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**GEOPHYSICAL SURVEY BY MAGNETOMETRY, LAND NEAR SHEPWAY CROSS,
LYMPNE, KENT**

Planning Reference: n/a

NGR: TR 126 350

DAS Site Code: LRSP19

OASIS Reference Number: TBC



Report prepared for Studying History & Archaeology in Lympne (SHAL)

By Darnley Archaeological Services

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Cover Image: View of site Area 2 looking south



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Forward - Background to the Lympe Roman Settlement Project

Lympe's Roman history, as we know it, originated with the construction of a port, known as *Portus Lemanis*, in a lagoon with an entrance to the sea near what is now West Hythe. From the documentary evidence, it is reasonable to assume that the port was associated with a naval base in the 2nd century AD.

Towards the end of the 3rd century, around 275AD, the Romans constructed a fort as one of the 13 Saxon Shore Forts built along the east and south coasts of England. The ruins of substantial walls are visible down the escarpment on a site known as Stutfall.

Prof. Sir Barry Cunliffe, who excavated the Roman fort between 1976-78, stated in his report that Lympe was a 'location of some significance' both early in the Roman period and later in the 4th century. Reasons for its importance lay both in the port's access to the Continent, and a Roman road network to Lympe. These included a direct link to Canterbury along Stone Street; the Clifftop road along the northern edge of the Weald via Ashford to Maidstone and onwards to London; and the third route to Dover. Further academic research by the University of Kent's Archaeology team (public lecture 2015) identified the importance of Lympe in an international context in the late Roman period. As the Romans' north-west empire was collapsing and their supply routes to the troops were being overrun, Lympe had a strategic role in sending grain from Britain to the Continent for the beleaguered Roman forces.

The evidence for Roman occupation at Lympe almost wholly relates to the fort, as the archaeological activity has centred on the Stutfall site with excavations by Roach-Smith in 1850 and Cunliffe in the 1970s. Cunliffe confirmed the layout of the fort and Roach-Smith's findings of a bathhouse and indicated that there should be evidence of a civilian settlement nearby. However, despite the importance of the port and later fort during the Roman period, and apart from the presence of Samian ware and a large hoard of Roman coins discovered during the 1970s, there has been no in-depth activity to search for a possible settlement until recently.

In 2014 Malcolm Davies, an experienced amateur archaeologist from London, approached SHAL (Studying History and Archaeology in Lympe) for support in carrying out geophysical surveys in this little researched geographical area. His main aim was to find the earlier fort and harbour, indicated by the discovery of an early Roman altar dedicated to Neptune (now in the British Museum) in the foundations of the east gate, together with several tiles marked CLBR. His geophysical surveys were mainly within the walls of the fort, using resistivity. SHAL members supported these surveys and participated in a trial trench excavation within Stutfall in May 2018, under the supervision of a professional archaeologist, Richard Taylor. The outcome of the excavation was inconclusive. Malcolm then turned his attention to the search for the road which would have led to the earlier fort on Stutfall, through a geophysical survey. However, no evidence for such a route has so far been found. Lloyd Bosworth from the University of Kent undertook a geophysical survey in 2015, with the resistivity not showing any features, and the magnetometry identifying routes within site but with no traces of a road connecting with the fort.

Malcolm's next focus was on fields to the north and east of Shepway Cross. SHAL had previously expressed interest in the visible landscape with a possible road running along the field boundary, and where brick, tile and pottery were visible on the ploughed field. Malcolm had also discovered that in previous years many Roman coins had been found in one of the fields. With the landowner's permission, he undertook further resistivity surveys. The results indicated that additional work was needed, and the services of Richard Taylor were sought to conduct an initial magnetometry survey,



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the results of which were very significant. A fieldwalking exercise on the same day by SHAL members revealed a considerable number of pieces of brick, tile and pottery.

In the past seven years, three sites west of Lympne are identified as Roman. Thanks to Malcolm Davies' initiatives, two sites, low-lying Marwood Farm near Aldington and Upper Park Farm near Court-at-Street were investigated.

At Marwood Farm in 2013, a small excavation was undertaken. Evidence indicates a single corridor villa/farm, on a site a few metres above a tidal inlet facing the lagoon, at which there was a large pottery assemblage, and an earthenware pot containing bones, with the pottery dated 100-125 AD. In 2014 Malcolm carried out a resistivity survey on a scheduled site at Upper Park Farm (about a mile west of Lympne). Excavation carried out in 1972 by Ashford Archaeological Group had found a tessellated floor, roof tiles and other Roman material and ragstone. Malcolm's survey revealed two buildings, with surface finds of tesserae indicating that there had been a mosaic floor, a small axe used as a votive offering, and a range of coins covering at least 300 years to 4th century AD. In 2017, with the assistance of SHAL members, Malcolm and Richard Taylor undertook further geophysical surveys to the north of the scheduled area to assess the extent of the site, the results of which were, unfortunately, less conclusive.

An external archaeology company excavated the third site at Otterpool (just under a mile NW of the fort) in 2018/9 in connection with the proposed significant housing development. The site was found to be a post-100 AD Roman villa with a rectangular layout, a Roman hypocaust for a heating system, and a coin dated 251 AD.

Findings from these three sites revealed a significant Roman presence across the W/SW landscape near the fort, which had hitherto been unknown. With this evidence, the initial results from the magnetometry and the finds by the authorised metal detectorist, SHAL engaged Richard Taylor to carry out a full series of magnetometry surveys in fields NE and E of the fort, which has revealed some intriguing results.



Guy Topham, SHAL



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Executive Summary

Darnley Archaeological Services (Richard Taylor) was commissioned by Studying History & Archaeology in Lympne (SHAL), to undertake a geophysical survey using magnetometry on land near Shepway Cross, Lympne, Kent. Three partial fields were surveyed as part of a research project undertaken by SHAL.

There is evidence for activity in the vicinity of the site during the Roman period, including scatters of Roman coins, small quantities of Roman pottery and ceramic building material.

A series of positive linear and curvilinear anomalies were identified occupying much of the area surveyed characteristic of a possible Iron Age enclosure to the south and a Roman ladder settlement to the north. Associated linear boundaries were also identified.



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1.0 Introduction

- 1.1 Darnley Archaeological Services (DAS) was commissioned by Studying History & Archaeology in Lympne (SHAL), to undertake a geophysical survey using magnetometry on land near Shepway Cross, Lympne, Kent, as part of a broader historical and archaeological study of the area.
- 1.2 The site survey and reporting conform to current national guidelines as set out in 'Geophysical Survey in Archaeological Field Evaluation' (English Heritage 2008), 'The Use of Geophysical Techniques in Archaeological Evaluations' (Gaffney et al. 2002) and the Chartered Institute for Archaeologists' Standard and guidance for archaeological geophysical survey' (CIfA 2014).

2.0 Site Location and Description

- 2.1 Shepway Cross is located in the administrative district of Folkstone & Hythe District Council, approximately 11km west of Folkstone, 3.5 km west of Hythe and 13km ESE of Ashford. The proposed survey site comprises three separate locations: (Area 1 centres on 612723, 135266; Area 2 centres on 612814, 134242; Area 3 centres on 612616, 135242).
- 2.2 The bedrock geology comprises sandstone and limestone of the Hythe Formation, overlain by superficial geological head deposits of clay and silt (<http://mapapps.bgs.ac.uk/geologyofbritain/home.html>).

3.0 Planning Background

- 3.1 No planning applications on the site are known to exist.

4.0 Archaeological and Historical Background

A detailed study of the Kent Historic Environment Record database¹ was undertaken to assist the analysis, discussion and conclusions to the geophysical results. The following provides each entry's HER Number and brief description:

4.1 Prehistoric

TR13NW47 - Prehistoric flint artefacts discovered in the field [north of Areas 1 & 3].

4.2 Roman

TR13SW5 – Stutfall Castle; the surviving remains belong to a fort of the Saxon Shore dating from c.AD 270. The remains were investigated by Charles Roach Smith and more recently by Barry Cunliffe. There is sufficient evidence to suggest that there

¹ The Historic Environment Record (HER) is an extensive collection of information relating to Kent's heritage. The database contains information about 40,000 archaeological discoveries and 18,000 listed buildings, landscapes, excavations and library sources. The HER also contains more than 6,500 archaeological reports as well as aerial photographs and maps.



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was an earlier occupation with military connotations. The present fort appears to have been abandoned c.AD 350 based on pottery and coin evidence.

TR13SW44 – Possible enclosure and ditches [Area 2] reported from a geophysical survey carried out in 1992.

TR13NW14 – Romano-British pottery and coins recovered from the field [Area 1a] in 1992.

TR13NW50 – Roman pottery, coins and tile recovered from the field [Area 3] in 1993-4

TR13NW48 – Roman pottery and tile recovered from the field [Area 1b] in 1992

Anglo-Saxon

TR13SW15 – describes the discovery of an Anglo-Saxon vase, but nothing else.

TR13NW54 – possible burials or inhumation cemetery indicated by seventh-century pots at Shepway Cross in 1992

Medieval

TR13SW66 – Lympne Castle, a grade I fortified manor house dating from C13, mid C14 and C15. Restoration and additions 1907 and 1911-12.

Post Medieval

TR13SW38 – Shepway Cross war memorial, a grade II listed building from 1923.

TR13SW18 – C16 beacon site [east of Area 2].

TR13SW95 – WWII pillbox [south of Area 2]

MKE88434 – Oathill, a multi yard farmstead dating from c.AD1800 [east of Area 2]

Scant supplementary artefact or documentary evidence for the area is available, the exception being Sam Moorhead (BM) was part of a small excavation during the 1980s & 1990s (Ashford Group) in Area 1 whose efforts amassed over 600 Roman coins. What is known about the coins is that the majority were dated to AD 330 to AD 380, which is a narrow grouping. A similar grouping of coins has been known to relate to the presence of Roman authorities working to extract agricultural produce for the *Annona militaris*, but presently, and without further investigation, this is a conjectural viewpoint relating to the role and function of the site.

In summary, the Kent Historic Environment Record database reveals likely continuity of human settlement in and around Lympne, from Late Prehistoric to the present



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day. The concentration of Roman finds located within the Areas surveyed by magnetometry suggest a high probability of archaeological remains associated with Roman settlement. Moreover, given the continuity of settlement over time, there is a medium to a high probability of archaeological remains within the Areas associated with other (i.e. Later Prehistoric, Anglo-Saxon, Medieval and Post-Medieval) periods of human activity.



(Figure 2 – Area 1 looking northeast)

5.0 Methodology

- 5.1 The geophysical survey consisted of a detailed gradiometer survey of the area made available, extending approximately 16 hectares.
- 5.2 The fieldwork was carried out by a team of experienced geophysicists (Richard Taylor & Fred Birkbeck) from Darnley Archaeological Services & Kent Archaeological Society, assisted by members of SHAL, on 15 & 29 March, 26 April, 21 June, 29 August, 11 October & 4 December 2019. The survey was accurately located and tied into the National Grid using a Leica GS18T RTK NetRover GPS.
- 5.3 The survey was carried out using a Bartington Grad601-2 Dual Fluxgate Gradiometer with an onboard automatic data logger. This instrument is a highly stable magnetometer which utilises two vertically aligned fluxgates, one positioned 1m above the other. This arrangement is then duplicated and separated by a 1m cross bar. The arrangement allows for rapid assessment of the archaeological potential of the site. Data storage from the two fluxgate pairs is automatically combined into one file and stored using the onboard data logger.



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- 5.4 Data collection was undertaken in a zig-zag traverse pattern, using a sample interval of 0.25m and a traverse interval of 1m.

Summary of Survey Parameters

5.5 Fluxgate Magnetometer

Instrument:	Bartington Grad601-2 Dual Fluxgate Gradiometer
Sample Interval:	0.25m
Traverse Interval:	1.0m
Traverse Separation:	1.0m
Traverse Method:	Zig-zag
Resolution:	0.01nT
Processing Software:	Terrasurveyor version 3.0.35.10
Surface Conditions:	Established Pasture & Freshly Cultivated
Area Surveyed:	16 Hectares (Area 1 = 6.4 ha; Area 2 = 7.6 ha; Area 3 = 2 ha)
Dates Surveyed:	15 & 29 March, 26 April, 21 June, 29 Aug, 11 Oct & 4 Dec 2019
Surveyor:	Richard Taylor
Survey Assistants:	Members of SHAL
Data Interpretation:	Fred Birkbeck

Data Collection and Processing

- 5.6 The grids were marked out with tape measures and recorded using a Leica GS18T RTK NetRover GPS. Magnetic data was collected on a west-east alignment. The data collected from the survey has been analysed using Terrasurveyor 3.0.35.10. The resulting data plots are presented with positive nT/m values and high resistance as black and negative nT/m values and low resistance as white.
- 5.7 The data sets have been subjected to processing using the following filters:
- Clipping
 - De-Striping
 - De-Spiking
 - Interpolate
- 5.8 The De-Striping process – when data from a magnetometer survey conducted in a zig-zag pattern are processed, they can exhibit alternating bands of light and dark traverses caused by the direction sensitivity of the survey machine. The De-Stripe



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function assumes that the directional error is constant and sets the mean of all traverses to either zero or a value typical to all traverses.

- 5.9 Clipping – the clip function removes extreme data values by replacing the min and max readings with either absolute values or by +/- standard deviations.
- 5.10 De-Spike – ferrous objects on or under the ground surface cause anomalously strong spikes in plotted data. The de-spike function detects and replaces these readings with a mean filter.
- 5.11 Interpolate – the interpolate function increases the resolution of plotted data by generating extra data points between every existing data point in both X and Y directions.

6.0 Results

- 6.1 To interpret the anomalies, the survey data has been processed to the values of -3 to 3 nT/m (Figures 5, 6, 8, 12 & 16). This enhances faint anomalies that may otherwise not be noted in the data, with several anomalies identified across the data set, and these are discussed in turn and noted as single or double-digit numbers.

Area 1

- 6.2 At the southern side of survey Area 1 is (1), a group of positive rectangular linear anomalies that are suggestive of boundary ditches, foundation or robber trenches associated with structures or buildings characteristic of the distinctive form of late Iron Age/Romano-British 'Ladder Settlements' based around a linear trackway. One possible extent of a trackway is a positive linear (enclosure boundary) anomaly heading due north (5), with (1) to the east side of the trackway.
- 6.3 Additional positive rectangular linear anomalies suggestive of boundary ditches, foundation or robber trenches (2) are found to the west of the possible trackway (5).
- 6.4 Toward the eastern side of survey Area 1 is (3), a positive curvilinear anomaly which continues into the adjacent woodland, and characteristic of an enclosure.
- 6.5 At the northern end of survey Area 1 is (4), which appears to be a series of positive rectangular linear anomalies suggestive of boundary ditches, foundation or robber trenches, which suggest the 'Ladder Settlement' continues for approximately 400m further north.
- 6.6 Scattered throughout survey Area 1 are several positive curvilinear anomalies of varying sizes. Depending on both size and shape, these anomalies can range from postholes, pits or other soil-filled hollows. However, there are several positive curvilinear anomalies (6) amongst the 'Ladder Settlement' linear anomalies, suggesting the likelihood of pits associated with possible habitation or industry.
- 6.7 At the southern edge of survey Area 1 is (9), a large area of magnetic noise. These are likely to relate to ferrous waste, areas of burning and other detritus accumulating around an area of a known demolition site of Beacon House, which was present on the 1929-1952 OS Map.
- 6.8 Toward the center of survey Area 1 is a large field drain or service pipe (10), which extends east-west across the site and likely turns south towards the Aldington Road.



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- 6.9 Areas of magnetic noise are present in the northern and southern extents of the site, especially in and around the 'Ladder Settlement' area. These are likely to relate to a combination of ferrous waste, thermoremanent material and other detritus accumulating around the margins of a probable settlement or industrial area.
- 6.10 Scattered randomly throughout survey Area 1 are several strong and weak dipolar responses, examples of which are highlighted as (11). The characteristic dipolar responses of pairs of positive and negative 'spikes' suggest near-surface ferrous metal or other highly fired material in the plough soil.

Area 2

- 6.11 At the northwestern side of survey Area 2 is (12), two positive curvilinear anomalies that are suggestive of a fluted entrance way up to 12metres wide, leading into what may be a large enclosure. To the west of (12) appears a group of positive rectangular linear anomalies (13) that are suggestive of boundary ditches, foundation or robber trenches and probably the southern extent of the 'Ladder Settlement'. The results seem to show that (13) truncates (12), implying that the possible fluted entranceway is earlier than the 'Ladder Settlement'.
- 6.12 Extending from the southwestern corner of survey Area 2 is a right-angled and very strong positive linear anomaly (14) and appears to show the remains of a large enclosure, at least 50 meters across. The results seem to show that (14) also truncates (12), implying that the possible fluted entranceway is earlier than the enclosure, and the latter is perhaps contemporary with the 'Ladder Settlement'.
- 6.13 At the northern side of survey Area 2 is (15), two positive linear anomalies that are suggestive of a trackway up to 8 meters wide, heading south into what appears to be a large enclosure area to the east of (14). (16), a right-angled positive linear anomaly, appears to respect (15) on its eastern flank, creating an enclosure, bounded by (17), a further strong positive curvilinear anomaly to the south.
- 6.14 At the eastern side of survey Area 2 is (18), a discrete right-angled positive linear anomaly that appears to form a further enclosure. To the east of (18) are several significant positive anomalies which may represent pits or quarrying and have since become soil-filled. Interesting though these anomalies have positive curvilinear anomalies either surrounding or adjacent to these pits.
- 6.15 To the east of (16) is a faint positive straight linear anomaly (20), which may be a modern pathway.
- 6.16 (21), (22), (23) and (24) are separate areas of magnetic noise and likely relate to a combination of ferrous waste, thermoremanent material and other detritus accumulating around the margins of a probable settlement, as defined by the various linear anomalies.
- 6.17 Scattered randomly throughout survey Area 2 are several strong and weak dipolar responses (annotated in orange). The characteristic dipolar responses of pairs of positive and negative 'spikes' suggest near-surface ferrous metal or other highly fired material in the plough soil.



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Area 3

- 6.18 Towards the western side of survey Area 3 is (25) a large rectangular positive anomaly which sits within (26), a further series of positive rectangular linear anomalies suggestive of boundary ditches, foundation or robber trenches, similar to (2) and found to the west of the possible trackway (5). To the east of (26), there is evidence for a large section of the central trackway (27) around which the 'Ladder Settlement' is based.
- 6.19 At the centre of survey Area 3 is (31), a sizeable dipolar reading within an enclosed area of (26), that suggests an area of highly fired or thermoremanent material, such as a furnace or oven. There are similar dipolar readings (28) and (29) toward the north of survey Area 3, which exhibit similar properties to (31).
- 6.20 Toward the southeastern corner of survey Area 3 is a large area of magnetic noise and likely relate to a combination of ferrous waste, thermoremanent material and other detritus accumulating around the margins of (26).

7.0 Discussion and conclusion

- 7.1 The investigation revealed what appears to be a late Iron Age/Romano-British 'Ladder Settlement' based around a linear trackway, visible in parts in all three survey Areas. In addition to the visible component enclosures attached either side of a central trackway or thoroughfare, several external linear and curvilinear features are visible in survey Areas 1 and 3, around the settlement, which may indicate farming or agricultural activity. Moreover, the concentrations of magnetic noise and dipolar responses suggest near-surface ferrous metal or other highly fired material in the plough soil, much of which may be modern agricultural detritus, but a portion of which may be contemporary with the Roman/British settlement.
- 7.2 Also, the investigation in survey Area 2 revealed potential Iron Age earthworks in the form of a possible fluted entranceway, which is truncated by the southern end of the 'Ladder Settlement', and what appears to be a part of a separate sizeable rectangular enclosure to the south. At this time, the 'Ladder Settlement' and the large rectangular enclosure to the south are thought to be contemporary.
- 7.3 Within survey Area 2 there are other large additional enclosures, and a significant trackway, none of which can yet be identified as contemporary with the likely Iron Age or Romano/British features, but certainly add to a potential picture of a continually-extended settlement east over some time, perhaps post-Roman/British.
- 7.4 Given Area 1 amassed over 600 Roman coins in the 1980s dated AD 330 to AD 380, it is known that similar grouping of coins found in settlements relates to the presence of Roman authorities working to extract agricultural produce for the *Annona militaris*. However, without further investigation, this is a conjectural viewpoint relating to the possible role and function of the site.



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- 7.5 In conclusion, the investigation has identified a complex site containing a multifarious series of anomalies with considerable potential for future research. At this stage, it is recommended that a strategy is formulated by SHAL to plan a small number of targeted evaluation trenches which, once excavated, may help determine the age and identity of anomalies within the survey Areas.

8.0 Effectiveness of Methodology

- 8.1 The non-intrusive evaluation employed was particularly appropriate to the scale and nature of the site to be surveyed. Magnetometry was the prospection technique best suited to the identification of archaeological remains on site. Other techniques would have required further justification and may have proved too time-consuming. However, any prospect of future archaeological evaluation trenching may benefit from additional small-scale resistivity survey over targeted areas that may indicate the presence of stone structures.

9.0 Acknowledgements

- 9.1 Sincere thanks are extended to the following SHAL members for their direction and assistance during the fieldwork and survey process: Guy Topham; Fiona Jarvest; Dave Earnshaw; Pam Clark; Georgina Donaldson; John East; Judith East; Martin Bryer; Mike Pearson; Rosemary Stutchbury; Alison Jackson; Yasser Rustom and Simon Read (metal detecting). Thanks also to Ian Plummer of the Shorne group.
- 9.2 Both Richard Taylor and SHAL wish to extend their gratitude to the landowners, Michael Owen and William Hurley, for their kind permissions and access to the site.

10.0 References

CIfA, 2014, Standard and guidance for archaeological survey, Chartered Institute for Archaeologists, Reading

English Heritage, 2008, Geophysical Survey in Archaeological Field Evaluation, English Heritage

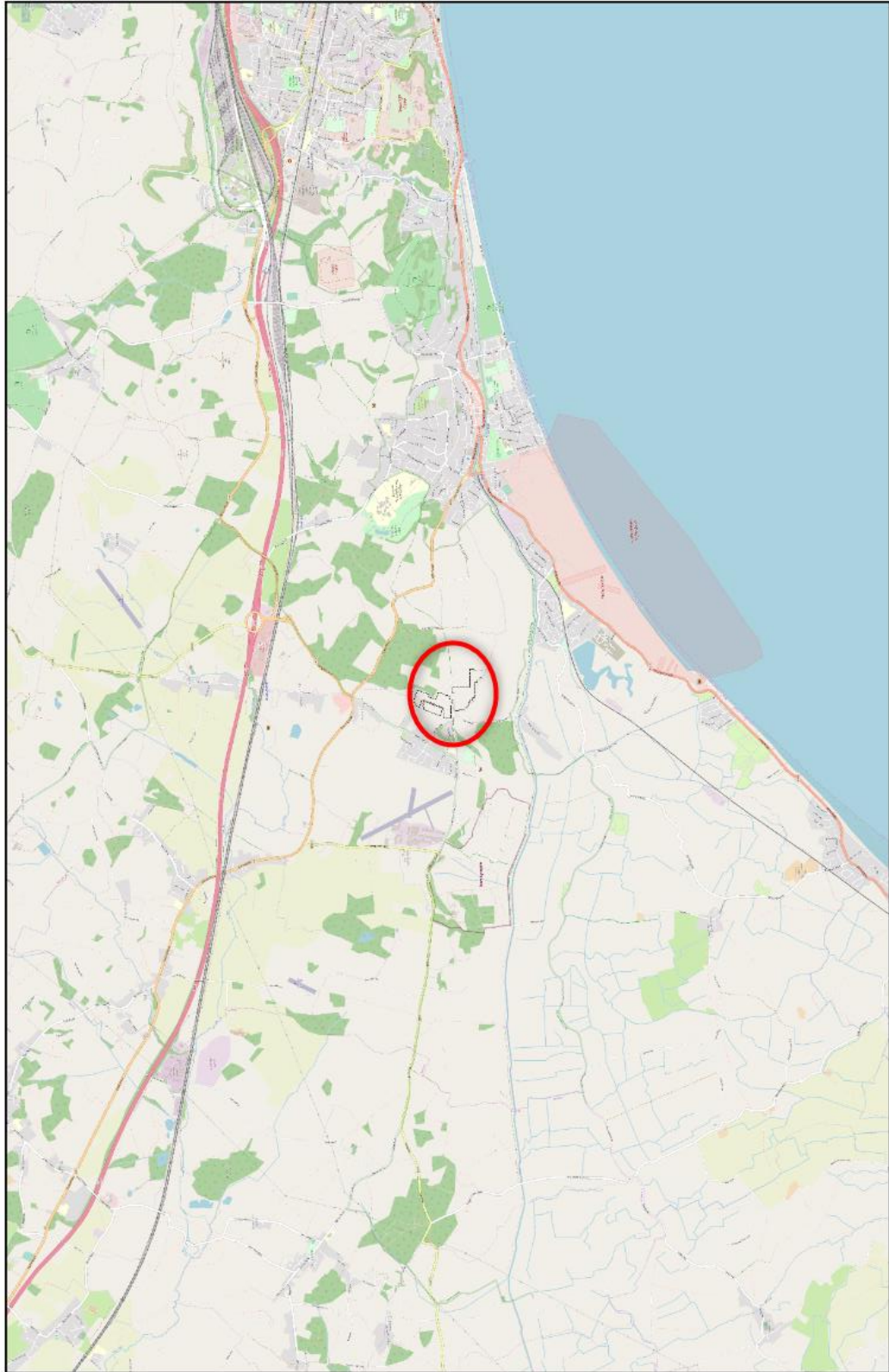
Gaffnet C., Gater J., and Ovenden S., 2002 the Use of Geophysics Techniques in Archaeological Evaluations. IFA No. 6 The Institute of Archaeologists

Webapps.kent.gov.uk/KCC.ExploringKentsPast.Web.Sites.Public



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Lympne Roman Settlement Project - 1:25,000 Location



(Figure 3: Site location outlined in red)





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Key:	
Area 1	Site boundary
	Area 1b greyscale data
	Area 1a greyscale data
Area 2	Site boundary
	Area 2 greyscale data
Area 3	Site boundary
	Area 3 greyscale data

Site code - LRSP19
Scale - 1:6000 @ A4
Drawn By - R Taylor
Date - 9 March 2020

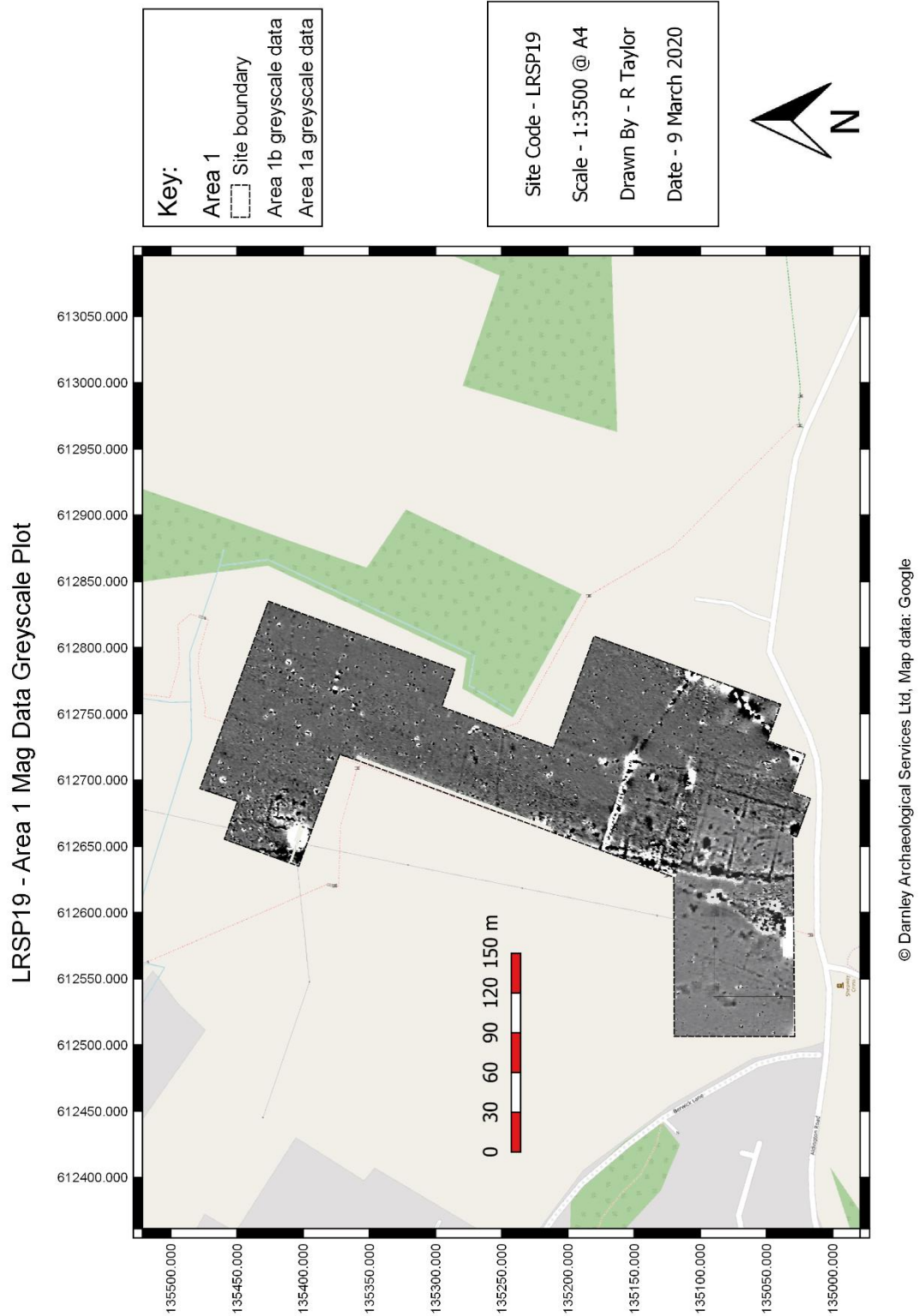


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(Figure 5 – Processed greyscale plot)



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(Figure 6 – Area 1 mag data greyscale plot)



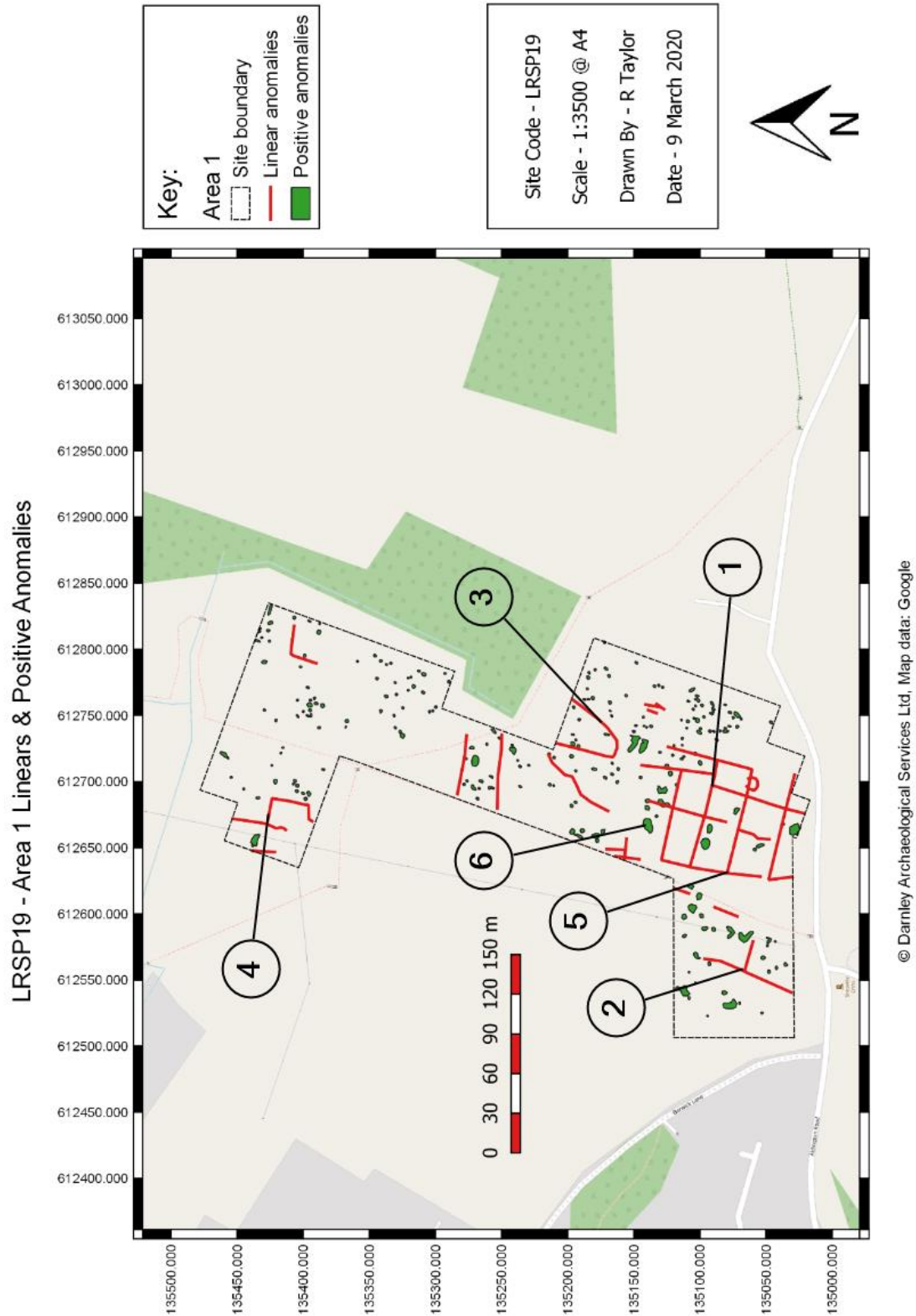
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(Figure 7 – Area 1 linears & positive anomalies)



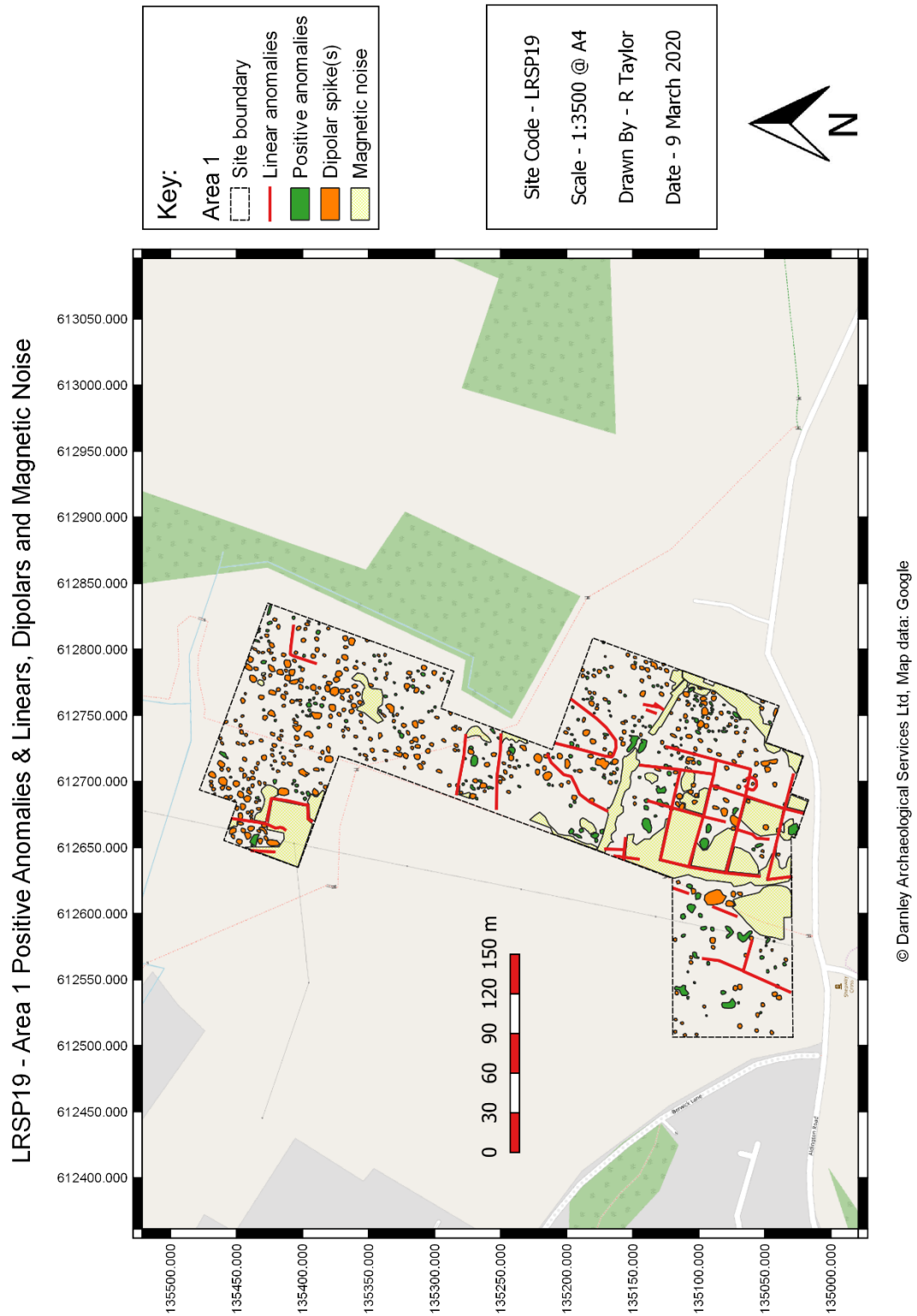
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(Fig 8 – Area 1 interpretations for linears & positive anomalies)



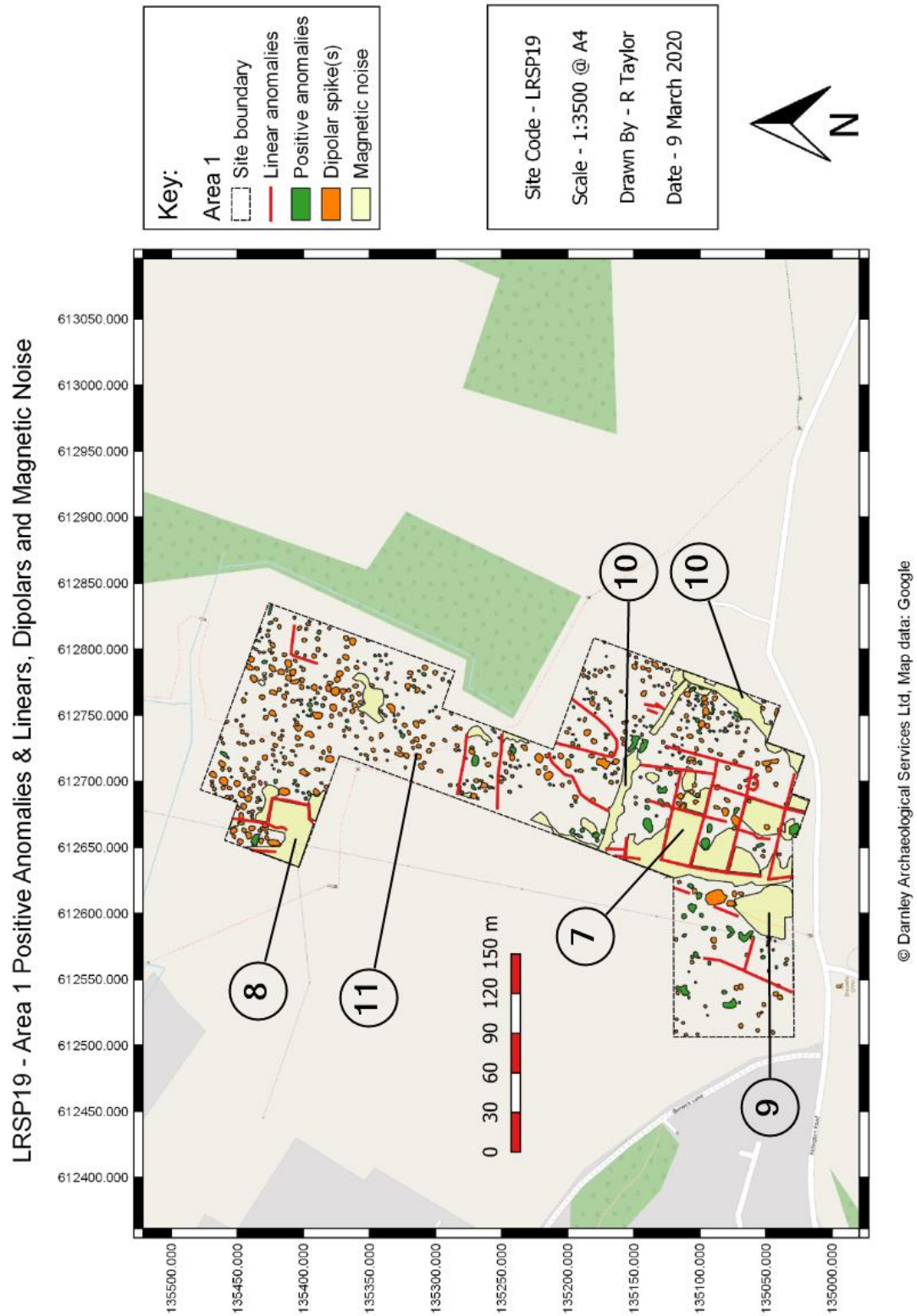
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(Figure 9 – Area 1 positive anomalies, linears, dipolars and magnetic noise)



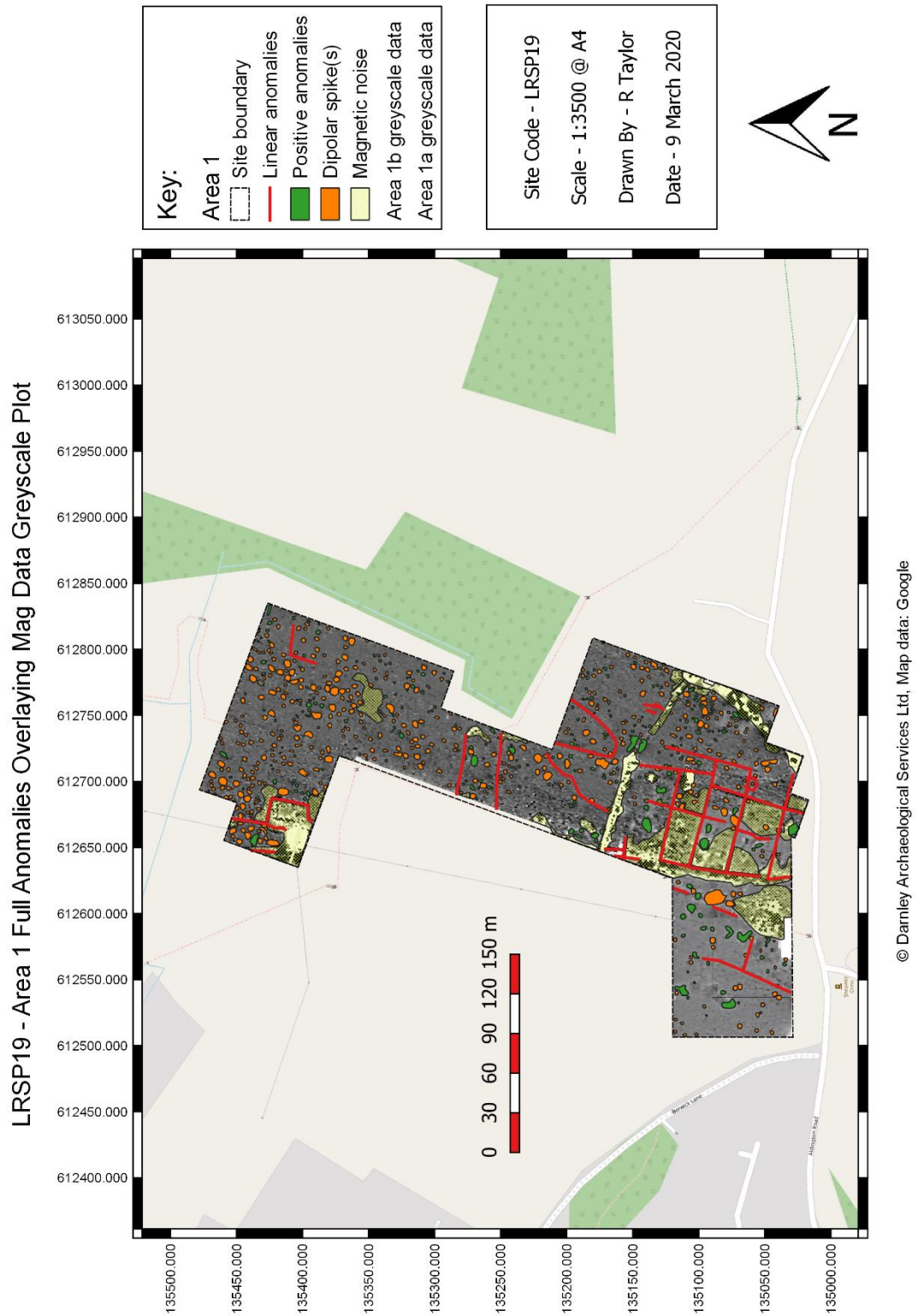
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(Figure 10 – Area 1 interpretations for dipolars and magnetic noise)



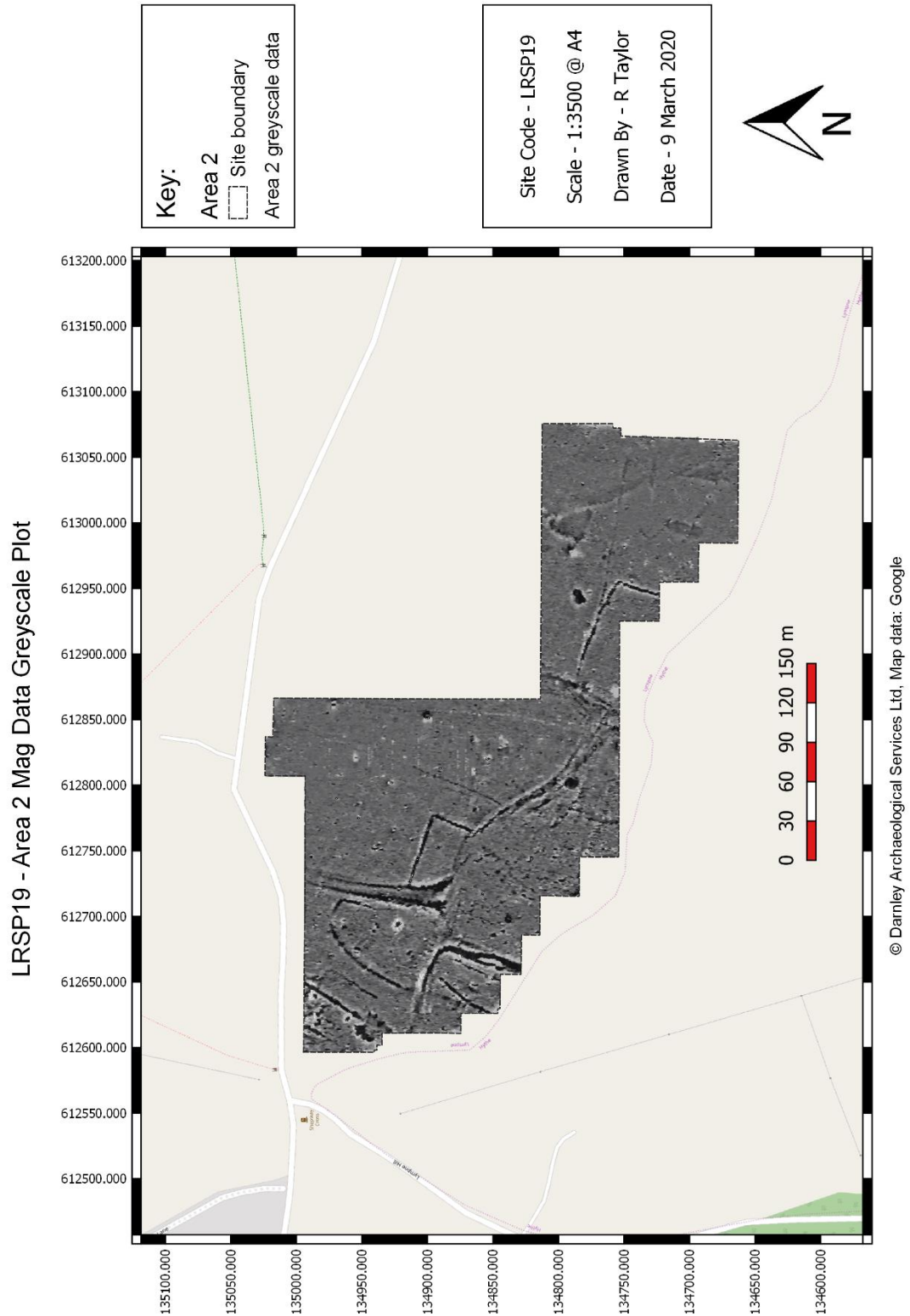
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(Figure 11 – Area 1 full anomaly coverage overlaying mag greyscale data)



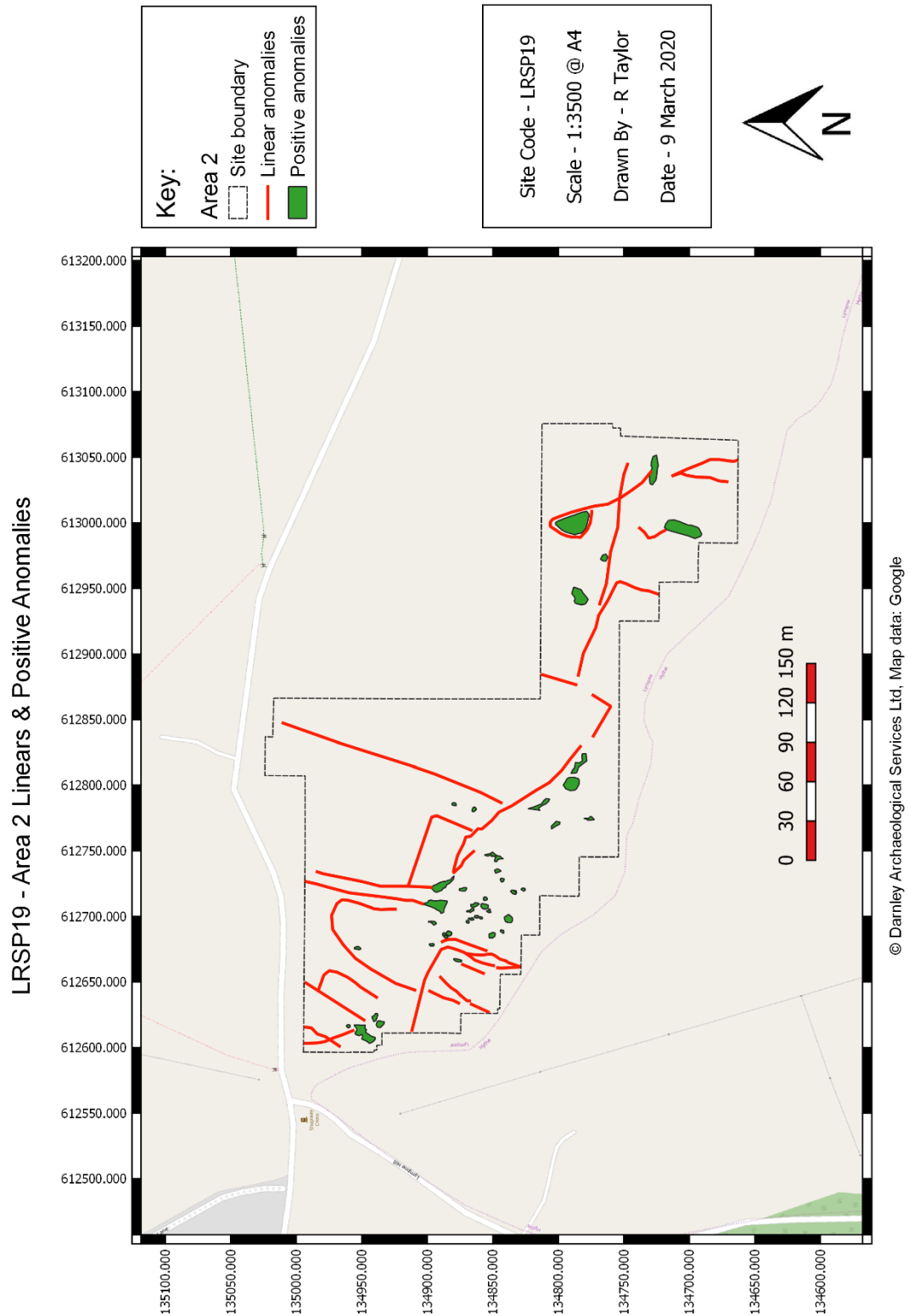
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(Figure 12 – Area 2 mag data greyscale)



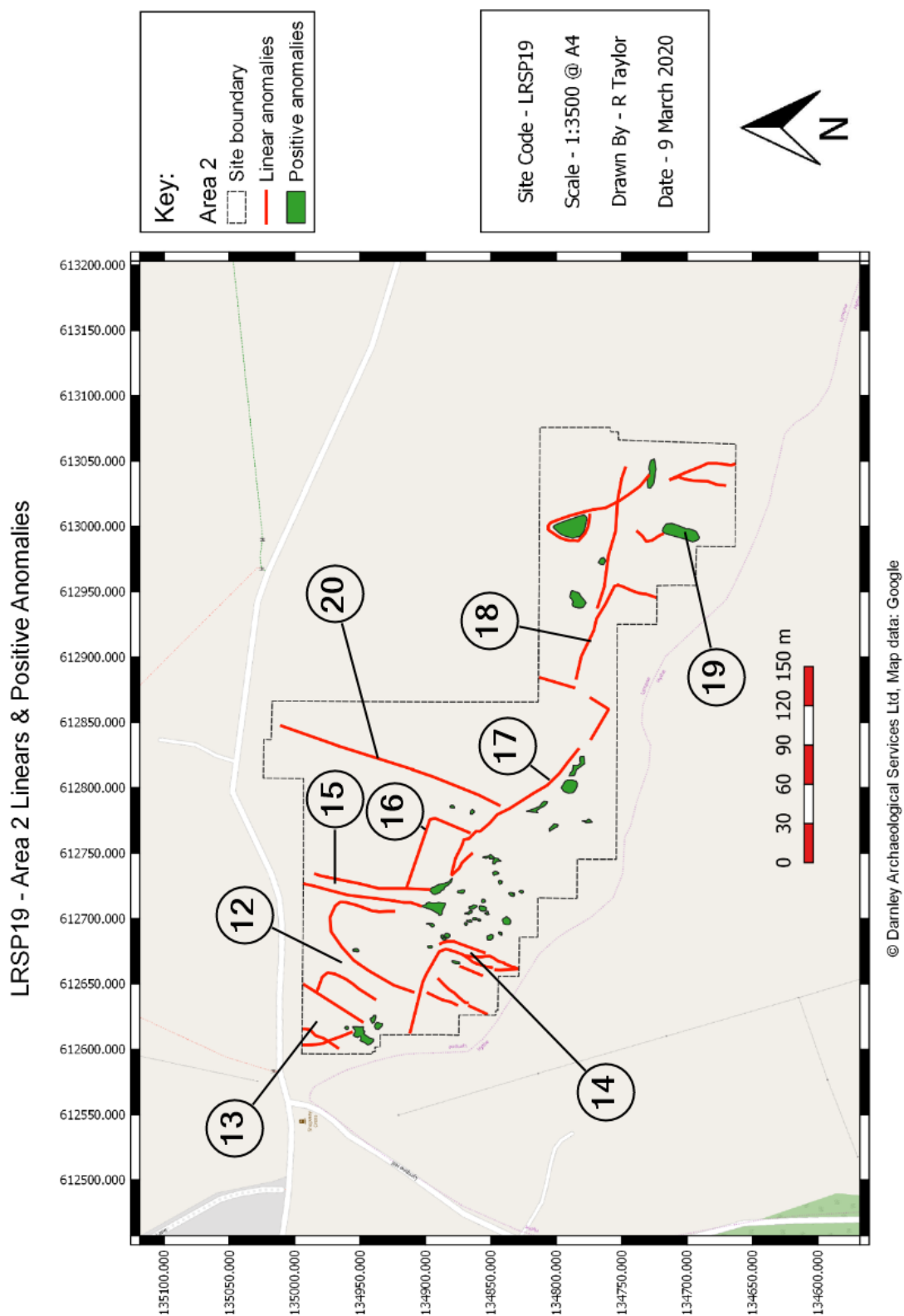
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(Figure 13 – Area 2 linears & positive anomalies)



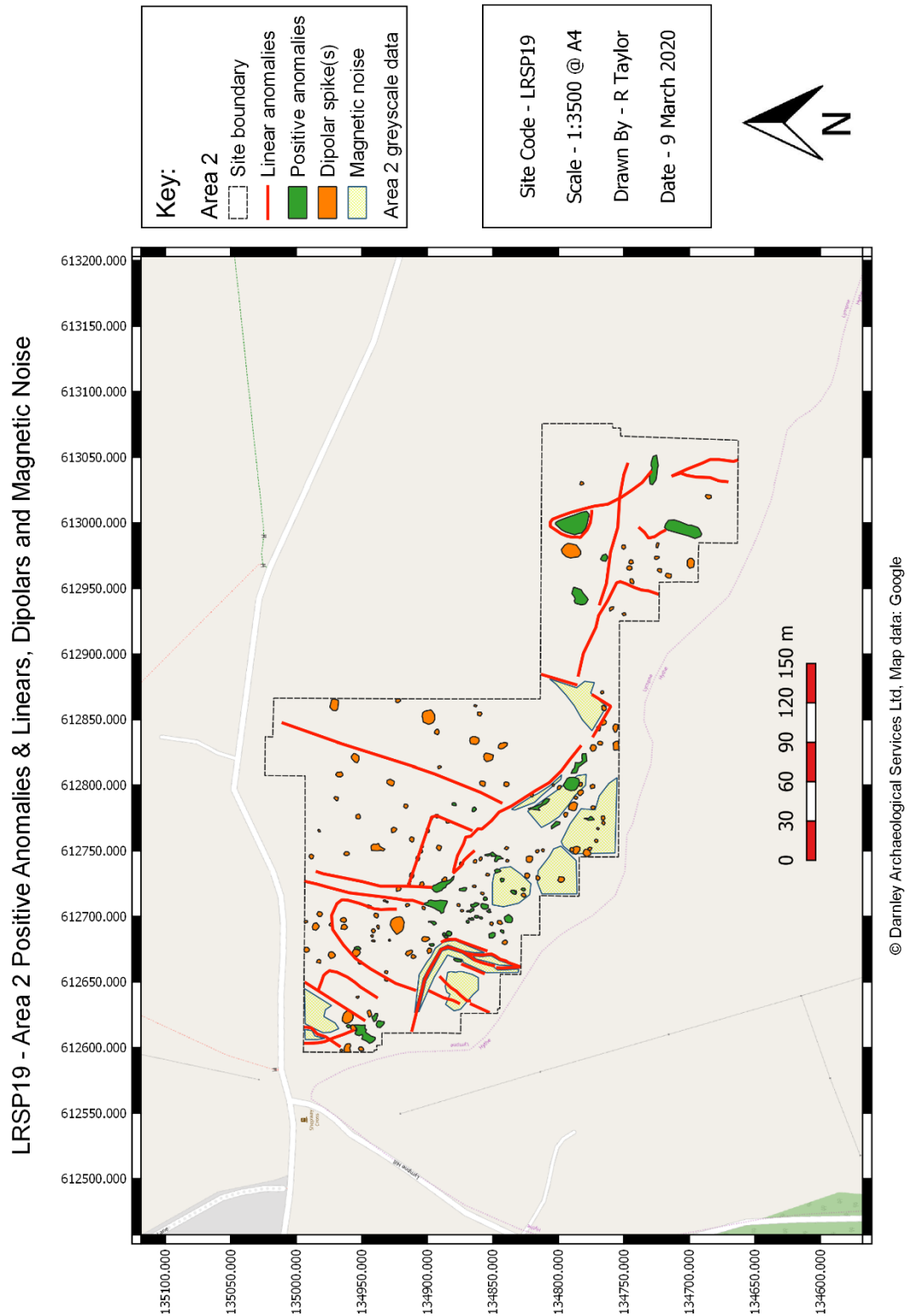
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(Figure 14 – Area 2 interpretations for linears & positive anomalies)



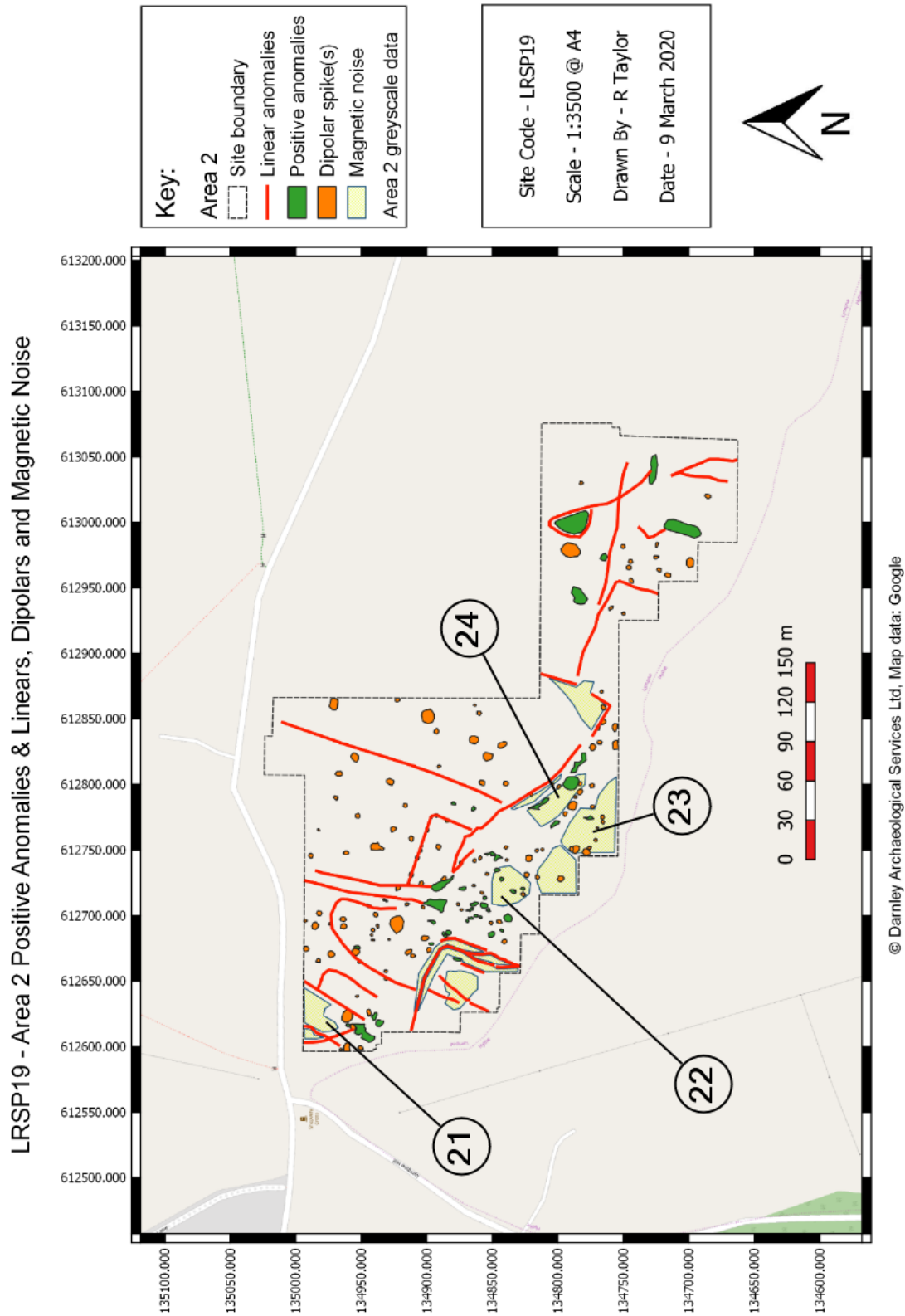
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(Figure 15 – Area 2 positive anomalies, linears, dipolars and magnetic noise)



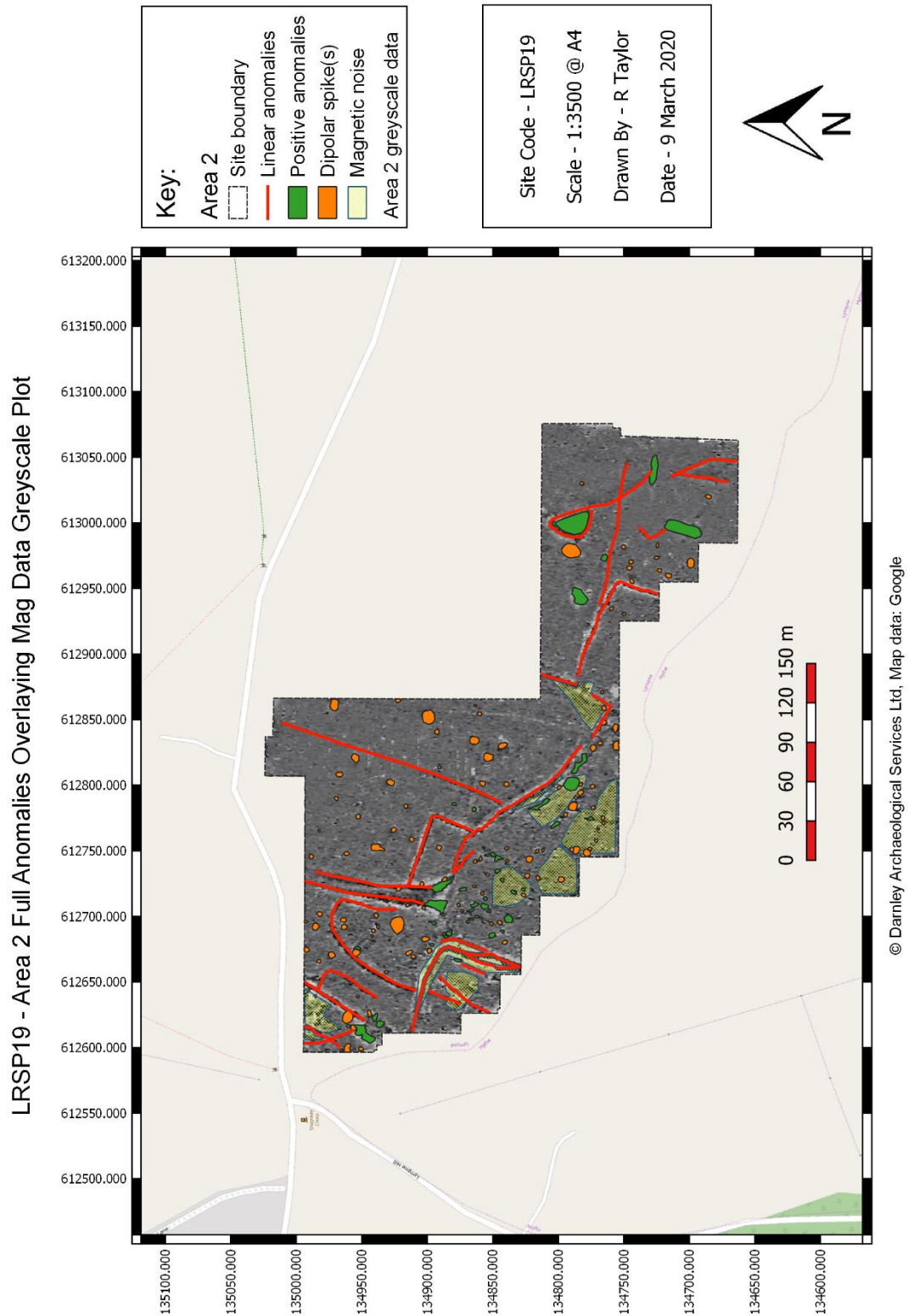
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(Figure 16 – Area 2 interpretation dipolars and magnetic noise)



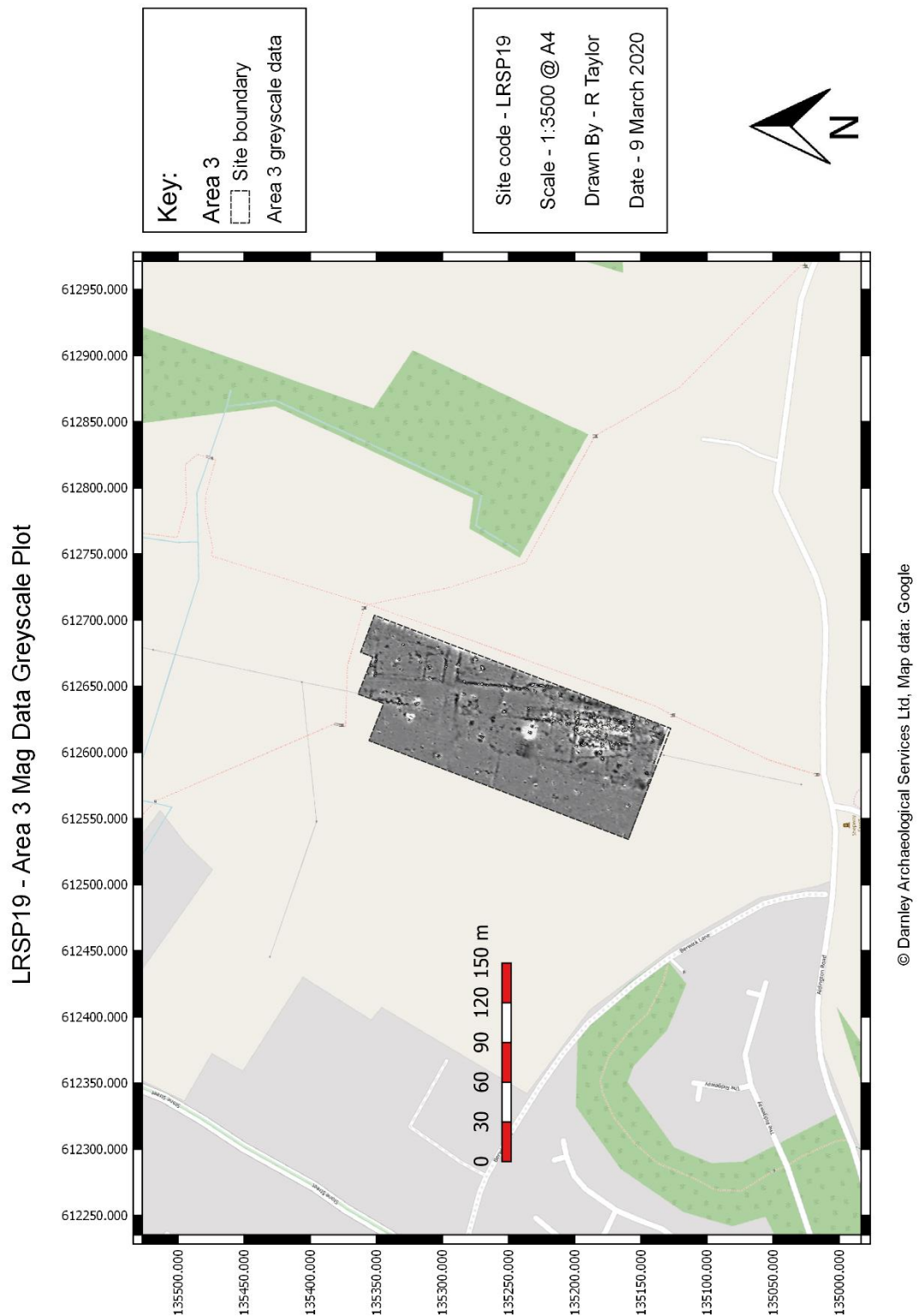
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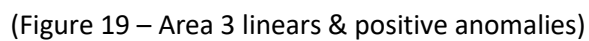
(Figure 17 – Area 2 full anomaly coverage overlaying mag greyscale data)



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(Figure 18 – Area 3 processed greyscale plot)





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(Figure 20 – Area 3 interpretation of linears and positive anomalies)



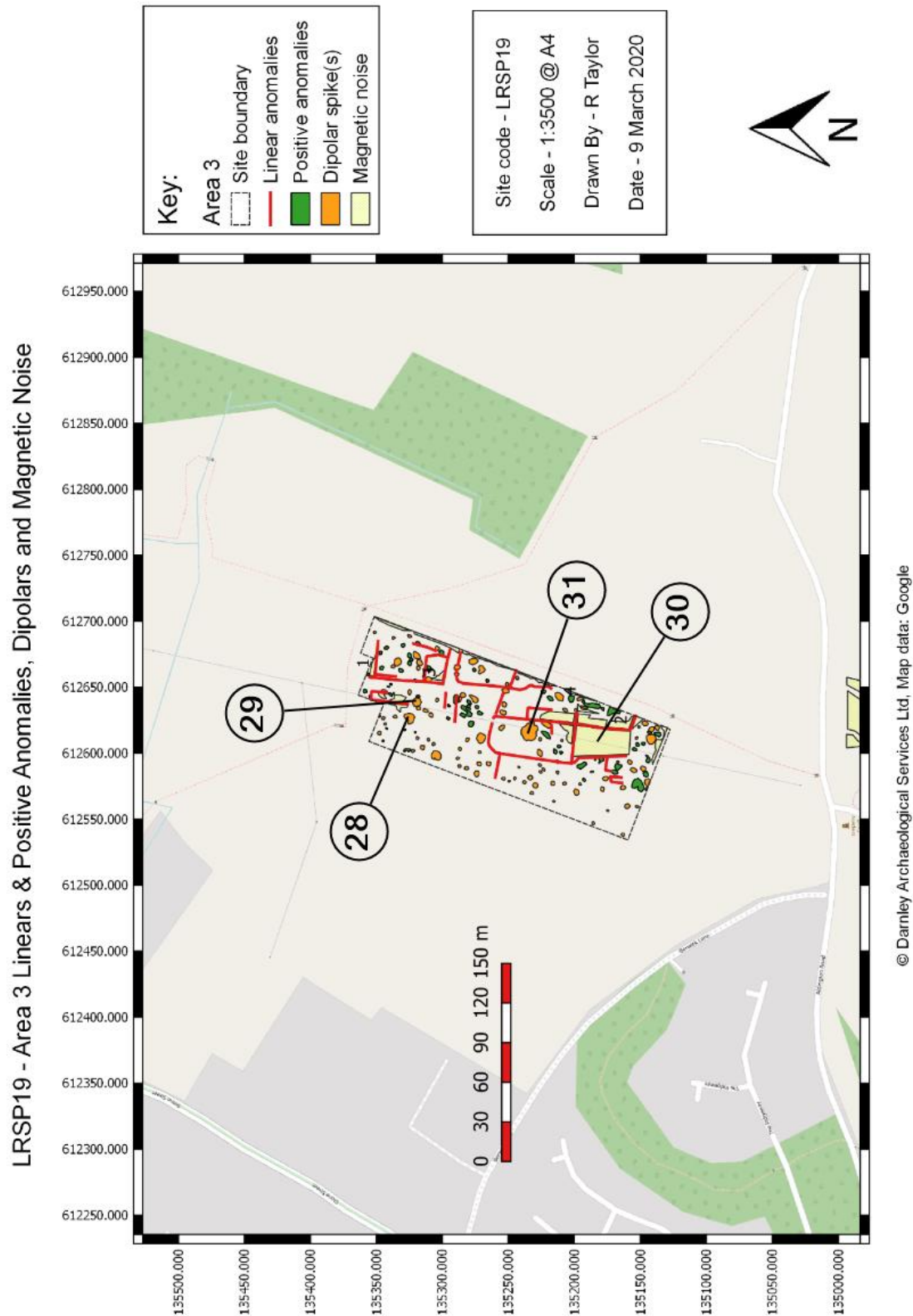
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(Figure 21 – Area 3 linears, positive anomalies, dipolars and magnetic noise)



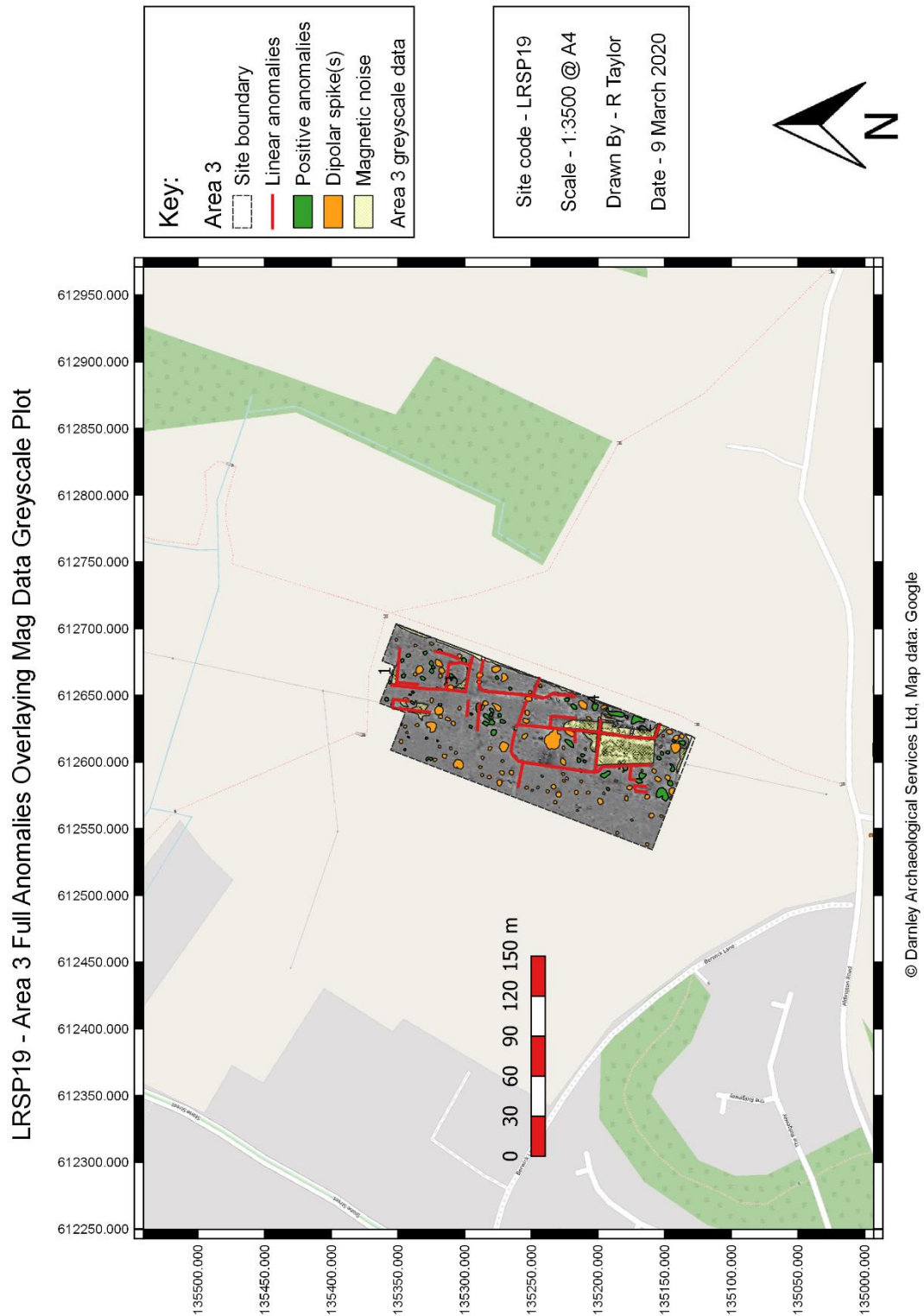
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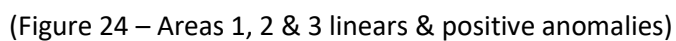
(Figure 22 – Area 3 interpretation dipolars and magnetic noise)



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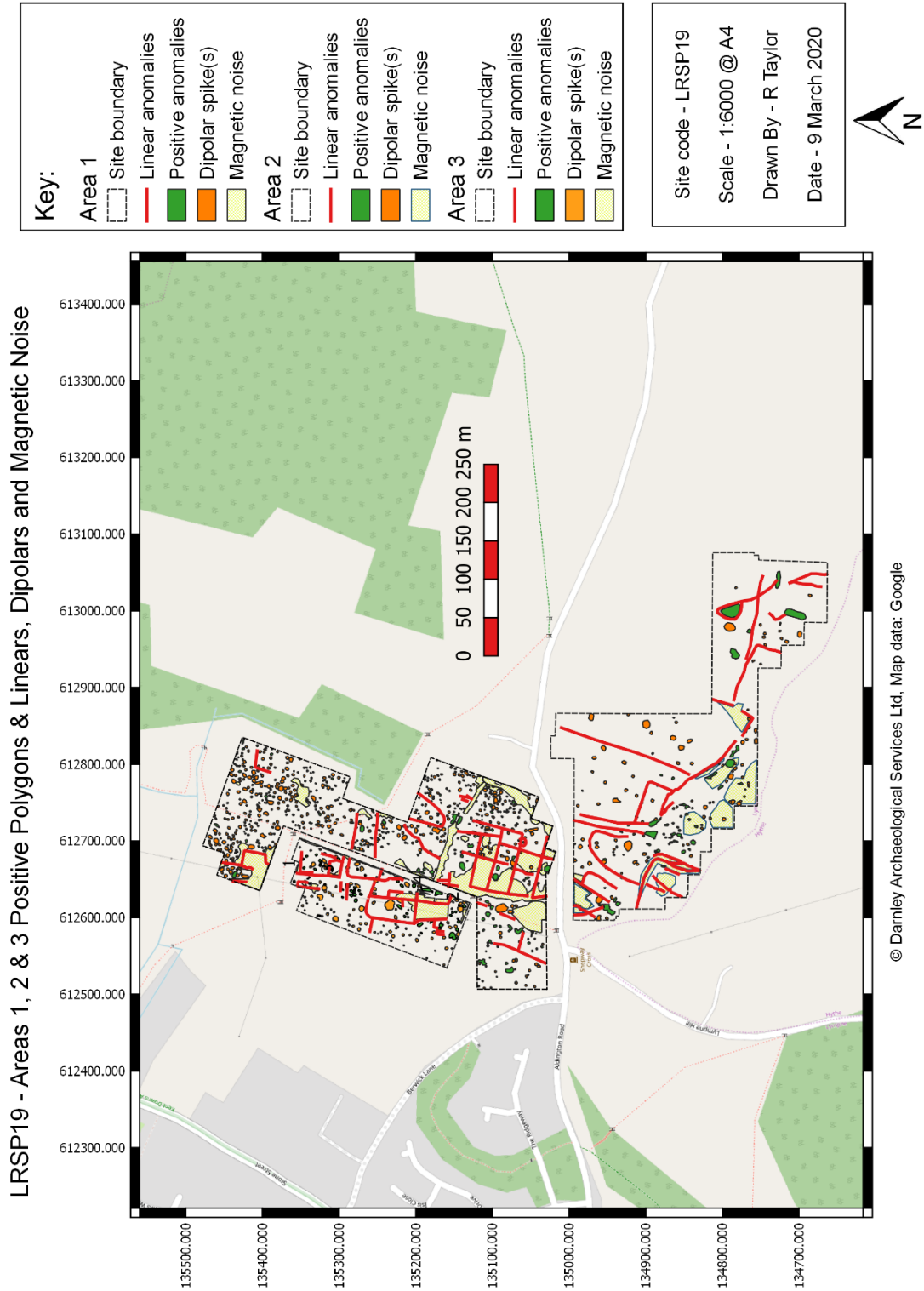


(Figure 23 - Area 3 full anomaly coverage overlaying mag greyscale data)





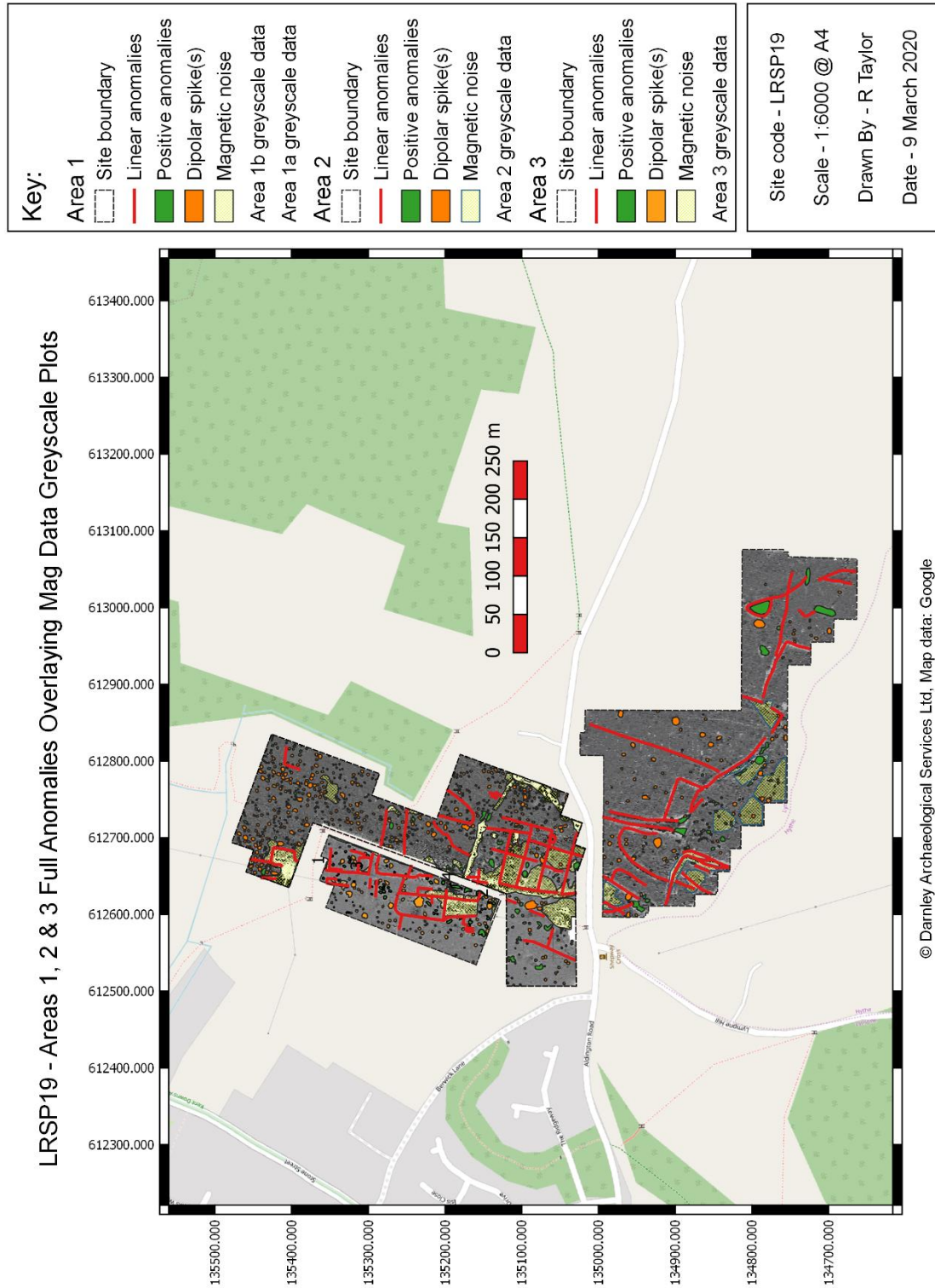
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(Figure 25 – Areas 1, 2 & 3 linears, positive anomalies, magnetic noise & dipolars)



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(Figure 26 – Areas 1, 2, & 3 full anomaly coverage overlaying mag greyscale data)