



GEOPHYSICAL SURVEY REPORT

Iver to Egham Trunk Main

Client

Dalcour Maclaren

Survey Report

20943

OASIS Ref. No.

Sumogeop1-532143

Date

01 April 2025



Survey Report 20943: Iver to Egham Trunk Main

Survey dates	17 - 21 March 2025
Field co-ordinator	Liam Brice-Bateman BA
Field Team	Gabriel Mazeski BA Darcy Hooper MSc
Report Date	01 April 2025
CAD Illustrations	Rebecca Fradgley BSc (Hons) ACIfA
Report Author	Rebecca Fradgley BSc (Hons) ACIfA
Project Manager	Rebecca Fradgley BSc (Hons) ACIfA
Report approved	Dr John Gater BSc DSc(Hon) MCIfA FSA

SUMO GeoSurveys
Suite1
Deer Park Business Centre
Woollas Hill
Eckington
Pershore
Worcestershire
WR10 3DN
T: 01684 592266
www.sumoservices.com
geophysics@sumoservices.com

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2 LIST OF APPENDICES

Appendix A	Technical Information: Magnetometer Survey Methods, Processing and Presentation
Appendix B	Technical Information: Magnetic Theory
Appendix C	OASIS Data Collection Sheet
Appendix D	Data Management Plan & Archive Selection Strategy

3 SURVEY TECHNIQUE

- 3.1 Detailed magnetic survey (magnetometry) was chosen as the most efficient and effective method of locating the type of archaeological anomalies which might be expected at this site. All survey techniques followed the guidance set out by ClfA (2020) and the European Archaeology Council (EAC) (2016).

Bartington Grad 601-2

Traverse Interval 1.0m

Sample Interval 0.25m

The only processes performed on data are the following unless specifically stated otherwise:

Zero Mean Traverse This process sets the background mean of each traverse within each grid to zero. The operation removes instrument striping effects and edge discontinuities over the whole of the data set.

Step Correction (De-stagger) When gradiometer data are collected in 'zig-zag' fashion, stepping errors can sometimes arise. These occur because of a slight difference in the speed of walking on the forward and reverse traverses. The result is a staggered effect in the data, which is particularly noticeable on linear anomalies. This process corrects these errors.

4 EXECUTIVE SUMMARY OF RESULTS

- 4.1 A detailed magnetometer survey was conducted over approximately 8.5 hectares along the proposed Iver to Egham Trunk Main, and it has not identified any anomalies of archaeological interest. A mixture of modern disturbances, including made ground and green waste, plus other areas of ferrous disturbance dominate the data.

5 INTRODUCTION

- 5.1 **SUMO GeoSurveys** was commissioned to undertake a geophysical survey of the proposed route of the Iver to Egham Trunk Main. This survey forms part of an archaeological investigation being undertaken by **Dalcour Maclaren**.

5.2 Site Details

NGR / Postcode	North: TQ 03938 80019 / SL0 9DG South: TQ 02715 72017 / TW18 4UA
Location	The survey area comprises a linear scheme, approximately 27km in length with a 30m easement. It starts to the west of Iver North Water Treatment Works, immediately west of the M25 and east of Thorney Lane North, and runs southwards to Wraysbury Road, north of Staines-upon-Thames.
HER	Buckinghamshire HER / Greater London HER / Surrey HER
OASIS Ref. No.	Sumogeop1-532143
District	Buckinghamshire / Spelthorne
Parish	Iver / Spelthorne (unparished area)
Topography	Flat
Land Use	Scrub / pasture / brownfield
Geology (BGS 2025)	Bedrock: London Clay Formation - clay, silt and sand. Superficial: Shepperton Gravel Member - sand and gravel; Alluvium - clay, silt, sand and gravel.
Soils (CU 2025)	Soilscape 22: loamy soils with naturally high groundwater; Soilscape 20: loamy and clayey floodplain soils with naturally high groundwater; Soilscape 6: freely draining slightly acid loamy soils
Survey Methods	Magnetometer survey (fluxgate gradiometer)
Study Area	c. 20.5 hectares - approximately 12ha could not be surveyed due to access issues, livestock, overgrown vegetation and some areas forming part of a working landfill site.

5.3 **Archaeological Background** (DM 2024)

- 5.3.1 A desk-based assessment for the site indicates that there are no designated heritage assets recorded by the HERs for Buckinghamshire, Greater London and Surrey within the proposed survey corridors. LiDAR and aerial imagery record that the northern section is aligned directly adjacent to circular cropmarks which are likely associated with the Scheduled Monument 'Two concentric ditches showing as cropmarks at Thorney' (NHLE 1006944).
- 5.3.2 There are five non-designated heritage assets within, or directly adjacent to the site routes, comprising: Staines to West Drayton railway line (disused) (SHER MSE15385), mid-19th century railway line, Staines Moor (SHER MSE15384), cropmarks of probably prehistoric monuments near Thorney Tower Arms Hotel (BHER MBC773), Great Western Railway (BHER MBC24622) and ring ditches and sub-rectangular ditch cropmarks, Staines (SHER MSE611).

The cropmarks as recorded at MSE611, in addition to other cropmarks recorded near the route, are reported to have been destroyed during previous gravel extraction.

- 5.3.3 The site route also runs through four areas noted for holding high archaeological potential, including: AHAP 'Later prehistoric settlement, Staines Moor, Stanwell (SHER SP018), ANA 'Neolithic barrow, pits and ditches found by trial trenching and geophysical survey (BHER 8637), ANA 'Early 19th century Great Western Railway, built 1835-1841 (BHER DBC9968), APA 'Heathrow Area' (GLHER 77820).
- 5.3.4 The assessment demonstrates that there is archaeological potential along the route for multi-period heritage assets, dating between the prehistoric and post-medieval periods.

5.4 **Aims and Objectives**

- 5.4.1 To locate and characterise any anomalies of possible archaeological interest within the study area.

6 **RESULTS**

- 6.1 *The survey has been divided into twenty-three survey areas (Areas 1-23). A number of areas could not be surveyed: Areas 2, 8 and 9 contained livestock; parts of Areas 7, 10, 11, 12 and 14, were densely overgrown with Areas 13, 20, 21 and 22 also overgrown; Areas 18 and 19 form part of a working landfill site and access was not permitted.*

6.2 **Probable / Possible Archaeology**

- 6.2.1 No magnetic responses have been recorded that could be interpreted as being of definite archaeological interest.

6.3 **Green waste**

- 6.3.1 This can have a marked effect on the results from magnetic surveys and has been recognised as an issue for some time (Gerrard et al 2015). However, not all green waste is the same, so it is impossible to predict in advance any potentially detrimental effects; it depends on the quantity of inorganic contaminants, including batteries, pieces of metal cans and other ferrous items which result in spurious anomalies or 'noise'.
- 6.3.2 Large parts of the survey corridor are disturbed, though it is difficult to distinguish between areas of green waste and / or made ground (see 6.4.1 below).

6.4 **Ferrous / Magnetic Disturbance**

- 6.4.1 Large areas of strong magnetic disturbance have been detected throughout the length of the survey corridor; it is indicative of modern made ground, or possible green waste, which has the potential to mask archaeological features. Smaller areas of scattered modern magnetic debris are also visible in Area 12.
- 6.4.2 Ferrous responses close to boundaries are due to adjacent fences and gates. Smaller scale ferrous anomalies ("iron spikes") are present throughout the data and are characteristic of small pieces of ferrous debris (or brick / tile) in the topsoil; they are commonly assigned a modern origin. Only the most prominent of these are highlighted on the interpretation diagram.

7 DATA APPRAISAL & CONFIDENCE ASSESSMENT

- 7.1 Historic England Table 4 (EH 2008) states that the typical magnetic response on the local soils / geology is variable. The majority of the data is heavily disturbed and comprises made ground which has the potential to mask archaeological anomalies.

8 CONCLUSION

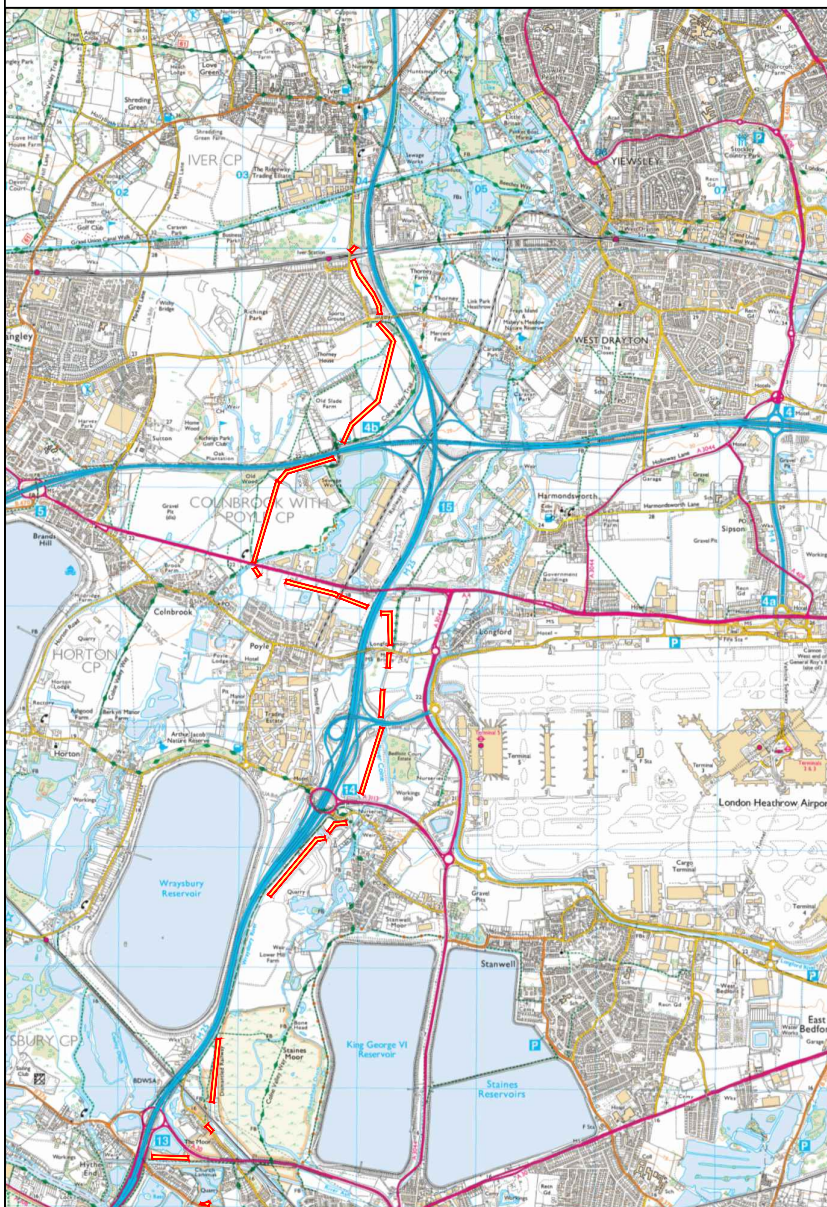
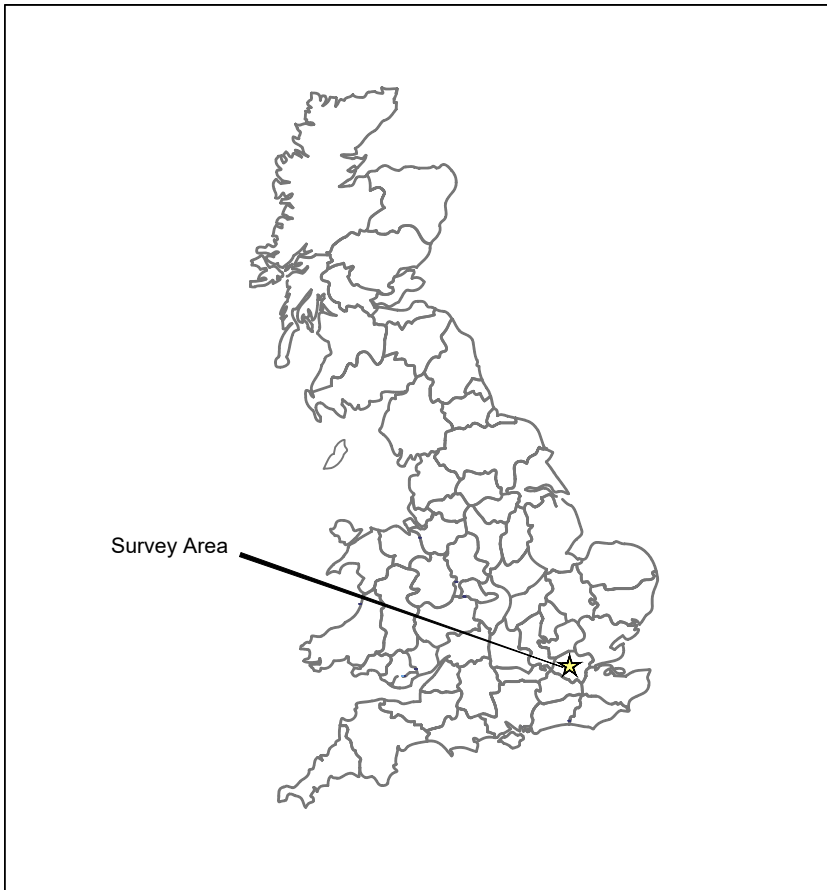
- 8.1 The magnetometer survey along the route of the proposed Iver to Egham Trunk Main has not identified any anomalies of archaeological interest. A mixture of modern disturbances, including green waste and made ground dominate the data and they have the potential to mask archaeological features, should they be present. Nothing of interest was identified in the few magnetically quiet areas.

9 REFERENCES

- BGS 2025 *Geology of Britain Viewer*, British Geological Survey, website:
(<http://www.bgs.ac.uk/opengeoscience/home.html?Accordion1=1#maps>)
- ClfA 2020 *Standard and Guidance for Archaeological Geophysical Survey*. 2014 amended 2020. ClfA Guidance note. Chartered Institute for Archaeologists, Reading
https://www.archaeologists.net/sites/default/files/ClfAS%26GGeophysics_3.pdf
- CU 2025 *The Soils Guide*. www.landis.org.uk. Cranfield University, UK. website:
<http://mapapps2.bgs.ac.uk/ukso/home.html>
- DM 2024 *Archaeological Desk-Based Assessment, Iver to Egham Trunk Main*. Dalcour Maclaren; unpublished report.
- EAC 2016 *EAC Guidelines for the Use of Geophysics in Archaeology*, European Archaeological Council, Guidelines 2.
- EH 2008 *Geophysical Survey in Archaeological Field Evaluation*. English Heritage, Swindon (now withdrawn, but used for evaluating suitability of soil types)
- 2015 Gerrard *Green Waste and Archaeological Geophysics*, Gerrard, James; Caldwell, Liz and Kennedy, Alisa, *Journal of Archaeological Prospection*, 22, 139 –142 (Wiley)

10 ARCHIVE

- 10.1 The minimally processed data, data images, XY traces and a copy of this report are stored in **SUMO GeoSurveys'** digital archive, on an internal RAID configured NAS drive in the Midlands Office. These data are also backed up to the Cloud for off-site storage.
- 10.2 The Grey Literature will be archived with OASIS and the relevant HER within a period of 12 months.



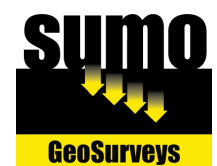
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Survey Areas



Unsurveyable



Title:

Site Location

Client:

Dalcour Maclaren

Project:

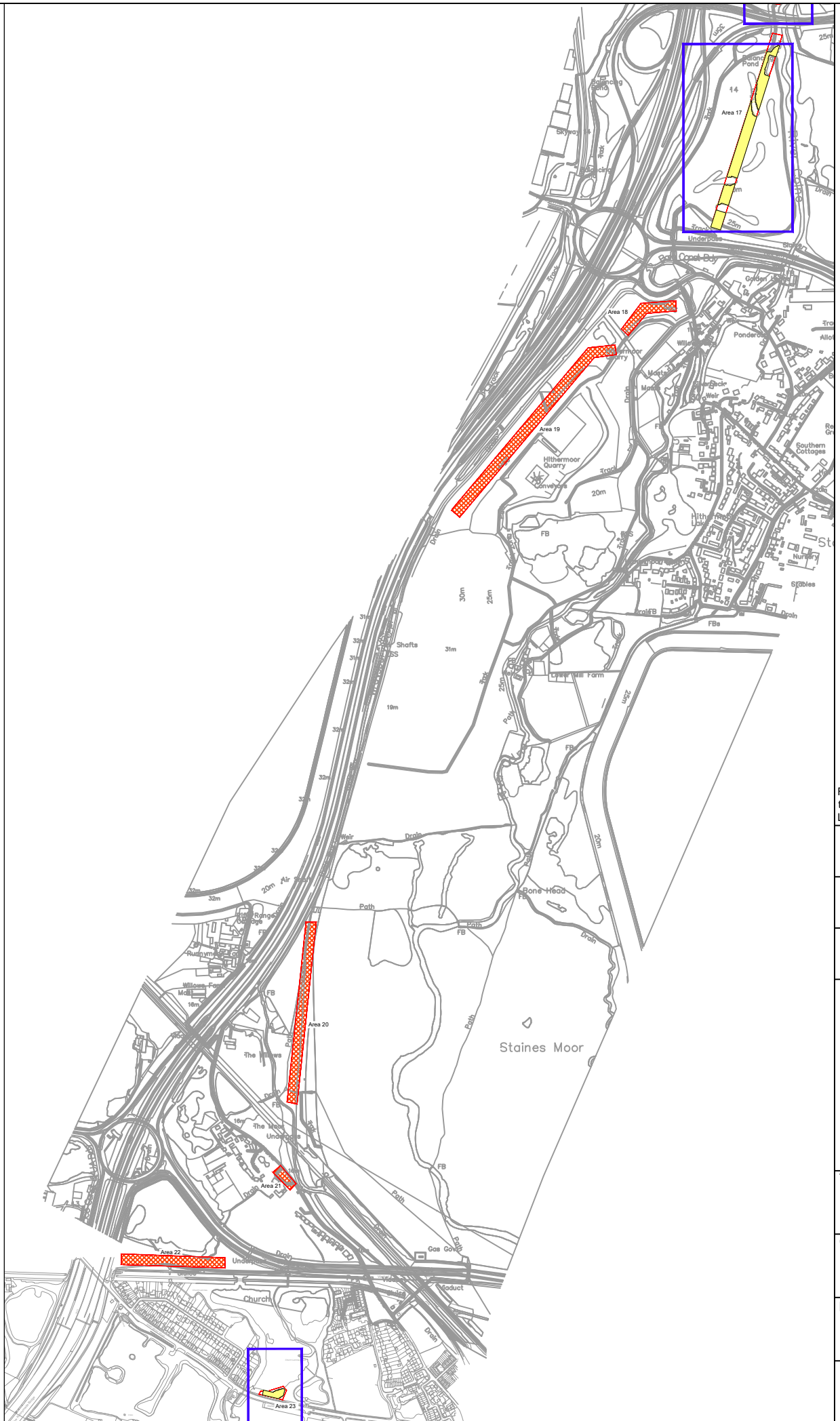
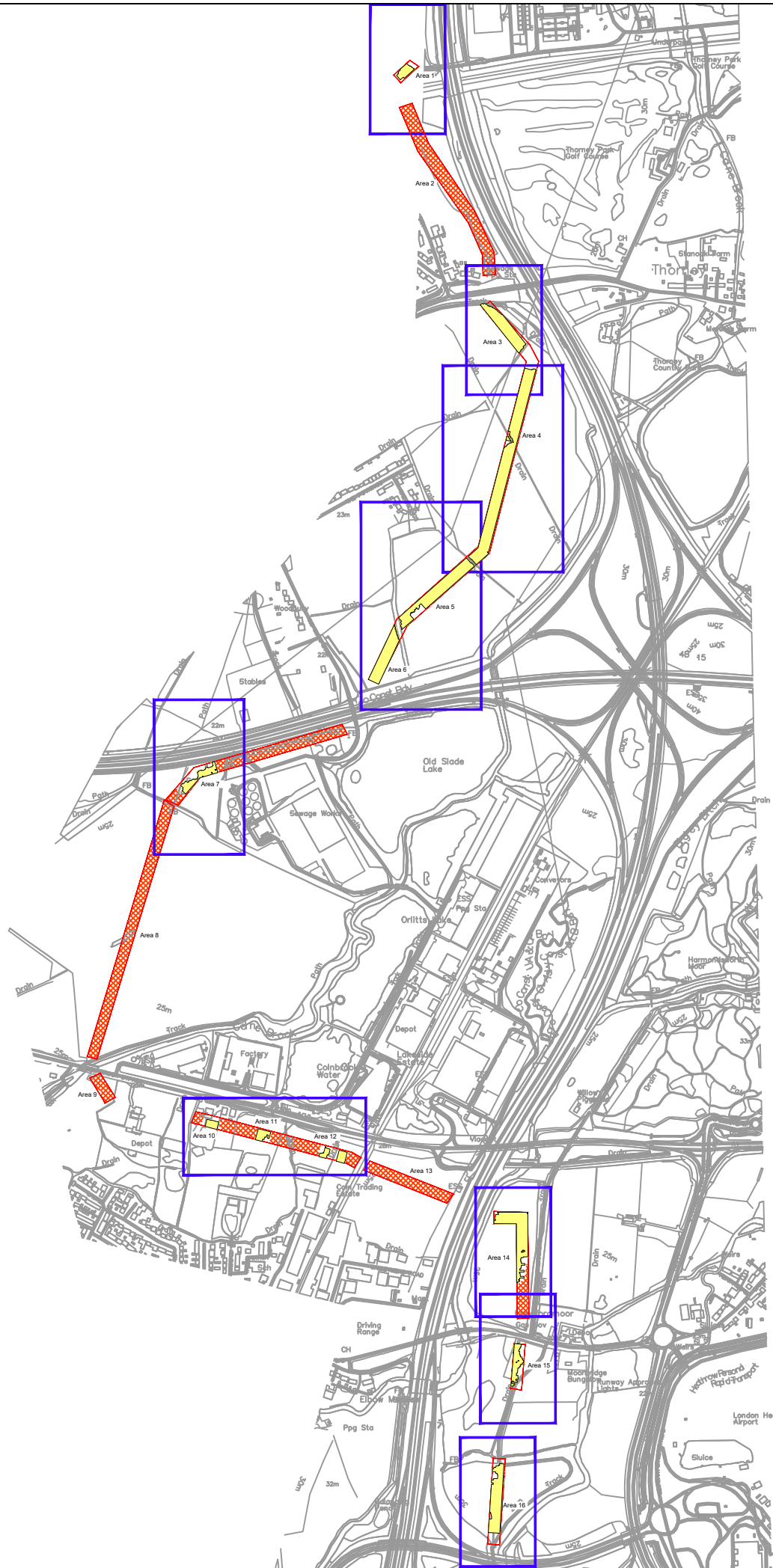
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
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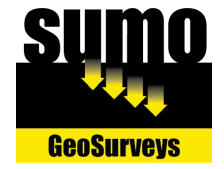
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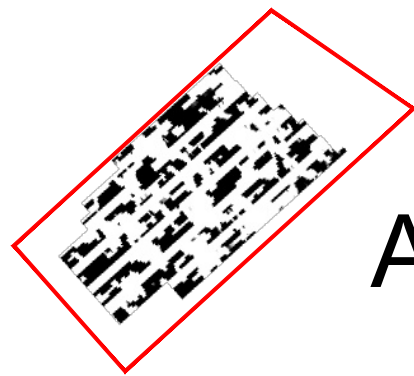


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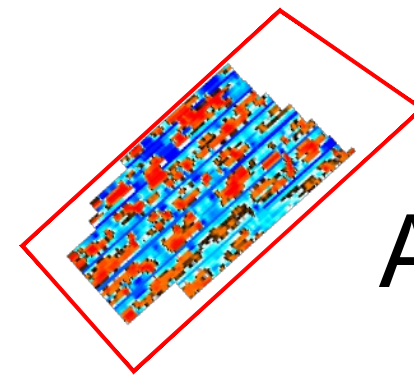
	Survey Areas
	Unsurveyable
	Viewport



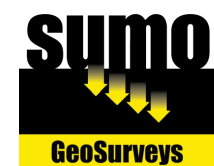
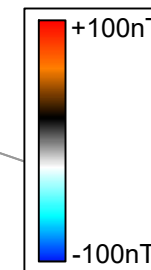
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Area 1



Area 1



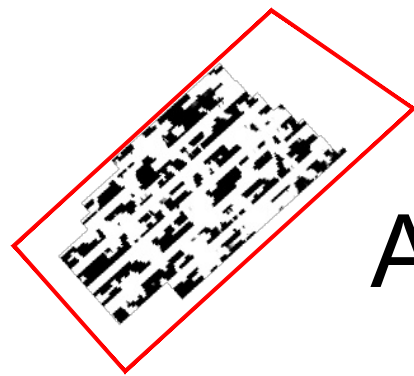
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Greyscale and Colour Plots - Area 1

Client: Dalcour Maclaren

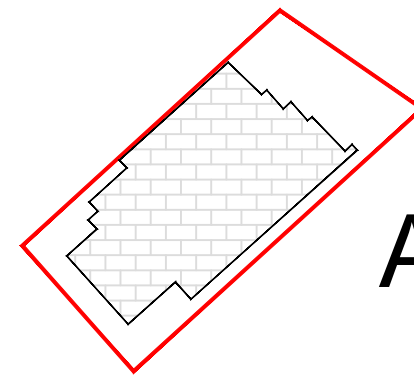
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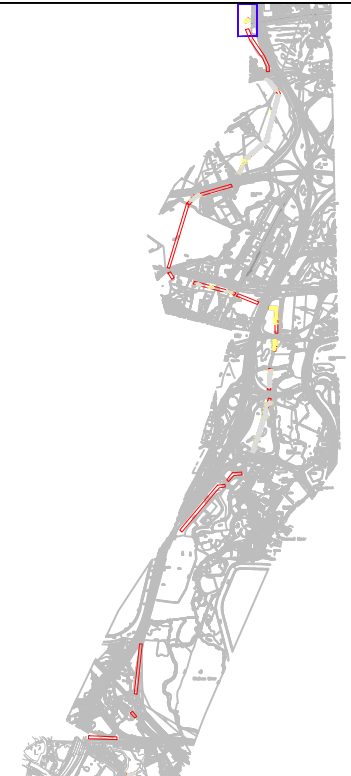
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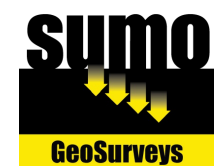


Area 1



KEY

 Magnetic disturbance - made ground / green waste



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Client: Dalcour Maclaren

Project: SUMO-20943: Iver to Egham Trunk Main

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Sewage
Ppg Sta

Sewage
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Track

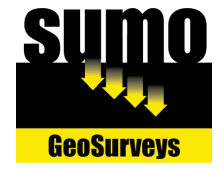
Track

Area 3

Area 3

Drain

Drain



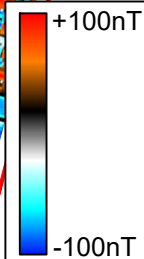
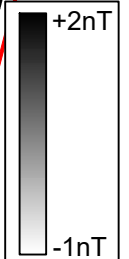
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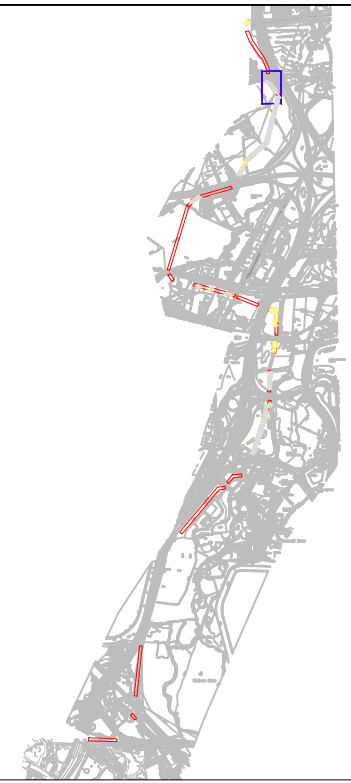
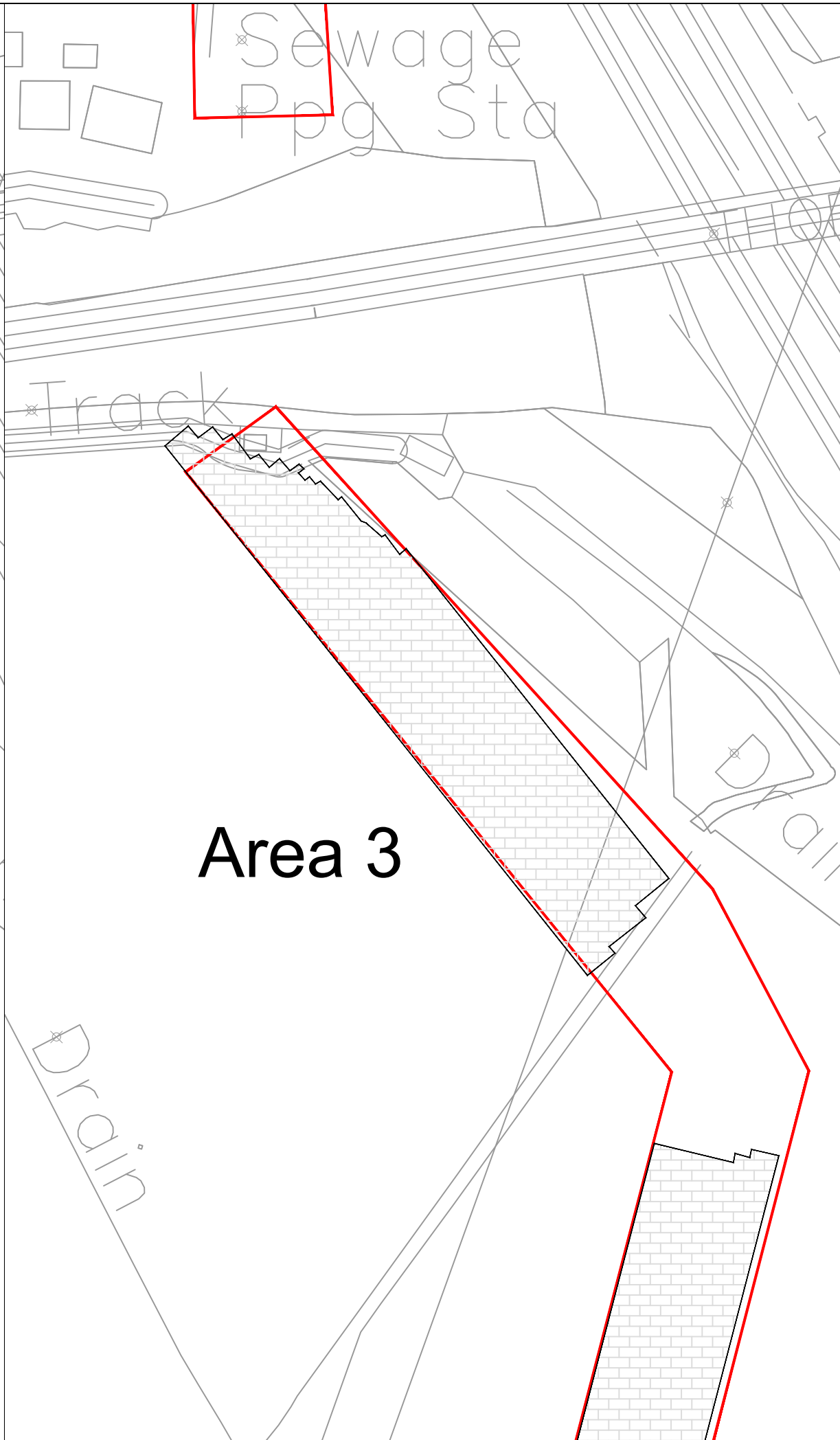
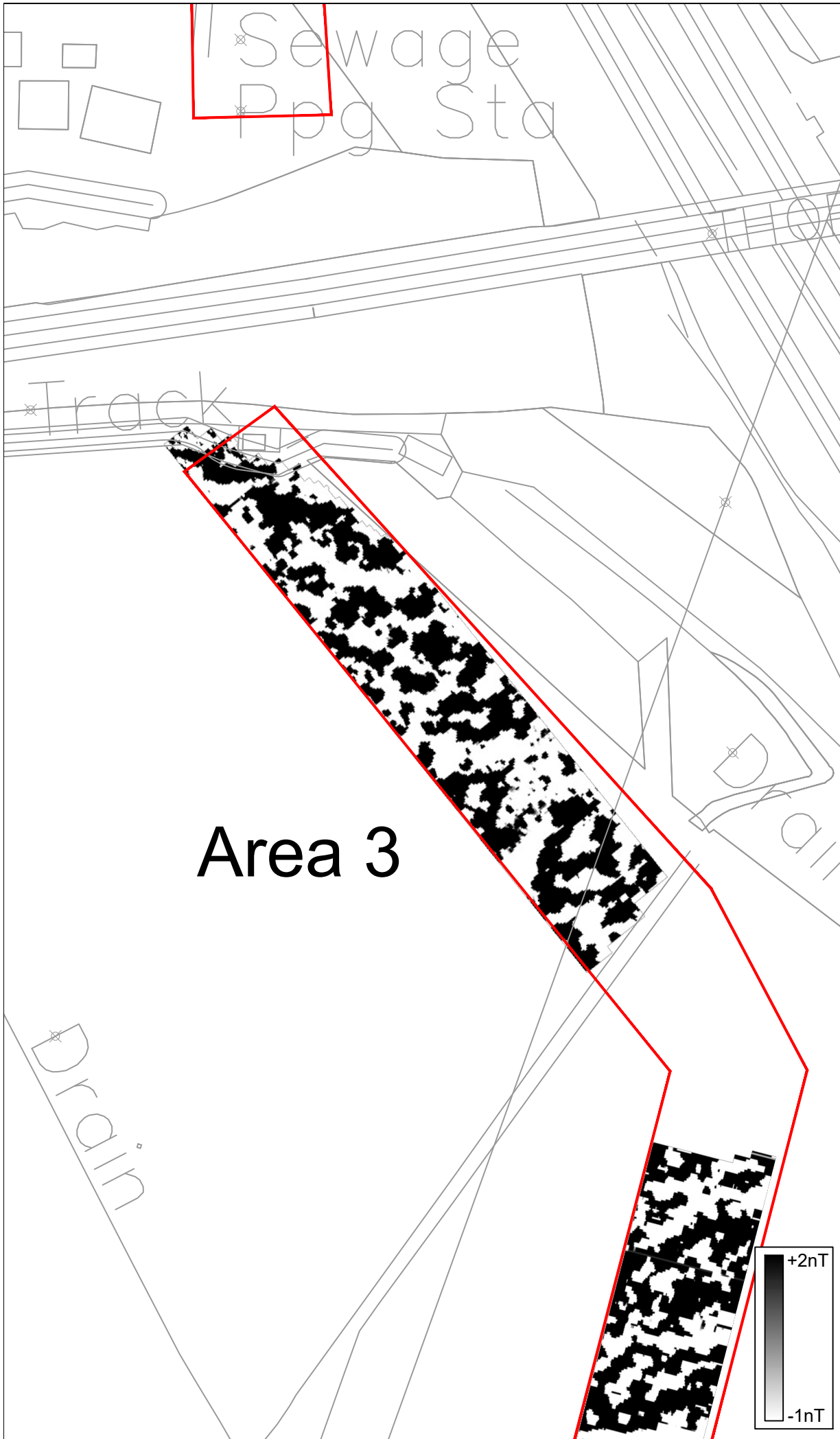
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
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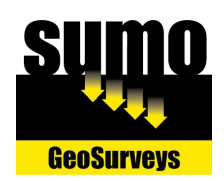
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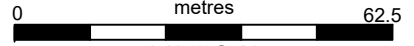
 Magnetic disturbance - made ground / green waste

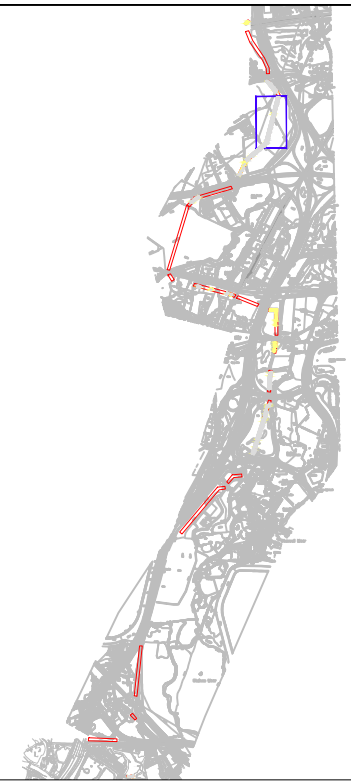
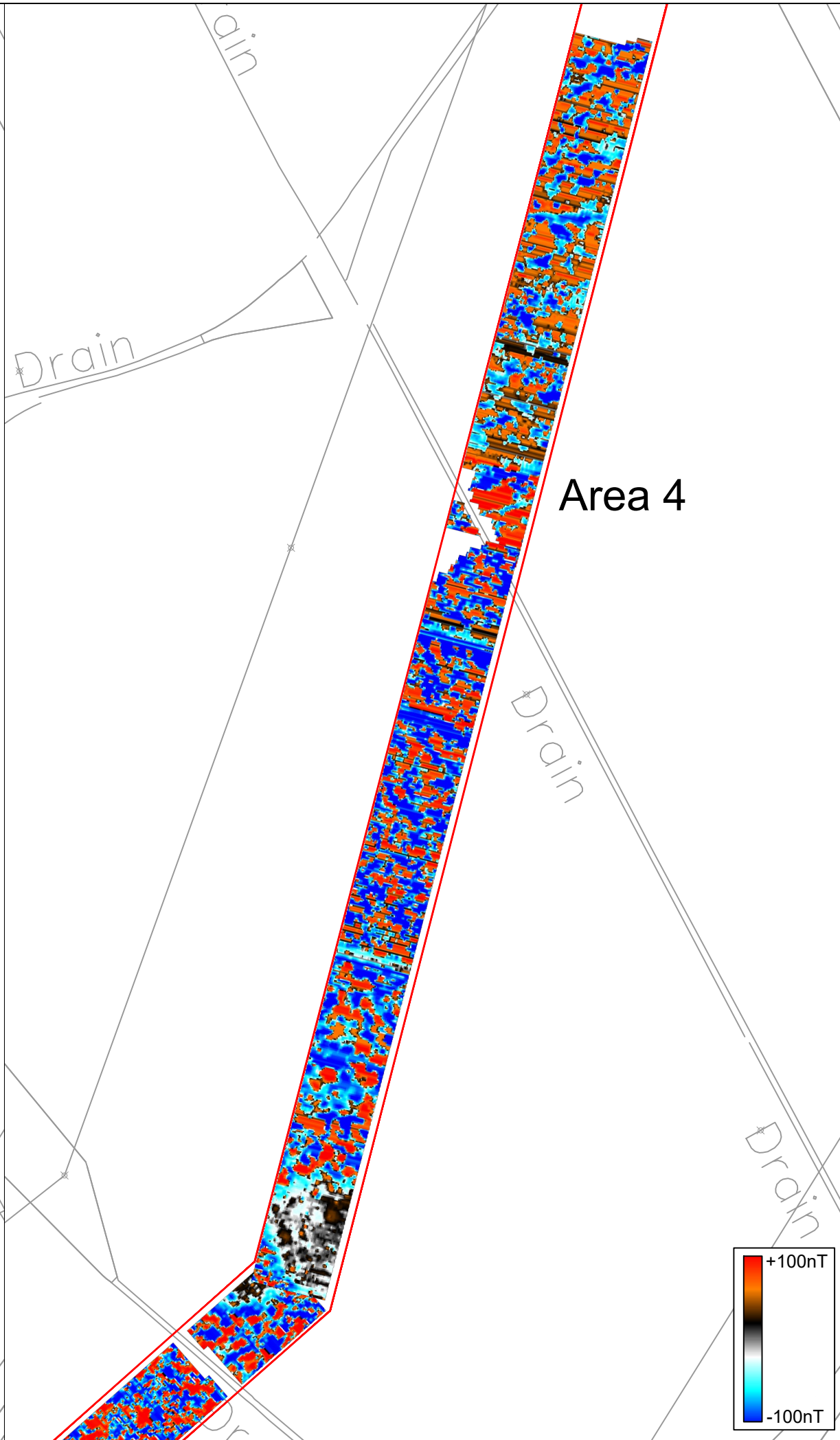
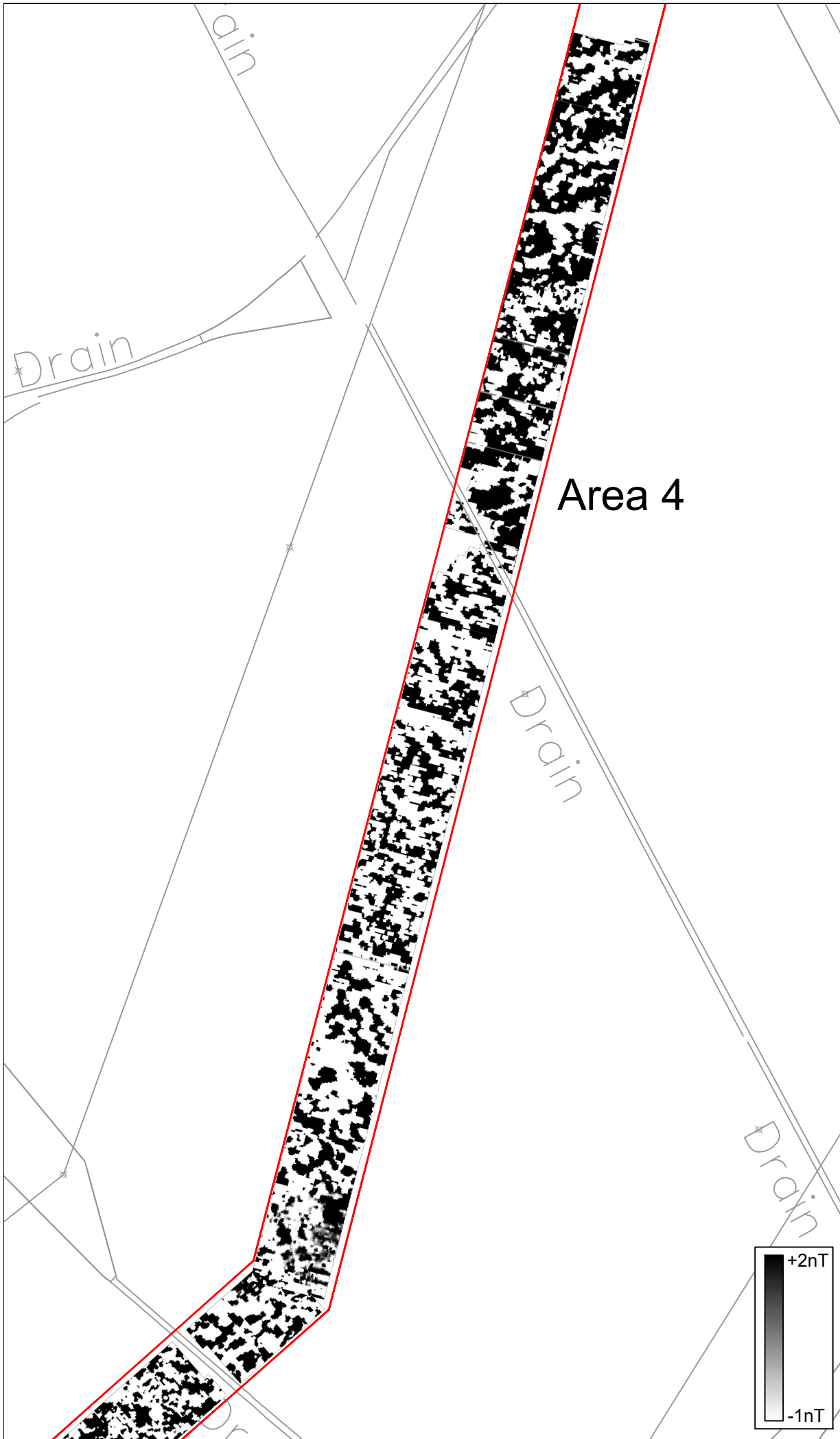


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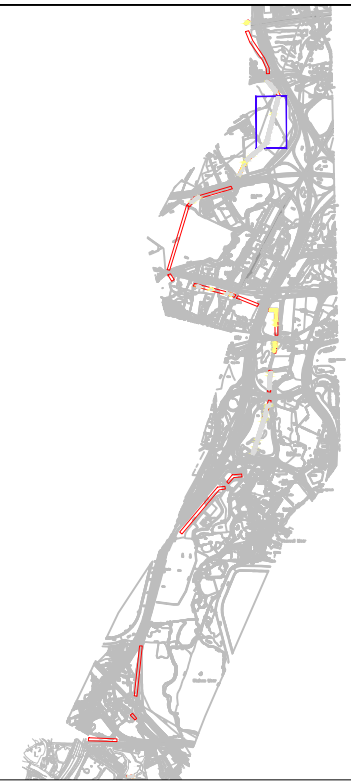
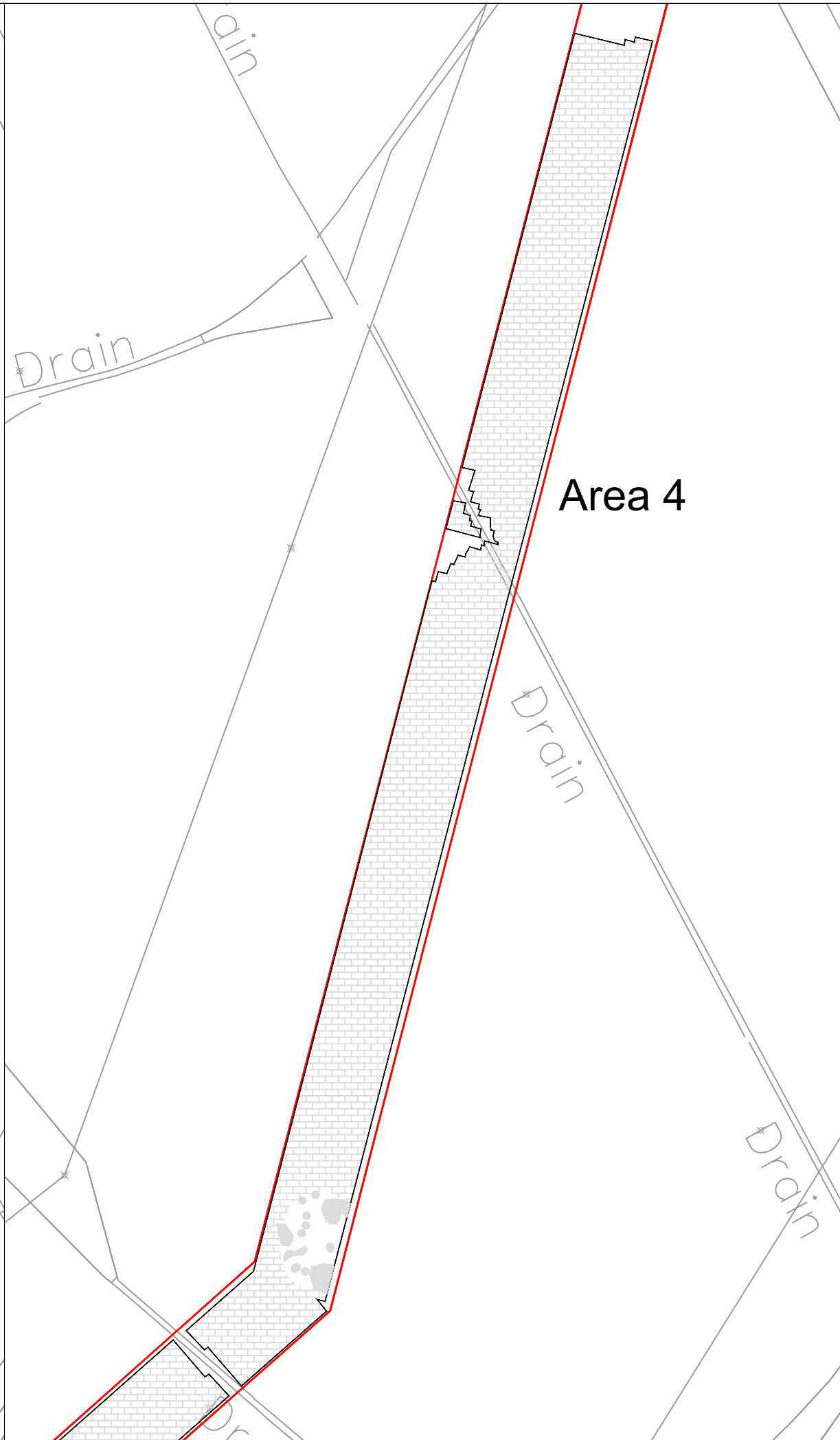
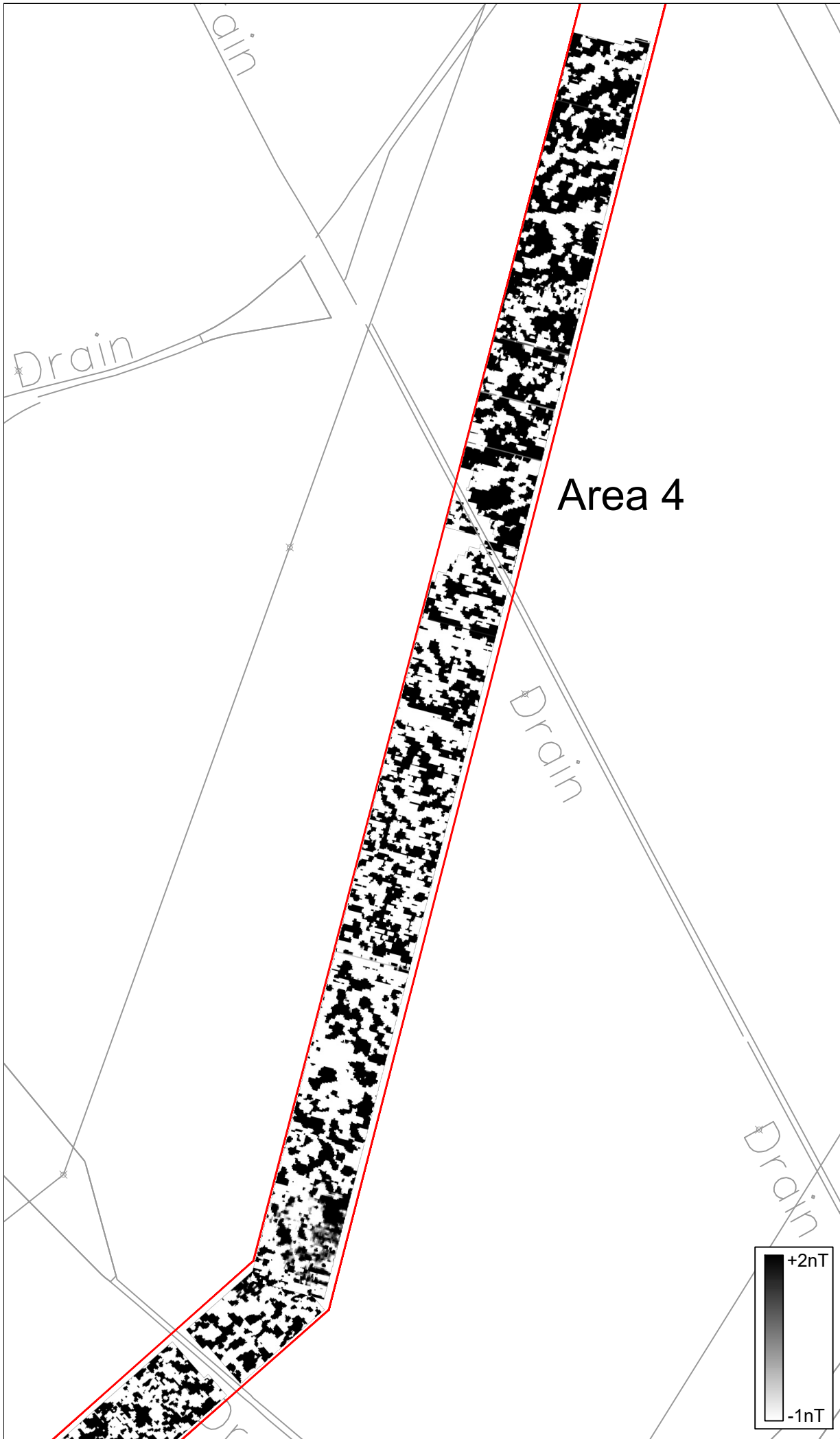
Client: Dalcour Maclaren

Project: SUMO-20943: Iver to Egham Trunk Main



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Client:		Dalcour Maclaren
Project:		SUMO-20943: Iver to Egham Trunk Main
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KEY

	Magnetic disturbance - made ground / green waste
	Ferrous



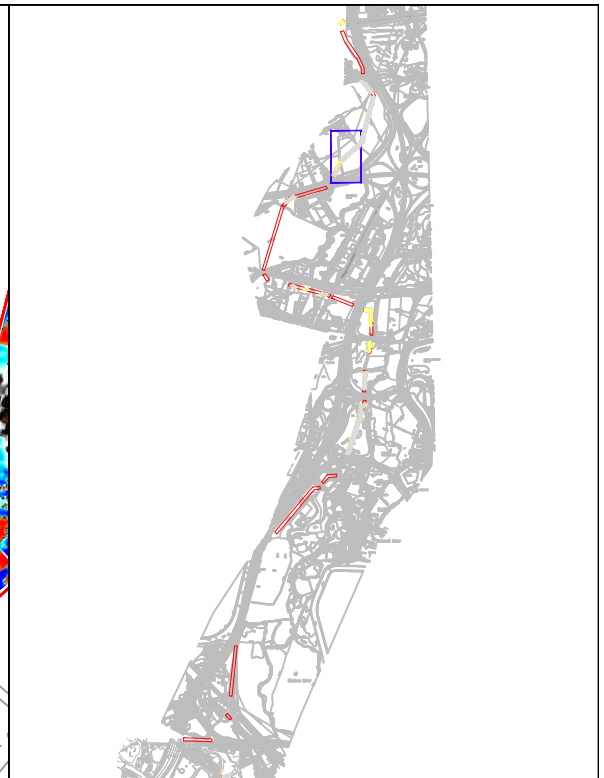
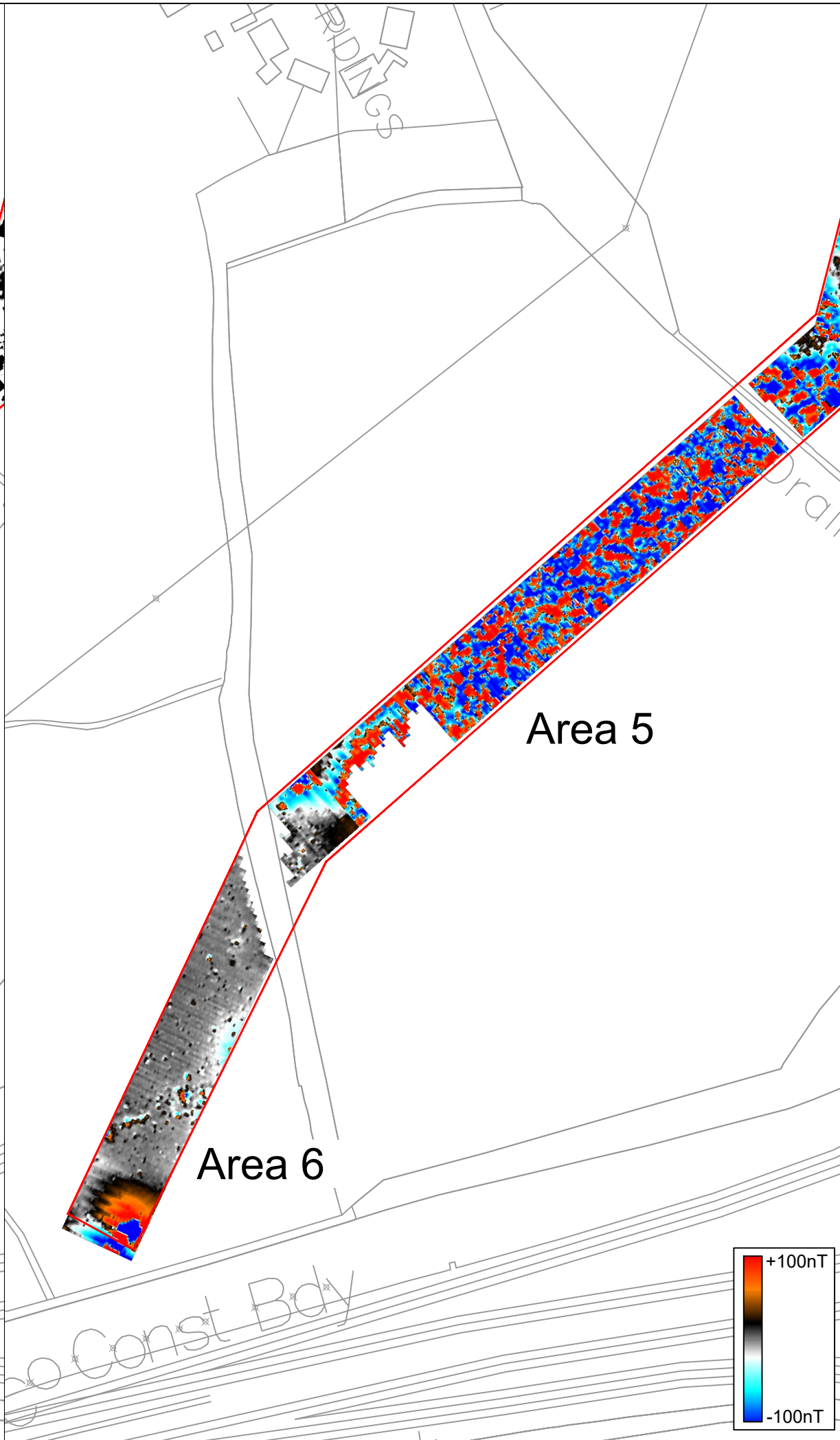
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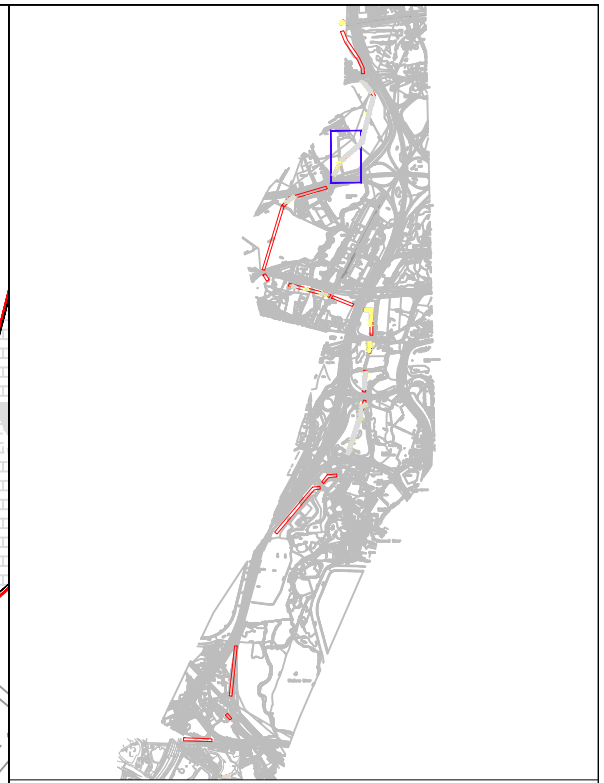
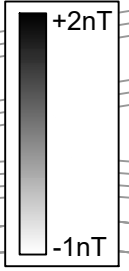
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KEY

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	Ferrous



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Client: Dalcour Maclaren

Project: SUMO-20943: Iver to Egham Trunk Main

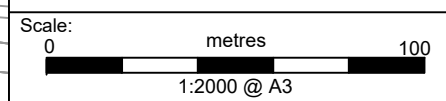
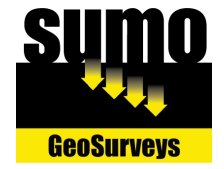
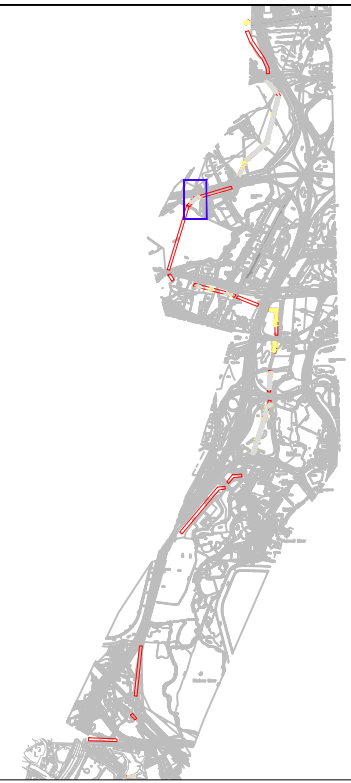


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Client: Dalcour Maclaren

Project: SUMO-20943: Iver to Egham Trunk Main

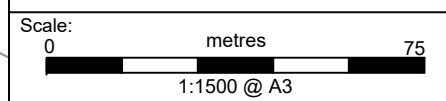
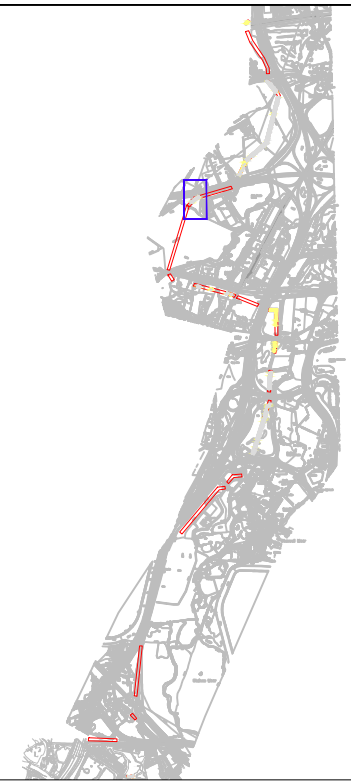

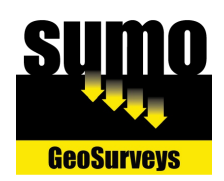


Fig No: 11



KEY

 Ferrous



Title: Magnetometer Survey -
Greyscale Plots and Interpretation - Area 7

Client: Dalcour Maclaren

Project: SUMO-20943: Iver to Egham Trunk Main

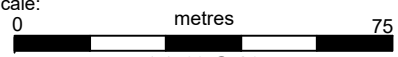
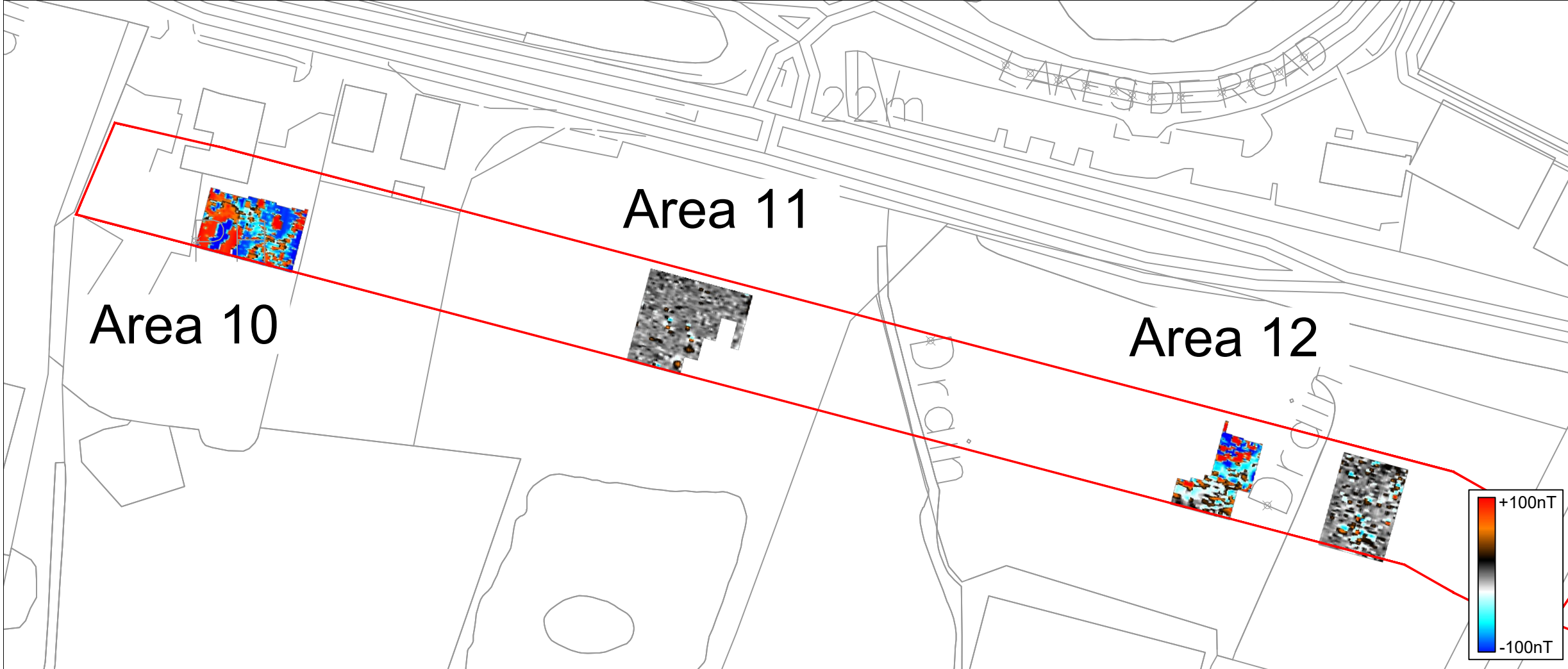
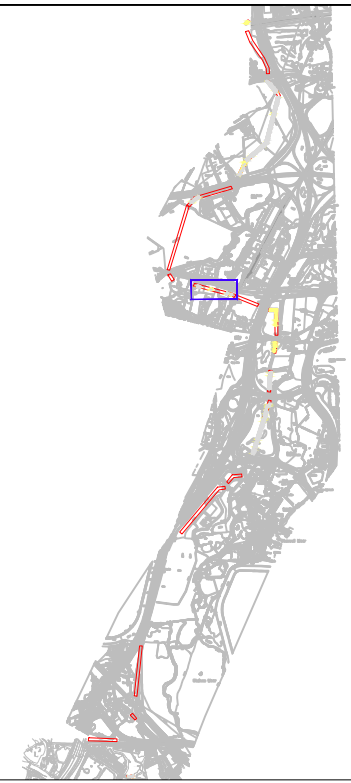
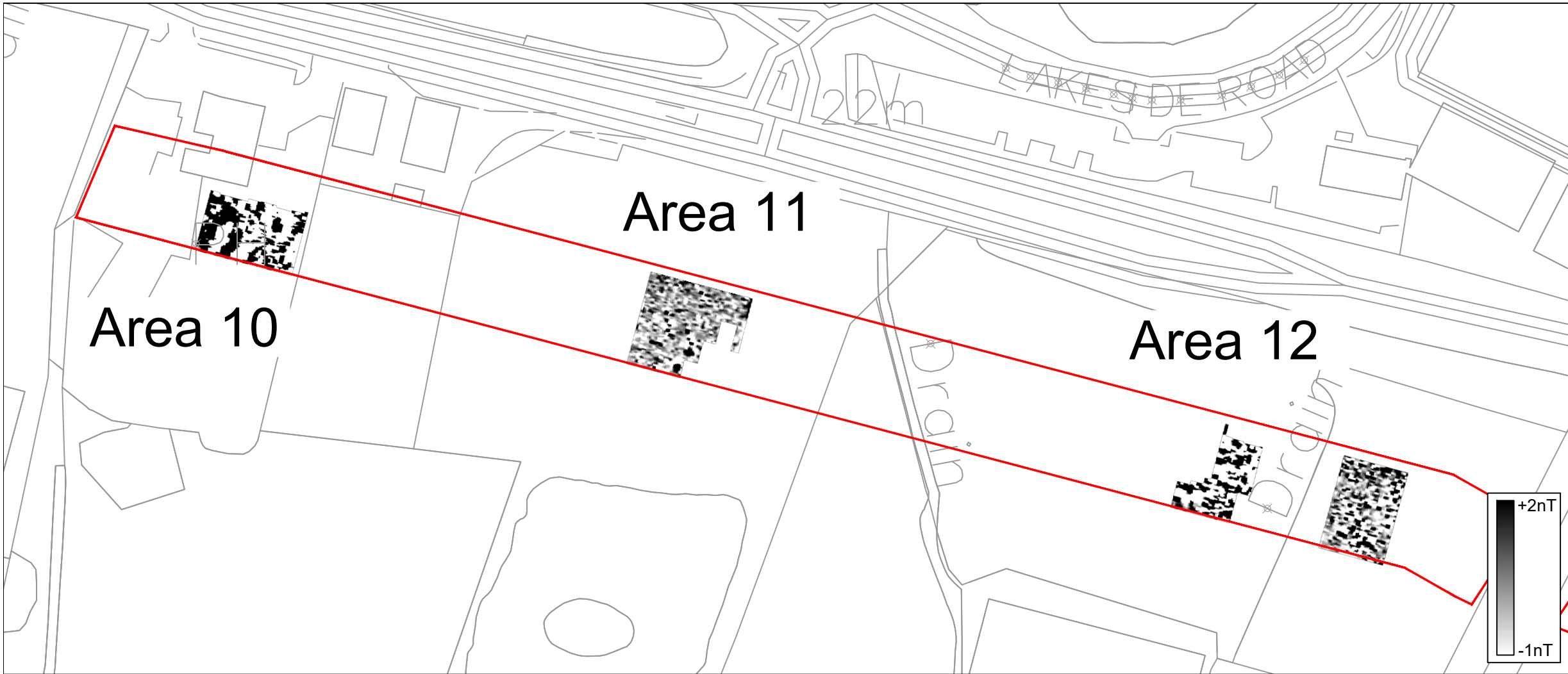
Scale:  1:1500 @ A3

Fig No: 12



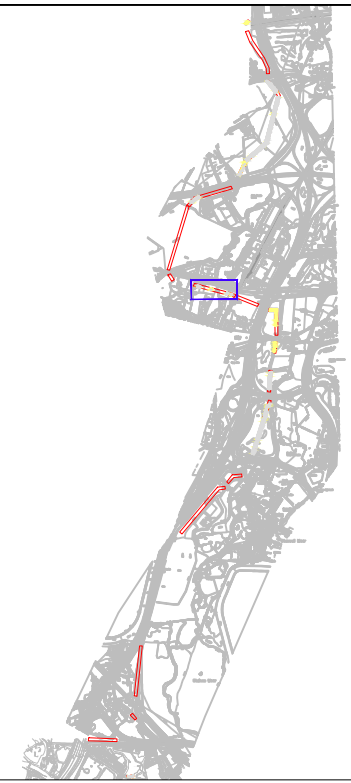
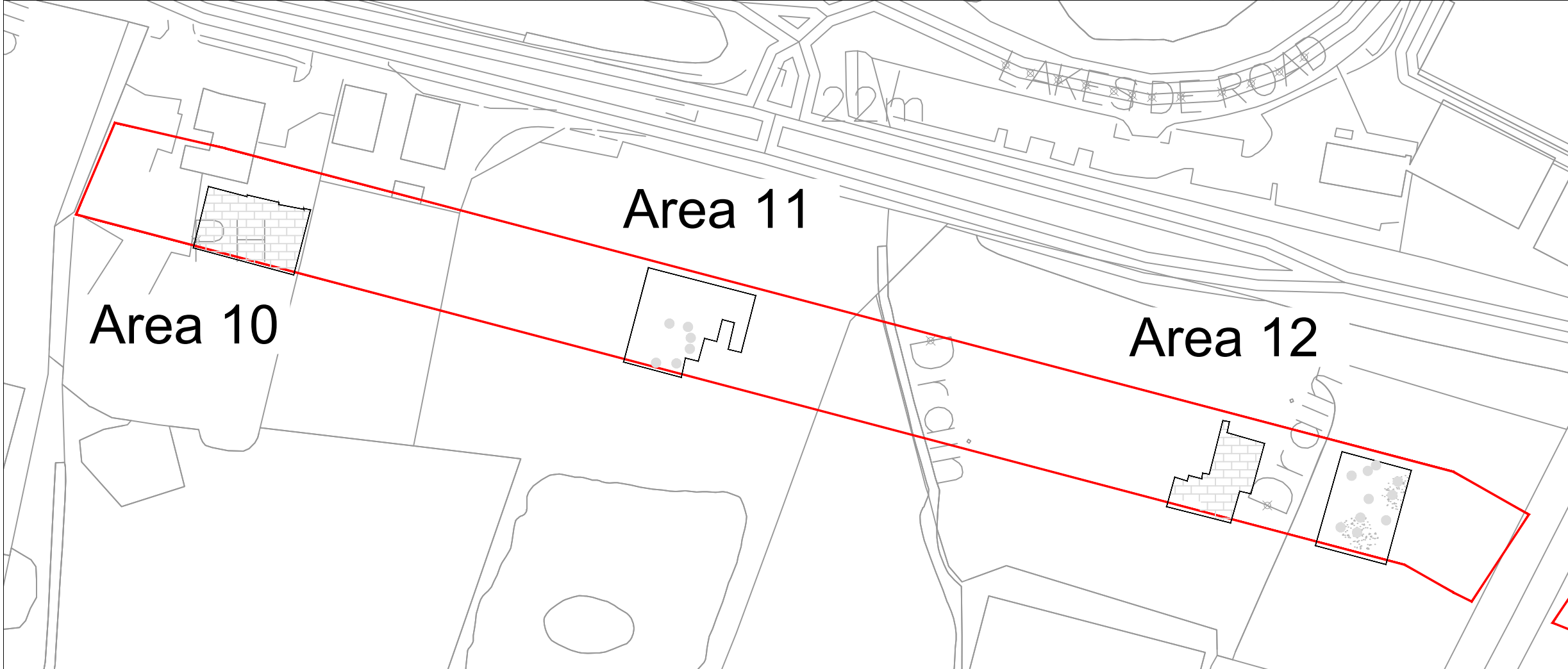
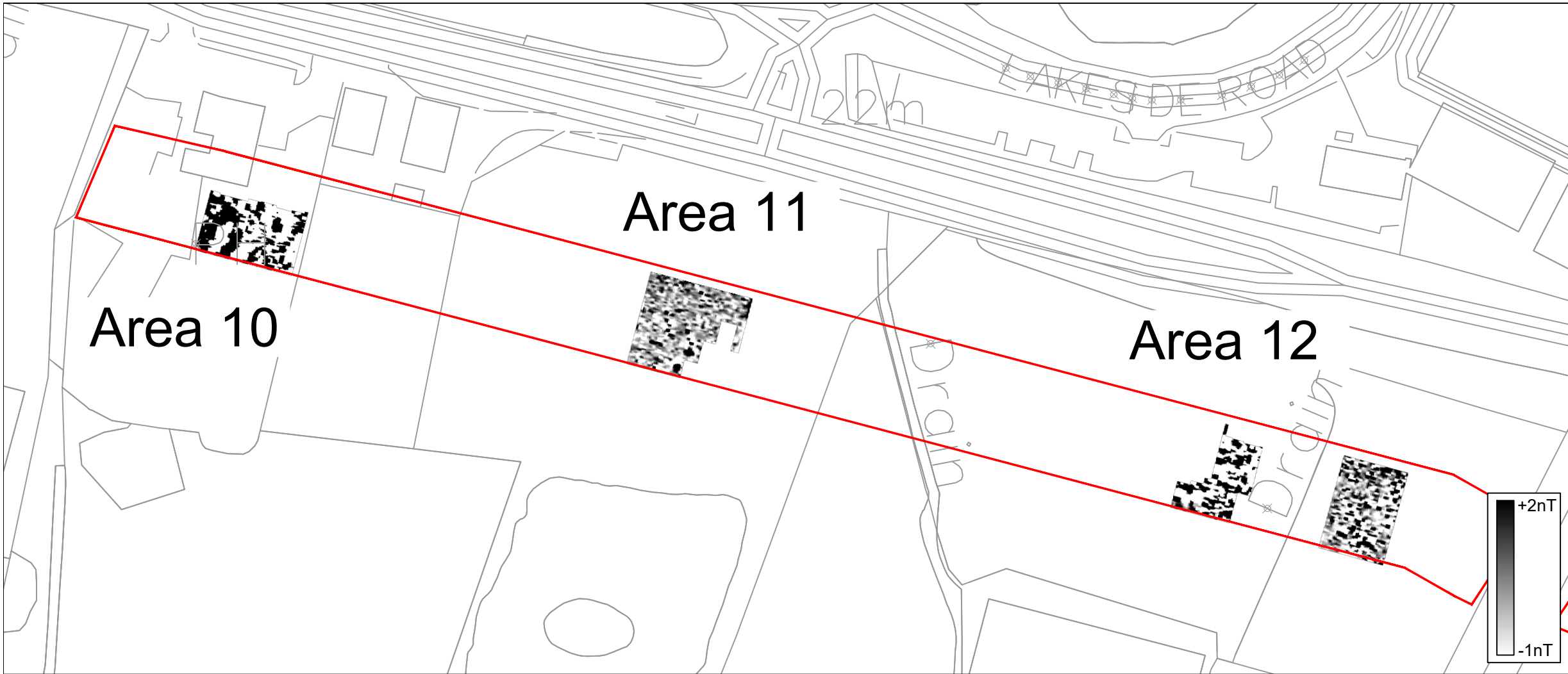
Title: Magnetometer Survey -
Greyscale and Colour Plots - Areas 10, 11 and 12

Client: Dalcour Maclaren

Project: SUMO-20943: Iver to Egham Trunk Main

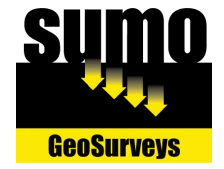
Scale: 0 metres 75
1:1500 @ A3

Fig No: 13



KEY

	Magnetic disturbance
	Magnetic disturbance - made ground / green waste
	Ferrous



Title: Magnetometer Survey -
Greyscale Plots and Interpretation
- Areas 10, 11 and 12

Client: Dalcour Maclaren

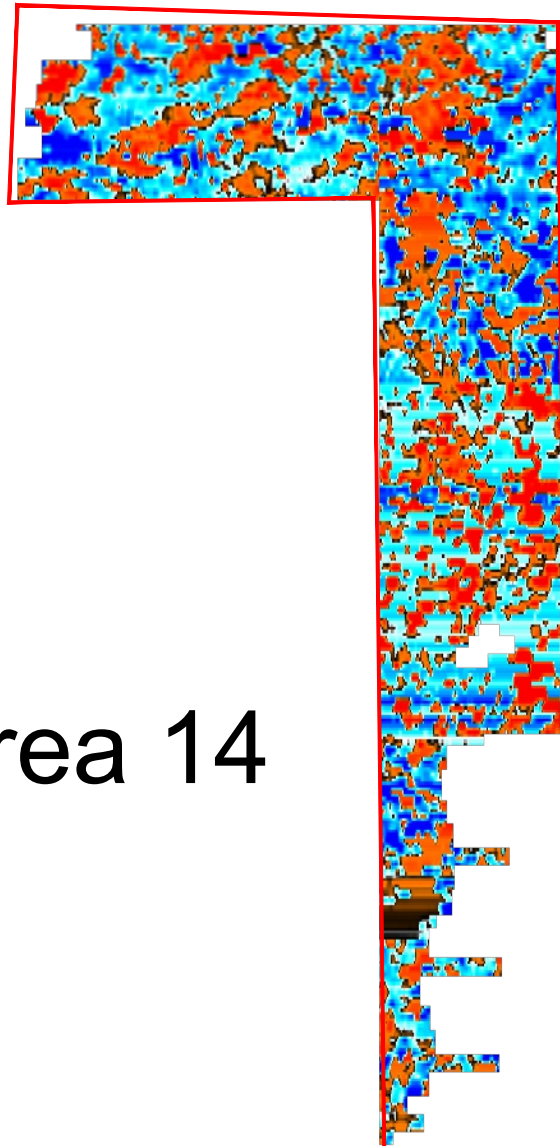
Project: SUMO-20943: Iver to Egham Trunk Main

Scale: 0 metres 75
1:1500 @ A3

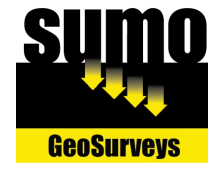
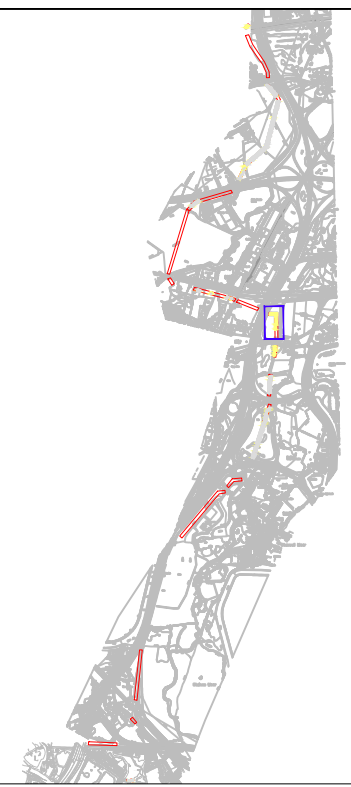
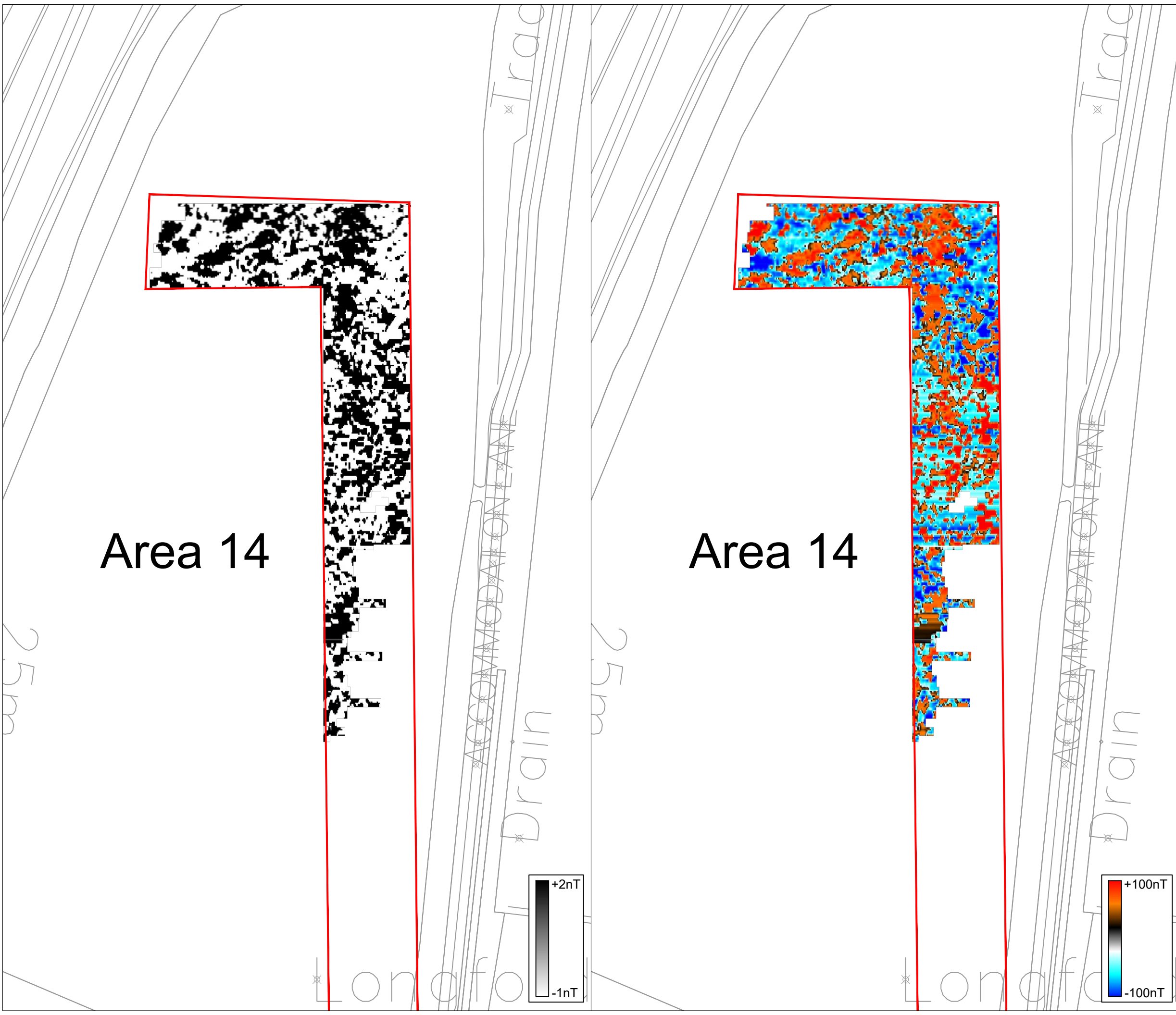
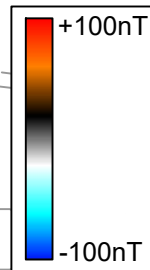
Fig No: 14



Area 14



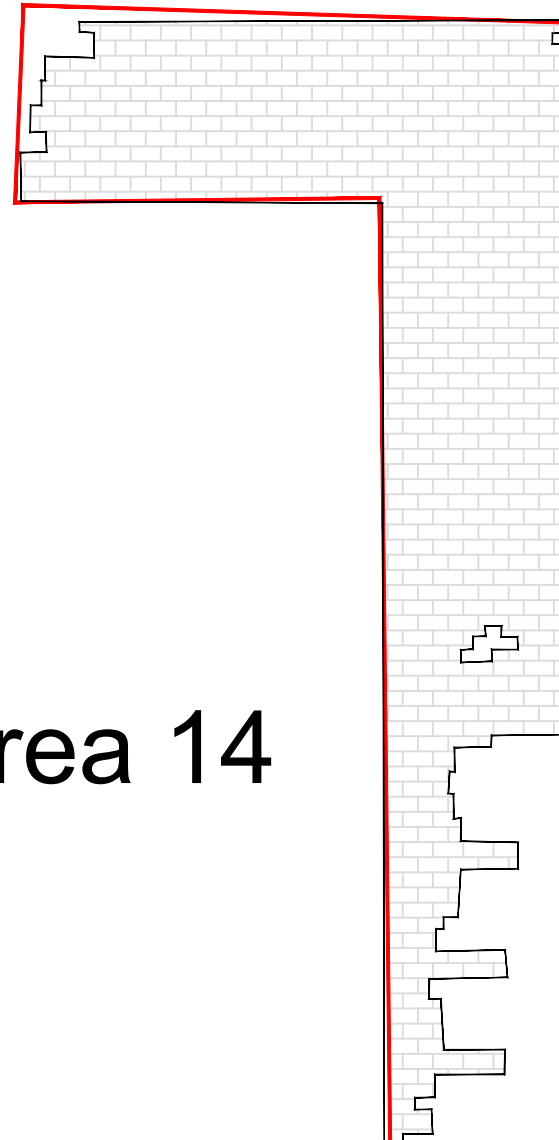
Area 14



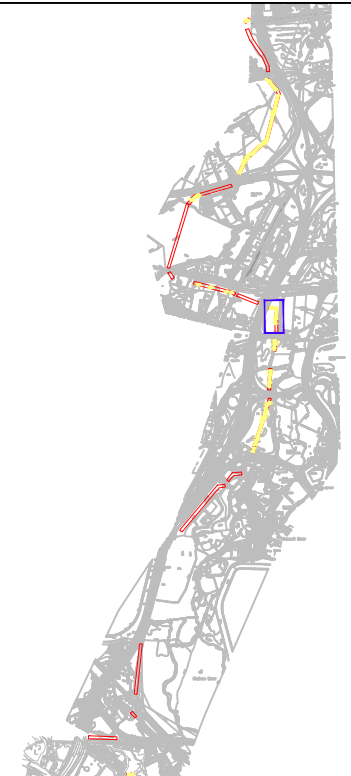
Title:	Magnetometer Survey - Greyscale and Colour Plots - Area 14	
Client:	Dalcour Maclaren	
Project:	SUMO-20943: Iver to Egham Trunk Main	
Scale:	0 metres 62.5	Fig No: 15
	1:1250 @ A3	




Area 14

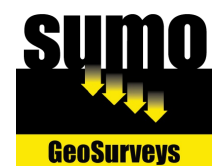


Area 14



KEY

 Magnetic disturbance - made ground / green waste



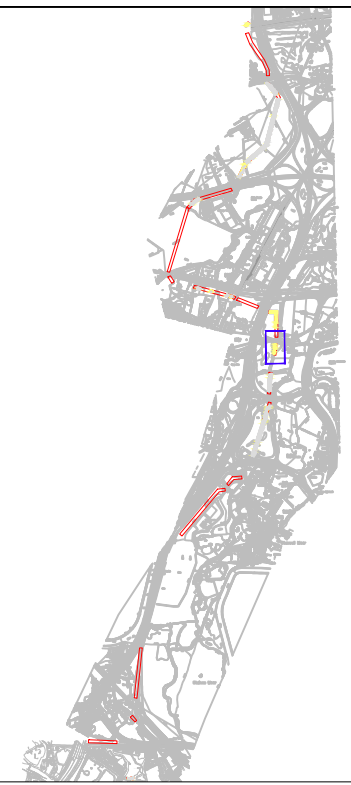
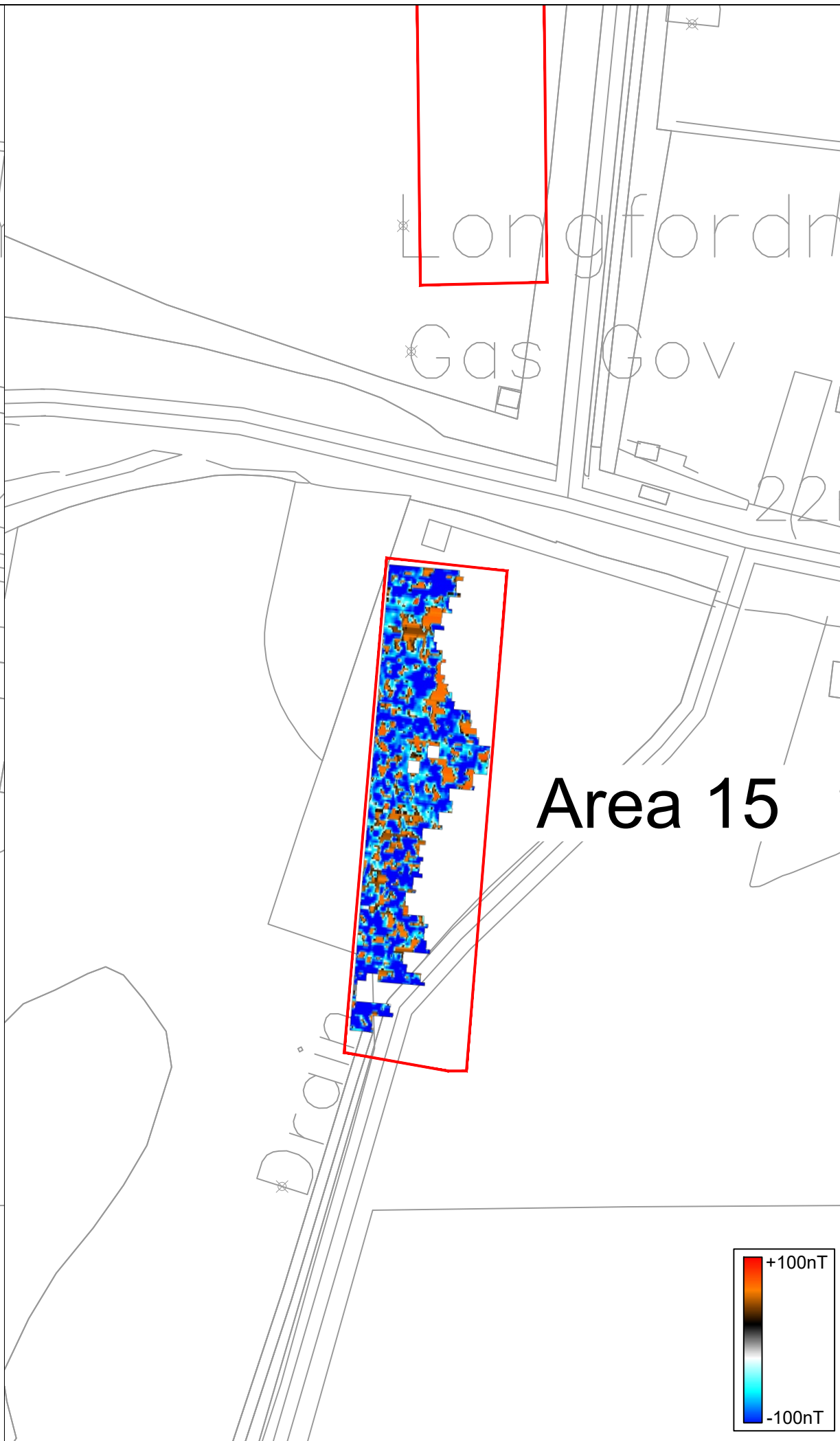
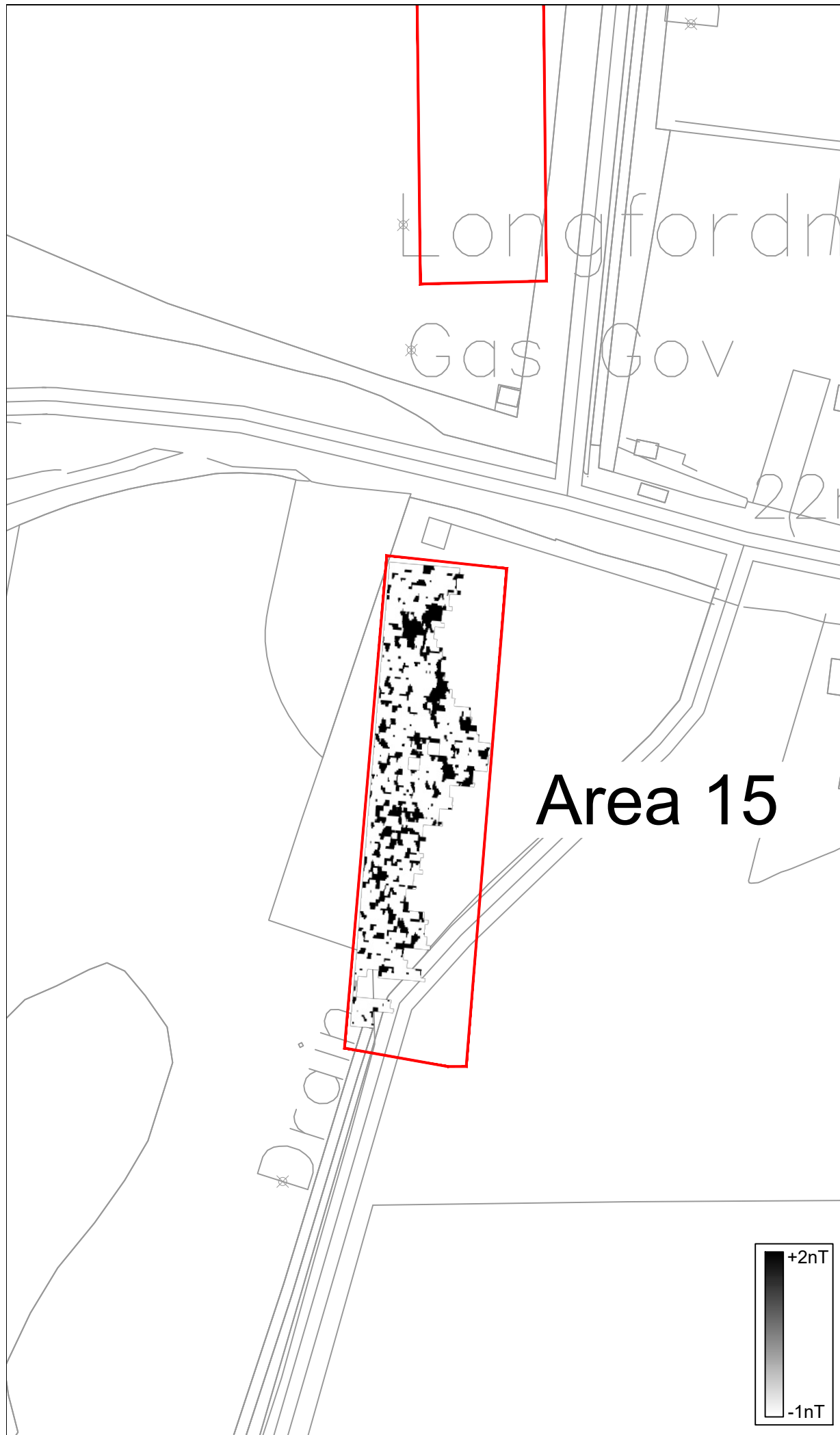
Title: Magnetometer Survey - Greyscale Plot and Interpretation - Area 14

Client: Dalcour Maclaren

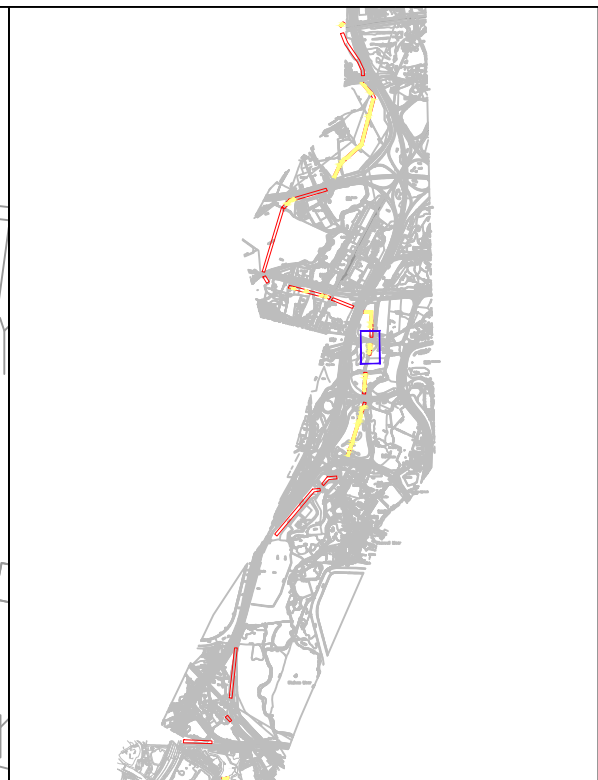
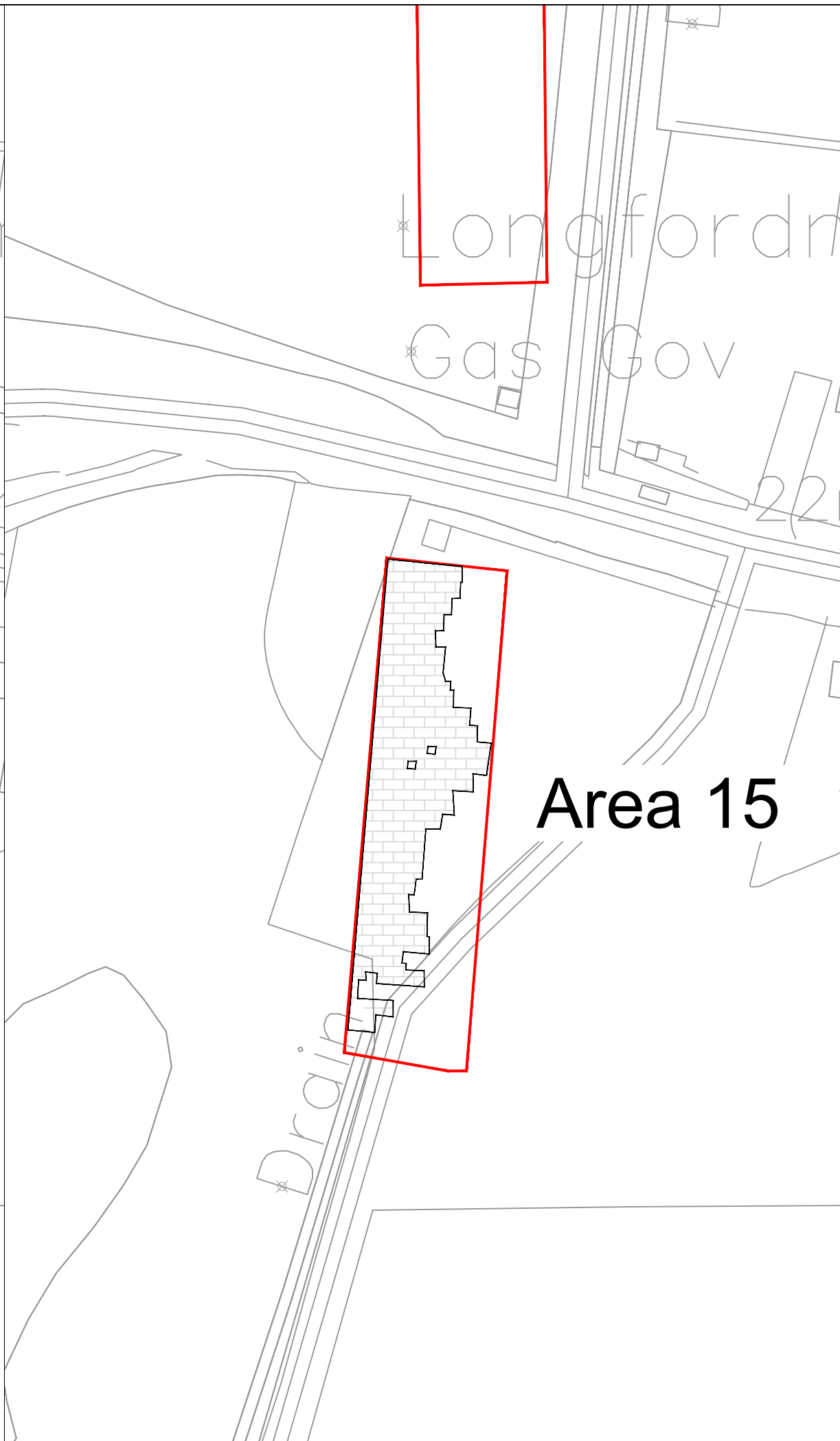
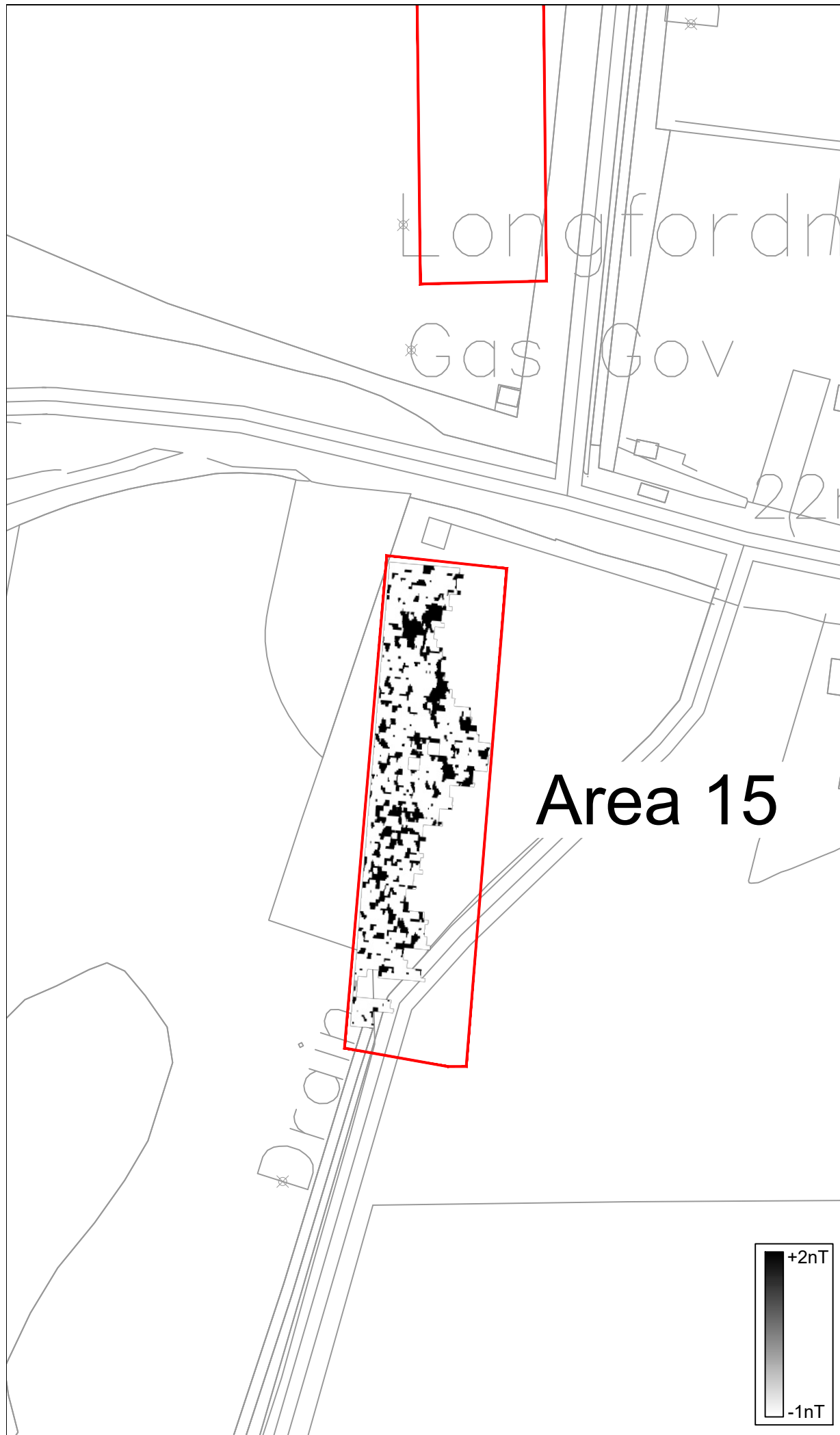
Project: SUMO-20943: Iver to Egham Trunk Main

Scale: 0 metres 62.5
1:1250 @ A3


Fig No: 16



Title:	Magnetometer Survey - Greyscale and Colour Plots - Area 15	
Client:	Dalcour Maclaren	
Project:	SUMO-20943: Iver to Egham Trunk Main	
Scale:	0 metres 62.5 1:1250 @ A3	Fig No: 17



KEY

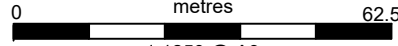
 Magnetic disturbance - made ground / green waste



Title: Magnetometer Survey -
Greyscale Plot and Interpretation - Area 15

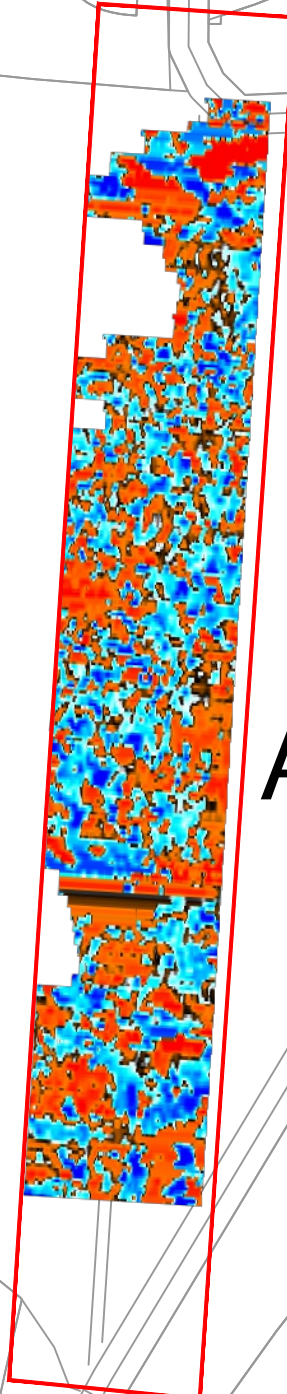
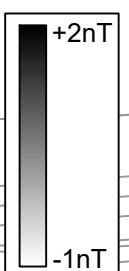
Client: Dalcour Maclaren

Project: SUMO-20943: Iver to Egham Trunk Main

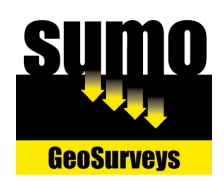
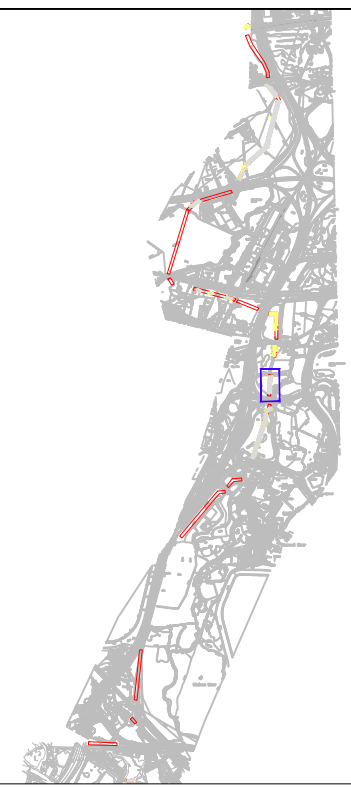
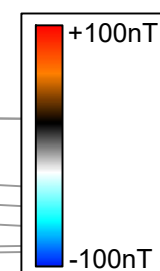
Scale:  1:1250 @ A3
Fig No: 18



Area 16



Area 16



Title: Magnetometer Survey - Greyscale and Colour Plots - Area 16

Client: Dalcour Maclaren

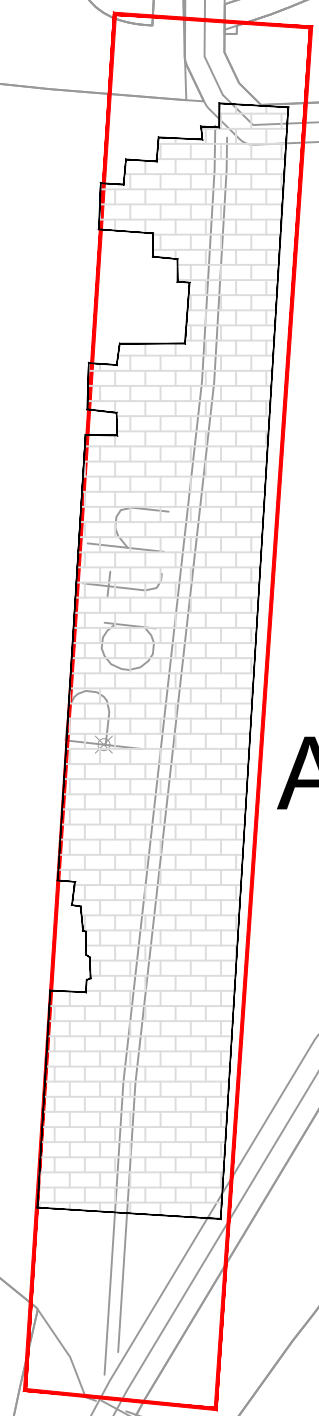
Project: SUMO-20943: Iver to Egham Trunk Main

Scale: 0 metres 62.5
1:1250 @ A3

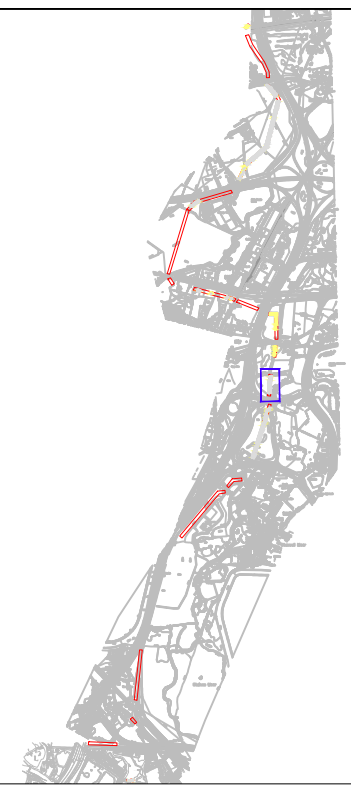
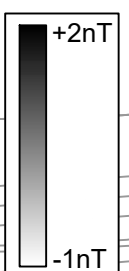
Fig No: 19




Area 16

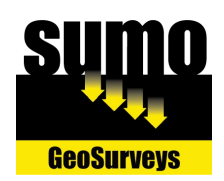


Area 16



KEY

 Magnetic disturbance - made ground / green waste



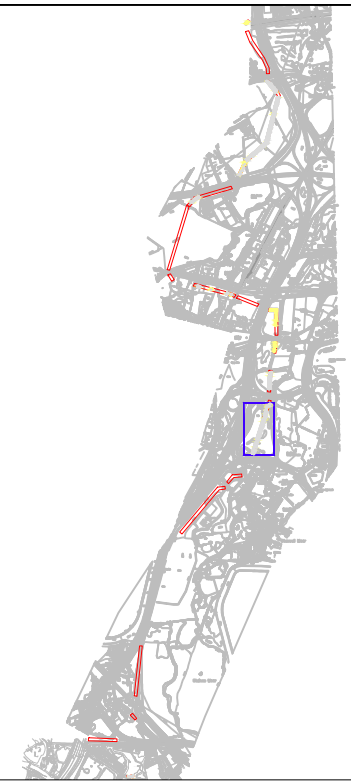
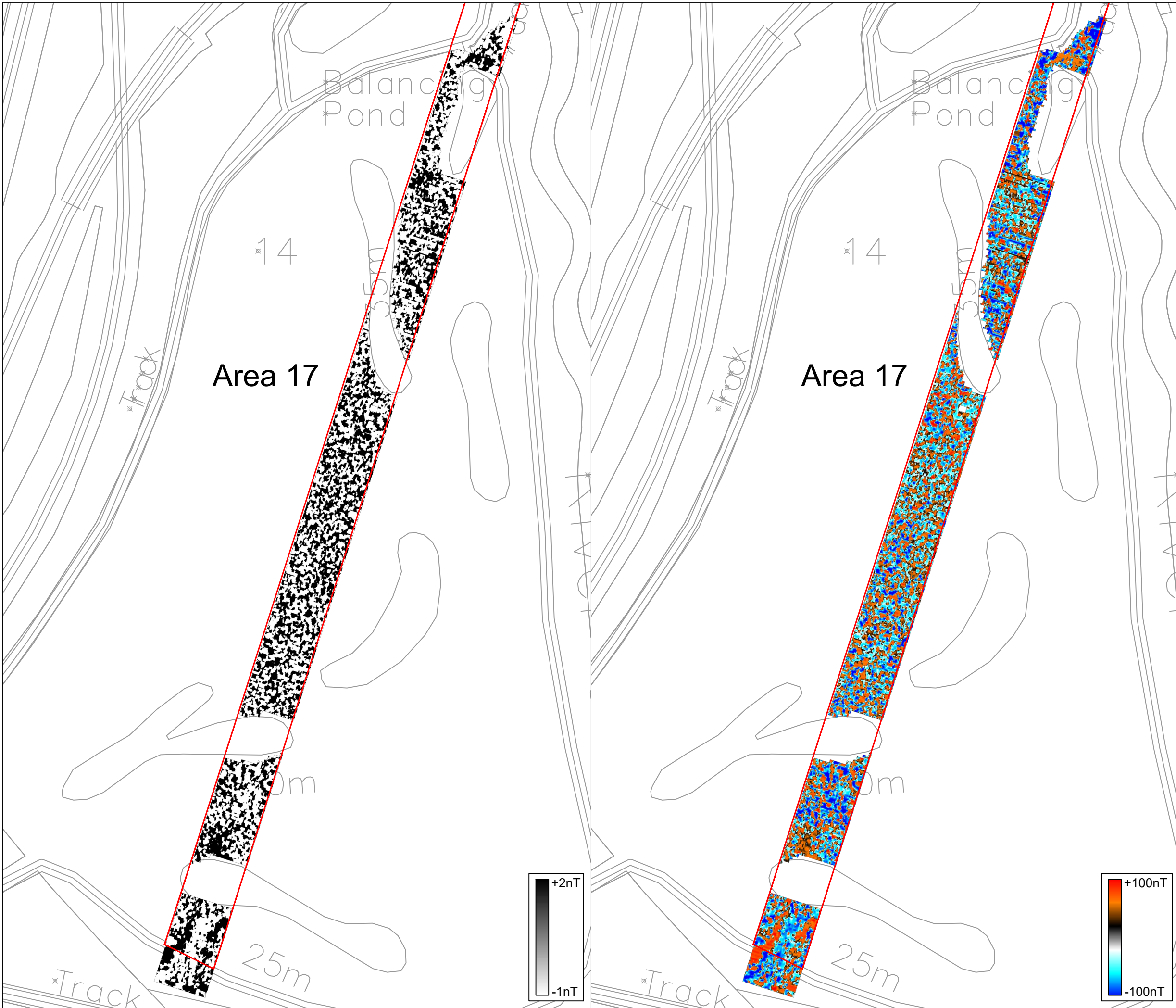
Title: Magnetometer Survey -
Greyscale Plot and Interpretation - Area 16

Client: Dalcour Maclaren

Project: SUMO-20943: Iver to Egham Trunk Main

Scale: 0 metres 62.5
1:1250 @ A3

Fig No: 20



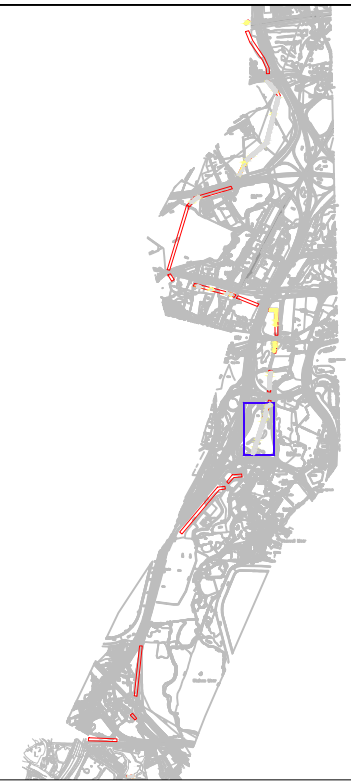
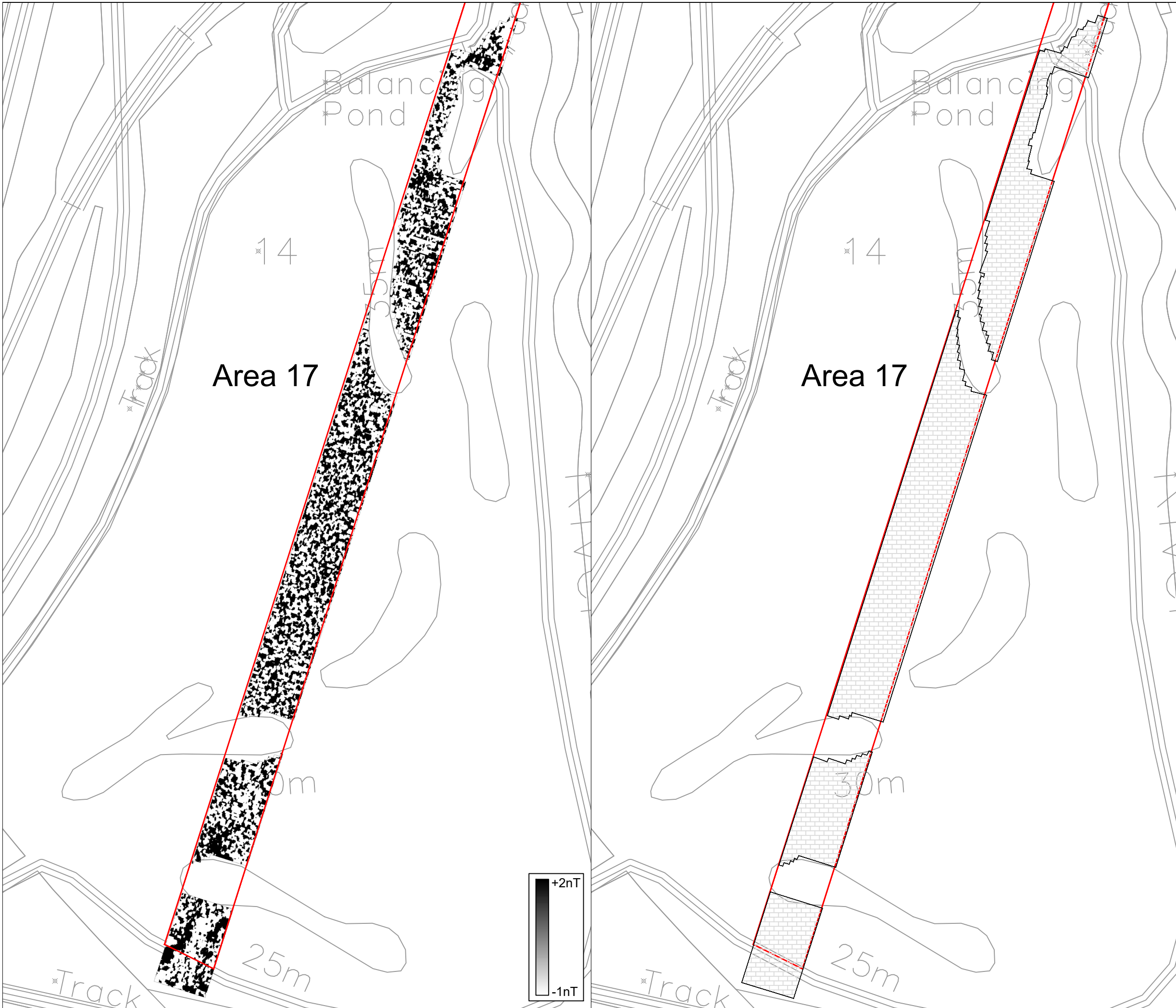
Title: Magnetometer Survey -
Greyscale and Colour Plots - Area 17

Client: Dalcour Maclaren


Project: SUMO-20943: Iver to Egham Trunk Main

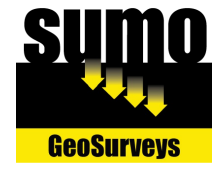
Scale: 0 metres 100
1:2000 @ A3

Fig No: 21



KEY

 Magnetic disturbance - made ground / green waste



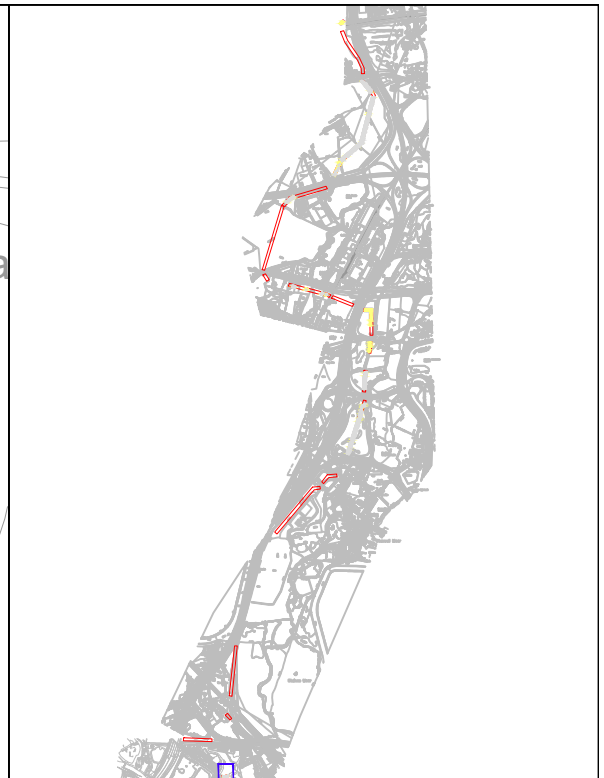
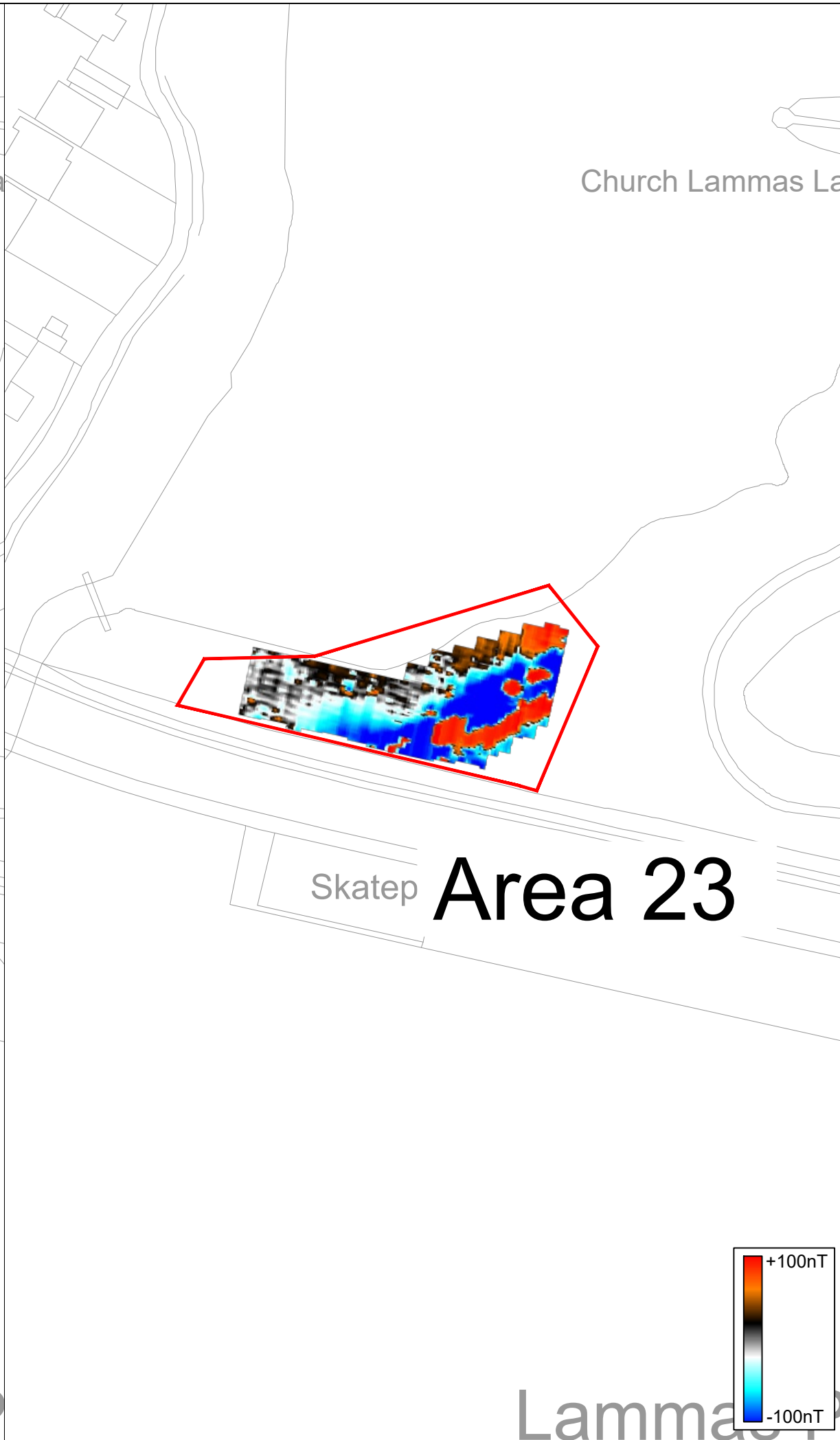
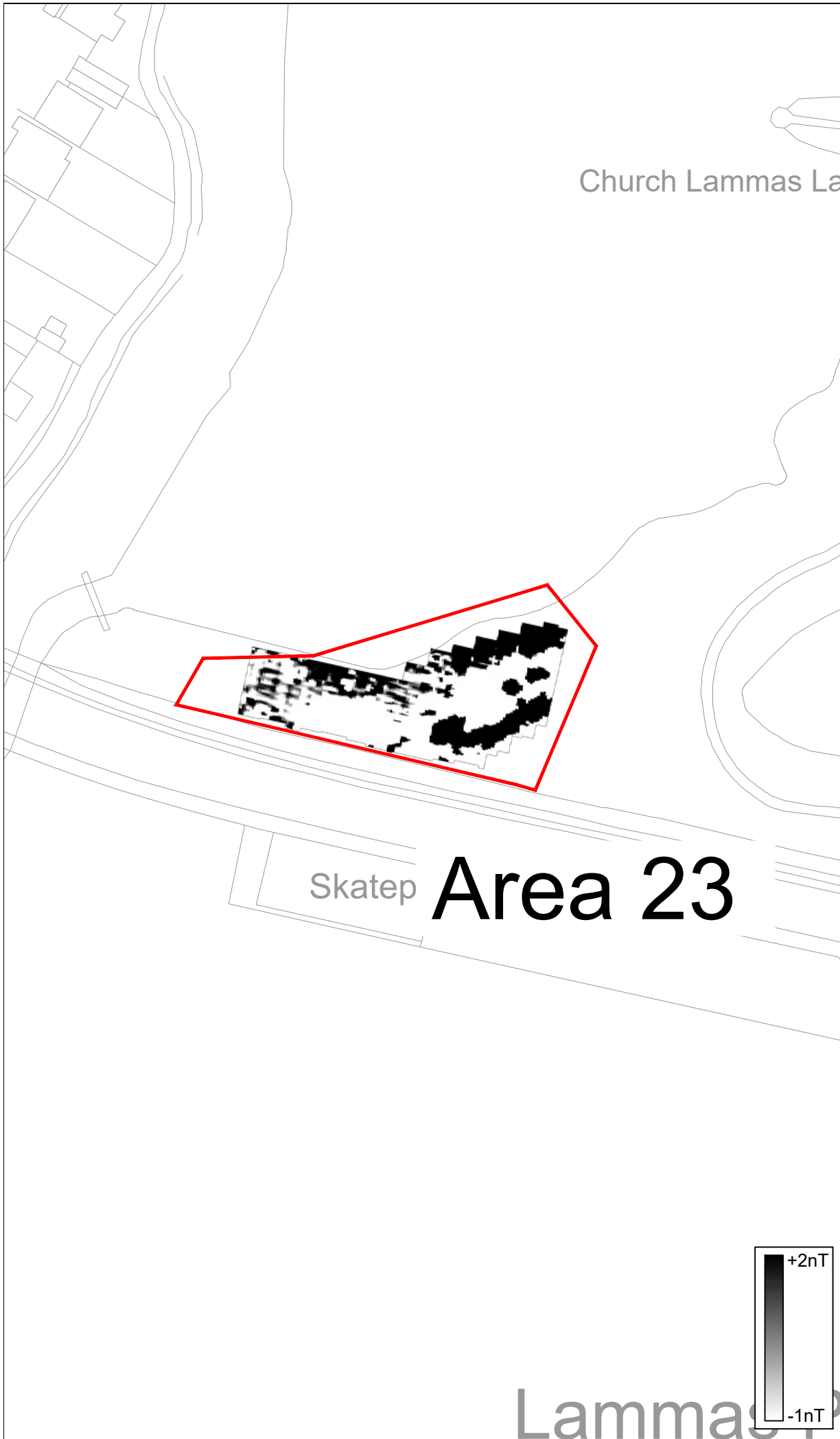
Title: Magnetometer Survey - Greyscale Plots and Interpretation - Area 17

Client: Dalcour Maclaren

Project: SUMO-20943: Iver to Egham Trunk Main

Scale: 0 metres 100
1:2000 @ A3

Fig No: 22



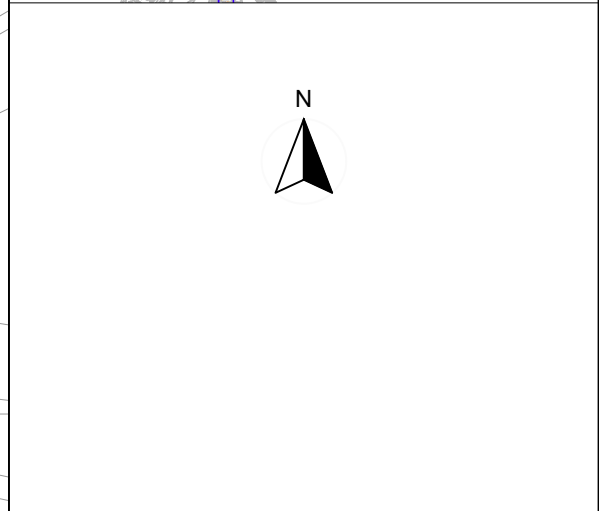
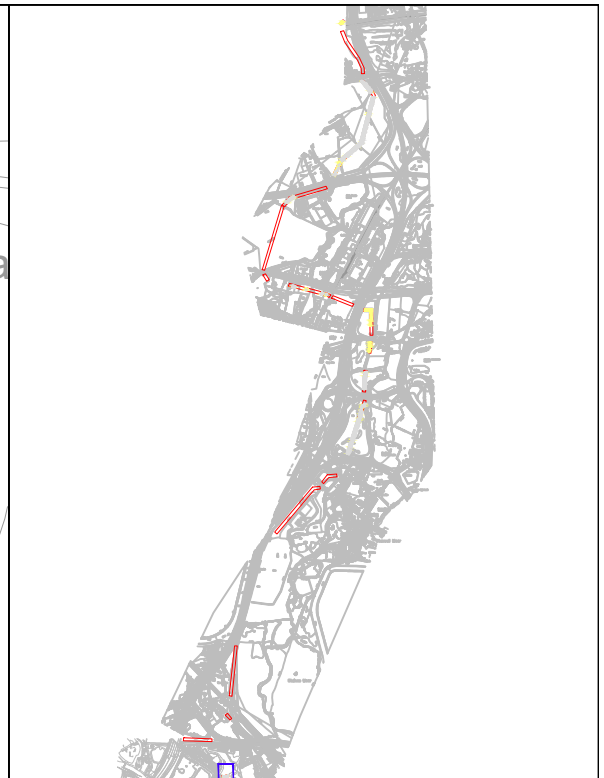
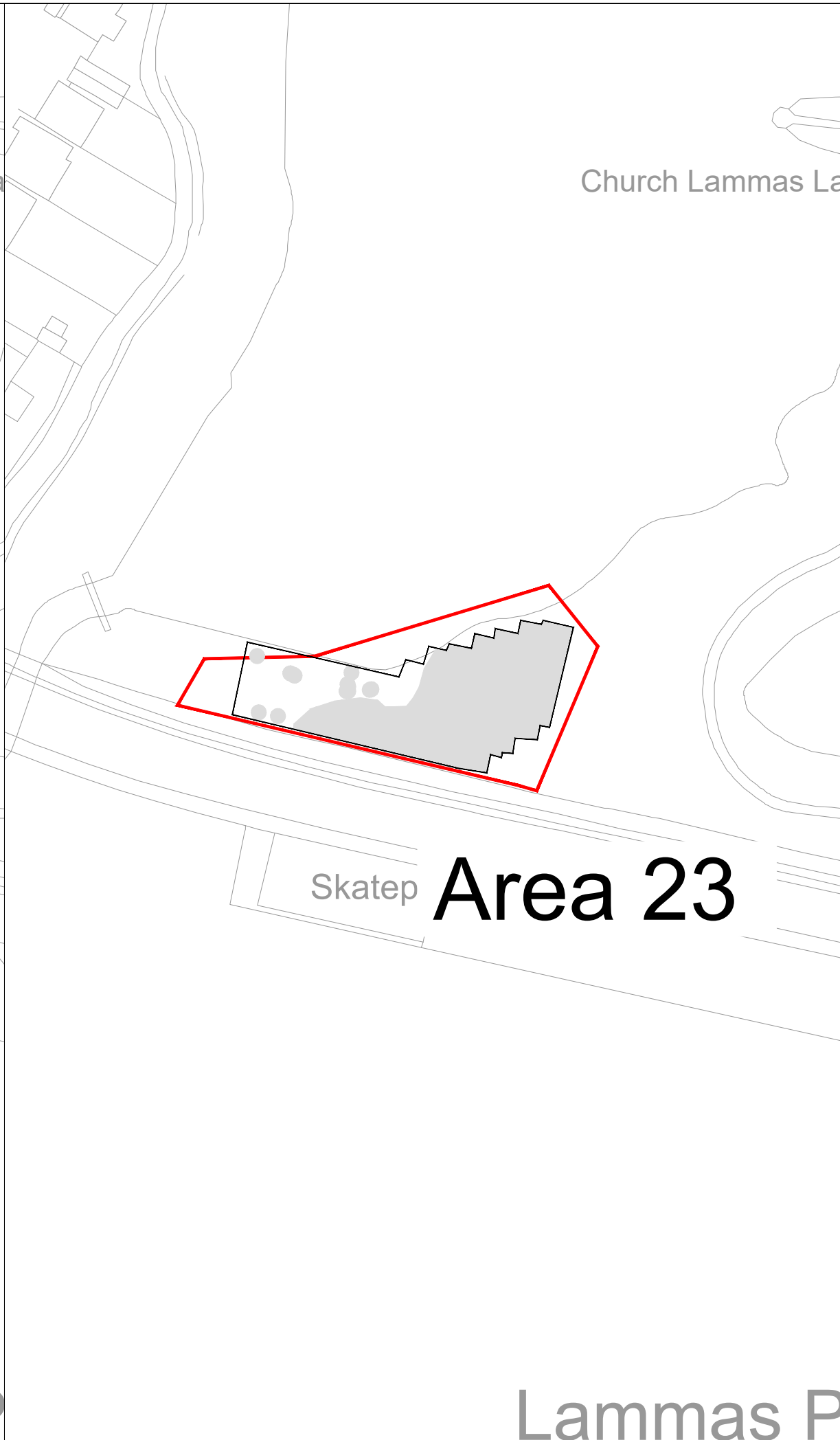
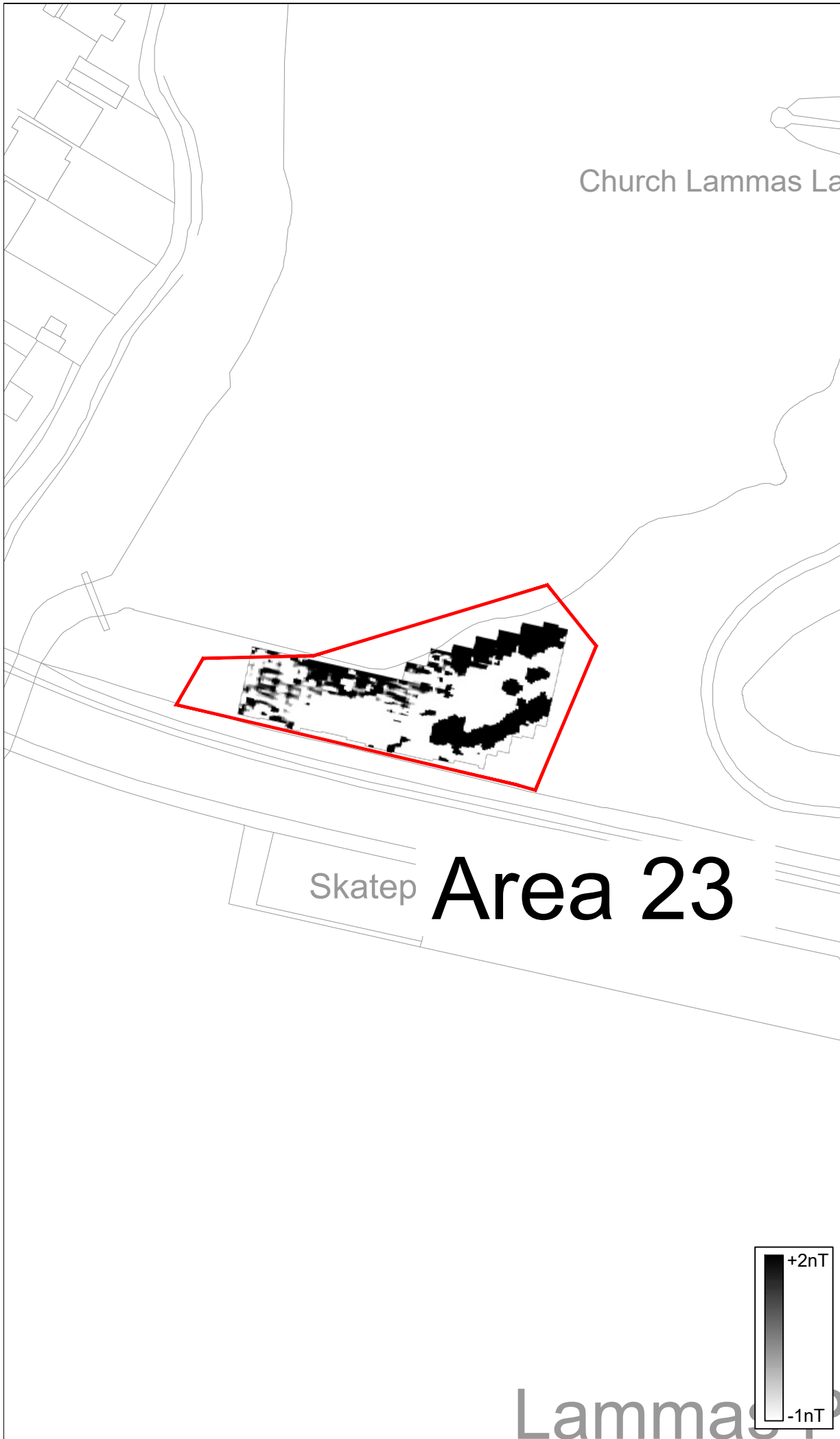
Title: Magnetometer Survey - Greyscale and Colour Plots - Area 23

Client: Dalcour Maclaren


Project: SUMO-20943: Iver to Egham Trunk Main

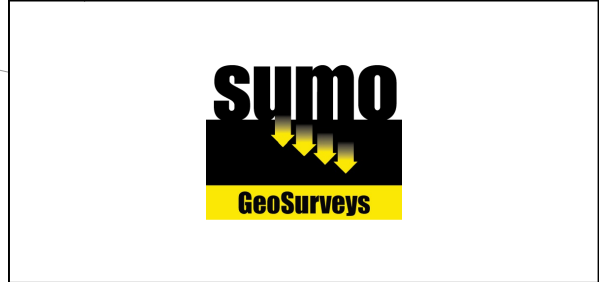
Scale: 0 metres 50
1:1000 @ A3

Fig No: 23



KEY

 Ferrous



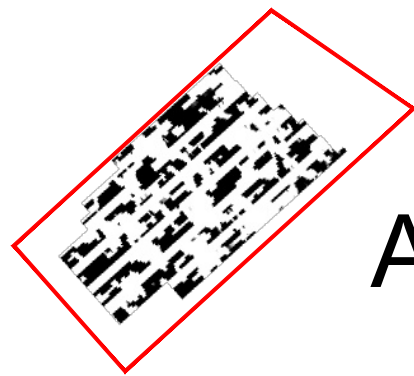
Title: Magnetometer Survey -
Greyscale Plot and Interpretation - Area 23

Client: Dalcour Maclaren

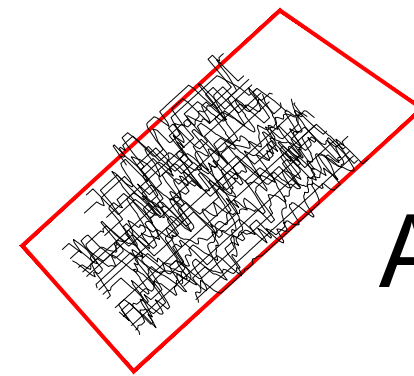
Project: SUMO-20943: Iver to Egham Trunk Main

Scale:  metres 50
1:1000 @ A3

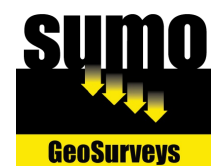
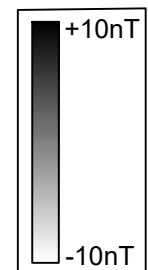
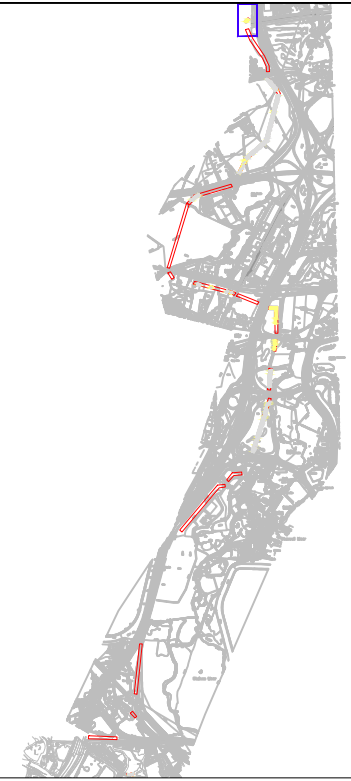
Fig No: 24



Area 1



Area 1



Title:
Minimally Processed Greyscale Plots and XY
Trace Plots (clipped at +/-30nT) - Area 1

Client:
Dalcour Maclaren

Project:
SUMO-20943: Iver to Egham Trunk Main

Scale:
0 metres 62.5
1:1250 @ A3

Fig No:
25

Sewage
Ppg Sta

Sewage
Ppg Sta

Track

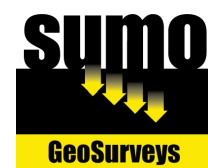
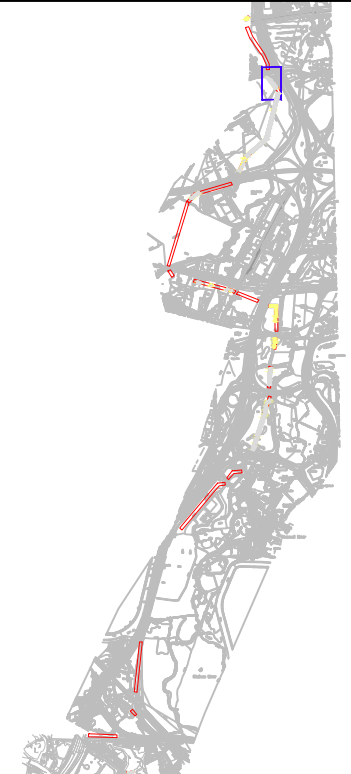
Track

Area 3

Area 3

Drain

Drain



Title:
Minimally Processed Greyscale Plots and XY
Trace Plots (clipped at +/-30nT) - Area 3

Client:
Dalcour Maclaren

Project:
SUMO-20943: Iver to Egham Trunk Main

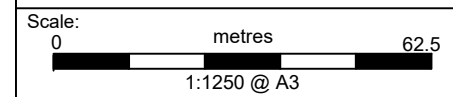
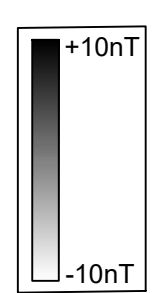
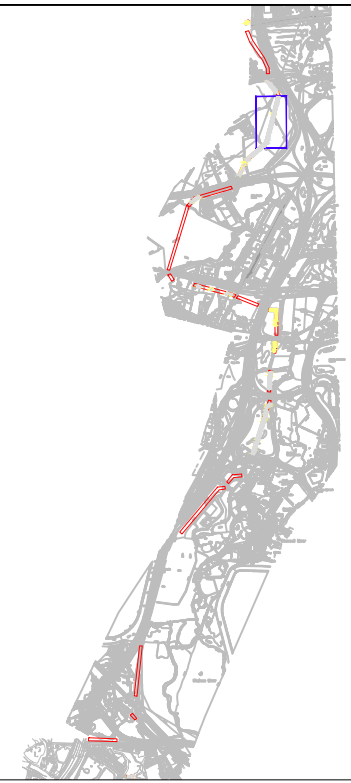
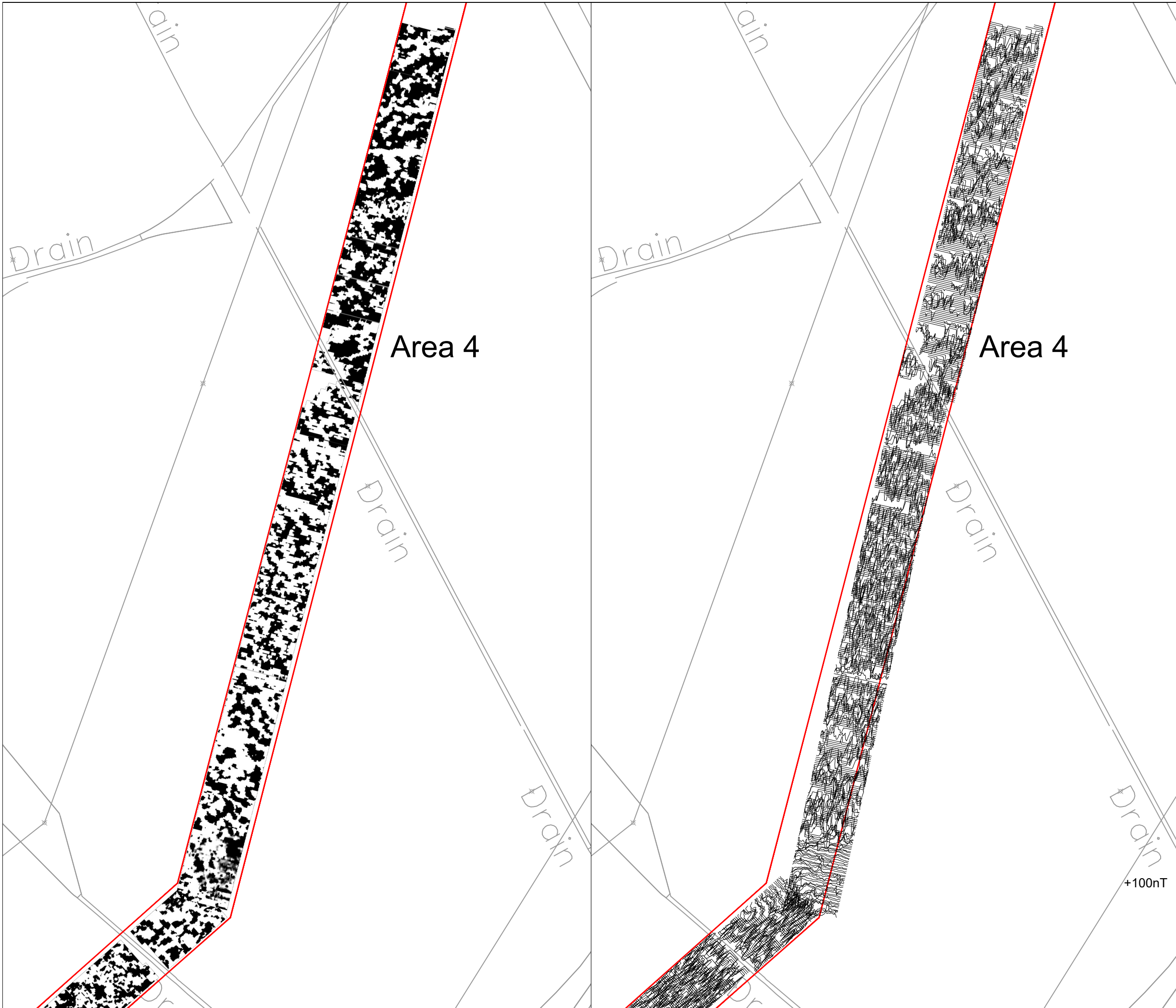


Fig No:
26



Title: Minimally Processed Greyscale Plots and XY Trace Plots (clipped at +/-30nT) - Area 4

Client: Dalcour Maclaren

Project: SUMO-20943: Iver to Egham Trunk Main

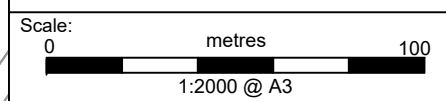
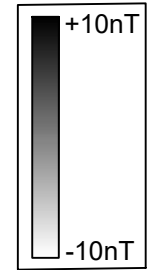
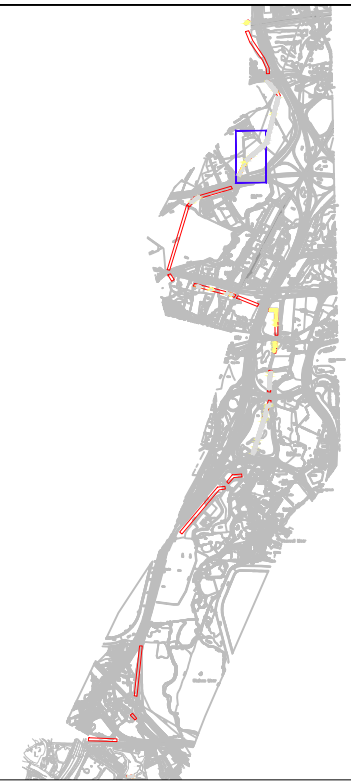


Fig No: 27



Title: Minimally Processed Greyscale Plots and XY Trace Plots (clipped at +/-30nT) - Areas 5 and 6

Client: Dalcour Maclaren

Project: SUMO-20943: Iver to Egham Trunk Main

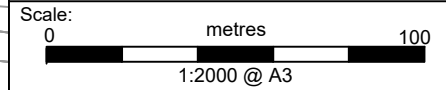
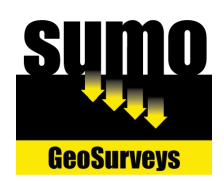
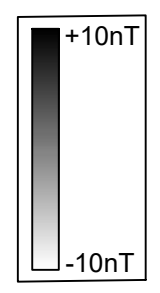
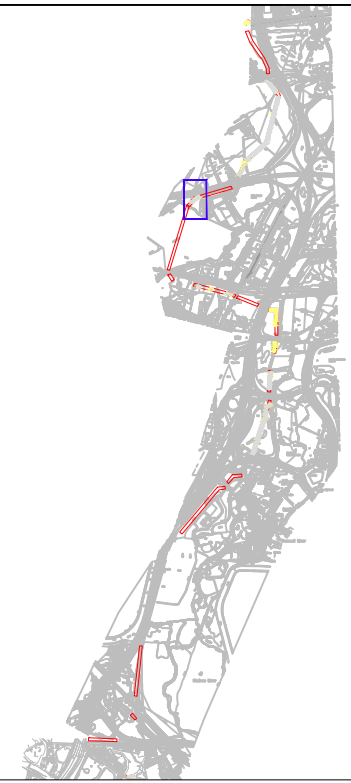


Fig No: 28



Title: Minimally Processed Greyscale Plots and XY Trace Plots (clipped at +/-30nT) - Area 7

Client: Dalcour Maclaren

Project: SUMO-20943: Iver to Egham Trunk Main

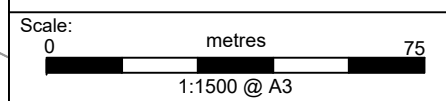
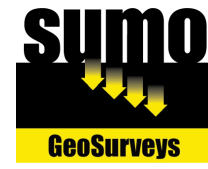
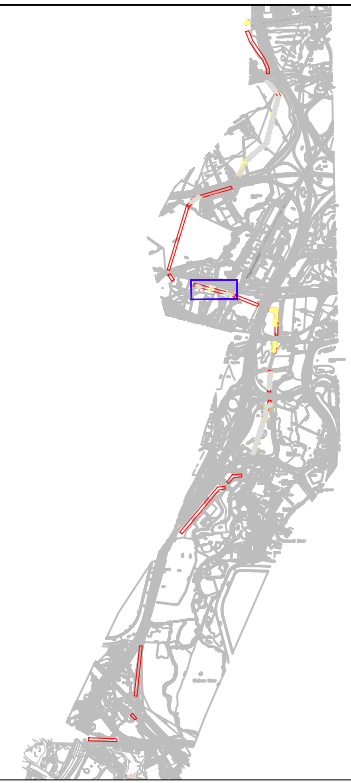
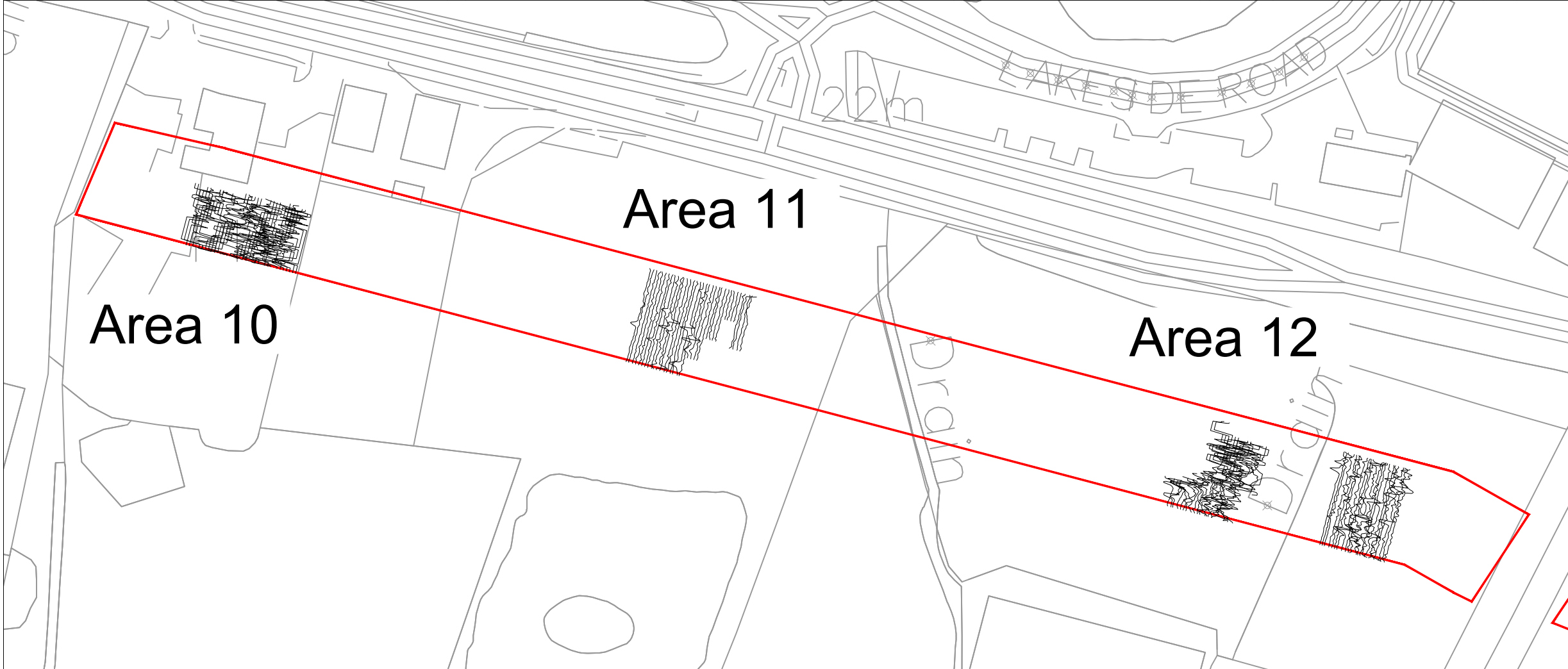
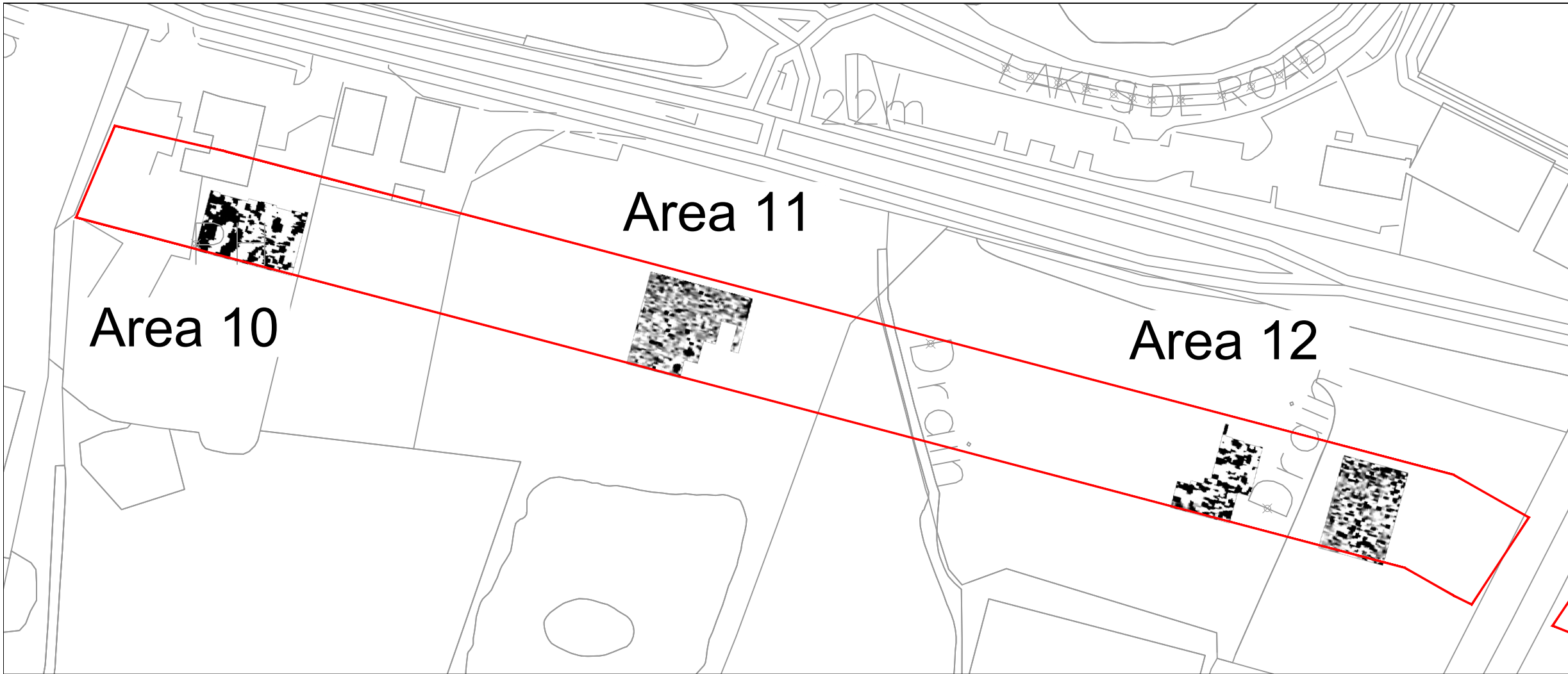


Fig No: 29



Title: Minimally Processed Greyscale Plots and XY Trace Plots (clipped at +/-30nT) - Areas 10, 11 and 12

Client: Dalcour Maclaren

Project: SUMO-20943: Iver to Egham Trunk Main

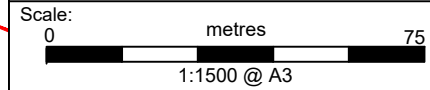
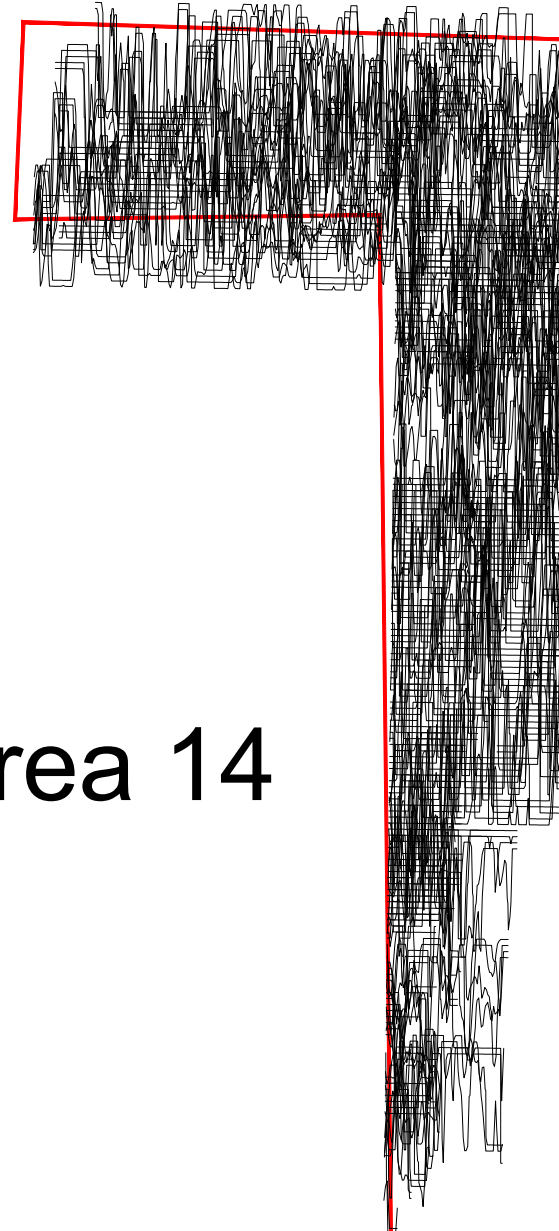


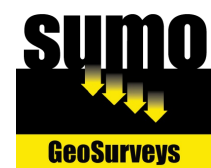
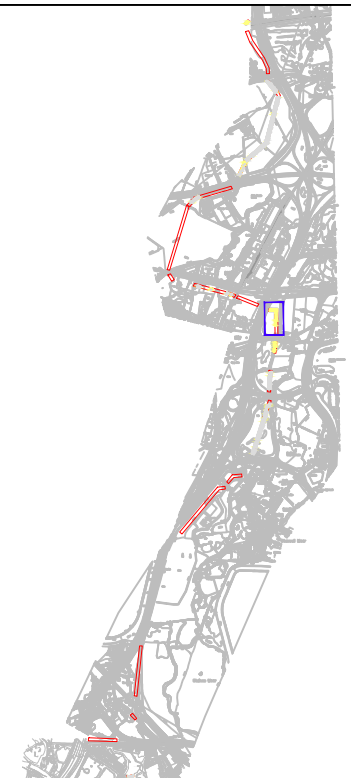
Fig No: 30



Area 14



Area 14



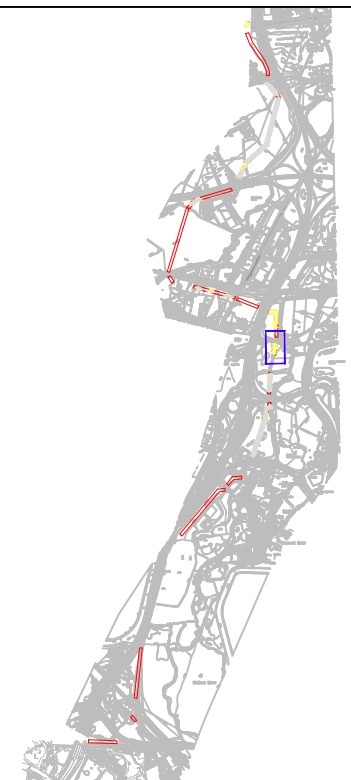
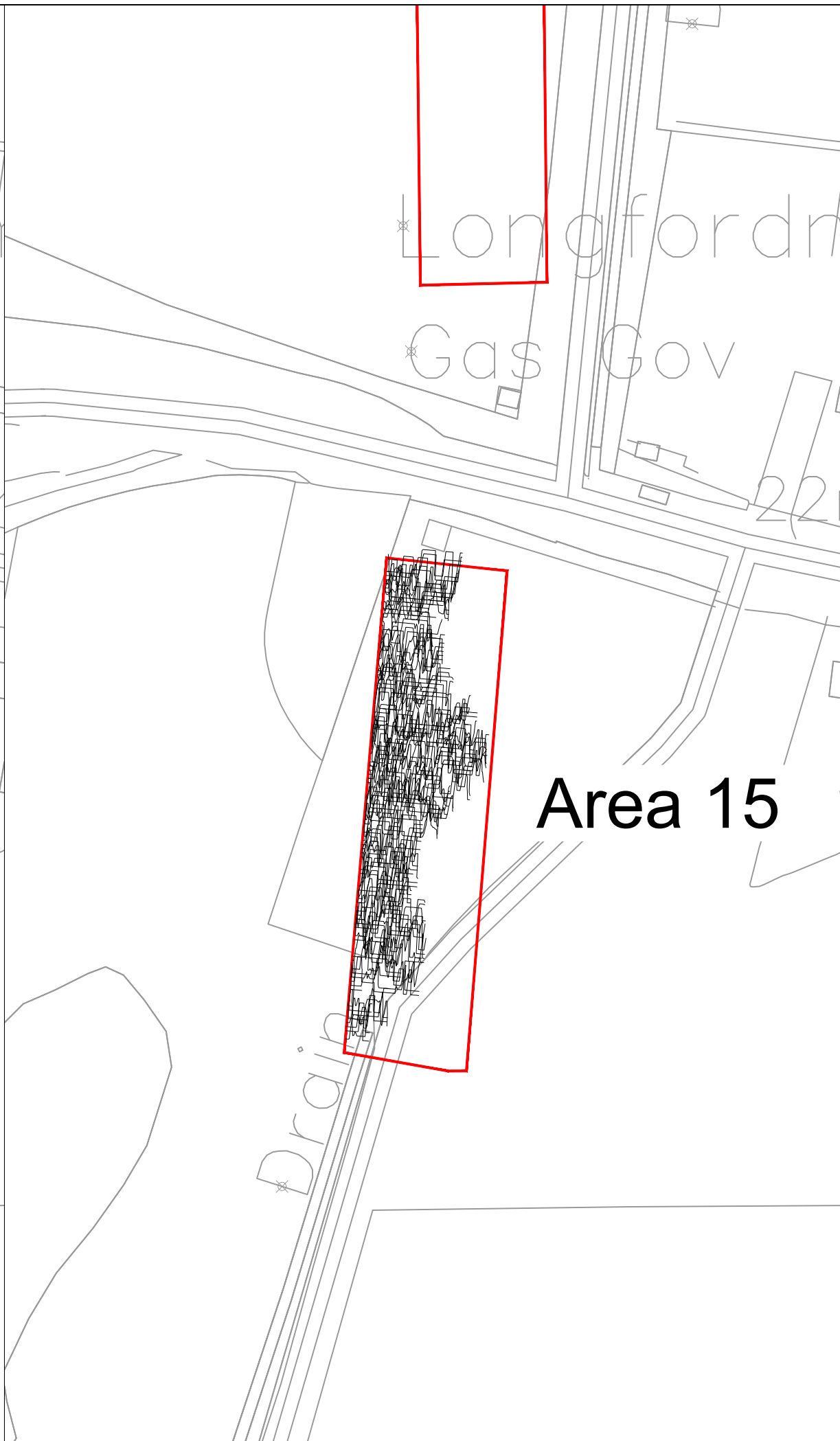
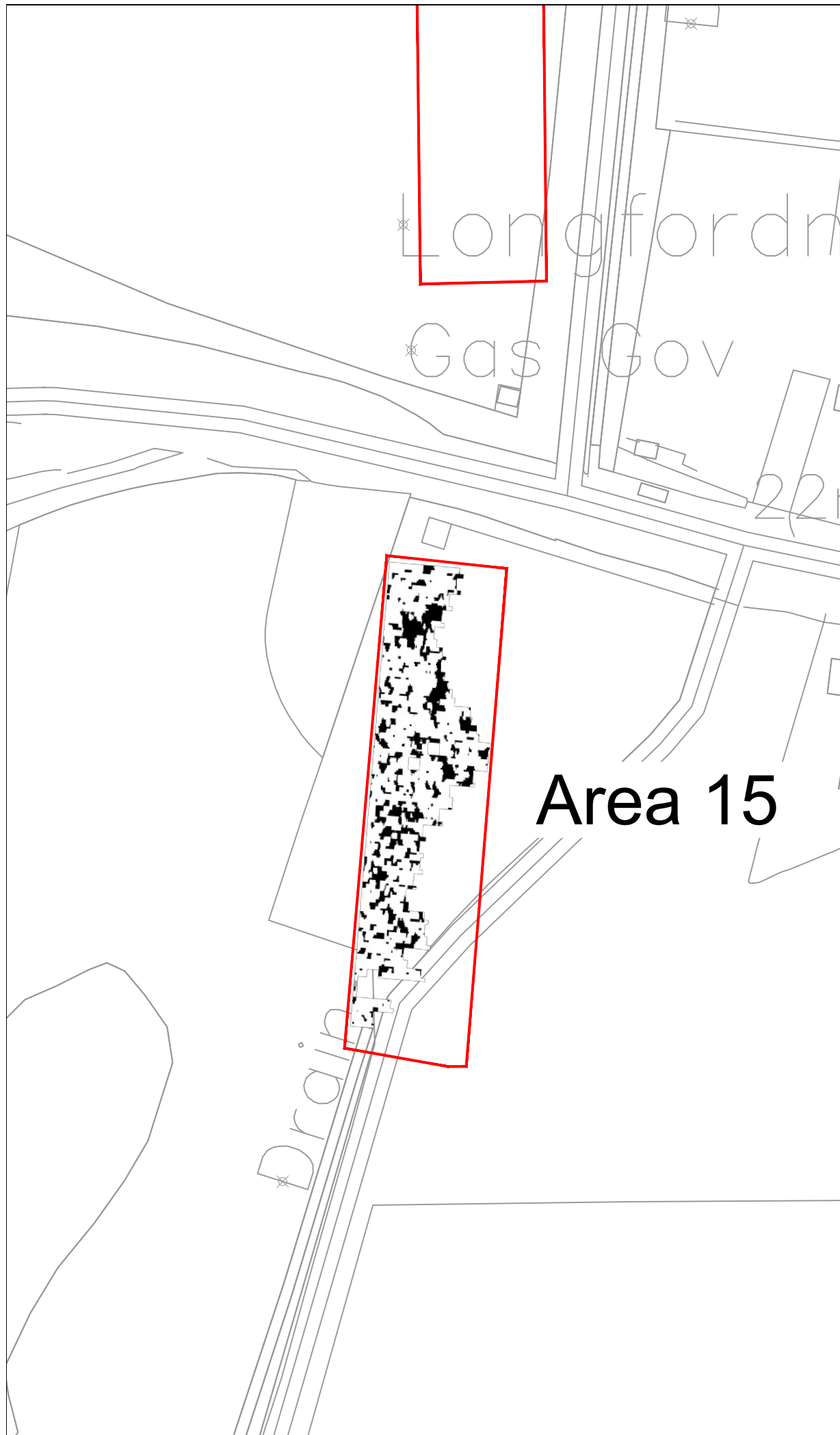
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Trace Plots (clipped at +/-30nT) - Area 14

Client:
Dalcour Maclaren

Project:
SUMO-20943: Iver to Egham Trunk Main

Scale:
0 metres 62.5
1:1250 @ A3

Fig No:
31



Title:
Minimally Processed Greyscale Plots and XY
Trace Plots (clipped at +/-30nT) - Area 15

Client:
Dalcour Maclaren

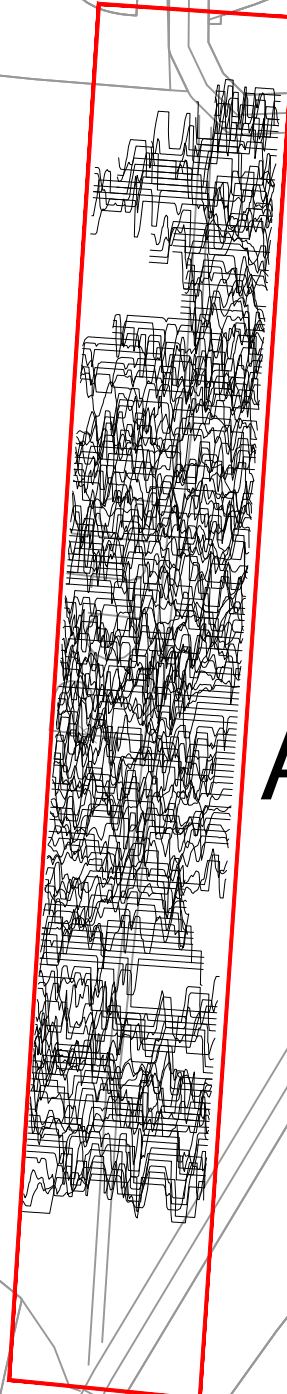
Project:
SUMO-20943: Iver to Egham Trunk Main

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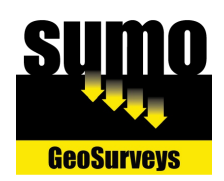
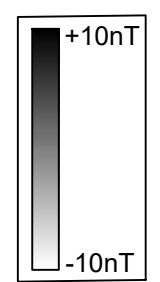
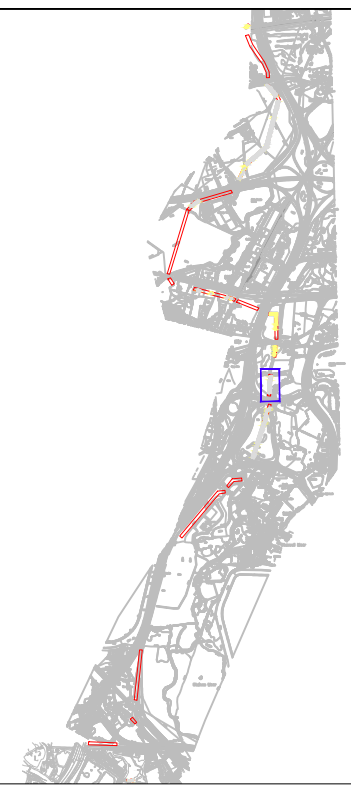
Fig No:
32



Area 16



Area 16



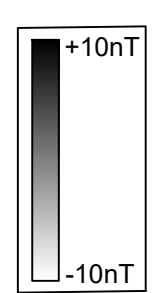
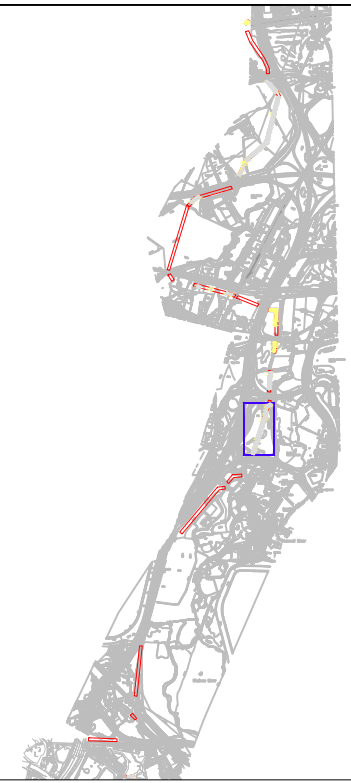
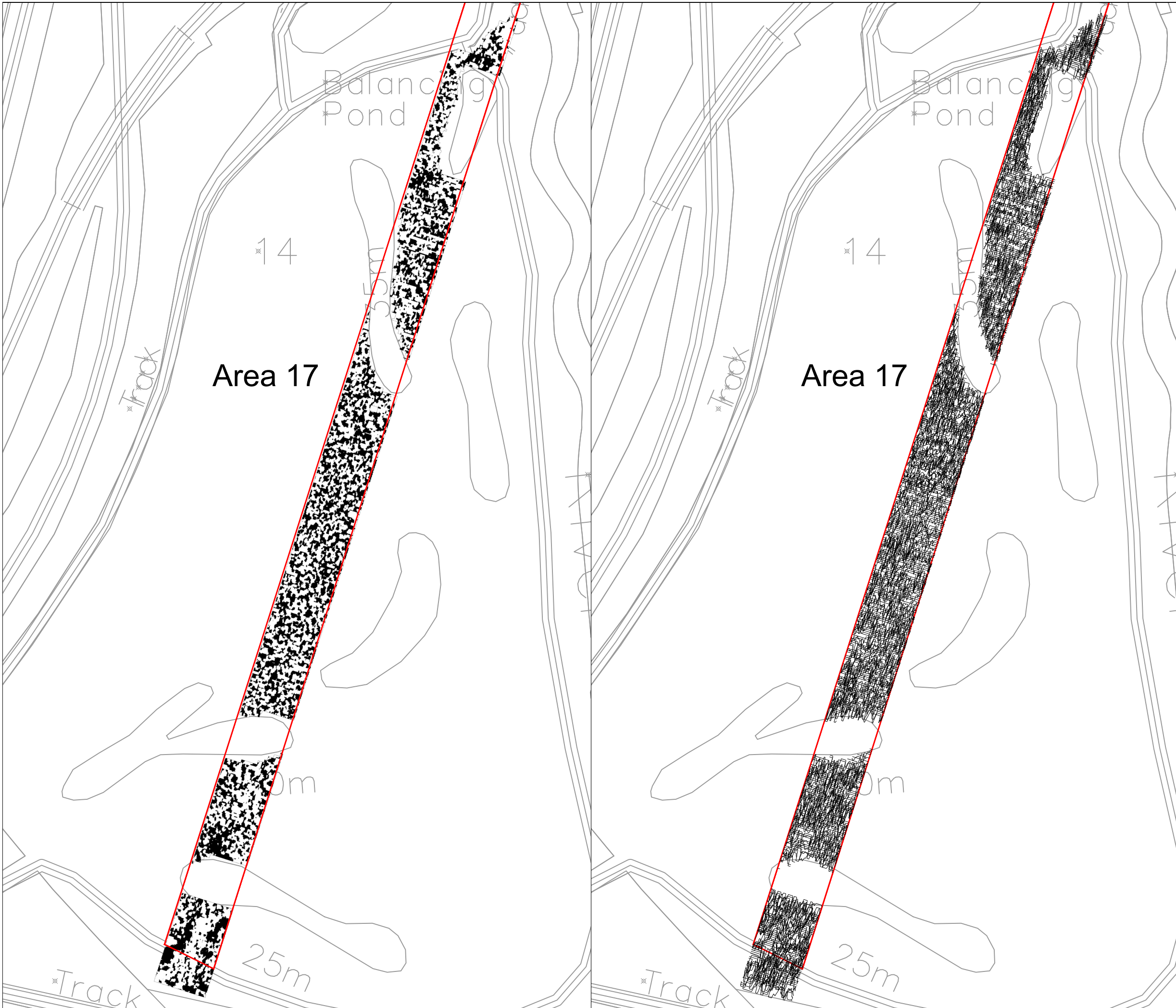
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Trace Plots (clipped at +/-30nT) - Area 16

Client:
Dalcour Maclaren

Project:
SUMO-20943: Iver to Egham Trunk Main

Scale:
0 metres 62.5
1:1250 @ A3

Fig No:
33



Title:
Minimally Processed Greyscale Plots and XY
Trace Plots (clipped at +/-30nT) - Area 17

Client:
Dalcour Maclaren

Project:
SUMO-20943: Iver to Egham Trunk Main

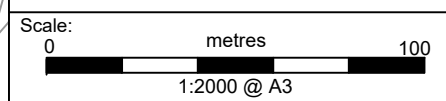
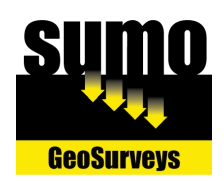
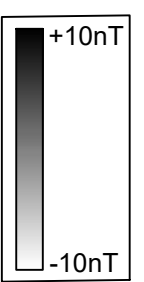
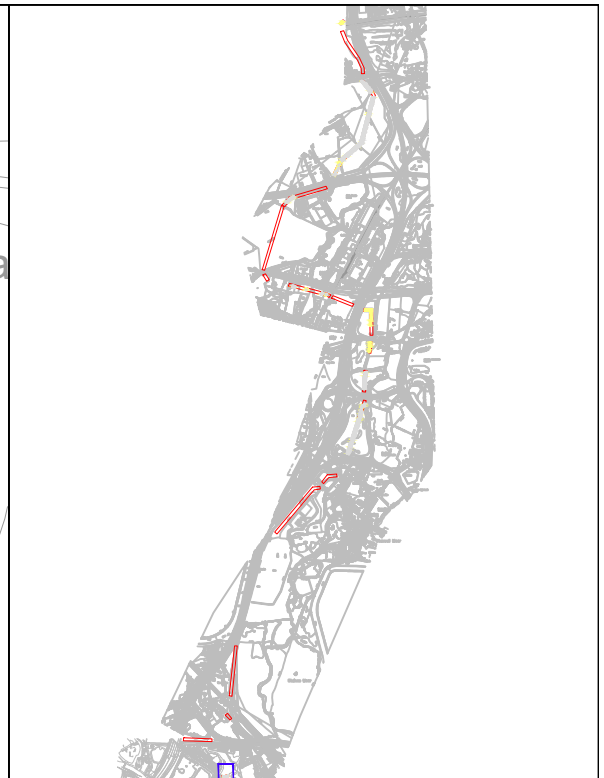
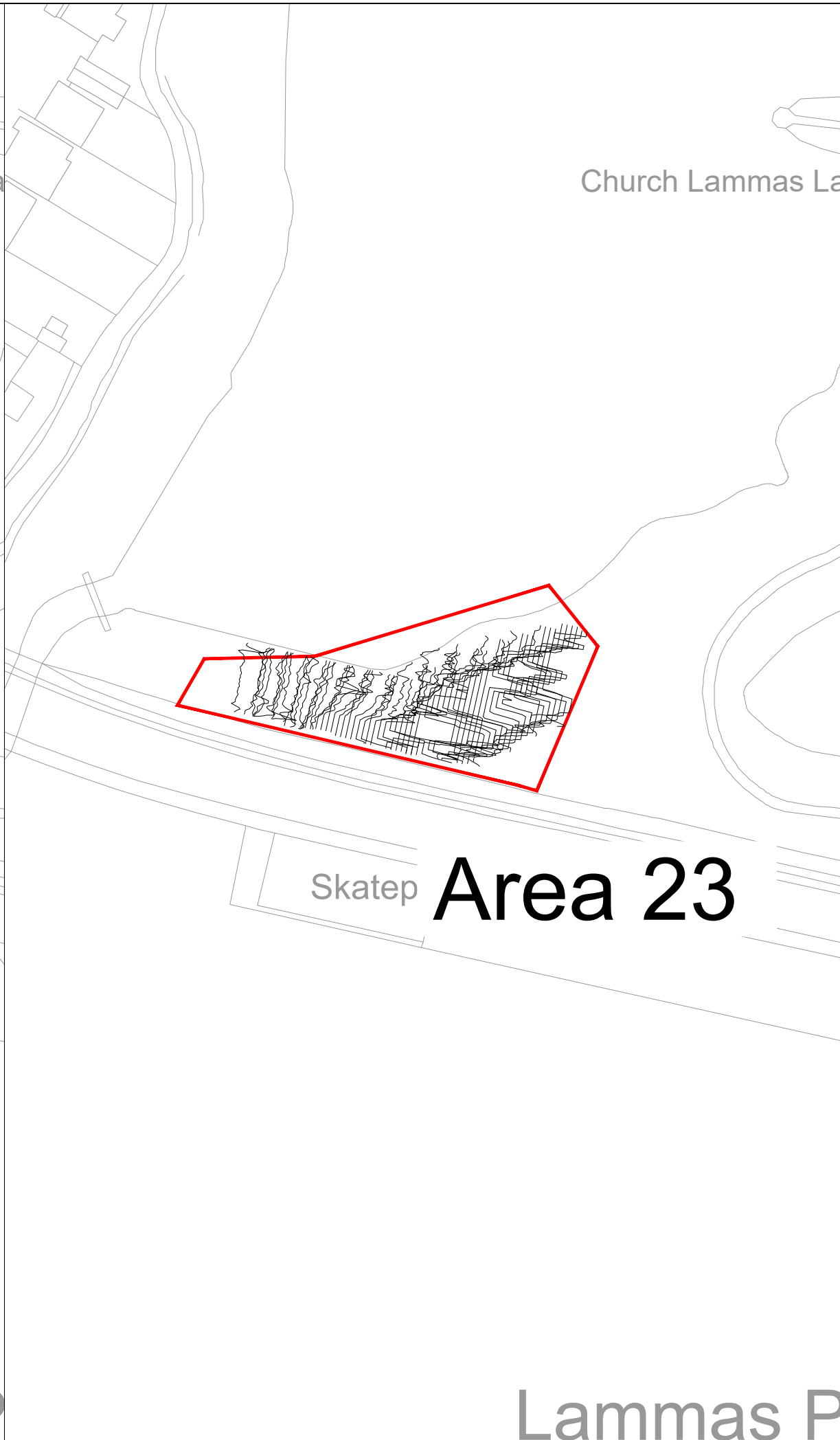
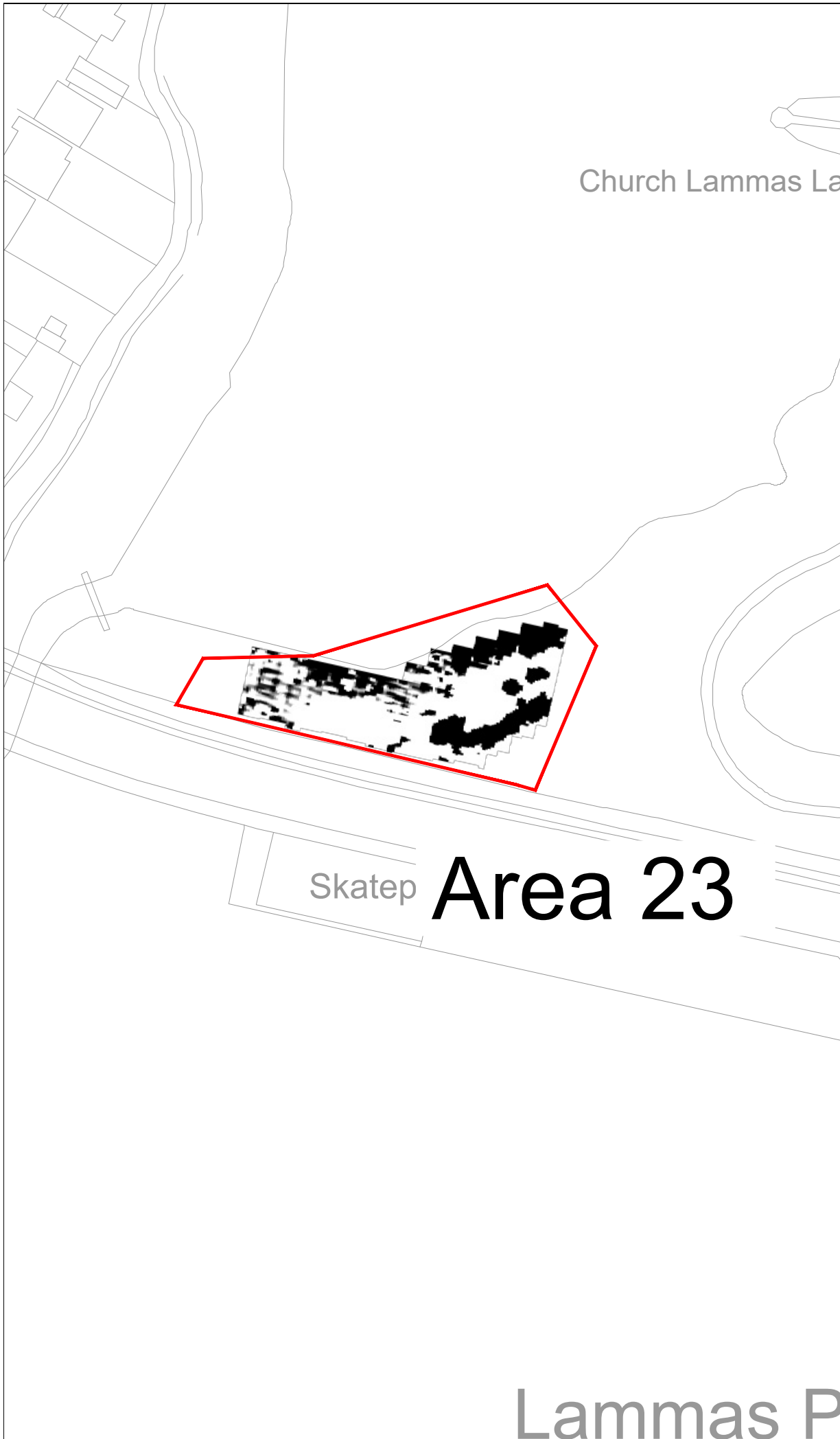


Fig No:
34



Title:
Minimally Processed Greyscale Plots and XY
Trace Plots (clipped at +/-30nT) - Area 23

Client:
Dalcour Maclaren

Project:
SUMO-20943: Iver to Egham Trunk Main

Scale:
0 metres 50
1:1000 @ A3

Fig No:
35

Appendix A - Technical Information: Magnetometer Survey Method

Grid Positioning

For hand held gradiometers the location of the survey grids has been plotted together with the referencing information. Grids were set out using a Trimble R8 Real Time Kinematic (RTK) VRS Now GNSS GPS system.

An RTK GPS (Real-time Kinematic Global Positioning System) can locate a point on the ground to a far greater accuracy than a standard GPS unit. A standard GPS suffers from errors created by satellite orbit errors, clock errors and atmospheric interference, resulting in an accuracy of 5m-10m. An RTK system uses a single base station receiver and a number of mobile units. The base station re-broadcasts the phase of the carrier it measured, and the mobile units compare their own phase measurements with those they received from the base station. This results in an accuracy of around 0.01m.

Technique	Instrument	Traverse Interval	Sample Interval
Magnetometer	Bartington Grad 601-2	1.0m	0.25m
Magnetometer	Bartington Cart System	1.0m	0.125m

Instrumentation:

Bartington instruments operate in a gradiometer configuration which comprises fluxgate sensors mounted horizontally, set 1.0m apart. The fluxgate gradiometer suppresses any diurnal or regional effects. The instruments are carried, or cart mounted, with the bottom sensor approximately 0.1-0.3m from the ground surface. At each survey station, the difference in the magnetic field between the two fluxgates is measured in nanoTesla (nT). The sensitivity of the instrument can be adjusted; for most archaeological surveys the most sensitive range (0.1nT) is used. Generally, features up to 1m deep may be detected by this method, though strongly magnetic objects may be visible at greater depths.

Bartington Grad 601-2

Hand-Held: Data will be collected using a Bartington Grad 601-2. The instrument consists of two paired sensors and readings are logged at 0.25m centres along traverses 1.0m apart across 30m grids. The collection of data at 0.25m centres provides an appropriate methodology balancing cost and time with resolution as per Historic England guidelines

Bartington Cart System

Data will be collected using a cart carrying four paired Bartington magnetic sensors. Each data point is geographically referenced using an on-board Trimble RTK survey grade GPS system. Readings will be taken at 0.125m centres along traverses 1.0m apart.

Data Processing

Zero Mean	This process sets the background mean of each traverse within each grid to zero.
Traverse	The operation removes striping effects and edge discontinuities over the whole of the data set.
Step Correction (De-stagger)	When gradiometer data are collected in 'zig-zag' fashion, stepping errors can sometimes arise. These occur because of a slight difference in the speed of walking on the forward and reverse traverses. The result is a staggered effect in the data, which is particularly noticeable on linear anomalies. This process corrects these errors.

Display

Greyscale/ Colourscale Plot	This format divides a given range of readings into a set number of classes. Each class is represented by a specific shade of grey, the intensity increasing with value. All values above the given range are allocated the same shade (maximum intensity); similarly, all values below the given range are represented by the minimum intensity shade. Similar plots can be produced in colour, either using a wide range of colours or by selecting two or three colours to represent positive and negative values. The assigned range (plotting levels) can be adjusted to emphasise different anomalies in the data-set.
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Interpretation Categories

In certain circumstances (usually when there is corroborative evidence from desk-based or excavation data) very specific interpretations can be assigned to magnetic anomalies (for example, *Roman Road, Wall, etc.*) and where appropriate, such interpretations will be applied. The list below outlines the generic categories commonly used in the interpretation of the results.

<i>Archaeology / Probable Archaeology</i>	This term is used when the form, nature and pattern of the responses are clearly or very probably archaeological and /or if corroborative evidence is available. These anomalies, whilst considered anthropogenic, could be of any age.
<i>Possible Archaeology</i>	These anomalies exhibit either weak signal strength and / or poor definition, or form incomplete archaeological patterns, thereby reducing the level of confidence in the interpretation. Although the archaeological interpretation is favoured, they may be the result of variable soil depth, plough damage or even aliasing as a result of data collection orientation.
<i>Industrial / Burnt-Fired</i>	Strong magnetic anomalies that, due to their shape and form or the context in which they are found, suggest the presence of kilns, ovens, corn dryers, metal-working areas or hearths. It should be noted that in many instances modern ferrous material can produce similar magnetic anomalies.
<i>Former Field Boundary (probable & possible)</i>	Anomalies that correspond to former boundaries indicated on historic mapping, or which are clearly a continuation of existing land divisions. Possible denotes less confidence where the anomaly may not be shown on historic mapping but nevertheless the anomaly displays all the characteristics of a field boundary.
<i>Ridge & Furrow</i>	Parallel linear anomalies whose broad spacing suggests ridge and furrow cultivation. In some cases, the response may be the result of more recent agricultural activity.
<i>Agriculture (ploughing)</i>	Parallel linear anomalies or trends with a narrower spacing, sometimes aligned with existing boundaries, indicating more recent cultivation regimes.
<i>Land Drain</i>	Weakly magnetic linear anomalies, quite often appearing in series forming parallel and herringbone patterns. Smaller drains may lead and empty into larger diameter pipes, which in turn usually lead to local streams and ponds. These are indicative of clay fired land drains.
<i>Natural</i>	These responses form clear patterns in geographical zones where natural variations are known to produce significant magnetic distortions.
<i>Magnetic Disturbance</i>	Broad zones of strong dipolar anomalies, commonly found in places where modern ferrous or fired materials (e.g. brick rubble) are present.
<i>Service</i>	Magnetically strong anomalies, usually forming linear features are indicative of ferrous pipes/cables. Sometimes other materials (e.g. pvc) or the fill of the trench can cause weaker magnetic responses which can be identified from their uniform linearity.
<i>Ferrous</i>	This type of response is associated with ferrous material and may result from small items in the topsoil, larger buried objects such as pipes, or above ground features such as fence lines or pylons. Ferrous responses are usually regarded as modern. Individual burnt stones, fired bricks or igneous rocks can produce responses similar to ferrous material.
<i>Uncertain Origin</i>	Anomalies which stand out from the background magnetic variation, yet whose form and lack of patterning gives little clue as to their origin. Often the characteristics and distribution of the responses straddle the categories of <i>Possible Archaeology / Natural</i> or (in the case of linear responses) <i>Possible Archaeology / Agriculture</i> ; occasionally they are simply of an unusual form.

Where appropriate some anomalies will be further classified according to their form (positive or negative) and relative strength and coherence (trend: weak and poorly defined).

Appendix B - Technical Information: Magnetic Theory

Detailed magnetic survey can be used to effectively define areas of past human activity by mapping spatial variation and contrast in the magnetic properties of soil, subsoil and bedrock. Although the changes in the magnetic field resulting from differing features in the soil are usually weak, changes as small as 0.1 nanoTeslas (nT) in an overall field strength of 48,000 (nT), can be accurately detected.

Weakly magnetic iron minerals are always present within the soil and areas of enhancement relate to increases in *magnetic susceptibility* and permanently magnetised *thermoremanent* material.

Magnetic susceptibility relates to the induced magnetism of a material when in the presence of a magnetic field. This magnetism can be considered as effectively permanent as it exists within the Earth's magnetic field. Magnetic susceptibility can become enhanced due to burning and complex biological or fermentation processes.

Thermoremanence is a permanent magnetism acquired by iron minerals that, after heating to a specific temperature known as the Curie Point, are effectively demagnetised followed by re-magnetisation by the Earth's magnetic field on cooling. Thermoremanent archaeological features can include hearths and kilns; material such as brick and tile may be magnetised through the same process.

Silting and deliberate infilling of ditches and pits with magnetically enhanced soil creates a relative contrast against the much lower levels of magnetism within the subsoil into which the feature is cut. Systematic mapping of magnetic anomalies will produce linear and discrete areas of enhancement allowing assessment and characterisation of subsurface features. Material such as subsoil and non-magnetic bedrock used to create former earthworks and walls may be mapped as areas of lower enhancement compared to surrounding soils.

Magnetic survey is carried out using a fluxgate gradiometer which is a passive instrument consisting of two sensors mounted vertically 1m apart. The instrument is carried about 30cm above the ground surface and the top sensor measures the Earth's magnetic field whilst the lower sensor measures the same field but is also more affected by any localised buried feature. The difference between the two sensors will relate to the strength of a magnetic field created by this feature, if no field is present the difference will be close to zero as the magnetic field measured by both sensors will be the same.

Factors affecting the magnetic survey may include soil type, local geology, previous human activity and disturbance from modern services.

Appendix C - OASIS Summary Sheet

OASIS Summary for sumogeop1-532143

OASIS ID (UID)	sumogeop1-532143
Project Name	Geophysical Survey at Iver to Egham Trunk Main
Sitename	Iver to Egham (north), Iver to Egham (south)
Sitecode	20943
Project Identifier(s)	20943
Activity type	Geophysical Survey, Magnetometry Survey, MAGNETOMETRY SURVEY
Planning Id	
Reason For Investigation	Planning: Pre application
Organisation Responsible for work	SUMO Geophysics Ltd.
Project Dates	17-Mar-2025 - 21-Mar-2025
Location	Iver to Egham (north) NGR : TQ 03938 80019 LL : 51.50955053667188, -0.503694330349541 12 Fig : 503938,180019 Iver to Egham (south) NGR : TQ 02715 72017 LL : 51.437847849646005, -0.523634475683922 12 Fig : 502715,172017
Administrative Areas	Country : England County/Local Authority : Buckinghamshire Local Authority District : Buckinghamshire Parish : Iver County/Local Authority : Surrey Local Authority District : Spelthorne Parish : Spelthorne, unparished area
Project Methodology	Detailed magnetic survey (magnetometry) was chosen as the most efficient and effective method of locating the type of archaeological anomalies which might be expected at this site. All survey techniques followed the guidance set out by ClfA (2020) and the European Archaeology Council (EAC) (2016). Bartington Grad 601-2 Traverse Interval 1.0m Sample Interval 0.25m
Project Results	A detailed magnetometer survey was conducted over approximately 8.5 hectares along the proposed Iver to Egham Trunk Main, and it has not identified any anomalies of archaeological interest. Modern made ground and areas of ferrous disturbance dominate the data.
Keywords	
Funder	Private or public corporation Dalcour Maclaren
HER	Buckinghamshire HER - unRev - STANDARD Surrey HER - unRev - STANDARD
Person Responsible for work	Rebecca Fradgley
HER Identifiers	
Archives	

Appendix D – Data Management Plan & Archive Selection Strategy

Data Management plan

Project ID / OASIS ID

SUMO-20943 / sumogeop1-532143

Project Name

Iver to Egham Trunk Main

Project Description

Detailed magnetic survey over approx. 20.5ha.

Client

Dalcour Maclaren

Project Manager

Rebecca Fradgley

Field Leader

Liam Brice-Bateman

Date DMP created

06.03.2025

Date DMP last updated

31.03.25

Version

2

Technique - data

Detailed magnetic survey.

Manual – cart - other

Handheld magnetometers.

Documentation and metadata

All documentation and data produced so far are stored on SUMO servers in a specific job file.

Data storage, access and back-up

- SUMO Secure server during the project life set up in a RAID configuration (a RAID configuration incorporates a level of data redundancy meaning if a single hard drive in fails data can still be restored).

- Snap shots of the data will be made at several intervals during the day to allow data to be restored for up to 30 days if changed / deleted.
- Once the final report has been completed data will be moved onto NAS drive set up in a RAID configuration.
- All data is backed up to an off-site location (Cloud storage).

ADS or other depository - Costs

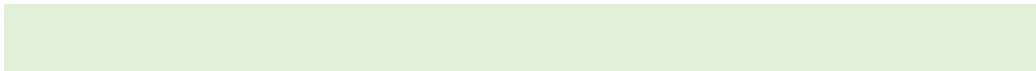
ADS has not been requested, all data, reports and corresponding documentation are securely stored by SUMO.

Digital files and data to be selected for archiving

- Raw data in XYZ format .csv and .png plus .pgw world file
- Processed data as .png plus .pgw world file
- Survey written report .pdf
- Survey photos .png

CAD and Vector graphics (interpretations) in .dwg format

Notes





- Archaeological Geophysics
- Engineering Geophysics
- Measured Building Services
- Utility and Topographic Services
- Aerial Surveys
- Rail Surveys

SUMO GeoSurveys is a trading name of SUMO Geophysics Ltd.
SUMO Services Ltd, incorporated under the laws of England and Wales,
Company Registration No.4275993.
Registered Office Unit 8 Hayward Business Centre, New Lane, Havant, Hampshire, PO9 2NL