

An archaeological gradiometer survey

# Land at Chapel Gover Newquay, Cornwall

Centred on NGR (E/N):183100,61000 (point)

Report: 1511CHA-R-1

Ross Dean BSc MSc MA MCIfA

15 December 2015

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# Project archive

Report	Adobe PDF format
Copies of report figures	
Raw and processed grid & composite files	DW Consulting TerraSurveyor 3 formats
Minimal processing data plots and metadata	DW Consulting TerraSurveyor 3 formats
Final data processing data plots and metadata	DW Consulting TerraSurveyor 3 formats
GIS project, shape files and classification schema	
GIS project	
GIS shape files	ESRI standard
GIS classification schema	Adobe PDF format
AutoCAD version of the survey interpretation	AutoCAD DXF

#### 1 Survey description and summary

## 1.1 Survey

2	
Type:	twin-sensor fluxgate gradiometer
Date:	9 to 17 November 2015
Area:	gradiometer survey: 25ha
Lead surveyor:	Mark Edwards BA
Author:	Ross Dean BSc MSc MA MIfA

#### 1.2 Client

Cotswold Archaeology, Building 11, Kemble Enterprise Park, Cirencester, Gloucestershire GL7 6BQ

1.3 Location

Site:	Land at Chapel Gover
Town and Civil Parish:	Newquay
County:	Cornwall
Nearest Postcode:	TR8 4NX
NGR:	SW 831 610
Ordnance Survey NGR (E/N):	183100,61000 (point)

1.4 Archive

OASIS number:	substrat1-234564
Archive:	At the time of writing, the archive of this survey will be held by
	Substrata and will be deposited with the ADS in due course.

## 1.5 Introduction

This report was commissioned by Cotswold Archaeology on behalf of clients. It is part of a programme of archaeological works undertaken in advance of a proposed residential development at the above site. The survey methodology conformed to a Written Scheme of Investigation (Brown, 2015) in accordance with the guidance of the Cornwall Archaeological Unit. The site location is shown in Figure 1.

### 1.6 Summary

## 2 Survey aims and objectives

## 2.1 Aims

- 1. The overall aim of the geophysical survey programme is to gather sufficient information to establish the extent, condition, character and date (as far as circumstances permit) of any previously unrecorded archaeological features and deposits within the site area.
- 2. A further aim of the survey is to obtain information that will contribute to an evaluation of the significance of impact of the scheme upon cultural heritage, and which will enable further evaluation and/or mitigation measures to be designed, as appropriate. If further mitigation measures include intrusive archaeological evaluation or monitoring, any anomalies or potential archaeological features identified through the geophysical will provide targets for evaluation trenching or monitoring during construction.

## 2.2 Survey objectives

- 1. Complete a magnetometer (gradiometer) survey across agreed parts of the survey area.
- 2. Identify any magnetic anomalies that may be related to archaeological deposits, structures or artefacts.
- 3. Within the limits of the techniques and dataset, archaeologically characterise any such anomalies or patterns of anomalies.
- 4. Accurately record the location of the identified anomalies.
- 5. Produce a report based on the survey that is sufficiently detailed to inform any subsequent development on the site about the location and possible archaeological character of the recorded anomalies.

## 3 Standards

The standards used to complete this survey are defined by the Chartered Institute for Archaeologists (2014a) and Historic England (2010). The codes of approved practice that were followed are those of the Chartered Institute for Archaeologists (2014b) and Archaeology Data Service/Digital Antiquity Guides (undated).

## 4 Site description

## 4.1 Landscape and land use

The development area (the Site) is located on the eastern edge of Newquay, Cornwall, approximately 1.65km southeast of the town centre in an area earmarked for significant urban expansion, including strategic infrastructure, residential and commercial development. The Site comprises seven agricultural fields, is irregular in shape and extends to approximately 29 hectares. It is bordered by Chapel Stream in the north, the Newquay to Par branch railway line in the south, open agricultural land in the east and land currently being developed for housing by Taylor Wimpey in the west.

The site slopes gently from south to north. The southern boundary adjacent to the railway line sits at approximately 45m Above Ordnance Datum (AOD) while the northern boundary is at approximately 25m AOD, adjacent to Chapel Stream. The proposed development area is subdivided by a series of Cornish banks, that form linear fields across part of the Site (Brown, 2015).

4.2 Geology

The solid geology across the site is the Devonian Meadfoot Group which typically comprises dark shales and siltstones with sporadic grey-brown sandstones and beds of decalcified shell debris (British Geological Survey, undated).

The superficial geology on the northeast of the site, south of Chapel Stream, comprises Quaternary Head. Head is a polymict deposit of gravel, sand and clay depending on upslope source and distance from source. The poorly sorted and poorly stratified deposits are formed mostly by solifluction and/or hillwash and soil creep. Essentially Head comprises sand and gravel, locally with lenses of silt, clay or peat and organic material. Quaternary alluvium is present in the vicinity of Chapel Stream on the northern boundary of the Site. Alluvium is normally soft to firm consolidated, compressible silty clay, but can contain layers of silt, sand, peat and basal gravel, often with a stronger, desiccated surface zone. Elsewhere within the Site the superficial deposits are in not recorded in the source used (ibid).

## 5 Archaeological background

In April 2014, the Cornwall Archaeology Unit made the following comments in response to an Environmental Impact Assessment Scoping Consultation related to the current application, 'This site lies within an area particularly rich in historic assets and increasingly well researched as a result of the various urban expansion schemes to the east and south of Newquay.' (Brown, 2015)

5.1 Historic landscape characterisation

Name : Farmland, Medieval

The agricultural heartland of Cornwall with farming settlements documented before the 17th century AD and whose field patterns are morphologically distinct from the generally straight-sided fields of later enclosure. The fields have either Medieval or Prehistoric origins (Cornwall Council, undated).

## 5.2 Known heritage assets

Archaeological sites, buildings, historic parks and gardens, conservation areas, registered battlefields and other aspects of the historic environment that are considered significant because of their historic, archaeological, architectural or artistic interest are considered monuments, listed buildings or through their inclusion within conservation areas.

The following is a summary of information provided in the WSI (Brown 2015) and from the Cornwall and Scilly Historic Environment Record (HER) via the Heritage Gateway (Historic England, undated). The heritage assets discussed below are within approximately 1000m of the site and relevant to the understanding of the geophysical survey.

5.2.1 Heritage assets within the site

Recorded heritage assets identified within the site boundary include the extant remains of the linear field system, as well as elements of it now only identified from aerial photographic evidence extending northwards beyond the northern boundary of the Site. The field systems within the site are likely to represent a former Medieval 'open field'. Historic maps suggest that a 'three field' system operated around the Medieval settlement of Trencreek. These fields which would have comprised individual narrow and unenclosed strips held and farmed in common are likely to have been gradually enclosed into the current narrow units in the later Medieval and Post-medieval period (Brown, 2015).

## 5.2.2 Heritage assets within 1000m of the site

The recorded heritage assets comprise Bronze Age (2200 BC to 701 BC), Iron Age (800 BC to 42 AD), Romano-British (43 AD to 409 AD), Early-medieval (410 AD to 1065 AD), Medieval (1066 to1539 AD) and Post-medieval (1540 AD- 1900AD) monuments, settlements and field systems. Little is known about the Mesolithic (8000 BC to 4001 BC) and Neolithic (4000 BC to 2501 BC) periods apart from a Mesolithic find spot to the North West of the site (Historic Environment Record (HER) 173094.10 at National Grid Reference (NGR) SW 8276 6169) and a Neolithic greenstone axe (HER 4637 at NGR SW 84 62) discovered to the northeast of site at Rialton Moor.

Three possible Bronze Age barrows at Treloggan (HER 55442 at NGR SW 8240 6058) and another at possible barrow at Trencreek (HER 4558.20 at NGR SW 828 608) lie to the southwest of the survey area.

A possible Iron Age/Romano-British hillfort (HER 4564.10 at NGR SW 84 62) may have existed to the northeast as evidenced by the place name 'Caskeys'. Vertical aerial photos show faint traces of a curvilinear banked feature approximately 50 meters in diameter to the north and adjacent to the survey area which have been provisionally dated as Iron Age/Romano-British (HER 55489 at NGR SW 8341 6125). Two Iron Age circular enclosures or Rounds lie to the northwest of the survey area at Tretherras (HER 173094 at NGR SW 8276 6169 and HER 4650 at NGR SW 8276 6160). The remains of an Iron-Age/Romano-British defended settlement with an associated hut circle and enclosures were excavated at the latter site.

Early-medieval (410AD-1065AD) and Medieval settlements are common within the study area. One Early-medieval field system has been recorded to the southwest at Lane (HER 55456 at NGR SW 8246 6023) and Medieval field systems are recorded at Treviglas to the north of the survey area (HER 55458 NGR SW 8326 6163), Porth Veor to the northwest (HER 4551.20 at NGR SW 83 62) and at Trencreek, itself a Medieval settlement, to the southwest (HER

#### 4558.10 at NGR SW 828 606).

From the Post Medieval period onwards there is evidence of mining activity in the area. At Treloggan (HER 41227 at NGR SW 822 611), to the southwest of the survey area, a mine was in operation from 1844 to 1846 and worked again in 1853. More evidence of Post-medieval mining can be seen in close proximity to the survey area at Wheal Arundell Consols (HER 41221 at NGR SW 8330 6125).

## 5.2.3 Previous archaeological investigations

## General

Archaeological investigations have been undertaken within and to the south of the site, along and around the Newquay Strategic Route to the north of the Chapel Stream (within the 'Newquay Growth Area'), and to the west (Trencreek / Trevenson developments by Taylor Wimpey). All of these investigations have demonstrated high archaeological potential with Middle Bronze Age settlement known from the Taylor Wimpey development, Iron Age Settlement known from the Newquay Strategic Route to the south, and further features known from geophysical surveys undertaken in advance of the Newquay Growth Area to the north of the Chapel Stream.

### Within the Site

The archaeological investigations undertaken in advance of the Newquay Strategic Route comprised a geophysical survey followed by excavations undertaken along a 40m wide strip which crossed the Site running toward its eastern edge. Both to the north and south of the Site these investigations revealed a range of Prehistoric to Modern archaeological features but within the Site, relatively few archaeological features were recorded. The post-geophysics evaluation trenching revealed undated ditches, two of which appear to be flanking ditches to a trackway, the western continuation of which is still in existence (Cotswold Archaeology, 2011).

A desk-based assessment has previously been completed for the Site (CGMS, 2013). The desk -based assessment identified limited evidence for archaeological remains within the proposed development site.

## 6 Results, discussion and conclusions

This survey was designed to record magnetic anomalies. The anomalies themselves cannot be regarded as actual archaeological features and the dimensions of the anomalies shown do not represent the dimensions of any associated archaeological features. The analysis presented below identifies and characterises anomalies and anomaly groups that may relate to archaeological deposits and structures.

disturbance of natural deposits thought to be the result of human activity and not undertaken as recent land development, maintenance or farming.

The reader is referred to section 7.

## 6.1 Results

The Site was divided into 10 survey areas for analysis as shown in Figure 2.

Figures 2 to 7 show the interpretation of the survey data. They include the anomaly groups identified as relating to archaeological deposits along with their numbers. Table 1 is an extract of the detailed analysis of the survey data which is provided in the attribute tables of the GIS project on the accompanying CD-ROM and in the project archive.

Figures 2 to 7 along with Table 1 comprise the analysis of the survey data.

Figures 8 to 13 are plots of processed data as specified in Table 3.

## 6.2 Discussion

6.2.1 General points

### Discussion scope

Not all anomalies or anomaly groups identified in Table 1 are necessarily discussed below. All identified anomaly groups are recorded in the GIS project held the survey archive.

#### Data collection

Data collection along the site edges was restricted as shown in Figures 8 to 13 due to the presence of magnetic materials adjacent to the site. Strong magnetic responses mapped close to survey boundaries are likely to relate to these materials except where otherwise indicated in Figures 2 to 7.

#### Anomaly characterisation and mapping

There are a number of anomaly groups that could be interpreted as relating to large postholes or pits although most will have natural origins. Anomalies of this sort are only mapped as potential archaeology if they are clustered in groups or otherwise form recognisable patterns.

Recent man-made objects such as manholes, water management equipment, drains, cables and other services were only mapped where they comprised significant magnetic responses across the dataset that needed clarification. If mapped, they are listed in Table 1 but are not discussed below.

Anomalies thought to relate to natural features were not mapped.

#### General data trends

Parallel repeating trends in the data plots provided in Figures 8 to 13 are likely to reflect relatively recent ploughing except where indicated in the interpretation plots.

## Enhance magnetic responses

The enhanced magnetic responses showing in the data collected adjacent to the railway track bordering the southern side of the Site are indicative of both relatively magnetic material deposited in the area, probably during the construction of the railway, and the strong magnetic readings generated by steel and other magnetic components of the track and surrounding structures (survey areas 8, 9 and 10).

The area of enhanced magnetic response recorded in area 6 is likely to reflect a spread of material from the demolished field wall represented by magnetic anomaly group 24 in Figures 2 and 5.

6.2.2 Data relating to historical maps and other records

Magnetic anomaly groups 19 (area 6, Figure 4), 24 (area 6, Figure 4), 27 (area 7, Figure 6), 39 (area 9, Figure 6), 42 (area 9, Figure 6), 43 (area 9, Figure 6), 44 (area 9, Figure 6), 50 (area 10, Figure 7) and 54 (area 10, Figure 7) coincide with historical field boundaries mapped by the Ordnance Survey as recorded in Table 1.

- 6.2.3 Data with no previous archaeological provenance All of the remaining anomaly groups characterised as representing potential archaeological deposits or features are typical of anomalies representing former field boundaries, enclosures and tracks of more than one phase of land enclosure.
- 6.3 Conclusions

The magnetic responses across the site were sufficient to be able to differentiate between anomalies representing possible archaeological features and background magnetic responses.

Sixty-seven magnetic anomaly groups were mapped as possibly representing archaeological deposits or features. Nine groups represent former field boundaries mapped by the Ordnance Survey since 1881 and now removed. A number of groups represent former ridge-and-furrow cultivation. All of the remaining anomaly groups characterised as representing potential archaeological deposits or features are typical of anomalies representing former field boundaries, enclosures and tracks of more than one phase of land enclosure.

## 7 Disclaimer and copyright

The description and discussion of the results presented in this report are the authors, based on his interpretation of the survey data. Every effort has been made to provide accurate descriptions and interpretations of the geophysical data set. The nature of archaeological geophysical surveying is such that interpretations based on geophysical data, while informative, can only be provisional. Geophysical surveys are a cost-effective early step in the multi-phase process that is archaeology. The programme of which this survey is part may also be informed by other archaeological assessment work and analysis. It must be presumed that more archaeological features will be present than those specified in this report.

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## 8 Acknowledgements

Substrata would like to thank Derek Evans, Project Manager, Cotswold Archaeology for commissioning us to complete this survey.

#### 9 Bibliography

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Chartered Institute for Archaeologists (2014b) Author [Online], http://www.archaeologists.net/sites/default/files/CodesofConduct.pdf [October 2015]

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CGMS (2013)

Cornwall Council (undated)

zoomlevel=3&xcoord=181424&ycoord=50321&maptype=basemap&wsName=ccmap&layerName=His toric%20Landscape%20Characterisation [December 2015]

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Historic England (undated) [Online], Available: http://www.heritagegateway.org.uk/gateway/ [December 2015]

Historic England (2010) Content. historic england.org.uk/images-books/publications/geophysical-survey-in-archaeological-field-evaluation/geophysics-guidelines.pdf/ [December 2015]

## Appendix 1 Analysis table and supporting plots

## General Guidance

The anomalies represented in the survey plots provided in this appendix are magnetic anomalies. The apparent size of such anomalies and anomaly patterns are unlikely to correspond exactly with the dimensions of any associated archaeological features.

A rough rule for interpreting magnetic anomalies is that the width of an anomaly at half its maximum reading is equal to the width of the buried feature, or its depth if this is greater (Clark, 2000: 83). Caution must be applied when using this rule as it depends on the anomalies being clearly identifiable and distinct from adjacent anomalies. In northern latitudes the position of the maximum of a magnetic anomaly will be displaced slightly to the south of any associated physical feature.



British Grid centre X: 183145.78 m, centre Y: 61079.06 m

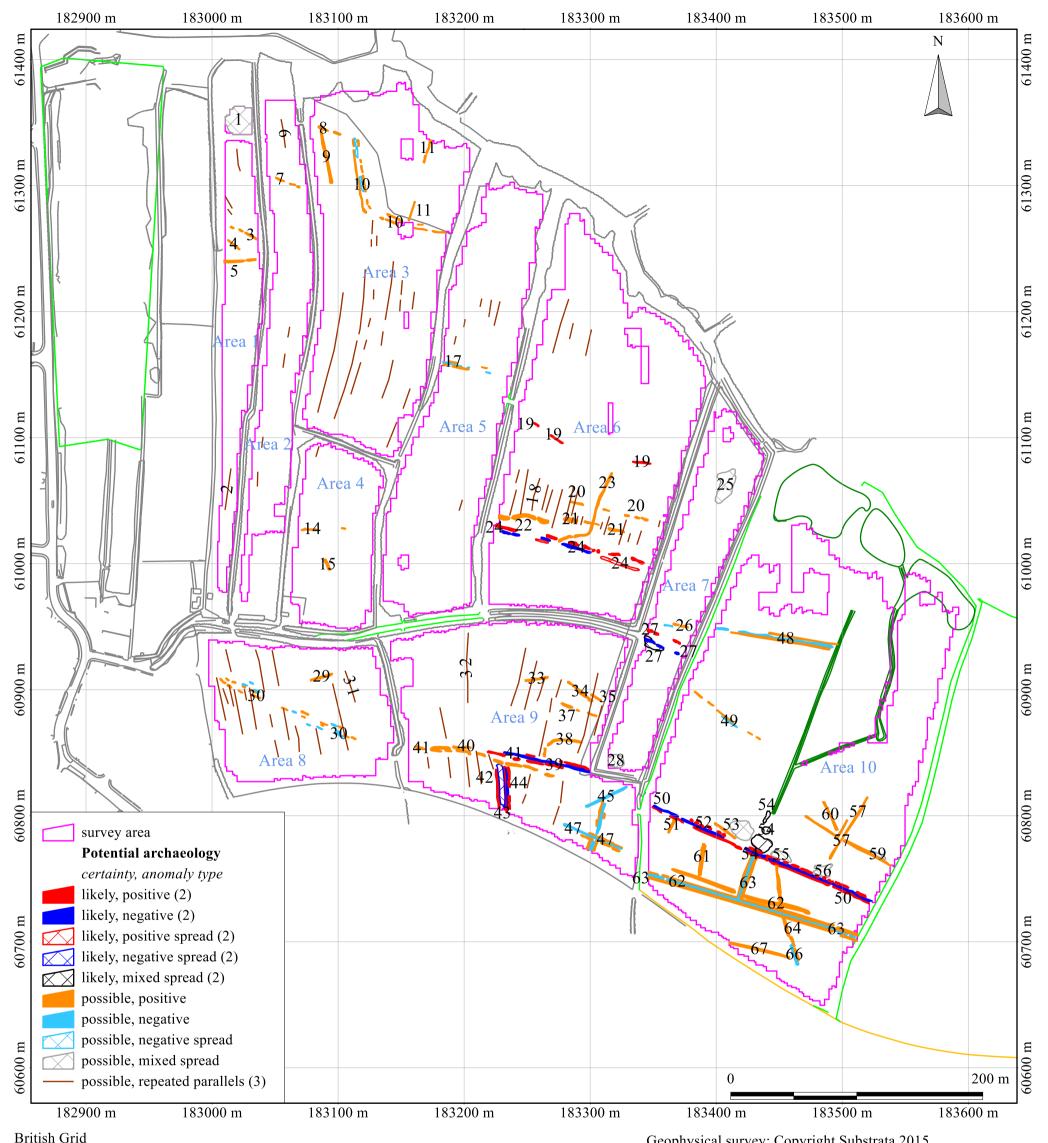
Geophysical survey: Copyright Substrata 2015. Base map: West Country Land Surveys Ltd Copyright 2011,

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Scale: 1:8000 @ A3. Spatial Units: Meter. Do not scale off this drawing

An archaeological gradiometer survey Land at Chapel Gover, Newquay, Cornwall Centred on NGR (E/N):183260,61030 (point) Report: 1511CHA-R-1

Figure 1: location map



centre X: 183247.52 m, centre Y: 60997.95 m

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## Scale: 1:3000 @ A3. Spatial Units: Meter. Do not scale off this drawing

### Notes:

1. All interpretations are provisional and represent potential archaeological deposits.

2. Anomalies designated "likely archaeology" have supporting evidence e.g. historical maps and or visible earthworks.

3. Representative; not all instances are mapped.

4. Anomalies likely to represent geological or other natural deposits are not mapped unless relevant to potential archaeological events or deposits.

An archaeological gradiometer survey Land at Chapel Gover, Newquay, Cornwall Centred on NGR (E/N):183260,61030 (point) Report: 1511CHA-R-1

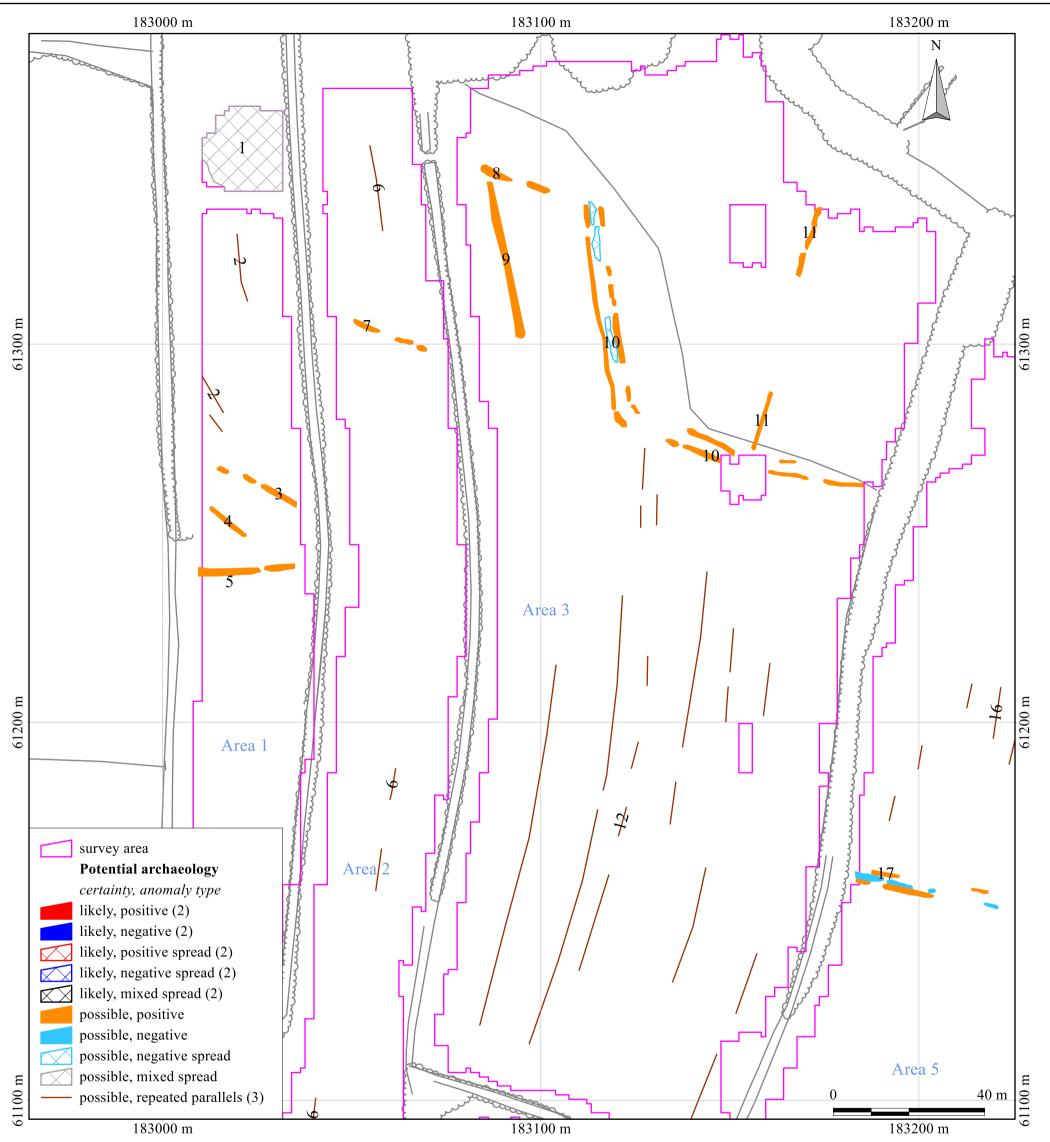
Figure 2: survey interpretation, all areas

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Site: An archaeological gradiometer survey Land at Chapel Gover, Newquay, Cornwall Centred on NGR (E/N):183260,61030 (point) Report: 1511CHA-R-1

	anomaly group		anomaly characterisation certainty & class	anomaly form	additional archaeological characterisation	comments
1	1		possible, mixed spread	irregular	rubble or near-surface bed rock	
	2		possible, repeated parallels	linear & curvilinear	former ploughing traces - possible ride-and-furrow	
	3		possible, positive	disrupted linear		anomaly group may represent a linear archaeological deposit, a ploughing trace or a field drain
	4		possible, positive	linear		anomaly group may represent a linear archaeological deposit, a ploughing trace or a field drain
	5		possible, positive	linear		
2	6		possible, repeated parallels	linear & curvilinear	former ploughing traces - possible ride-and-furrow	
3	7		possible, positive	disrupted linear		anomaly group may represent a linear archaeological deposit, a ploughing trace or a field drain
	8		possible, positive	disrupted linear		anomaly group may represent a linear archaeological deposit, a ploughing trace or a field drain
	9		possible, positive	linear		anomaly group is most likely to represent ridge-and-furrow but may represent a field boundary
	10		possible, positive & negative spread	disrupted parallel linear	ditch-lined track	anomaly group may represent a former track or routeway, possibly with stony metalling
	11		possible, positive	disrupted linear		
	12		possible, repeated parallels	linear & curvilinear	former ploughing traces - possible ride-and-furrow	
4	13		possible, repeated parallels	linear	former ploughing traces - possible ride-and-furrow	
	14		possible, positive	disrupted linear		
	15		possible, positive	linear		anomaly group may represent a linear archaeological deposit, a ploughing trace or a field drain
5	16		possible, repeated parallels	linear	former ploughing traces - possible ride-and-furrow	
	17		possible, positive/negative/positive	disrupted linear	field boundary - Cornish bank	anomaly group is faint but is most likely to represent a former field boundary
6	18		possible, repeated parallels	linear & curvilinear	former ploughing traces - possible ride-and-furrow	
	19		likely, positive	multi-linear	field boundary	although very faint, the anomaly group coincides with and likely represents a former field boundary mapped by the OS between 1881-83 and 1973-74
	20		possible, positive	disrupted linear		anomaly group may represent an archaeological deposit or is an expression of near-surface geology
	21		possible, positive	disrupted linear		anomaly group may represent an archaeological deposit or is an expression of near-surface geology
	22		possible, positive	disrupted linear		anomaly group may represent an archaeological deposit or is an expression of near-surface geology
ľ	23		possible, positive	disrupted curvilinear		anomaly group may represent a former field boundary or a combination of field boundary and remnant ridge-and-furrow
	24		likely, positive/negative/positive	disrupted linear	field boundary - Cornish bank	anomaly group is faint but is most likely to represent a former field boundary a former field boundary mapped by the OS between 1881 and 1963
7	25		possible, mixed spread	irregular	archaeological deposit, recent rubble or near-surface bed rock	
	26		possible, positive & negative	8		
	27		likely, mixed spread/positive/negative	linear	rubble from former field boundary	anomaly group coincides with and is most likely to represent a former field boundary mapped by the OS between 1881 and 1963
	28		possible, mixed spread	irregular	archaeological deposit, recent rubble or near-surface bed rock	
8	29		possible, positive	U		
8	30		possible, positive & negative	disrupted linear spread	route way or other linear disturbance	anomaly group is most likely to represent a routeway between two extant field entrances or, less likely in this case, the line of disturbance caused by service pipe or cable laving
8	31		possible, repeated parallels	linear & curvilinear	former ploughing traces - possible ride-and-furrow	
	32		possible, repeated parallels	linear & curvilinear	former ploughing traces - possible ride-and-furrow	
9	33		possible, positive	linear		
	34		possible, positive	linear		
	35		possible, positive	linear		
	36					
	37		possible, positive	disrupted linear		
	38		possible, positive	disrupted curvilinear		
	39	4(	likely, positive/negative/positive	disrupted linear	field boundary - Cornish bank	anomaly group coincides with and is most likely to represent a former field boundary mapped by the OS between 1881 and 1963
	40		possible, positive	disrupted linear		anomaly group may represent an extension westwards of group 39
	41		possible, positive	disrupted linear		
	42		likely, positive	linear	field lane edge	anomaly group coincides with and is most likely to represent a former field boundary mapped by the OS between 1881 and 1963
	43		likely, negative spread	linear	field lane	anomaly group coincides with and is most likely to represent a former field boundary mapped by the OS between 1881 and 1963
	44		likely, positive/negative/positive	disrupted linear	field boundary - Cornish bank	anomaly group coincides with and is most likely to represent a former field boundary mapped by the OS between 1881 and 1963
	45		possible, negative	linear		
	46		possible, positive/negative/positive	disrupted linear	field boundary - Cornish bank	
	47		possible, positive/negative/positive	disrupted linear	field boundary - Cornish bank	
10	48		possible, positive/negative/positive	linear	field boundary - Cornish bank	
-~	49		possible, positive & negative	disrupted linear		
	50		likely, positive/negative/positive	disrupted linear	field boundary - possible Cornish bank	anomaly group coincides with and likely represents a former field boundary mapped by the OS between 1881 and sometime after
	51		possible, positive	linear	nerd obundary - possible comisti bank	anomaly group concretes with and merry represents a former field boundary mapped by the OS between 1861 and sometime are
	52		possible, positive	linear		
	53		possible, mixed spread	irregular	rubble	
	54		likely, mixed spread	irregular	rubble associated with former field wall	anomaly group coincides with and likely represents a former field boundary mapped by the OS between 1881 and 1973 - 83
	55		possible, mixed spread	irregular	rubble	anomaly group conclues with and fixely represents a former field boundary mapped by the OS between 1881 and 1973 - 85
	56		possible, mixed spread		rubble	
	57			irregular parallel linear	ditched track or road	
			possible, positive			
	58		possible, positive	disrupted linear		
	59	30	possible, mixed spread	linear		an annaly, anoun many samacant a linear analyzable sized describe and surplice times. (7,11,1,1)
	60		possible, positive	linear		anomaly group may represent a linear archaeological deposit, a ploughing trace or a field drain
	61		possible, positive	linear		
	62		possible, positive	disrupted linear		
	63		possible, positive/negative/positive	disrupted multilinear	field boundary - Cornish bank	
	64		possible, positive	disrupted linear		
	65		possible, positive	disrupted linear		
······		1	In a suit la supervision	linear		
10	66 67		possible, negative possible, positive	linear		

	supporting evidence
	Ordnance Survey maps 1881-83 1:2500 to 1981-91 1:2500
	Ordnance Survey maps 1881-83 1:2500 to 1963 1:10560
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}	Ordnance Survey maps 1881-83 1:2500 to 1973-83 1:10000



# British Grid

centre X: 183095.02 m, centre Y: 61238.58 m

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## Scale: 1:1000 @ A3. Spatial Units: Meter. Do not scale off this drawing

#### Notes:

1. All interpretations are provisional and represent potential archaeological deposits.

2. Anomalies designated "likely archaeology" have supporting evidence e.g. historical maps and or visible earthworks.

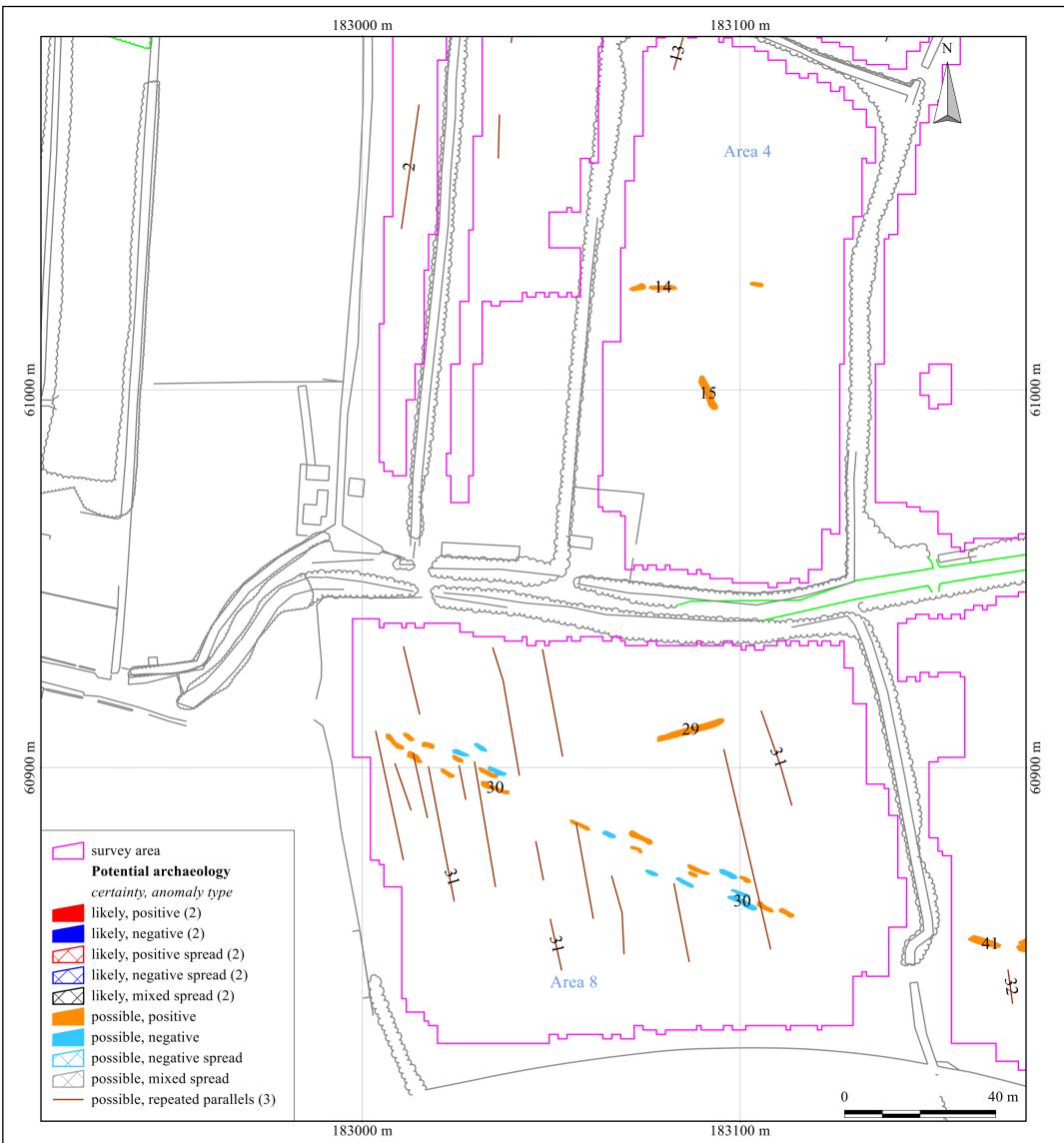
3. Representative; not all instances are mapped.

4. Anomalies likely to represent geological or other natural deposits are not mapped unless relevant to potential archaeological events or deposits.

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Figure 3: survey interpretation, area 1, area 2 and area 3

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## British Grid centre X: 183045.30 m, centre Y: 60949.96 m

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## Notes:

1. All interpretations are provisional and represent potential archaeological deposits.

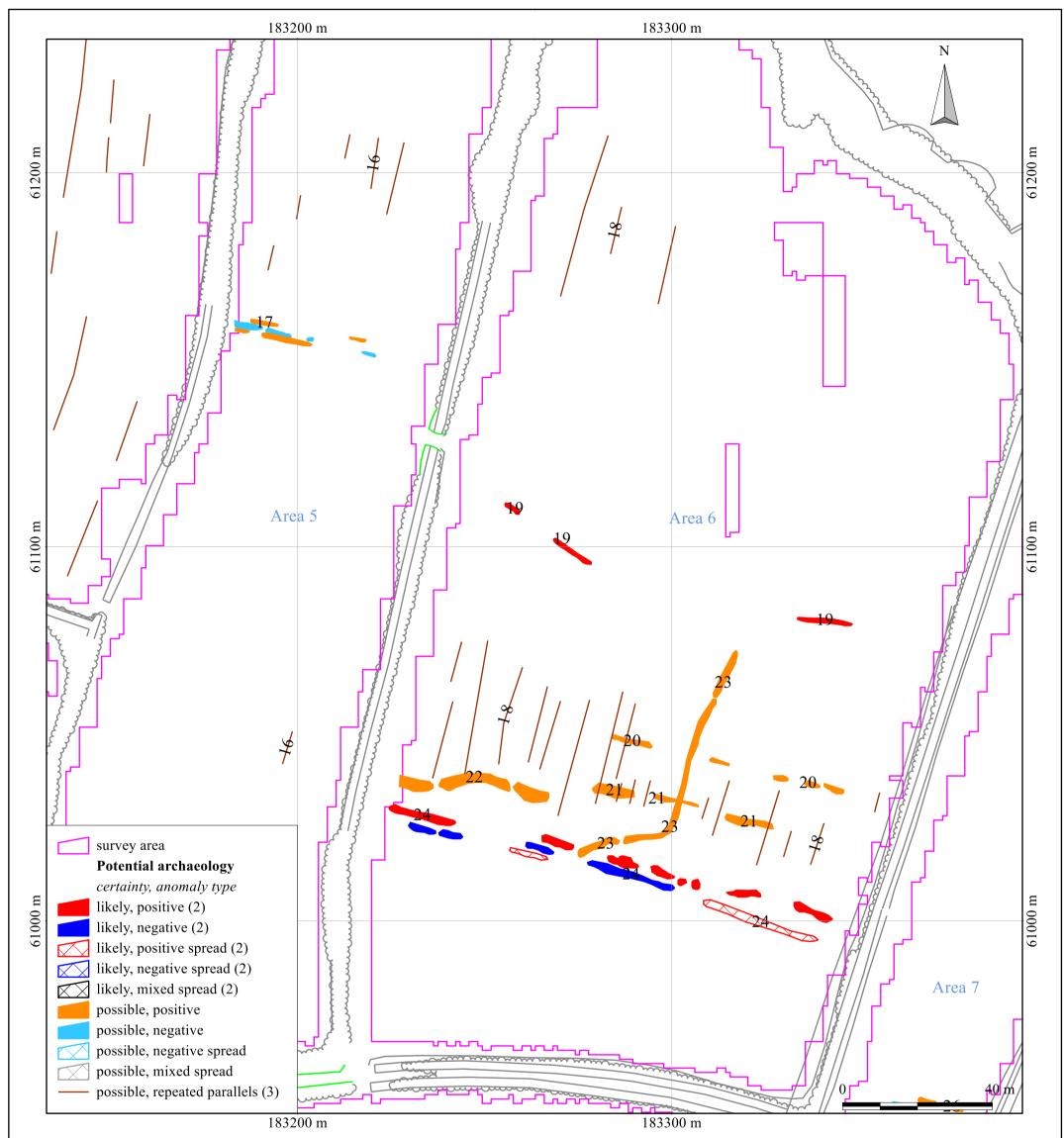
2. Anomalies designated "likely archaeology" have supporting evidence e.g. historical maps and or visible earthworks.

3. Representative; not all instances are mapped.

4. Anomalies likely to represent geological or other natural deposits are not mapped unless relevant to potential archaeological events or deposits.

An archaeological gradiometer survey Land at Chapel Gover, Newquay, Cornwall Centred on NGR (E/N):183260,61030 (point) Report: 1511CHA-R-1

Figure 4: survey interpretation, area 4 and area 8



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## Scale: 1:1000 @ A3. Spatial Units: Meter. Do not scale off this drawing

## Notes:

1. All interpretations are provisional and represent potential archaeological deposits.

2. Anomalies designated "likely archaeology" have supporting evidence e.g. historical maps and or visible earthworks.

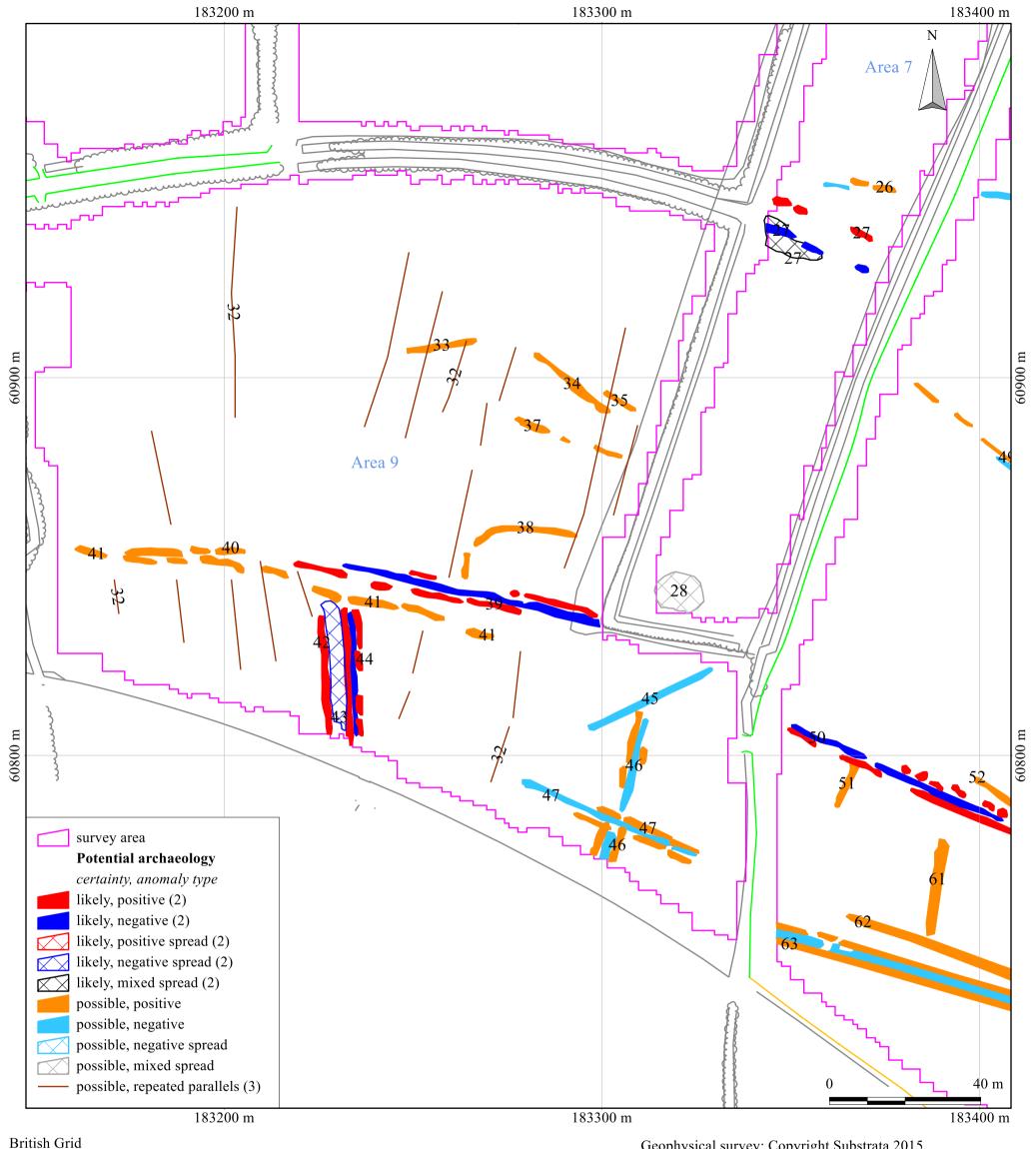
3. Representative; not all instances are mapped.

4. Anomalies likely to represent geological or other natural deposits are not mapped unless relevant to potential archaeological events or deposits.

An archaeological gradiometer survey Land at Chapel Gover, Newquay, Cornwall Centred on NGR (E/N):183260,61030 (point) Report: 1511CHA-R-1

Figure 5: survey interpretation, area 5 and area 6

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Geophysical survey: Copyright Substrata 2015. Base map: West Country Land Surveys Ltd Copyright 2011,

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## Scale: 1:1000 @ A3. Spatial Units: Meter. Do not scale off this drawing

## Notes:

1. All interpretations are provisional and represent potential archaeological deposits.

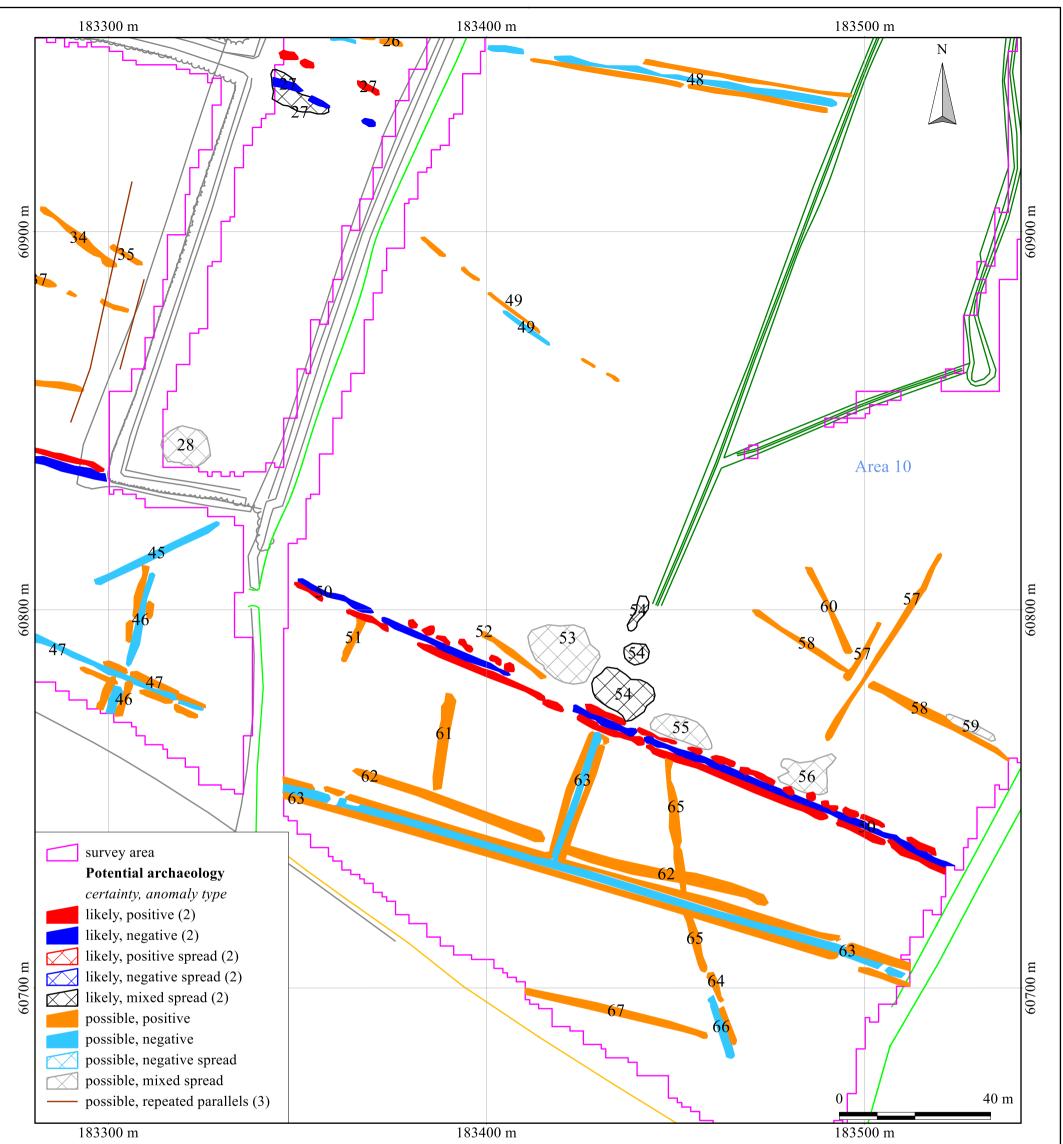
2. Anomalies designated "likely archaeology" have supporting evidence e.g. historical maps and or visible earthworks.

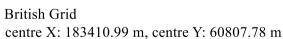
3. Representative; not all instances are mapped.

4. Anomalies likely to represent geological or other natural deposits are not mapped unless relevant to potential archaeological events or deposits.

An archaeological gradiometer survey Land at Chapel Gover, Newquay, Cornwall Centred on NGR (E/N):183260,61030 (point) Report: 1511CHA-R-1

Figure 6: survey interpretation, area 7 and area 9





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## Scale: 1:1000 @ A3. Spatial Units: Meter. Do not scale off this drawing

## Notes:

1. All interpretations are provisional and represent potential archaeological deposits.

2. Anomalies designated "likely archaeology" have supporting evidence e.g. historical maps and or visible earthworks.

3. Representative; not all instances are mapped.

4. Anomalies likely to represent geological or other natural deposits are not mapped unless relevant to potential archaeological events or deposits.

An archaeological gradiometer survey Land at Chapel Gover, Newquay, Cornwall Centred on NGR (E/N):183260,61030 (point) Report: 1511CHA-R-1

Figure 7: survey interpretation, area 10



centre X: 183247.52 m, centre Y: 60997.95 m

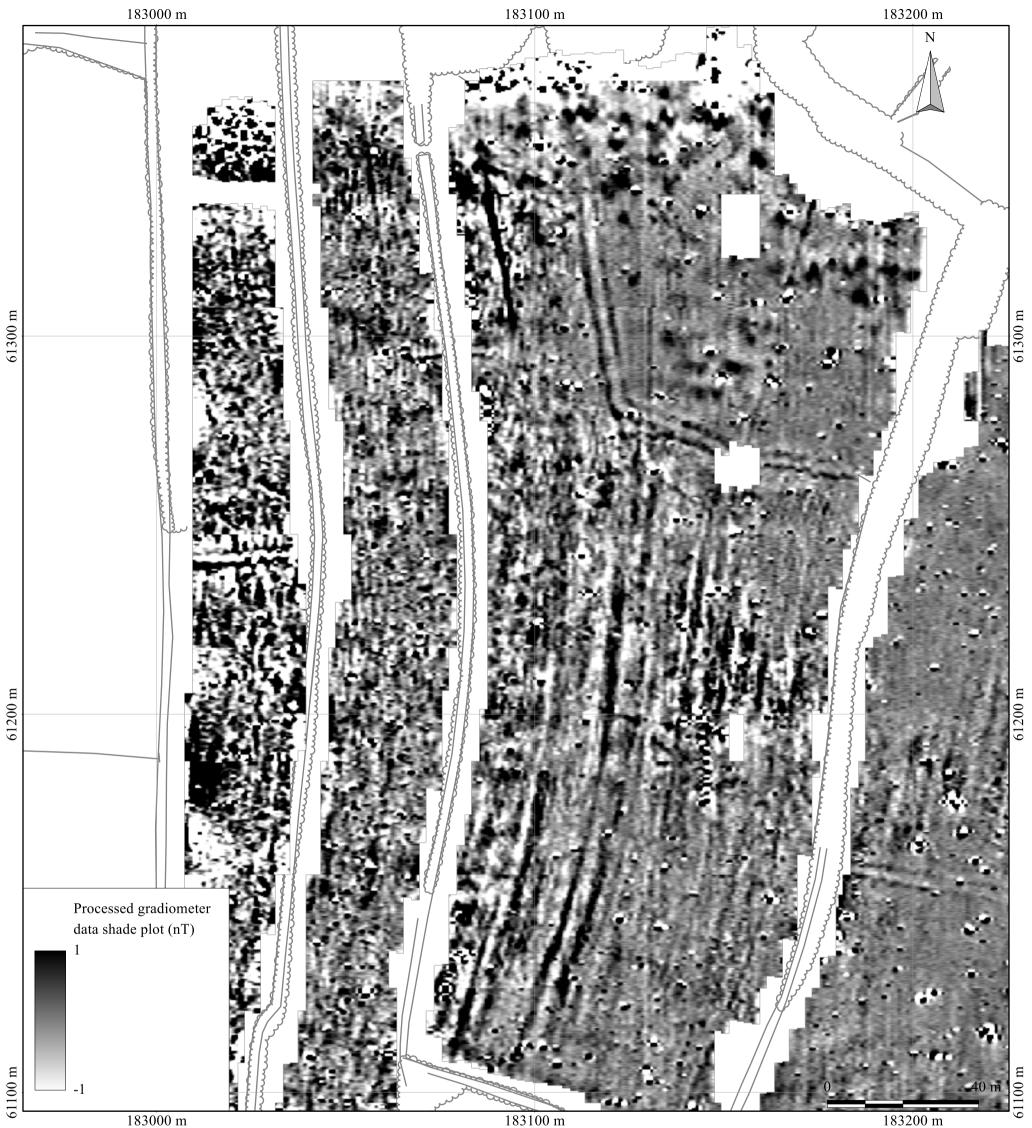
All rights reserved.

Scale: 1:3000 @ A3. Spatial Units: Meter. Do not scale off this drawing

An archaeological gradiometer survey Land at Chapel Gover, Newquay, Cornwall Centred on NGR (E/N):183260,61030 (point) Report: 1511CHA-R-1

Figure 8: shade plot of processed data, all areas

Base map: West Country Land Surveys Ltd Copyright 2011,



183200 m

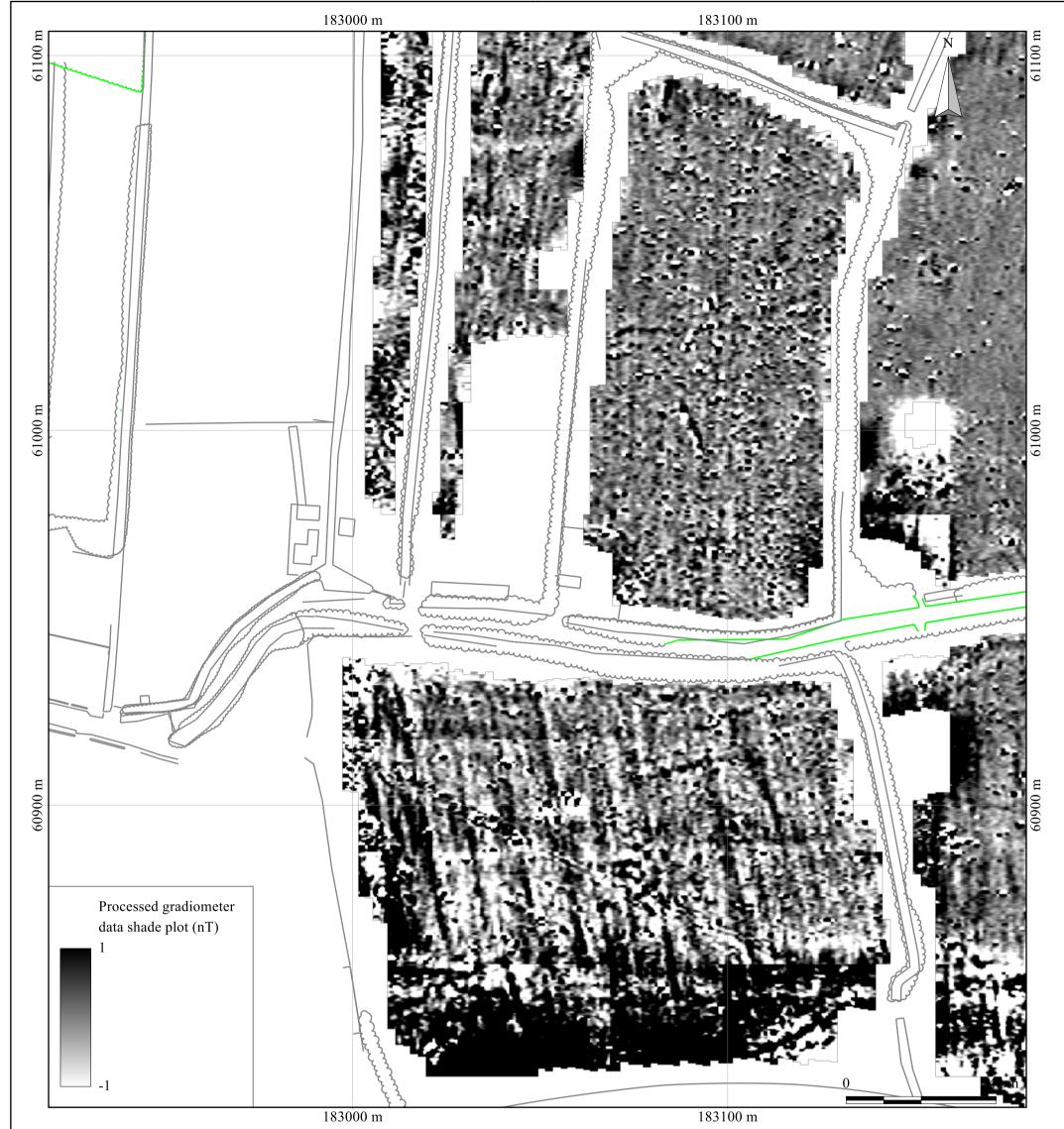
Geophysical survey: Copyright Substrata 2015. Base map: West Country Land Surveys Ltd Copyright 2011,

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Scale: 1:1000 @ A3. Spatial Units: Meter. Do not scale off this drawing

An archaeological gradiometer survey Land at Chapel Gover, Newquay, Cornwall Centred on NGR (E/N):183260,61030 (point) Report: 1511CHA-R-1

Figure 9: shade plot of processed data, area 1, area 2 and area 3



## British Grid centre X: 183049.26 m, centre Y: 60962.93 m

Base map: West Country Land Surveys Ltd Copyright 2011,

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Scale: 1:1000 @ A3. Spatial Units: Meter. Do not scale off this drawing

An archaeological gradiometer survey Land at Chapel Gover, Newquay, Cornwall Centred on NGR (E/N):183260,61030 (point) Report: 1511CHA-R-1

Figure 10: shade plot of processed data, area 4 and area 8

Geophysical survey: Copyright Substrata 2015. Base map: West Country Land Surveys Ltd Cor



Geophysical survey: Copyright Substrata 2015. Base map: West Country Land Surveys Ltd Copyright 2011,

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Scale: 1:1000 @ A3. Spatial Units: Meter. Do not scale off this drawing

An archaeological gradiometer survey Land at Chapel Gover, Newquay, Cornwall Centred on NGR (E/N):183260,61030 (point) Report: 1511CHA-R-1

Figure 11: shade plot of processed data, area 5 and area 6



British Grid centre X: 183277.92 m, centre Y: 60850.19 m

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Scale: 1:1000 @ A3. Spatial Units: Meter. Do not scale off this drawing

An archaeological gradiometer survey Land at Chapel Gover, Newquay, Cornwall Centred on NGR (E/N):183260,61030 (point) Report: 1511CHA-R-1

Figure 12: shade plot of processed data, area 7 and area 9

Geophysical survey: Copyright Substrata 2015. Base map: West Country Land Surveys Ltd Copyright 2011,



British Grid centre X: 183410.99 m, centre Y: 60807.78 m Geophysical survey: Copyright Substrata 2015. Base map: West Country Land Surveys Ltd Copyright 2011,

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Scale: 1:1000 @ A3. Spatial Units: Meter. Do not scale off this drawing

An archaeological gradiometer survey Land at Chapel Gover, Newquay, Cornwall Centred on NGR (E/N):183260,61030 (point) Report: 1511CHA-R-1

Figure 13: shade plot of processed data, area 10

#### Appendix 2 Methodology Summary

Table 2: methodology summary

#### Documents

Written Scheme of Investigation: Brown (2015) Survey methodology statement: Dean (2015)

#### Methodology

- The work was undertaken in accordance with the survey methodology statement. 1.
- 2. The geophysical survey was undertaken with reference to standard guidance provided by the Chartered Institute for Archaeologists (2014a), Historic England (2010) and Archaeology Data Service/Digital Antiquity Guides (undated).
- 3. The survey grid location information and grid plan was recorded as part of the project in a suitable GIS system.
- Data processing was undertaken using appropriate software, with all anomalies assessed as 4. relevant being digitised and geo-referenced.
- 5. The final report included a graphical and textual account of the techniques undertaken, the data obtained and an archaeological interpretation of that data and conclusions about any likely archaeology.

## Grid

DGPS set-out using pre-planned survey grids and Ordnance Survey coordinates. **30m by 30m grids** 

Geo-referenced and recorded using digital map tiles.

Description PM5V2 GPS with external antenna and survey pole and DigiTerra Explorer 7 as the survey control program.

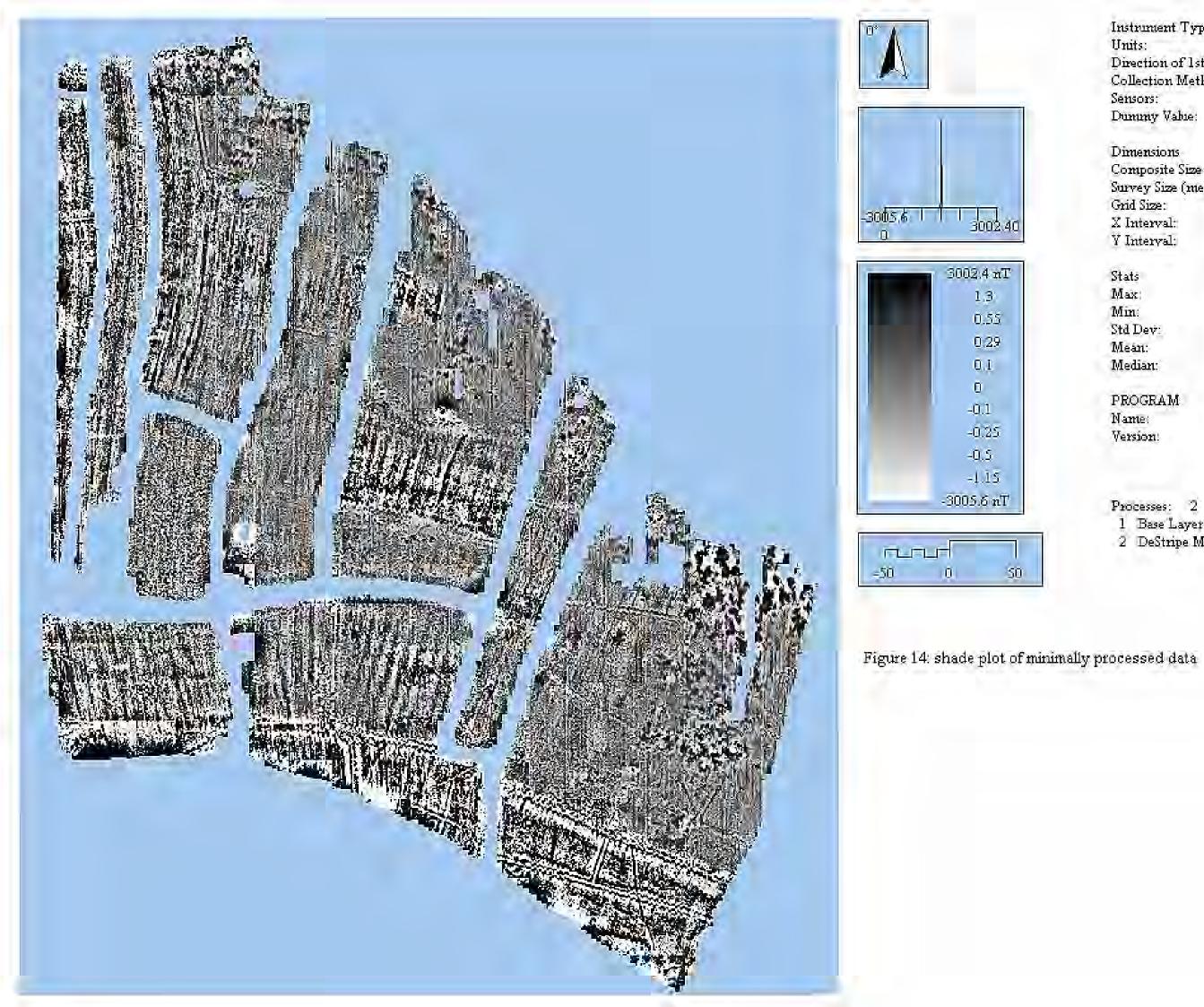
#### Equipment

Data Capture Bartington Instruments grad601-2 0.25m version 6.1 1 metre GUILLING Data Processing, Analysis and Presentation Software IntelliCAD Technology Consortium IntelliCAD 8.0 DW Consulting TerraSurveyor3 Manifold System 8 GIS Microsoft Corp. Office Excel 2013 Microsoft Corp. Office Publisher 2013 Adobe Systems Inc Adobe Acrobat 9 Pro Extended

# Appendix 3 Data processing

D:	Bartington Grad 610 iT
Direction of 1st Trav	verse: 0 deg
Collection Method:	ZigZag
Sensors: Dummy Value:	2 @ 0.00 m spacing. 32702
Dimensions Composite Size (read	$\dim_{\mathcal{O}}(x) = 2000 \times 620$
	$2100 \times 0.00 \times 0.00$ m $2100 \times 0.00$ m
Grid Size:	30 m x 30 m
X Interval:	0.25 m
Y Interval:	1 m
Stats Max:	58.61
	54.12
Std Dev:	3.15
	0.09
Median:	0.00
PROGRAM Name:	TerraSurveyor
Version:	3.0.28.1
<ul> <li>5 De Stagger: Grid</li> <li>6 DeStripe Media 115.xgd k24.y j6.xgd j11.xg</li> <li>7 DeStripe Media g27.xgd</li> <li>8 DeStripe Media j34+i6.xgd</li> <li>9 DeStripe Media 10 DeStripe Media 11 DeStripe Media 12 DeStripe Media c12.xgd d5.xg</li> <li>13 DeStripe Media c16.xgd d9.xg</li> <li>15 Edge Match (Ai 16 Edge Match (Ai 17 DeStripe Media n10+h12.xgd h21.xgd h22.x</li> <li>18 DeStripe Media n21.xgd n20.x</li> </ul>	ds: All Mode: Both By: -2 intervals ds: b1.xgd Mode: Both By: 1 intervals m Traverse: Grids: k6+j2.xgd k13.xgd l6.xgd l16.xgd k23.xgd l23+f18.xgd j3+k7.xgd k12.xgd l7.xg kgd l24.xgd j4.xgd k11.xgd l8.xgd l14.xgd l27.xgd l25.xgd j5.xgd k10.xgd l9.xgd l13.xgd l26.xg d l10.xgd l12.xgd j7.xgd j10.xgd l11.xgd n Traverse: Grids: h25.xgd h30.xgd g25.xgd h26+l34.xgd h31.xgd g26.xgd l33+h27+j22.xgd h32.xg n Traverse: Grids: i22+h34.xgd i2.xgd i23+h35.xgd i3.xgd i24+h36.xgd i4.xgd i25.xgd i5.xgd j33.xg n Traverse: Grids: j6.xgd j11.xgd j7.xgd j10.xgd j8.xgd j9.xgd m Traverse: Grids: j6.xgd j11.xgd j7.xgd j10.xgd i8.xgd j9.xgd m Traverse: Grids: a5.xgd a6+f5.xgd an Traverse: Grids: a12.xgd b4.xgd m1.xgd a21.xgd c11.xgd d4.xgd a11.xgd b5.xgd m2.xgd a22.xg gd a10.xgd b6.xgd m3.xgd a23.xgd c13.xgd d6.xgd a9.xgd m4.xgd b14.xgd a24.xgd c14.xgd d7.xgd an Traverse: Grids: c1.xgd a20.xgd c10.xgd d3.xgd m1.xgd a21.xgd c11.xgd d4.xgd a11.xgd b5.xgd m2.xgd a22.xg gd d12.xgd d19.xgd n3+f23.xgd n4.xgd a27.xgd c17.xgd d10.xgd d11.xgd f22.xgd a28.xgd rea: Top 570, Left 0, Bottom 629, Right 119) to Right edge rea: Top 570, Left 0, Bottom 629, Right 119) to Right edge rea: Top 570, Left 480, Bottom 419, Right 599) to Bottom edge dian Traverse: Grids: n6.xgd h1.xgd n7+h11.xgd h2.xgd n8+h9.xgd h3.xgd n9+h10.xgd h4.xg h5.xgd n11+h13.xgd h6.xgd m1.xgd n7-xgd m6.xgd m7.xgd m8.xgd m9.xgd m10.xgd m11.xgd m12.xgd m13.xg m Traverse: Grids: c1.xgd m1.xgd m1.xgd m7-xgd m8.xgd m9.xgd m10.xgd m11.xgd m12.xgd m13.xg m1 Traverse: Grids: n6.xgd m1.xgd m7-xgd m8.xgd m9.xgd m10.xgd m11.xgd m12.xgd m13.xg m1 Traverse: Grids: n6.xgd m1.xgd m7-xgd m8.xgd m9.xgd m10.xgd m11.xgd m12.xgd m13.xg m1 Traverse: Grids: n6.xgd m1.xgd m7-xgd m8.xgd m9.xgd m10.xgd m11.xgd m12.xgd m13.xg m1 Traverse: Grids: n6.xgd m1.xgd m7-xgd m8.xgd m9.xgd m10.xgd m11.xgd m12.xgd m13.xg m1 Traverse: Grids: k27+m5.xgd m6.xgd m7.xgd m8.xgd m9.xgd m10.xgd m11.xgd m12.xgd m13.xg m1 Traverse: Grids: k27+m5.xgd m6.xgd m7.xgd m8.xgd m9.xgd m10.xgd m11.xgd m12.xgd m13.

# Appendix 4 Raw data plots



Bartington Grad 610 Instrument Type: Units: nTDirection of 1st Traverse: 0 deg ZigZag 2 @ 0.00 m spacing. 32702 Collection Method: Sensors: Dummy Value:

Dimensions Composite Size (readings): 3000 x 630 Survey Size (meters): 750 m x 630 m Grid Size: 30 m x 30 m X Interval: 0.25 m Y Interval: 1 m

Stats Max: Min: Std Dev: Mean: Median:

3002.40

1,3

0.55

0.29

0.1

0

-0.1

-0.25

-0.5 -1.15

50

3002.48 -3005.60 46.95 0.06 0.00

PROGRAM Name: Version:

TerraSurveyor 3.0.28.1

Processes: 2 1 Base Layer

2 DeStripe Median Sensors: All