

**LAND AT GREENBANK
CONNOR DOWNS
GWINEAR-GWITHIAN
CORNWALL**

Results of a Geophysical Survey



South West Archaeology Ltd. report no. 210707



www.swarch.net

01769 573555

01872 223164

LAND AT GREENBANK, CONNOR DOWNS, GWINEAR-GWITHIAN, CORNWALL

RESULTS OF A GEOPHYSICAL SURVEY

By P. Webb
Report Version: Final
Draft issued: 7th July 2021
Finalised: 13th July 2021

Work undertaken by SWARCH for a private client

SUMMARY

This report presents the results of a geophysical survey carried out by South West Archaeology Ltd. (SWARCH) on land at Greenbank, Connor Downs, Gwinear-Gwithian, Cornwall.

The site comprises a rectangular field located on the northern edge of the settlement of Connor Downs. The surrounding landscape is rich in Prehistoric activity (a Bronze Age barrow cemetery is recorded immediately to the east of the site) as well as further afield. Iron Age and/or Romano-British settlements, medieval farmsteads and post-medieval settlement and industry are all recorded in the local area. However, the results of this survey are very limited.

The survey identified six groups of anomalies. Most of these were linear anomalies associated with the existing field layout and modern services, and included modern geotechnical investigative pits and agricultural activity. The identified anomaly groups include: one ditch; two modern services; and four modern geotechnical investigation pits. Evidence of ploughing and metallic debris and ground disturbance was also identified.

The results of the geophysical survey would suggest that the archaeological potential for the site is low. Some of the identified features relate to existing boundaries (Anomaly Group 1); the remaining features representing buried and overground modern services (Groups 2, 3 and 4) and recently excavated geotechnical investigation pits (Group 5) still visible on the ground. Further linear anomalies (Group 6) are likely to indicate episodes of agricultural activity such as ploughing; modern disturbance and metallic objects were also identified across the site.



July 2021

South West Archaeology Ltd. shall retain the copyright of any commissioned reports, tender documents or other project documents, under the Copyright, Designs and Patents Act 1988 with all rights reserved, excepting that it hereby provides an exclusive licence to the client for the use of such documents by the client in all matters directly relating to the project. The views and recommendations expressed in this report are those of South West Archaeology Ltd. and are presented in good faith on the basis of professional judgement and on information available at the time of production.

CONTENTS

<i>SUMMARY</i>	2
<i>CONTENTS</i>	3
<i>LIST OF FIGURES</i>	3
<i>LIST OF TABLES</i>	3
<i>LIST OF APPENDICES</i>	3
<i>ACKNOWLEDGEMENTS</i>	3
<i>PROJECT CREDITS</i>	3
1.0 INTRODUCTION	4
1.1 PROJECT BACKGROUND	4
1.2 TOPOGRAPHICAL AND GEOLOGICAL BACKGROUND	4
1.3 HISTORICAL AND ARCHAEOLOGICAL BACKGROUND	4
1.4 METHODOLOGY	5
2.0 GEOPHYSICAL SURVEY	6
2.1 INTRODUCTION	6
2.2 SITE INSPECTION	6
2.3 METHODOLOGY	6
2.4 RESULTS	7
2.5 DISCUSSION	7
2.6 ARCHAEOLOGICAL POTENTIAL	8
3.0 CONCLUSION	11
4.0 BIBLIOGRAPHY & REFERENCES	12

LIST OF FIGURES

Cover plate: View across the proposal site; viewed from the south-west.

FIGURE 1: SITE LOCATION.	5
FIGURE 2: SHADE PLOT OF THE GRADIOMETER SURVEY DATA; BAND WEIGHT EQUALIZED, GRADIATED SHADING.	9
FIGURE 3: INTERPRETATION OF THE GRADIOMETER SURVEY DATA.	10

LIST OF TABLES

TABLE 1: INTERPRETATION OF GRADIOMETER SURVEY DATA.	7
---	---

LIST OF APPENDICES

APPENDIX 1: ADDITIONAL GRAPHICAL IMAGES OF THE GRADIOMETER SURVEY	13
APPENDIX 2: SUPPORTING PHOTOGRAPHS	16

ACKNOWLEDGEMENTS

THE CLIENT FOR ACCESS

PROJECT CREDITS

DIRECTOR: DR. SAMUEL WALLS, MCIFA
 FIELDWORK, REPORT, GRAPHICS: PETER WEBB
 EDITING: DR. BRYN MORRIS, ACIFA

1.0 INTRODUCTION

LOCATION:	GREENBANK, CONNOR DOWNS
PARISH:	GWINEAR-GWITHIAN
DISTRICT:	CAMBORNE
COUNTY:	CORNWALL
NGR:	SW 159830 039346
SWARCH REF.	CDLG21

1.1 PROJECT BACKGROUND

South West Archaeology Ltd. (SWARCH) was commissioned by a private client to undertake a geophysical survey on land at Greenbank, Connor Downs, Gwinear-Gwithian, Cornwall. This work was undertaken in accordance with best practice and ClfA guidance.

1.2 TOPOGRAPHICAL AND GEOLOGICAL BACKGROUND

The proposed site is located on the northern edge of the settlement of Connor Downs, c.4.5km west of Camborne and 3km north-east of Hayle. The site comprises a single sub-rectangular field, on a very slight north-west facing slope at an altitude of c.75m. The soils of this area are the well-drained fine loamy or fine silty soils over rock of the Manod Association (SSEW 1983). These overlie the slate and siltstone of the Mylor Slate Formation (BGS 2021).

1.3 HISTORICAL AND ARCHAEOLOGICAL BACKGROUND

Connor Downs, formerly Connerton Downs, lies on the western edge of the parish of Gwinear-Gwithian, in the Deanery and Hundred of *Penwith* (formerly *Connerton Hundred*). The modern settlement is post-medieval in date, expanding in the 19th and 20th centuries.

The site falls within land designated on the Historic Landscape Characterisation as: *Medieval Farmland* (the agricultural heartland, with farming settlements documented before the 17th century with either medieval or Prehistoric origins). It is bordered to the north by *Modern Enclosed Land* and to the south by *20th Century Settlement*.

The site lies within an area rich in Prehistoric archaeology: a Bronze Age barrow cemetery is recorded immediately to the east (MCO2892-2894, MCO56439), with further barrows to the south-west (MCO2041, MCO34032) and north-east (MCO3174). Several Iron Age and/or Romano-British rounds (enclosed settlements) have been identified in the surrounding landscape, at Trevarnon (MCO8774) to the north, Roseworthy Barton to the east (MCO36545), Angarrack Hill (MCO34031) and Trenowin (MCO8707) to the south, and Carthew (MCO13860) and Carwin (MCO7821) to the south-west. Medieval settlements are recorded at Carwin from 1311 (MCO13896), Trenowin from 1316 (MCO17634), Trevaskis from 1334 (MCO17837), Angarrack from 1335 (MCO13276) with an associated mill in use by 1342 (MCO27820). The wider landscape at this time was largely agricultural, though there is evidence for medieval extractive sites to the south (MCO52495) and at the eastern limit of Connor Downs (MCO52494).

No archaeological investigations have been carried out on the proposed development site, though geophysical survey and archaeological monitoring and recording were carried out during the construction of the residential properties to the immediate south (Bampton 2015; ECO4138) and east of the proposal site (Thorpe 1995; ECO139). A further archaeological watching brief was carried out during the construction of the A30 as it passes through the adjacent barrow cemetery (ECO1340).

1.4 METHODOLOGY

This work was undertaken in accordance with current best practice and CfA guidance. The geophysical (gradiometer) survey follows the general guidance as outlined in: *EAC Guidelines for the use of geophysics in Archaeology: Questions to Ask and Points to Consider* (Europae Archaeologiae Consilium/European Archaeological Council 2016) and the *CfA Standard and Guidance for Archaeological Geophysical Survey* (CfA 2014b).

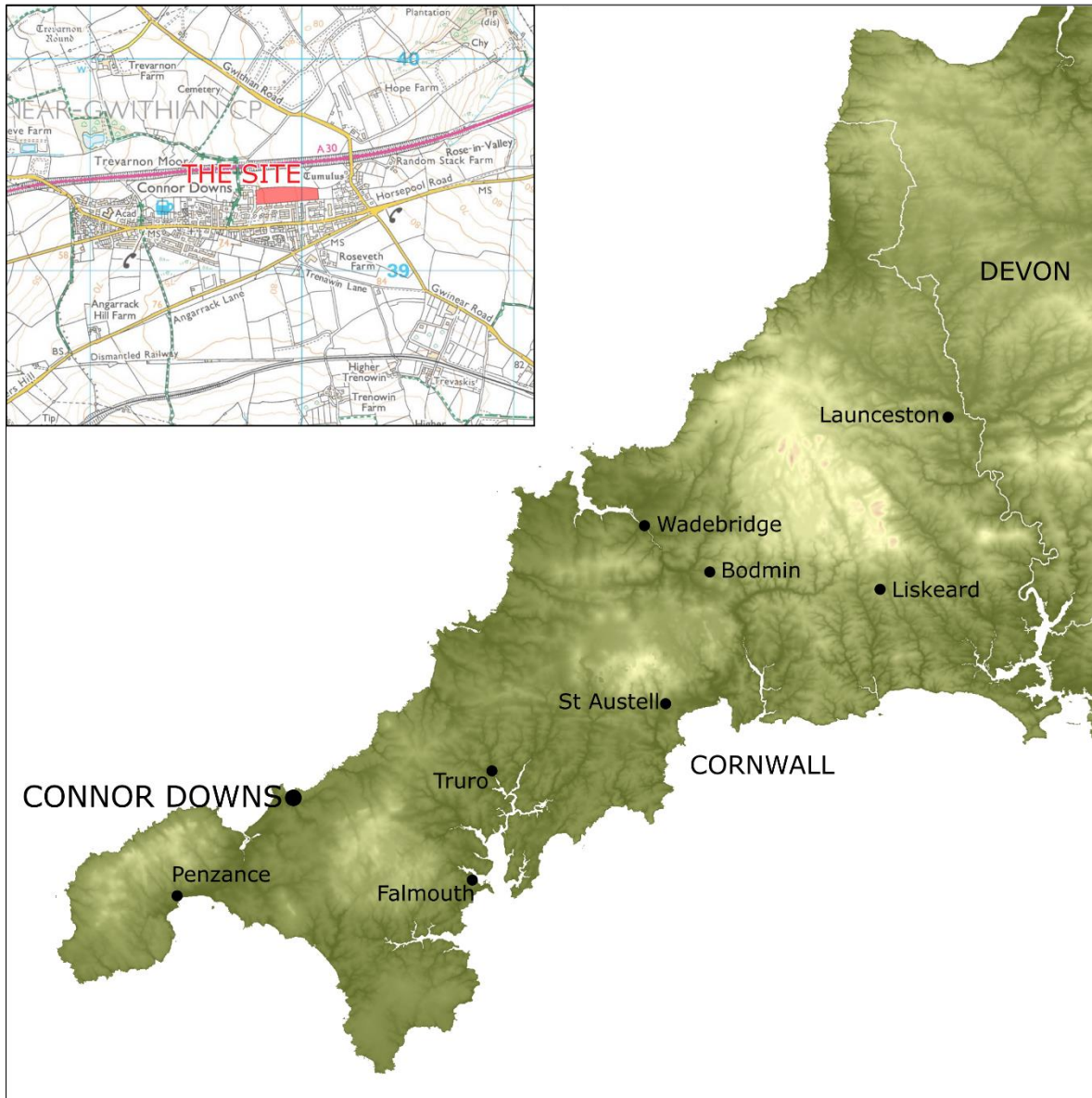


FIGURE 1: SITE LOCATION (THE SITE IS INDICATED).

2.0 GEOPHYSICAL SURVEY

2.1 INTRODUCTION

An area of c.1.9ha was the subject of a magnetometry (gradiometer) survey. The purpose of this survey was to identify and record magnetic anomalies within the proposed site. While identified anomalies may relate to archaeological deposits and structures the dimensions of recorded anomalies may not correspond directly with any associated features. The following discussion attempts to clarify and characterise the identified anomalies. The survey was undertaken on 21st May 2021 by P. Webb; the survey data was processed by P. Webb. Additional graphic images of the survey data and numbered grid locations can be found in Appendix 1; supporting photographs for the site inspection can be found in Appendix 2.

2.2 SITE INSPECTION

The site comprises a sub-rectangular field on the northern edge of Connor Downs. The field was used for arable last year, and the stubble had yet to be ploughed. The area of the survey was relatively level, though the wider area slopes gently down to the north-west. The site is bounded to the north and east by stone-faced hedgebanks with internal post-and-wire fences; to the south by a mix of earth bank and modern fencing; and to the west by a mix of young trees, a recently installed earth bank and rope fence.

A series of geotechnical investigation pits were identified across the survey area, and there is a water trough in the south-west corner. No earthwork features were visible.

2.3 METHODOLOGY

The gradiometer survey follows the general guidance as outlined in: *EAC Guidelines for the use of geophysics in Archaeology: Questions to Ask and Points to Consider* (Europae Archaeologiae Consilium/European Archaeological Council 2016) and *Standard and Guidance for Archaeological Geophysical Survey* (CifA 2014b).

The survey was carried out using a twin-sensor fluxgate gradiometer (Bartington Grad601). These machines are sensitive to depths of up to 1.50m. The survey parameters were: sample intervals of 0.25m, traverse intervals of 1m, a zigzag traverse pattern, traverse orientation was circumstantial, grid squares of 30×30m. The gradiometer was adjusted ('zeroed') every 0.5-1ha. The survey grid was tied into the Ordnance Survey National Grid- and set out using a Leica CS15 GNSS Rover GPS. The data was downloaded onto *Grad601 Version 3.16* and processed using *TerraSurveyor Version 3.0.36.0*. The primary data plots and analytical tools used in this analysis were *Shade* and *Metadata*. The details of the data processing are as follows:

Processes:

Clip +/- 1SD; removes extreme data point values.

DeStripe all traverses, median; used to equalise underlying differences between grids (potentially caused by instrument drift or orientation, directional effects inherent in magnetic instrument, or differences in instrument set up during survey e.g. using two gradiometers).

DeStagger selected grids, all traverses out- and inbound by 0.50m; reduces staggering effects within data derived from zig-zag collection method.

Details F1:

1.8894ha surveyed

Stats unadjusted; Max. 98.47nT, Min. -100.00nT; Standard Deviation 12.14nT, mean 2.03nT, median 1.32nT.

2.4 RESULTS

Table 1 with the accompanying Figures 2 and 3 show the analyses and interpretation of the geophysical survey data.

TABLE 1: INTERPRETATION OF GRADIOMETER SURVEY DATA.

Anomaly Group	Class and Certainty	Form	Archaeological Characterisation	Comments
1	Weak positive, probable	Linear	Ditch	Indicative of a cut and infilled feature such as a ditch. Aligned approximately east to west along the current southern boundary. Responses of between +0.17nT and +20.52nT.
2	Very strong bipolar, probable	Linear	Modern service	Indicative of a modern service. Aligned approximately north to south. Responses of between -179.84nT and +129.81nT.
3	Weak to moderate positive with associated negative, possible	Linear	Modern service	Indicative of a modern service. Aligned approximately north-west to south-east between pylons. Responses of between -35.59nT to +14.47nT.
4	Very strong dipolar, probable	Discrete ovoid	Modern service	Indicative of ferrous objects. Corresponds to position of pylons. Responses of between -102.31nT and +96.68nT.
5	Very strong positive with associated negative, probable	Discrete rectangular	Geotechnical pits	Indicative of cut and in-filled features such as pits. Visible on the ground. Responses of between -96.01nT and +91.60nT.
6	Weak positive with associated negative, probable	Linear	Agricultural activity	Linear striations covering the entire site with regularity. Weak mixed positive and negative responses suggest shallow ploughing. Aligned east to west. Responses of between +/-8nT.
	Strong dipolar (mixed response)	Discrete	Ferrous anomaly	Indicative of metallic object. Responses of between c. +/-100nT.
	Strong bipolar (mixed response)	Irregular	Modern disturbance	Indicative of disturbed ground and disturbance caused by proximity to metallic fences and debris. Responses of between c. +/-90nT.

2.5 DISCUSSION

The survey identified six groups of anomalies. These were predominantly linear anomalies associated with the existing field layout and modern services, but the survey also picked up some of the geotechnical pits and agricultural activity. The identified anomaly groups include: one ditch; two modern services; and four modern geotechnical pits. Evidence for ploughing and metallic debris and ground disturbance was also identified.

The background geological variation across the site was between +/-3nT.

Anomaly Group 1 consists of a weak positive (+0.17nT to +20.52nT) linear responses indicative of a cut and infilled feature such as a ditch. It is orientated approximately east to west, along the line of the existing southern field boundary, and is likely to represent a flanking ditch.

Anomaly Group 2 consists of a very strong bipolar (-179.84nT to -11.20nT and +4.45nT to +129.81nT) linear response indicative of a buried modern service. It is orientated approximately north to south along the western edge of the survey area.

Anomaly Group 3 consists of a weak positive (+0.71nT to +14.47nT) with associated negative (-35.59nT to -1.24nT) linear response indicative of a cut and infilled feature such as a ditch with associated compacted/banked material. It is orientated approximately north-west to south-east between two modern pylons and is likely to represent a buried modern service.

Anomaly Group 4 consists of a pair of very strong dipolar (-102.31nT to -13.43nT and +6.19nT to +96.68nT) discrete ovoid responses indicative of metallic objects. Both correspond to the positions of pylons.

Anomaly Group 5 consists of four very strong positive (+18.33nT to +91.60) with associated negative (-96.01nT to -6.99nT) discrete rectangular anomalies indicative of recently excavated cut and infilled features such as pits. All were visible as features on the ground.

Linear striations (anomaly Group 6) of weak negative and positive (+/-8nT) responses orientated approximately east to west are present across the field, the regularity and weakness of the responses suggesting that they represent shallow ploughing.

Modern disturbance, dipolar anomalies and magnetic disturbance are also located across the field, particularly around the site boundaries. This is likely due to the presence of ferrous objects and other metallic debris and the metallic components of fence lines and field boundaries.

2.6 ARCHAEOLOGICAL POTENTIAL

The results of the geophysical survey would suggest that the archaeological potential for the site is *low*. Some of the identified features relate to existing boundaries (Anomaly Group 1); the remaining features representing buried modern services (Groups 2, 3, and 4) and recently excavated geotechnical investigation pits (Group 5) still visible on the ground. Further linear anomalies (Group 6) are likely to indicate episodes of agricultural activity such as ploughing; modern disturbance and metallic objects were also identified across the site.

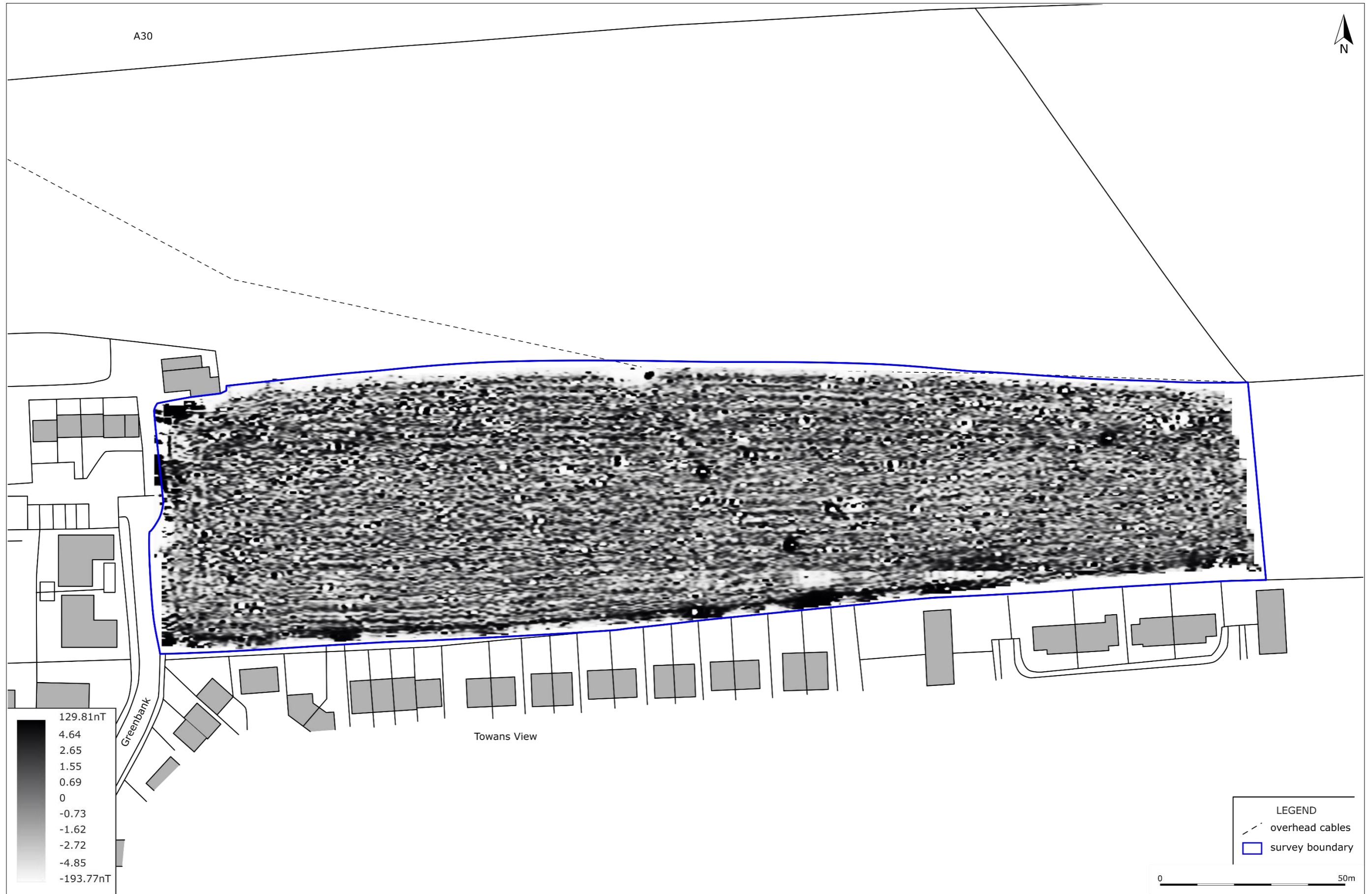


FIGURE 2: SHADE PLOT OF THE GRADIOMETER SURVEY DATA; BAND WEIGHT EQUALIZED, GRADIATED SHADING.

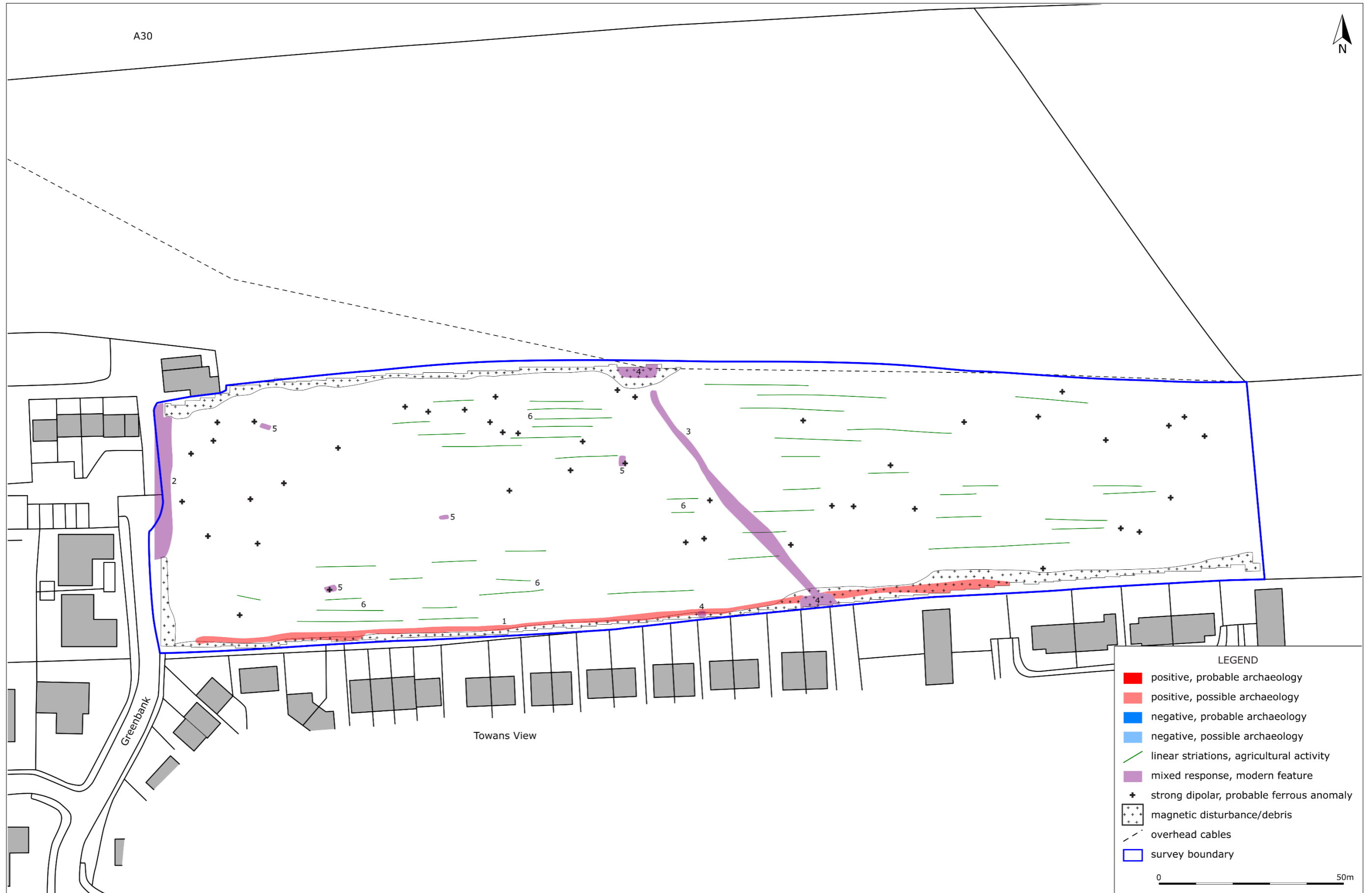


FIGURE 3: INTERPRETATION OF THE GRADIOMETER SURVEY DATA.

3.0 CONCLUSION

The site comprises the western end of a sub-rectangular field on the northern edge of Connor Downs. The surrounding landscape is rich in Prehistoric activity; a Bronze Age barrow cemetery has been recorded immediately to the east of the site. Iron Age and/or Romano-British settlements, medieval farmsteads and post-medieval settlement and industry are all recorded in the local area.

The survey identified six groups of anomalies. These were mainly linear anomalies associated with the existing field layout and modern services, but also included modern geotechnical investigative pits and agricultural activity. The identified anomaly groups include: one ditch; two modern services; and four modern geotechnical investigation pits. Evidence of ploughing and metallic debris and ground disturbance was also identified.

The results of the geophysical survey would suggest that the archaeological potential for the site is *low*. Some of the identified features relate to existing boundaries (Anomaly Group 1); the remaining features representing buried and overground modern services (Groups 2, 3, and 4) and recently excavated geotechnical investigation pits (Group 5) still visible on the ground. Further linear anomalies (Group 6) are likely to indicate episodes of agricultural activity such as ploughing; and modern disturbance and metallic objects were also identified across the site.

4.0 BIBLIOGRAPHY & REFERENCES

Published Sources:

- Chartered Institute for Archaeologists** 2014 (revised 2017): *Standard and Guidance for Archaeological Geophysical Survey*.
- DW Consulting** 2016: *TerraSurveyor User Manual*.
- Europae Archaeologiae Consilium** 2016: *EAC Guidelines for the use of geophysics in Archaeology: Questions to Ask and Points to Consider, EAC guidelines 2*.
- English Heritage** 2008: *Geophysical Survey in Archaeological Field Evaluation*.
- Schmidt, A.** 2002: *Geophysical Data in Archaeology: A Guide to Good Practice*. ADS series of Guides to Good Practice. Oxbow Books, Oxford.
- Soil Survey of England and Wales** 1983: *Legend for the 1:250,000 Soil Map of England and Wales (a brief explanation of the constituent soil associations)*.

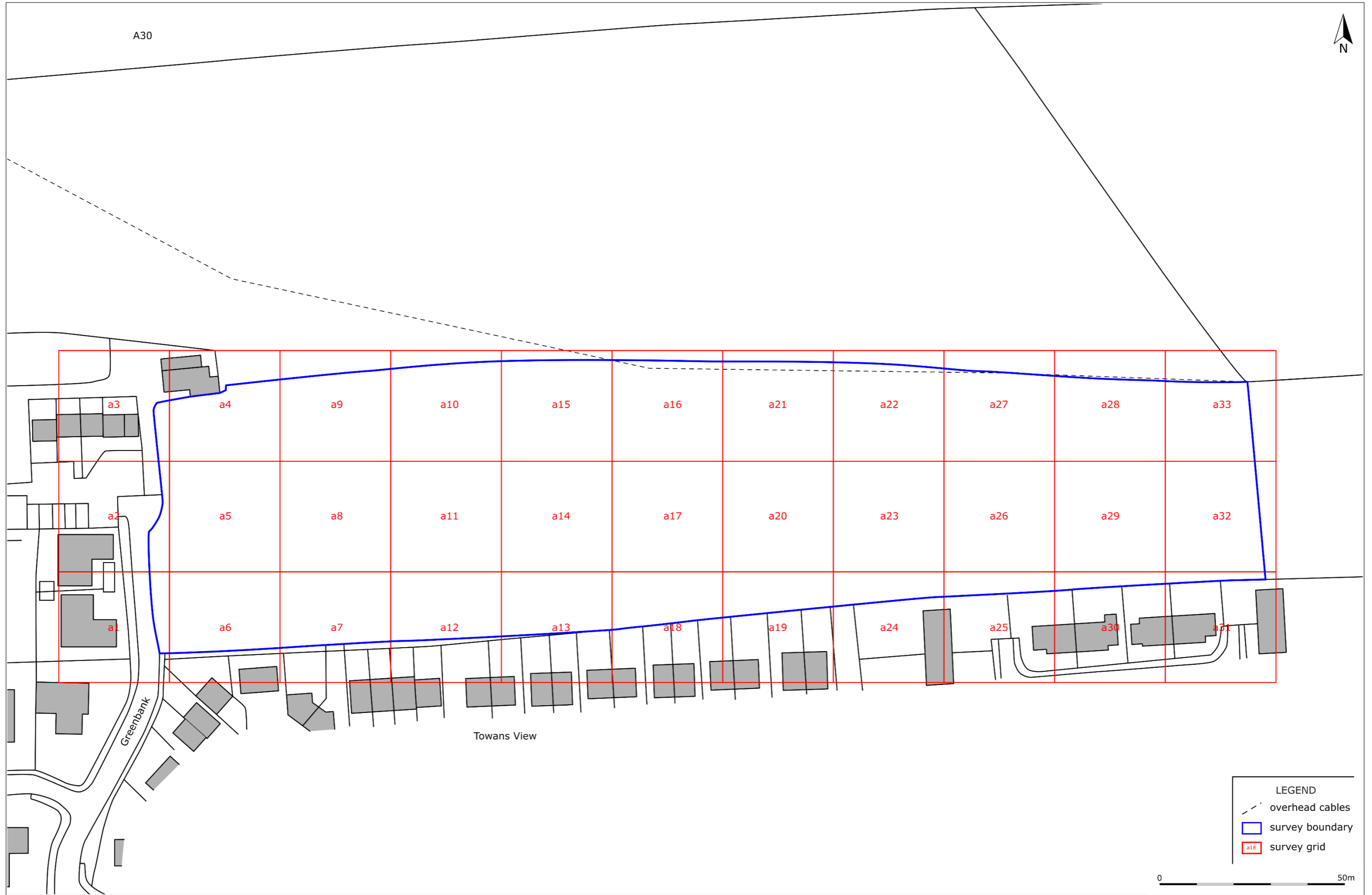
Unpublished Sources:

- Bampton, J.** 2015: *Land at Horsepool Road, Connor Downs, Gwithian, Cornwall, TR27 5FG*. South West Archaeology HER Report.
- Thorpe, C.** 1995: *Gwithian Road, Connor Downs: A Watching Brief Report*. Cornwall Archaeological Unit Report no.: 1995R053.

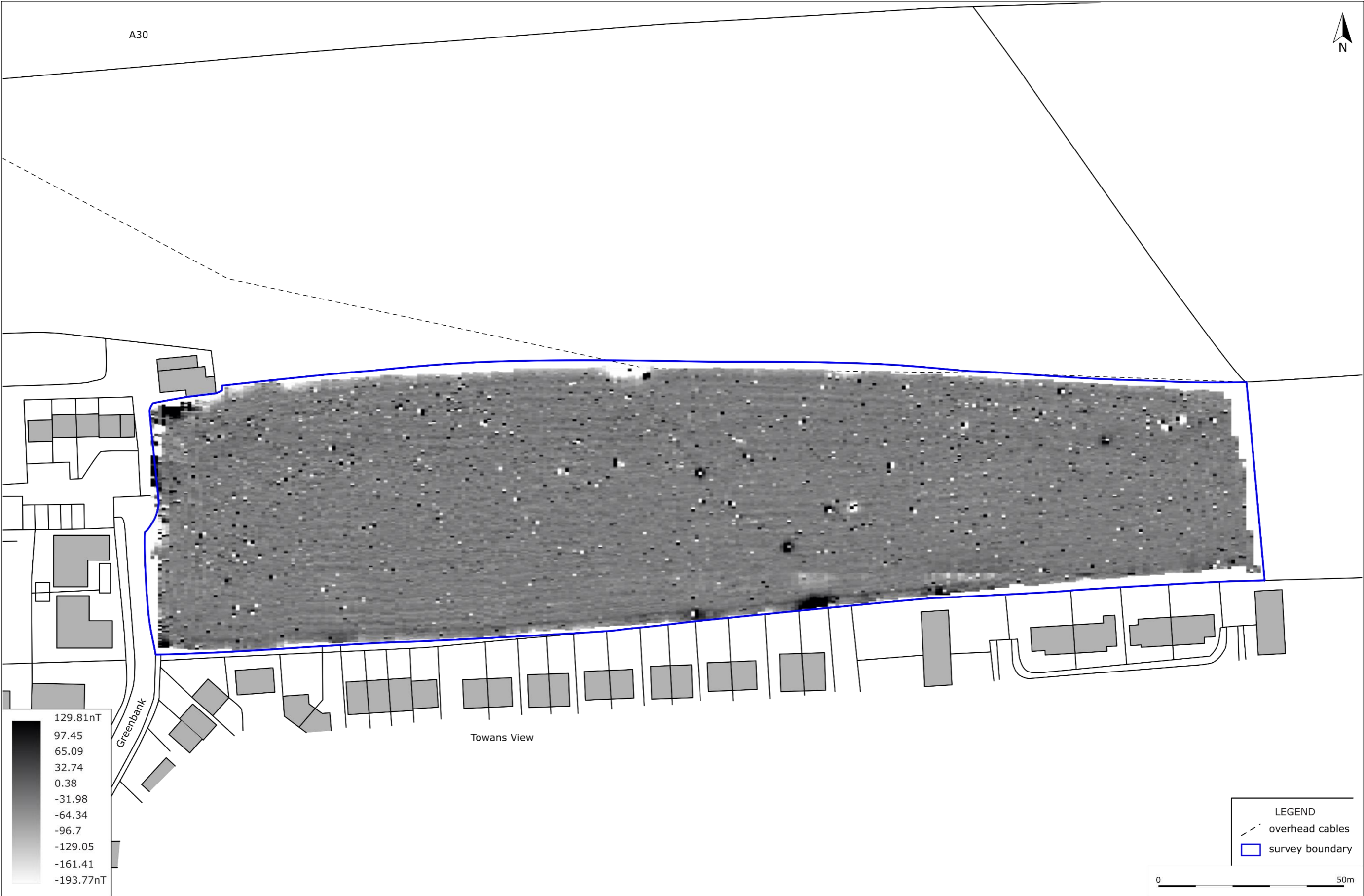
Websites:

- British Geological Survey** 2021: *Geology of Britain Viewer*.
<http://mapapps.bgs.ac.uk/geologyofbritain/home.html>

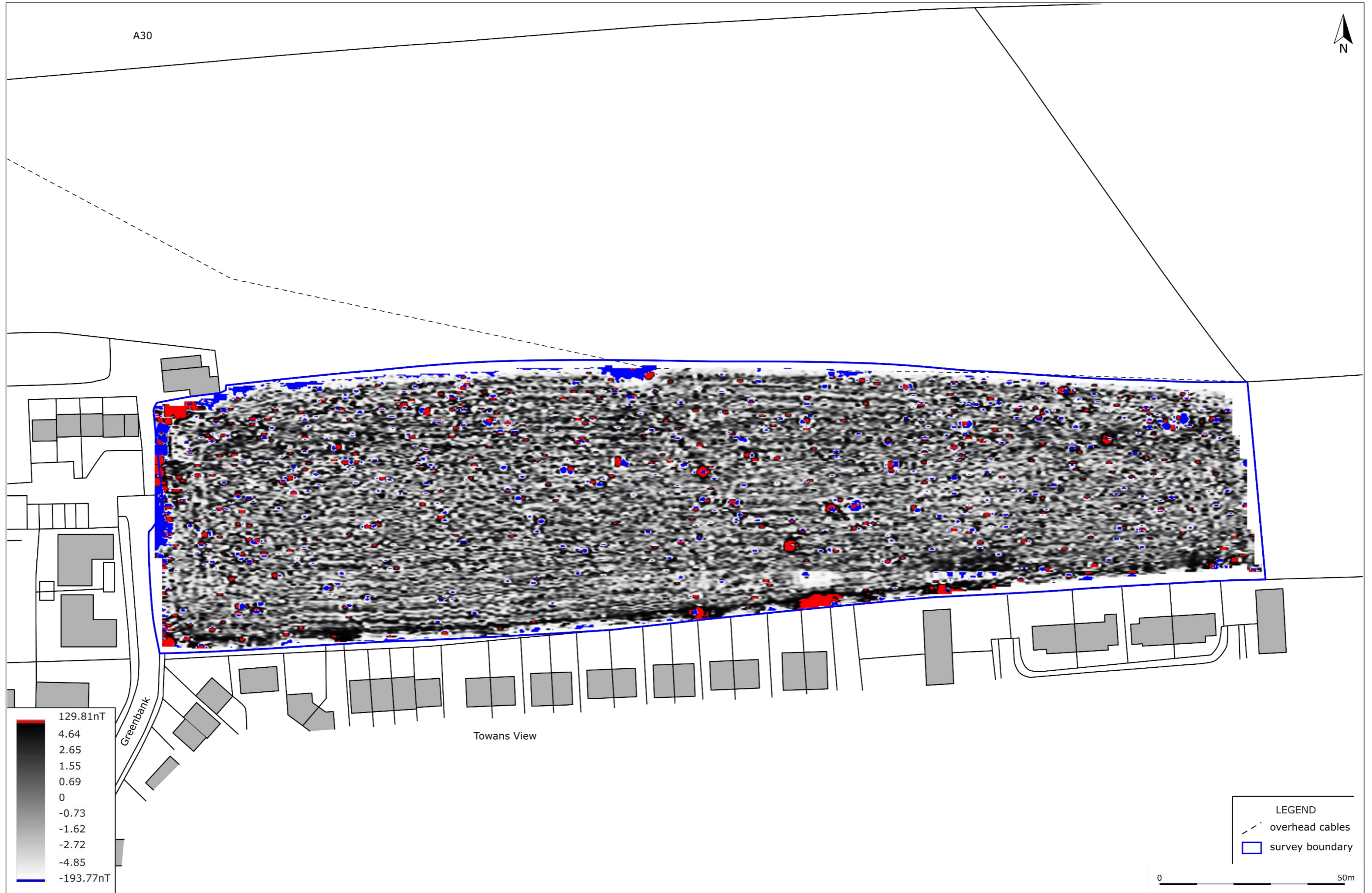
APPENDIX 1: ADDITIONAL GRAPHICAL IMAGES OF THE GRADIOMETER SURVEY



1. GEOPHYSICAL SURVEY GRID LOCATION AND NUMBERING.



2. SHADE PLOT OF GRADIOMETER SURVEY DATA; MINIMAL PROCESSING.



3. RED-GREY-BLUE SHADE PLOT OF GRADIOMETER SURVEY DATA; BAND WEIGHT EQUALIZED, GRADIATED SHADING.

APPENDIX 2: SUPPORTING PHOTOGRAPHS



1. VIEW ACROSS THE SURVEY AREA; VIEWED FROM THE SOUTH-WEST (NO SCALE).



2. VIEW ACROSS THE SURVEY AREA; VIEWED FROM THE NORTH-EAST (NO SCALE).



3. VIEW ACROSS THE SURVEY AREA; VIEWED FROM THE EAST-SOUTH-EAST (NO SCALE).



4. VIEW ACROSS THE WESTERN END OF THE SURVEY AREA; VIEWED FROM THE NORTH-NORTH-EAST (NO SCALE).



5. DETAIL OF THE WATER TROUGH LOCATED IN THE SOUTH-WEST CORNER OF THE SITE; VIEWED FROM THE NORTH-WEST (1M SCALE).



6. DETAIL OF A RECENTLY EXCAVATED GEOTECHNICAL INVESTIGATION PIT; VIEWED FROM THE SOUTH-WEST (1M SCALE).



7. DETAIL OF NORTHERN HEDGEBANK BOUNDARY; VIEWED FROM THE EAST-SOUTH-EAST (1M SCALE).



8. DETAIL OF OVERGROWN GATED ACCESS IN THE NORTHERN HEDGEBANK BOUNDARY; VIEWED FROM THE SOUTH-EAST (1M SCALE).



9. DETAIL OF EASTERN HEDGEBANK BOUNDARY; VIEWED FROM THE SOUTH-WEST (1M SCALE).



10. DETAIL OF THE SOUTHERN HEDGEBANK BOUNDARY; VIEWED FROM THE WEST (NO SCALE).



THE OLD DAIRY
HACCHE LANE BUSINESS PARK
PATHFIELDS BUSINESS PARK
SOUTH MOLTON
DEVON
EX36 3LH

01769 573555

01872 223164

MAIL@SWARCH.NET