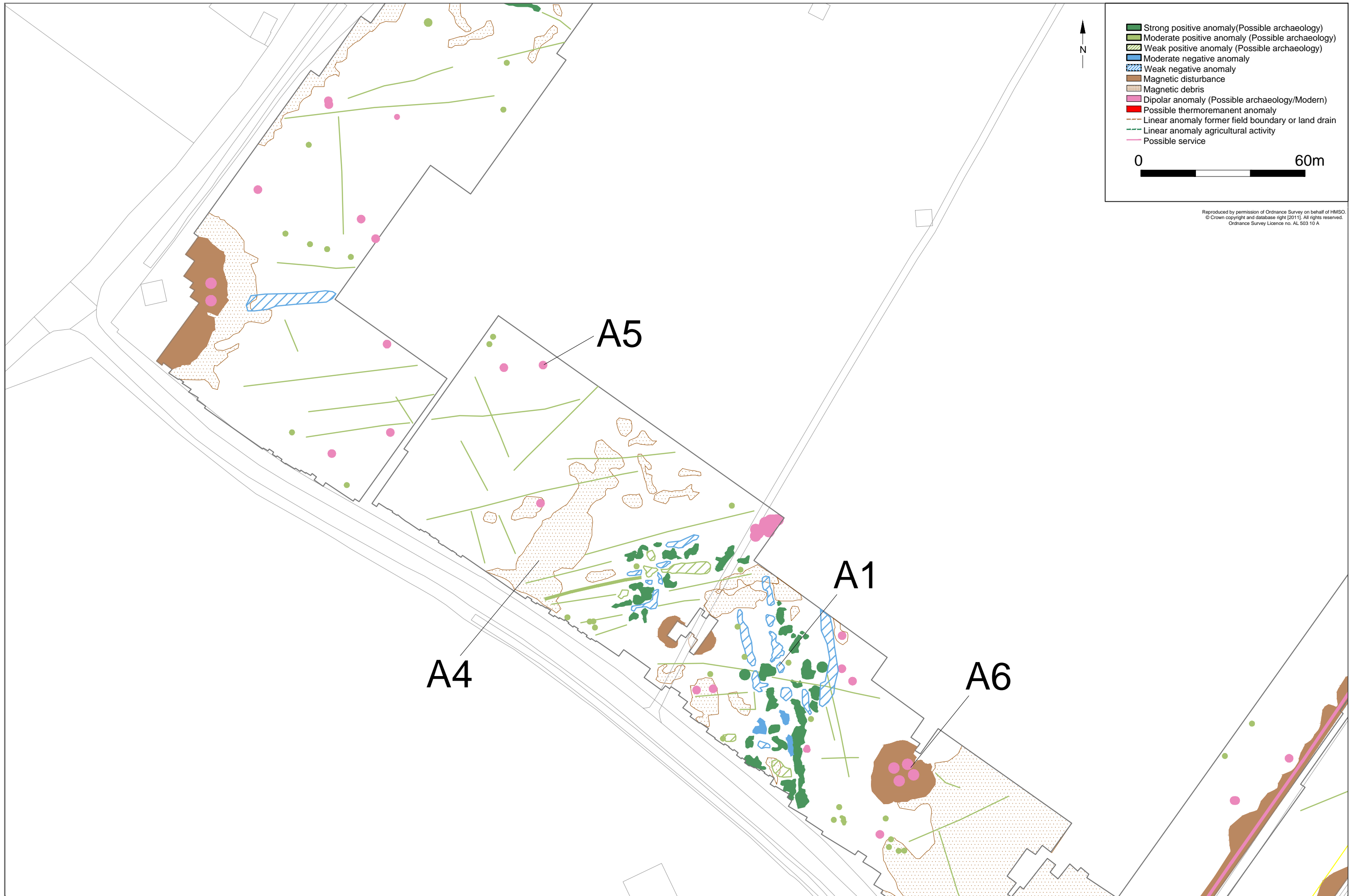
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© Archaeology South-East		Land at Ebbsfleet Green, Swanscombe, Kent	Fig. 6
Project Ref: 170376	November 2017	Raw data - chainage 780-1240	
Report Ref: 2017499	Drawn by: JC		



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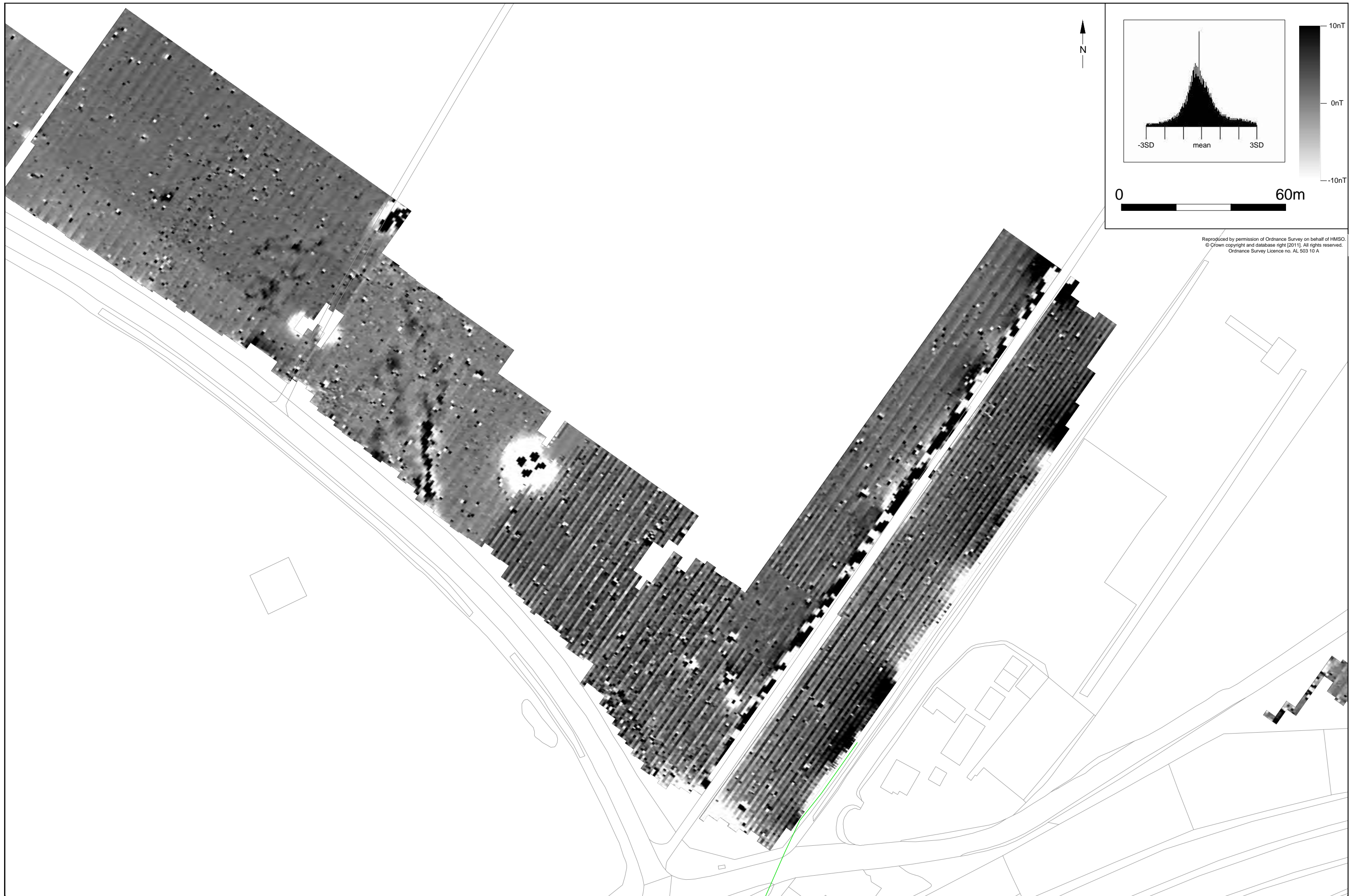
© Archaeology South-East		Land at Ebbsfleet Green, Swanscombe, Kent	Fig. 7
Project Ref: 170376	November 2017	Processed data - chainage 780-1240	
Report Ref: 2017499	Drawn by: JC		



■ Strong positive anomaly (Possible archaeology)  
 ■ Moderate positive anomaly (Possible archaeology)  
 ■ Weak positive anomaly (Possible archaeology)  
 ■ Moderate negative anomaly  
 ■ Magnetic debris  
 ■ Dipolar anomaly (Possible archaeology/Modern)  
 ■ Possible thermoremanent anomaly  
 - - - Linear anomaly former field boundary or land drain  
 - - - Linear anomaly agricultural activity  
 - - - Possible service

0 60m

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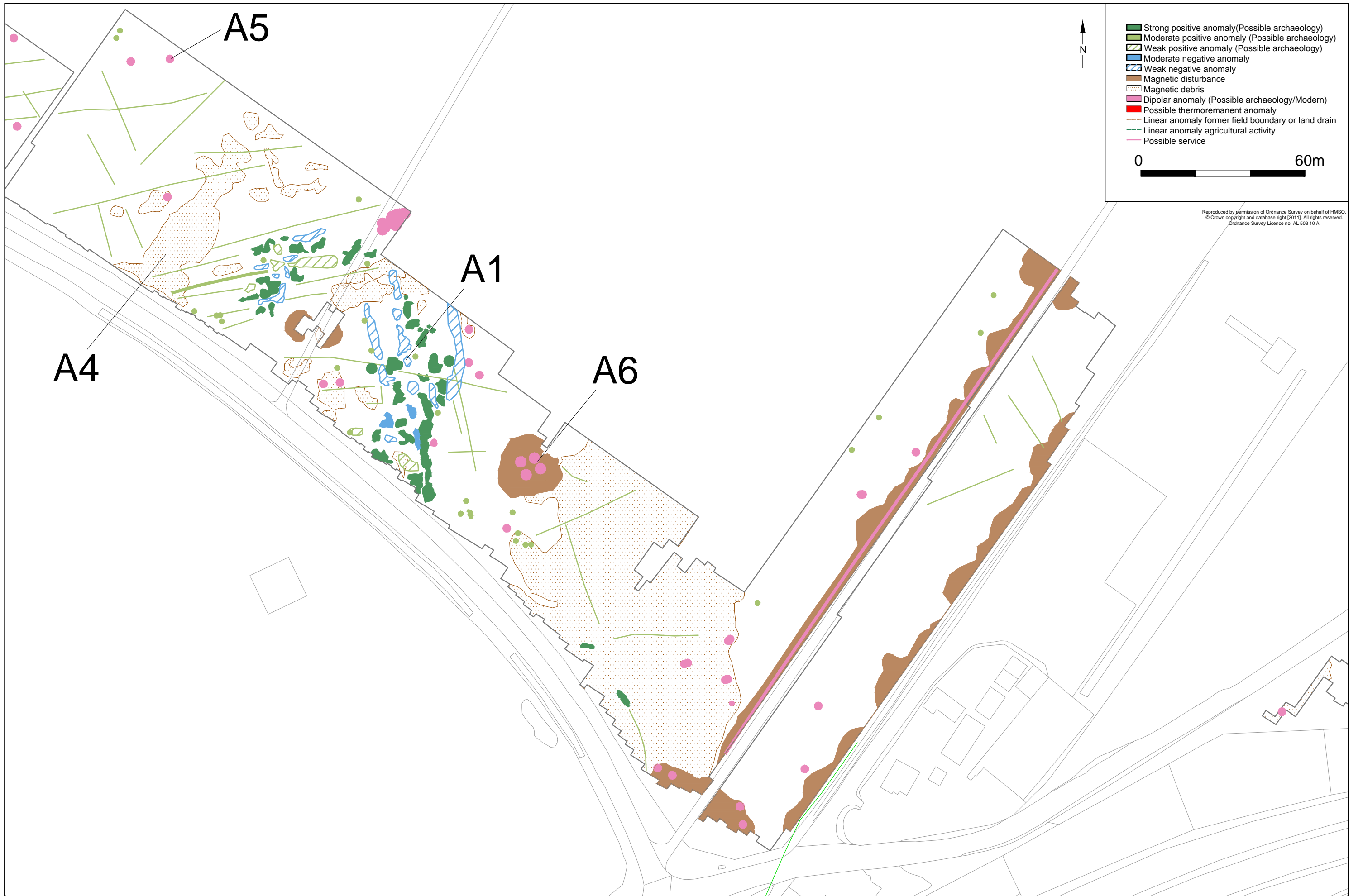
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© Archaeology South-East		Land at Ebbsfleet Green, Swanscombe, Kent	Fig. 9
Project Ref: 170376	November 2017	Raw data - chainage 1020-1560	
Report Ref: 2017499	Drawn by: JC		



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© Archaeology South-East		Land at Ebbsfleet Green, Swanscombe, Kent	Fig. 10
Project Ref: 170376	November 2017	Processed data - 1020-1560	
Report Ref: 2017499	Drawn by: JC		









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Fig. 17a Oblique Google Earth imagery historical imagery 2013



Fig. 17ba Oblique Google Earth imagery historical imagery 2013 with geophysical survey data overlay

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Project Ref: 170376	November 2017	Google Earth images	
Report Ref: 2017499	Drawn by: JC		



Fig. 18a Oblique Google Earth imagery historical imagery 1960 (KCC 2017) with geophysical survey data overlain



Fig. 18b Oblique Google Earth imagery historical imagery 1940 (KCC 2017) with geophysical survey data overlain

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Project Ref: 170376	November 2017	Google Earth images	
Report Ref: 2017499	Drawn by: JC		



Fig. 19a



Fig. 19b



Fig. 19c



Fig. 19d



Fig. 19e



Fig. 19f



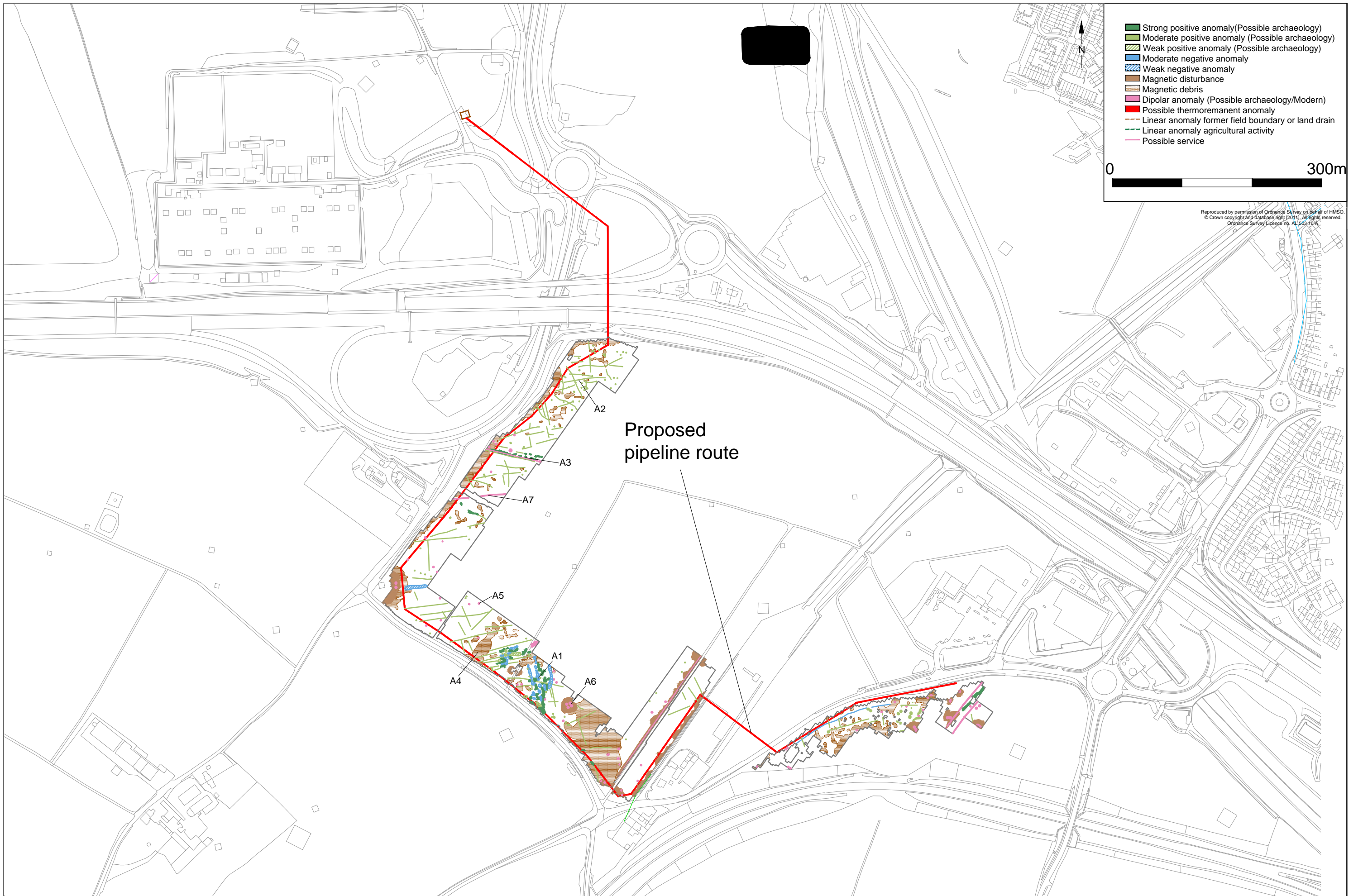


© Archaeology South-East		Land at Ebbsfleet Green, Swanscombe, Kent	Fig. 20
Project Ref: 170376	November 2017	Raw trace plot with hidden lines removed (clipped -100 to 100nT)	
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Project Ref: 170376	November 2017	Processed data - with service plan overlain	
Report Ref: 2017499	Drawn by: JC		



**Detailed Magnetometer Survey  
Land at Ebbsfleet Green, Swanscombe, Kent**

**NGR: 561792 172142 to 561125 172964  
(TQ 61792 72142 TO TQ 61125 72964)**

**SAM No: 1005140**



**November 2017**

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