

Sonning Quarry, East Extension, Sonning Eye, Oxfordshire

Geophysical Survey (Magnetic)

by Kyle Beaverstock

Site Code: SEE21/272

(SU 7608 7720)

Sonning Quarry, East Extension, Sonning Eye, Oxfordshire

Geophysical Survey (Magnetic) Report

For Tarmac Limited

by Kyle Beaverstock

Thames Valley Archaeological Services Ltd

Site Code SEE 21/272

April 2023

Summary

Site name: Sonning Quarry, East Extension, Sonning Eye, Oxfordshire

Grid reference: SU 7608 7720

Site activity: Magnetometer survey

Date and duration of project: 6 December 2021 – 18 April 2023

Project coordinator: David Sanchez

Site supervisor: Kyle Beaverstock

Site code: SEE 21/272

Area of site: c. 62ha

Summary of results: A small number of potential prehistoric features were uncovered by the geophysical survey as well as a number of other linear and discrete features of indeterminate date.

Location of archive: The archive is presently held at Thames Valley Archaeological Services, Reading in accordance with TVAS digital archiving policies.

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Report edited/checked by: Steve Ford ✓ 02.05.23 David Sanchez ✓ 02.05.23

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Sonning Quarry, East Extension, Sonning Eye, Oxfordshire A Geophysical Survey (Magnetic)

by Kyle Beaverstock

Report 21/272

Introduction

This report documents the results of a geophysical survey (magnetic) carried out at Henley Road, Reading, Oxfordshire (SU 7608 7720) (Fig. 1). The work was commissioned by Andy Richmond of Phoenix Consulting Archaeology Ltd, Bedford Office, 13 Grove Place, Bedford, MK40 3JJ, on behalf of Tarmac Ltd. T3 Solihull Office. Trinity Park, Bickenhill Lane, Ground Floor, T3 Birmingham B37 7ES.

Planning permission is to be sought from Oxfordshire County Council for the eastern extension of Sonning Quarry, Sonning Eye, Oxfordshire (SU 7550 7683). As such, a geophysical survey has been requested in order to inform the application. The survey site covers an area of c.62ha across several arable fields to the south and east of the current quarry workings. This is in accordance with the *National Planning Policy Framework* (NPPF 2021), and the County's policies on archaeology. The field investigation was carried out to a specification approved by Steven Weaver, Planning Archaeologist for Oxfordshire County Council. The fieldwork was undertaken by Kyle Beaverstock and Luciano Cicu, between 6th of December 2021 and 18th of April 2023 and the site code is CQS 17/112.

The archive is presently held at Thames Valley Archaeological Services, Reading in accordance with TVAS digital archiving policies.

Location, topography and geology

The site is located on the north-eastern edge of Reading (Fig. 1), just to the north of Sonning with the River Thames running approximately 80m to the south-east. Bounded by mostly farmland to the south, east and north with an open quarry to the north-west. This relatively level parcel of land sitting at a height of c. 34m above Ordnance Datum across the survey area and being utilised for arable farming. The underlying geology is stated as Brickearth above Upper Chalk in the south-east and central areas and Alluvium in the east of the site (BGS 2000).

Site history and archaeological background

The site lies in the archaeologically rich Thames Valley, with many sites recorded during the process of gravel extraction (Manning and Moore 2011), via aerial photography (Gates 1975), field survey (Ford 1987) and latterly by planning-led archaeological interventions (Barnes et al. 1997). The archaeological potential of the site has been highlighted in an archaeological desktop study (Coates and Richmond 2009). Aerial photography (Palmer 2009), geophysical survey (Bartlett 2010 a and b), evaluation trenching (Ford 2004; Newboult and McNicoll-Norbury 2011), archaeological excavation (Porter and Weale 2014) and recording action (Attard and Taylor 2018) has provided a comprehensive study of the site.

Methodology

Sample interval

Data collection involved the traversing of the survey area along straight and parallel lines using two cartmounted Bartington Grad601-2 fluxgate gradiometers. Even coverage was achieved with the use of regularly spaced markers at the ends of traverses and the real-time positional trace plot. Readings were taken at 0.13m intervals along traverses 1m apart, providing an appropriate methodology balancing cost and time with resolution. Traverses were walked at an alternating zig-zag pattern along a south-west to north-east and northwest to south-east orientation across fields A, B, D, E, F, G, H, I, J and north to south across field C. A number of obstructions were encountered including woodland fences and vegetation. Conditions were mostly dry and bright with some frost and rain.

The Grad 601-2 has a typical depth of penetration of 0.5m to 1.0m. This would be increased if strongly magnetic objects have been buried in the site. Under normal operating conditions it can be expected to identify buried features >0.5m in diameter. Features which can be detected include disturbed soil, such as the fill of a ditch, structures that have been heated to high temperatures (magnetic thermoremnance) and objects made from ferro-magnetic materials. The strength of the magnetic field is measured in nano Tesla (nT), equivalent to 10^{-9} Tesla, the SI unit of magnetic flux density.

Equipment

The purpose of the survey was to identify geophysical anomalies that may be archaeological in origin in order to inform a targeted archaeological investigation of the site prior to development. The survey and report generally

follow the recommendations and standards set out by both European Archaeological Council (EAC 2015) and the Chartered Institute *for* Archaeologists (2002, 2014).

Magnetometry was chosen as a survey method as it offers the most rapid ground coverage and responds to a wide range of anomalies caused by past human activity. These properties make it ideal for the fast yet detailed surveying of an area.

The detailed magnetometry survey was carried out using two dual sensor Bartington Instruments Grad 601-2 fluxgate gradiometers mounted upon a Bartington non-magnetic cart. A two-wheeled lightweight structure pushed by hand, the cart consisted a bank of four vertically-mounted Bartington Grad601-2 magnetic sensor tubes at 1m apart and a Trimble R2 Receiver, centimetre edition GPS. Readings were collected by two Bartington Grad601-2 loggers and collated using MLgrad601 software on a Linx 12x64 tablet running Windows 10 mounted at the rear of the cart. This enables readings to be taken of both the general background magnetic field and any localised anomalies with the difference being plotted as either positive or negative buried features. All sensors are calibrated to cancel out the local magnetic field and react only to anomalies above or below this base line. On this basis, strong magnetic anomalies such as burnt features (kilns and hearths) will give a high response as will buried ferrous objects. More subtle anomalies such as pits and ditches can be seen from their infilling soils containing higher proportions of humic material, rich in ferrous oxides, compared to the undisturbed subsoil. This will stand out in relation to the background magnetic readings and appear in plan following the course of a linear feature or within a discrete area.

The Trimble R2 Receiver, centimetre edition GPS system with centimetre real-time accuracy was used to tie the cart traverses into the Ordnance Survey national grid. This unit offers both real-time correction and postsurvey processing; enabling a high level of accuracy to be obtained both in the field and in the final postprocessed data.

Data gathered in the field was processed using the TerraSurveyor software package. This allows the survey data to be collated and manipulated to enhance the visibility of anomalies, particularly those likely to be of archaeological origin. The table below lists the processes applied to this survey, full survey and data information is recorded in Appendix 1.

Process	Effect
Clip from -2.20 to 2.21 nT	Enhance the contrast of the image to improve the appearance of possible archaeological anomalies.
De-stripe: median, all sensors	Removes the striping effect caused by differences in sensor calibration, enhancing the visibility of potential archaeological anomalies.
De-spike: threshold 1, window size 3×3	Compresses outlying magnetic points caused by

interference of metal objects within the survey area.

De-stagger: all grids, both by -1 intervals

Cancels out effects of site's topography on irregularities in the traverse speed.

The raw data plot is presented as a greyscale plot shown in relation to the site (Fig. 2) with the processed data then presented as a second figure (Fig. 3), followed by a third plan to present the abstraction and interpretation of the magnetic anomalies (Fig. 4). Anomalies are shown as colour-coded lines, points and polygons.

The greyscale plot of the processed data is exported from TerraSurveyor in a georeferenced portable network graphics (.PNG) format, a raster image format chosen for its lossless data compression and support for transparent pixels, enabling it to easily be overlaid onto an existing site plan. The data plot is combined with grid and site plans in QGIS 2.18.15 and exported again in .PNG format in order to present them in figure templates in Adobe InDesign CS5.5, creating .INDD file formats. Once the figures are finalised they are exported in .PDF format for inclusion within the finished report.

Results

Across the survey area are a series of irregular positive anomalies with some associated negative anomalies [1], these come in the forms of linears and globular shaped features and are mostly in the alluvial areas to the east and are likely caused by geological features. In the east of field A is a short weak positive linear [2] orientated south-east to north-west and measuring 42m long and is likely related to the field system.

In the south-west of field B are two positive curvilinear anomalies **[3]**, these measure c. 17m in diameter and c. 7m. These most likely represent barrow ditches as a number of barrows were identified by previous surveys in the adjacent field to the north. In the north of the field are two parallel positive linears **[4]**, these are orientated north-west to south-east and measure 36m and 22m and approximately 2.2m apart. These likely represent a possible trackway. To the north of this is another positive linear **[5]** running south-east to north-west across the south-west of field C and the north of field B for 87m before turning to the north-west for 18m with a small branch heading north. To the north of this is a weak positive linear **[6]** orientated north-west to south-east and measuring 17m, these linears most likely represent agricultural field systems.

In the centre of field C are a series of positive linears [7], one is orientated south-west to north-east and measures 24m long, to the north-east are two parallel positive linears. The northern linear is orientated north-east to south-west for 33m before turning to the north-west for 10m, the southern linear runs along the same orientation as the northern linear, 4m apart, for 30m before turning to the south-east for 6m.

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In the south-west of field E is an irregular positive linear **[8]**, it runs roughly from the south-west to the north-east before turning to the south-east and measuring 192m long in total. Running across the centre of field G into the west of field F is a positive linear **[9]**, its orientated south-west to the north-east and measures 210m long and is likely part of a field system. To the south-east of this in field F are two weak positive linears **[10]**, one orientated south-west to the north-east and the other orientated north-west to the south-east and measuring 44m and 37m long respectively and intersecting to the north-east.

In the south of field J is a positive curvilinear measuring 23m long and likely represents a ring ditch

[11] or potentially a barrow. In the east and west of the field are two irregular positive discrete features [12] measuring c. 9m in diameter which may represent pits.

Conclusion

The geophysical survey detected a number of anomalies, these include a few curvilinear features which likely

represent prehistoric deposits. There are a number of potential trackways as well as agricultural field systems

that may be related to the prehistoric and Roman systems uncovered by the quarry excavations to the south west,

as well as a number of discrete features such as pits.

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TerraSurveyor Name: Version: 3.0.25.0 Raw data Sonning Quarry A RAW.xcp Filename: MLgrad Import Instrument Type: Units: UTM Zone: 30 Survey corner coordinates (X/Y): Northwest corner: 474939.426591188, 176504.16138988 m 475230.496591188, 176263.27138988 m Southeast corner: Direction of 1st Traverse: 90 deg Collection Method: Parallel 2 @ 1 m spacing. Sensors: Dummy Value: 32702 Dimensions 291 m x 241 m Survey Size (meters): X&Y Interval: 0.13 m Source GPS Points: Active: 56287, Recorded: 56287 Stats Max: 104.61 Min: -109.71 Std Dev: 4.17 0.27 Mean: Median: 0.21 Composite Area: 7.0116 ha 1.9726 ha Surveyed Area: Filename: Sonning Quarry B RAW.xcp Instrument Type: MLgrad Import Units: UTM Zone: 30 Survey corner coordinates (X/Y): 475010.80679237, 176532.899740575 m Northwest corner: 475289.26679237, 176247.939740575 m Southeast corner: Direction of 1st Traverse: 90 deg Parallel Collection Method: 2 @ 1 m spacing. Sensors: Dummy Value: 32702 Dimensions 278 m x 285 m Survey Size (meters): X&Y Interval: 0.13 m Source GPS Points: Active: 23863, Recorded: 23863 Stats Max: 102.04 -80.92 Min: 3.20 Std Dev: Mean: 1.19 Median: 1.24 Composite Area: 7.935 ha Surveyed Area: 0.85587 ha Sonning Quarry C RAW.xcp Filename: Instrument Type: MLgrad Import Units: UTM Zone: 30 *Survey corner coordinates (X/Y):* 475020.910350223, 176357.045999223 m Northwest corner: Southeast corner: 475244.770350223, 176125.645999223 m Direction of 1st Traverse: 90 deg Collection Method: Parallel

Programme:

Sensors: 2 @ 1 m spacing. Dummy Value: 32702 Dimensions Survey Size (meters): 224 m x 231 m *X&Y Interval:* 0.13 m Active: 83895, Recorded: 83895 Source GPS Points: Stats 105.17 Max: Min: -109.72 Std Dev: 4.99 Mean: 1.68 Median: 1.59 5.1801 ha Composite Area: Surveyed Area: 2.6216 ha Sonning Quarry D RAW.xcp Filename: Instrument Type: MLgrad Import Units: UTM Zone: 30 Survey corner coordinates (X/Y): Northwest corner: 475365.05699408, 176655.587025247 m 475536.78699408, 176462.147025247 m Southeast corner: Direction of 1st Traverse: 90 deg Collection Method: Parallel Sensors: 2 @ 1 m spacing. 32702 Dummy Value: Dimensions Survey Size (meters): 172 m x 193 m *X&Y Interval:* 0.13 m Active: 51759, Recorded: 51759 Source GPS Points: Stats 104.63 Max: Min: -109.71 Std Dev: 3.38 Mean: 141 Median: 1.63 Composite Area: 3.3219 ha Surveyed Area: 1.6554 ha Sonning Quarry E RAW.xcp Filename: Instrument Type: MLgrad Import Units: UTM Zone: 30 Survey corner coordinates (X/Y): Northwest corner: 475603.597205531, 176970.635999969 m 475813.287205531, 176472.605999969 m Southeast corner: Direction of 1st Traverse: 90 deg Collection Method: Parallel 2 @ 1 m spacing. Sensors: Dummy Value: 32702 Dimensions Survey Size (meters): 210 m x 498 m *X&Y Interval:* 0.13 m Source GPS Points: Active: 123191, Recorded: 123191 Stats Max: 106.71 -109.72 Min: Std Dev: 3.96 Mean: 0.18 Median: 0.28 Composite Area: 10.443 ha 4.2458 ha Surveyed Area: Sonning Quarry F RAW.xcp Filename: Instrument Type: MLgrad Import Units: UTM Zone: 30 Survey corner coordinates (X/Y): Northwest corner: 475803.924022065, 177037.230369471 m 475998.144022065, 176858.480369471 m Southeast corner:

Direction of 1st Traverse: 90 deg Collection Method: Parallel 2 @ 1 m spacing. Sensors: 32702 Dummy Value: Dimensions Survey Size (meters): 194 m x 179 m *X&Y Interval:* 0.13 m Source GPS Points: Active: 63623, Recorded: 63623 Stats Max: 103.21 Min: -64.98 Std Dev: 2.17 Mean: 0.23 Median: 0.16 Composite Area: 3.4717 ha Surveyed Area: 2.1754 ha Sonning Quarry G RAW.xcp Filename: Instrument Type: MLgrad Import Units: UTM Zone: 30 Survey corner coordinates (X/Y): 476136.676603755, 177404.970422644 m Northwest corner: Southeast corner: 476468.176603755, 177051.630422644 m Direction of 1st Traverse: 90 deg Parallel Collection Method: Sensors: 2 @ 1 m spacing. Dummy Value: 32702 Dimensions Survey Size (meters): 331 m x 353 m X&Y Interval: 0.13 m Source GPS Points: Active: 187151, Recorded: 187151 Stats Max: 106.81 -105.95 Min: Std Dev: 2.72 Mean: 0.28 Median: 0.11 Composite Area: 11.713 ha Surveyed Area: 6.3371 ha Sonning Quarry H RAW.xcp Filename: Instrument Type: MLgrad Import Units: UTM Zone: 30 Survey corner coordinates (X/Y): 476405.302781783, 177514.721177178 m Northwest corner: Southeast corner: 476644.502781783, 177322.841177178 m Direction of 1st Traverse: 90 deg Parallel Collection Method: Sensors: 2 @ 1 m spacing. Dummy Value: 32702 Dimensions Survey Size (meters): 239 m x 192 m X&Y Interval: 0.13 m Source GPS Points: Active: 49599, Recorded: 49599 Stats Max: 100.21 -109.65 Min: Std Dev: 2.12 Mean: 0.74 Median: 0.67 Composite Area: 4.5898 ha Surveyed Area: 1.6199 ha Sonning Quarry J RAW.xcp Filename: Instrument Type: MLgrad Import Units: UTM Zone: 30 Survey corner coordinates (X/Y):

476018.226740359, 177592.992576279 m Northwest corner: 476192.426740359, 177345.472576279 m Southeast corner: Direction of 1st Traverse: 90 deg Parallel Collection Method: Sensors: 2 @ 1 m spacing. Dummy Value: 32702 Dimensions Survey Size (meters): 174 m x 248 m X&Y Interval: 0.13 m Source GPS Points: Active: 64439, Recorded: 64439 Stats Max: 101.04 -105.77 Min: Std Dev: 4.46 Mean: 0.35 Median: 0.32 4.3118 ha Composite Area: 2.176 ha Surveyed Area: Sonning Quarry K RAW.xcp Filename: Instrument Type: MLgrad Import Units: UTM Zone: 30 Survey corner coordinates (X/Y): Northwest corner: 476156.224288633, 177591.32894179 m 476262.174288633, 177333.53894179 m Southeast corner: Direction of 1st Traverse: 90 deg Collection Method: Parallel 2 @ 1 m spacing. Sensors: Dummy Value: 32702 Dimensions Survey Size (meters): 106 m x 258 m X&Y Interval: 0.13 m Source GPS Points: Active: 50471, Recorded: 50471 Stats 106.92 Max: Min: -108.88 Std Dev: 4.85 0.63 Mean: Median: 0.59 Composite Area: 2.7313 ha 1.6069 ha Surveyed Area: Filename: Sonning Quarry L RAW.xcp Instrument Type: MLgrad Import Units: 30 UTM Zone: Survey corner coordinates (X/Y): 476221.966412434, 177723.12918664 m Northwest corner: 476458.826412434, 177553.21918664 m Southeast corner: Direction of 1st Traverse: 90 deg Parallel Collection Method: Sensors: 2 @ 1 m spacing. Dummy Value: 32702 Dimensions Survey Size (meters): 237 m x 170 m X&Y Interval: 0.13 m Source GPS Points: Active: 31559, Recorded: 31559 Stats Max: 104.61 Min: -109.71 Std Dev: 4.04 Mean: 1.30 Median: 1.46 Composite Area: 4.0245 ha 1.0357 ha Surveyed Area: Sonning Quarry N RAW.xcp Filename: Instrument Type: MLgrad Import Units:

UTM Zone: 30 Survey corner coordinates (X/Y): 476258.021260073, 177641.072546705 m Northwest corner: 476627.871260073, 177389.392546705 m Southeast corner: Direction of 1st Traverse: 90 deg Parallel Collection Method: 2 @ 1 m spacing. Sensors: Dummy Value: 32702 Dimensions Survey Size (meters): 370 m x 252 m X&Y Interval: 0.13 m Source GPS Points: Active: 122319, Recorded: 122319 Stats Max: 106.50 Min: -95.23 Std Dev: 1.55 Mean: -0.68 Median: -0.77 Composite Area: 9.3084 ha Surveyed Area: 4.2166 ha Sonning Quarry 3-4-23 A RAW.xcp Filename: MLgrad Import Instrument Type: Units: UTM Zone: 30 Survey corner coordinates (X/Y): Northwest corner: 475988.999644704, 177214.350052849 m Southeast corner: 476218.579644704, 176929.650052849 m Direction of 1st Traverse: 90 deg Parallel Collection Method: Sensors: 2 @ 1 m spacing. Dummy Value: 32702 Dimensions Survey Size (meters): 230 m x 285 m *X&Y* Interval: 0.13 m Active: 101327, Recorded: 101327 Source GPS Points: Stats 106.81 Max: -109.72 Min: Std Dev: 2.88 0.39 Mean: Median: 0.77 Composite Area: 6.5361 ha Surveyed Area: 3.4901 ha Filename: Sonning Quarry 3-4-23 B RAW.xcp Instrument Type: MLgrad Import Units: UTM Zone: 30 Survey corner coordinates (X/Y): Northwest corner: 475612.438313537, 177328.114851458 m 475880.628313537, 177129.214851458 m Southeast corner: Direction of 1st Traverse: 90 deg Parallel Collection Method: 2 @ 1 m spacing. Sensors: Dummy Value: 32702 Dimensions Survey Size (meters): 268 m x 199 m *X&Y* Interval: 0.13 m Source GPS Points: Active: 93551, Recorded: 93551 Stats 102.40 Max: Min: -106.51 Std Dev: 2.96 Mean · -0.09 Median: -0.24 5.3343 ha Composite Area: 3.1598 ha Surveyed Area: Sonning Quarry 3-4-23 C RAW.xcp Filename:

Instrument Type: MLgrad Import Units: UTM Zone: 30 Survey corner coordinates (X/Y): Northwest corner: 475785.089197283, 177339.220148746 m 475985.029197283, 177198.560148746 m Southeast corner: Direction of 1st Traverse: 90 deg Collection Method: Parallel 2 @ 1 m spacing. 32702 Sensors: Dummy Value:

Dimensions

Survey Size (meters): 200 m x 141 m X&Y Interval: 0.13 m Source GPS Points: Active: 45031, Recorded: 45031

Stats

Max:	104.82
Min:	-107.15
Std Dev:	3.12
Mean:	0.20
Median:	0.02
Composite Area:	2.8124 ha
Surveyed Area:	1.4575 ha

Processed data

Filename:	Sonning Quarry A.xcp
Stats	
Max:	2.21
Min:	-2.20
Std Dev:	0.76
Mean:	0.08
Median:	0.04
Composite Area:	7.0116 ha
Surveyed Area:	1.9679 ha

GPS based Proce5

1 Base Layer.

- 2 Unit Conversion Layer (Lat/Long to UTM).
- 3 DeStripe Median Traverse:
 4 Clip from -2.00 to 2.00
- 5 DeStagger by: 50.00cm, Shift Positions

Sonning Quarry B.xcp
2.21
-2.20
0.83
0.07
0.03
7.935 ha
0.85587 ha

GPS based Proce4

- 1 Base Layer. 2 Unit Conversion Layer (Lat/Long to UTM).
- 3 DeStripe Median Traverse:
- 4 Clip from -2.00 to 2.00

Filename: Sonning Quarry C.xcp Stats Max: 2.21 Min: -2.20 Std Dev: 0.89 Mean: 0.05 Median: 0.02 5.1801 ha Composite Area: Surveyed Area: 2.6138 ha

GPS based Proce5

- 1 Base Layer.
- 2 Unit Conversion Layer (Lat/Long to UTM).

3 DeStripe Median Traverse:

4 Clip from -2.00 to 2.00

5 DeStagger by: 50.00cm, Shift Positions

Filename:	Sonning Quarry D.xcp
Stats	
Max:	2.21
Min:	-2.20
Std Dev:	0.74
Mean:	0.04
Median:	0.02
Composite Area:	3.3219 ha
Surveyed Area:	1.6554 ha

GPS based Proce4

- 1 Base Layer.
- 2 Unit Conversion Layer (Lat/Long to UTM).
- 3 DeStripe Median Traverse:
- 4 Clip from -2.00 to 2.00

Filename:	Sonning Quarry E.xcp
Stats	
Max:	2.21
Min:	-2.20
Std Dev:	0.51
Mean:	0.02
Median:	0.01
Composite Area:	10.443 ha
Surveyed Area:	4.2387 ha

GPS based Proce6

- 1 Base Layer.
- Date Dayer.
 Unit Conversion Layer (Lat/Long to UTM).
 Destripe Median Traverse:
- 4 Clip from -2.00 to 2.00
- 5 DeStagger by: 20.00cm, Shift Positions
- 6 DeStagger by: 20.00cm, Shift Positions

Sonning Quarry F.xcp
2.21
-2.20
0.55
0.01
0.00
3.4717 ha
2.1642 ha

GPS based Proce6

- 1 Base Layer.
- 2 Unit Conversion Layer (Lat/Long to UTM).
- 3 DeStripe Median Traverse:
- 4 Clip from -2.00 to 2.00
- 5 DeStagger by: 20.00cm, Shift Positions
 6 DeStagger by: 20.00cm, Shift Positions

Filename:	Sonning Quarry G.xcp
Stats	
Max:	2.21
Min:	-2.20
Std Dev:	0.58
Mean:	0.00
Median:	0.00
Composite Area:	11.713 ha
Surveyed Area:	6.3176 ha

GPS based Proce6

- 1 Base Layer.
- 2 Unit Conversion Layer (Lat/Long to UTM).
- 3 DeStripe Median Traverse:
- 4 Clip from -2.00 to 2.00
- 5 DeStagger by: 20.00cm, Shift Positions
- 6 DeStagger by: 20.00cm, Shift Positions

Filename: Sonning Quarry H.xcp

Max: 2.21 Min 2.20

1:		-2.

13

Std Dev:	0.72
Mean:	0.07
Median:	0.01
Composite Area:	4.5898 ha
Surveyed Area:	1.579 ha

GPS based Proce9

- 1 Base Layer.
- 2 Unit Conversion Layer (Lat/Long to UTM).
- 3 DeStripe Median Traverse:
- 4 Clip from -2.00 to 2.00
- 5 DeStagger by: 40.00cm, Shift Positions
- Destagger by: 40.00cm, Shift Positions
 Destagger by: 40.00cm, Shift Positions
 Destagger by: 40.00cm, Shift Positions
 Destagger by: 20.00cm, Shift Positions
- 9 DeStagger by: 10.00cm, Shift Positions

Filename:	Sonning Quarry J.xcp
Stats	
Max:	2.21
Min:	-2.20
Std Dev:	0.65
Mean:	0.00
Median:	0.01
Composite Area:	4.3118 ha
Surveyed Area:	2.1429 ha

GPS based Proce8

- 1 Base Layer.
- 2 Unit Conversion Layer (Lat/Long to UTM).

- DeStripe Median Traverse:
 Clip from -2.00 to 2.00
 DeStagger by: 40.00cm, Shift Positions
- 6 DeStagger by: 40.00cm, Shift Positions
- Destagger by: 40.00cm, Shift Positions
 DeStagger by: 50.00cm, Shift Positions

Filename:	Sonning Quarry K.xcp
Stats	
Max:	2.21
Min:	-2.20
Std Dev:	0.93
Mean:	0.07
Median:	0.02
Composite Area:	2.7313 ha
Surveyed Area:	1.6034 ha

GPS based Proce5

- 1 Base Layer.
- Unit Conversion Layer (Lat/Long to UTM). 2
- 3 DeStripe Median Traverse:
- 4 Clip from -2.00 to 2.00
- 5 DeStagger by: 20.00cm, Shift Positions

Filename:	Sonning Quarry L.xcp
Stats	
Max:	2.21
Min:	-2.20
Std Dev:	0.75
Mean:	0.06
Median:	0.00
Composite Area:	4.0245 ha
Surveyed Area:	1.0285 ha

GPS based Proce6

- 1 Base Layer.
- 2 Unit Conversion Layer (Lat/Long to UTM).
- 3 DeStripe Median Traverse:
- 4 Clip from -2.00 to 2.00
- 5 DeStagger by: 40.00cm, Shift Positions
- 6 DeStagger by: 20.00cm, Shift Positions

Filename: Sonning Quarry M.xcp

Crister	
Mais	
DIGIN	

- 2.21 Max: Min:
 - -2.20

14

Std Dev:	0.57
Maan	0.04
Mean.	0.04
Median:	0.01
Composite Area:	6.7195 ha
Surveyed Area	2.4454 ha
~	
 GPS based Proce6 1 Base Layer. 2 Unit Conversio 3 DeStripe Media 4 Clip from -2.00 5 DeStagger by: 6 DeStagger by: 	n Layer (Lat/Long to UTM). ın Traverse: to 2.00 40.00cm, Shift Positions 20.00cm, Shift Positions
Filename	Sonning Quarry MRAW xcn
Instrument Tunes	MI and Import
instrument Type.	MLgraa Import
Units:	
UTM Zone:	30
Survey corner coor	dinates (X/Y) .
Northwest correct:	476228 024045246 177670 204580027 m
Norinwest corner:	4/0238.024043340, 17/079.204380037 m
Southeast corner:	476503.094045346, 177425.704580037 m
Direction of 1st Tra	verse: 90 deg
Collection Method	Parallel
Concention memora.	$2 \oplus 1$ we are active
Sensors.	2 W 1 m spacing.
Dummy Value:	32702
Dimensions	
	265 252
Survey Size (meters)	265 m x 253 m
X&Y Interval:	0.13 m
Source GPS Points.	Active: 70303. Recorded: 70303
G	
Stats	
Max:	103.30
Min:	-89.35
Std Day:	2.00
Siu Dev.	2.09
Mean:	1.40
Median:	1.48
Composite Area:	6.7195 ha
Surveyed Area	2 1518 ha
Surveyeu Area.	2.4548 na
Filename:	Sonning Quarry N.xcp
Stats	02 / 1
Man	2.04
Max:	2.04
Min:	-1.89
Std Dev:	0.59
Mean	0.03
Modian.	0.01
Median.	0.01
Composite Area:	9.3084 ha
Surveyed Area:	4.2054 ha
-	
CDS harad Proces	
GFS based Froces	
1 Base Layer.	
2 Unit Conversio	n Layer (Lat/Long to UTM).
3 DeStrine Media	in Traverse.
A Clin at 1 00 CD	
4 Cup at 1.00 SD	50.00 GLIG D. 11
5 DeStagger by:	50.00cm, Shift Positions
Filename	Sonning Quarry 3-4-23 A xcp
State	Somming Quanty of Y 20 minop
Siais	2.27
Max:	3.27
Min:	-3.12
Std Dev:	0.55
Maan	0.03
wieun.	0.05
Median:	0.01
Composite Area:	6.4326 ha
Surveyed Area	3.3547 ha
~	
GPS based Proce4	
1 Base Laver.	
2 Unit Conversion	n Laver (Lat/Long to UTM)
2 DoStuine Mall	In Traverse:
5 Desiripe Medic	III LIUVEISE.
A ('lin at 1.00 SE	
4 Cup ui 1.00 SD	
4 Cup ui 1.00 SD	
Filename:	Sonning Quarry 3-4-23 B.xcn
<i>Filename: Stats</i>	Sonning Quarry 3-4-23 B.xcp
Filename: Stats	Sonning Quarry 3-4-23 B.xcp

Min:	-2.86
Std Dev:	0.70
Mean:	0.06
Median:	0.02
Composite Area:	5.2376 ha
Surveyed Area:	3.0461 ha

GPS based Proce4

- Base Layer.
 Unit Conversion Layer (Lat/Long to UTM).
 DeStripe Median Traverse:
 Clip at 1.00 SD

Filename:	Sonning Quarry 3-4-23 C.xcp
Stats	
Max:	4.08
Min:	-3.99
Std Dev:	0.74
Mean:	0.02
Median:	0.01
Composite Area:	2.7463 ha
Surveyed Area:	1.3836 ha

- GPS based Proce4
 1 Base Layer.
 2 Unit Conversion Layer (Lat/Long to UTM).
 3 DeStripe Median Traverse:
 4 Clip at 1.00 SD

Appendix 1. Survey and data information

Programme:		Sensors: 2 @ 1 m spacing.	
Name:	TerraSurveyor	Dummy Value: 32702	
Version:	3.0.25.0		
		Dimensions	
Raw data		Survey Size (meters): 224 m x 231 m	
Filename:	Sonning Quarry A RAW.xcp	X&Y Interval: 0.13 m	
Instrument Type:	MLgrad Import	Source GPS Points: Active: 83895, Recorded: 83895	
Units:			
UTM Zone:	30	Stats	
Survey corner coord	dinates (X/Y):	Max: 105.17	
Northwest corner:	474939.426591188, 176504.16138988 m	Min: -109.72	
Southeast corner:	475230.496591188, 176263.27138988 m	<i>Std Dev:</i> 4.99	
Direction of 1st Tra	werse: 90 deg	<i>Mean:</i> 1.68	
Collection Method:	Parallel	Median: 1.59	
Sensors:	2 @ 1 m spacing.	Composite Area: 5.1801 ha	
Dummy Value:	32702	Surveyed Area: 2.6216 ha	
Dimensions		Filename: Sonning Quarry D RAW.xcp	
Survey Size (meters): $291 m x 241 m$	Instrument Type: MLgrad Import	
X&Y Interval:	0.13 m	Units:	
Source GPS Points.	Active: 56287, Recorded: 56287	UTM Zone: 30	
		Survey corner coordinates (X/Y):	
Stats		Northwest corner: 475365.05699408, 176655.587025247	т
Max:	104.61	Southeast corner: 475536.78699408, 176462.147025247	т
Min:	-109.71	Direction of 1st Traverse: 90 deg	
Std Dev:	4.17	Collection Method: Parallel	
Mean:	0.27	Sensors: 2 @ 1 m spacing.	
Median:	0.21	Dummy Value: 32702	
Composite Area:	7.0116 ha	-	

Surveyed Area:	1.9726 ha	D
Filename:	Sonning Quarry B RAW.xcp	X
Instrument Type:	MLgrad Import	S
Units:		
UTM Zone:	30	S
Survey corner coord	tinates (X/Y):	N.
Southeast corner:	475010.80079257, 17652.899740575 m 475280 26670237 176247 030740575 m	IV. S
Direction of 1st Tra	verse: 90 deg	N
Collection Method:	Parallel	N
Sensors:	2 @ 1 m spacing.	C
Dummy Value:	32702	S
Dimensions		F
Survey Size (meters)): $278 m x 285 m$	Ir
X&Y Interval:	0.13 m	U
Source GPS Points:	Active: 23863, Recorded: 23863	L
Ct		S
Stats Max:	102.04	10
Max. Min·	-80 92	S
Std Dev:	3.20	D
Mean:	1.19	C
Median:	1.24	S
Composite Area:	7.935 ha	D
Surveyed Area:	0.85587 ha	
Filmana	Source Oursen C. P. A.W. son	D S
Instrument Type	MI grad Imnort	X
Units:		S
UTM Zone:	30	
Survey corner coord	linates (X/Y):	S_{i}
Northwest corner:	475020.910350223, 176357.045999223 m	N
Southeast corner:	4/5244.7/0350223, 1/6125.645999223 m	N.
Direction of 1st 1ra	Verse: 90 deg	2
Composite Area	10 443 ha	N
Surveyed Area:	4.2458 ha	N
		\mathcal{N}
Filename:	Sonning Quarry F RAW.xcp	C
Instrument Type:	MLgrad Import	S
Units:	20	-
Survey corner coor	JU dinatas (Y/Y):	Г Іı
Northwest corner:	475803.924022065. 177037.230369471 m	U
Southeast corner:	475998.144022065, 176858.480369471 m	Ū
Direction of 1st Tra	verse: 90 deg	S
Collection Method:	Parallel	N
Sensors:	2 @ 1 m spacing.	G
Dummy Value:	32702	S
Dimensions		C
Survey Size (meters	$194 m \times 179 m$	S
X&Y Interval:	0.13 m	\tilde{D}
Source GPS Points:	Active: 63623, Recorded: 63623	
~		D
Stats	102.24	S
Max:	103.21	X
Min: Std Dev:	-04.96 2.17	3
Mean:	0.23	S
Median:	0.16	Ň
Composite Area:	3.4717 ha	N
Surveyed Area:	2.1754 ha	S_{i}
F :1		N
Filename:	Sonning Quarry G RAW.xcp	N.
Instrument Type:	MLgraa Import	C C
UTM Zone	30	5
Survey corner coord	dinates (X/Y):	F
Northwest corner:	476136.676603755, 177404.970422644 m	Ir
Southeast corner:	476468.176603755, 177051.630422644 m	U
Direction of 1st Tra	verse: 90 deg	U
Collection Method:	Parallel	S
Sensors:	2 w 1 m spacing.	1V

imensions urvey Size (meters): 172 m x 193 m &Y Interval: 0.13 m Active: 51759, Recorded: 51759 ource GPS Points: tats 104.63 lax: 1in: -109.71 td Dev: 3.38 1.41 lean: ledian: 1.63 Composite Area: 3.3219 ha 1.6554 ha urveyed Area: Sonning Quarry E RAW.xcp ilename: nstrument Type: MLgrad Import Inits: 30 TM Zone: urvey corner coordinates (X/Y): 475603.597205531, 176970.635999969 orthwest corner: т 475813.287205531, 176472.605999969 m outheast corner: Direction of 1st Traverse: 90 deg Parallel Collection Method: 2 @ 1 m spacing. ensors: 32702 ummy Value: imensions urvey Size (meters): 210 m x 498 m &Y Interval: 0.13 m ource GPS Points: Active: 123191, Recorded: 123191 tats 106.71 lax: -109.72 ∕in: td Dev: 3.96 lean: 0.18ledian: 0.28 0 74 lean: ledian: 0.67 Composite Area: 4.5898 ha 1.6199 ha urveyed Area: ilename: Sonning Quarry J RAW.xcp nstrument Type: MLgrad Import nits: TM Zone: 30 urvey corner coordinates (X/Y): orthwest corner: 476018.226740359, 177592.992576279 т outheast corner: 476192.426740359, 177345.472576279 m Direction of 1st Traverse: 90 deg Parallel Collection Method: 2 @ 1 m spacing. ensors: ummy Value: 32702 imensions 174 m x 248 m urvey Size (meters): &Y Interval: 0.13 m ource GPS Points: Active: 64439, Recorded: 64439 tats 101.04 lax: -105.77 1in · td Dev: 4.46 lean: 0.35 ledian: 0.32 4.3118 ha Composite Area: urveyed Area: 2.176 ha ilename. Sonning Quarry K RAW.xcp nstrument Type: MLgrad Import nits: TM Zone: 30 urvey corner coordinates (X/Y): 476156.224288633, 177591.32894179 m orthwest corner:

Dummy Value: 32702 476262.174288633, 177333.53894179 m Southeast corner: Direction of 1st Traverse: 90 deg Dimensions Collection Method: Parallel Survey Size (meters): 331 m x 353 m Sensors: 2 @ 1 m spacing. X&Y Interval: Dummy Value: 32702 0.13 mSource GPS Points: Active: 187151, Recorded: 187151 Dimensions Stats Survey Size (meters): 106 m x 258 m Max: 106.81 X&Y Interval: 0.13 m -105.95 Source GPS Points: Active: 50471, Recorded: 50471 Min: Std Dev: 2.72 Mean: 0.28 Stats Median: 106.92 0.11 Max: Composite Area: 11.713 ha -108.88 Min Std Dev: Surveyed Area: 6.3371 ha 4.85 Mean: 0.63 Filename: Sonning Quarry H RAW.xcp Median: 0.59 Composite Area: 2.7313 ha Instrument Type: MLgrad Import Units: Surveyed Area: 1.6069 ha UTM Zone: 30 Survey corner coordinates (X/Y): Filename: Sonning Quarry L RAW.xcp 476405.302781783, 177514.721177178 m Northwest corner: Instrument Type: MLgrad Import 476644.502781783, 177322.841177178 m Southeast corner: Units: Direction of 1st Traverse: 90 deg UTM Zone: 30 Collection Method: Parallel Survey corner coordinates (X/Y): Sensors: 2 @ 1 m spacing. Northwest corner: 476221.966412434, 177723.12918664 m Dummy Value: 32702 Southeast corner: 476458.826412434, 177553.21918664 m Direction of 1st Traverse: 90 deg Dimensions Collection Method: Parallel 239 m x 192 m Survey Size (meters): 2 @ 1 m spacing. Sensors: Dummy Value: X&Y Interval: 0.13 m 32702 Source GPS Points: Active: 49599, Recorded: 49599 Dimensions Survey Size (meters): 237 m x 170 m Stats 100.21 X&Y Interval: Max: 0.13 m-109.65 Source GPS Points: Active: 31559, Recorded: 31559 Min: Std Dev: 2.12 Stats 104 61 Max X&Y Interval: 0.13 mMin: -109.71 Active: 101327, Recorded: 101327 Source GPS Points: Std Dev: 4.04 Mean: 1.30 Stats 1.46 Median: Max: 106.81 Composite Area: 4.0245 ha -109.72 Min Surveyed Area: 1.0357 ha Std Dev: 2.88 Mean: 0.39 Sonning Quarry M RAW.xcp Filename: Median: 0.77Instrument Type: MLgrad Import Composite Area: 6.5361 ha Units: Surveyed Area: 3.4901 ha UTM Zone: 30 Survey corner coordinates (X/Y): Sonning Quarry 3-4-23 B RAW.xcp Filename: 476238.024045346, 177679.204580037 m Northwest corner: Instrument Type: MLgrad Import 476503.094045346, 177425.704580037 m Southeast corner: Units: Direction of 1st Traverse: 90 deg UTM Zone: 30 Collection Method: Parallel Survey corner coordinates (X/Y): Sensors: 2 @ 1 m spacing. Northwest corner: 475612.438313537, 177328.114851458 Dummy Value: 32702 т Southeast corner: 475880.628313537, 177129.214851458 m Dimensions Direction of 1st Traverse: 90 deg Survey Size (meters): 265 m x 253 m Collection Method: Parallel X&Y Interval: 013 m Sensors: 2 @ 1 m spacing. Source GPS Points: Active: 70303, Recorded: 70303 32702 Dummy Value: Stats Dimensions 103.30 Max: Survey Size (meters): 268 m x 199 m Min: -89.35 X&Y Interval 0.13 mStd Dev: 2.09 Source GPS Points: Active: 93551, Recorded: 93551 1.40 Mean: 1.48 Median: Stats 6.7195 ha Composite Area: Max: 102.40 Surveyed Area: 2.4548 ha Min: -106.51 Std Dev: 2.96 Sonning Quarry N RAW.xcp Filename: -0.09 Mean: Instrument Type: MLgrad Import Median: -0.24 Units: Composite Area: 5.3343 ha

UTM Zone: 30 Surveyed Area: 3.1598 ha Survey corner coordinates (X/Y): Northwest corner: 476258.021260073, 177641.072546705 m Filename: Sonning Quarry 3-4-23 C RAW.xcp 476627.871260073, 177389.392546705 m Southeast corner: Instrument Type: MLgrad Import Direction of 1st Traverse: 90 deg Units: Collection Method: Parallel UTM Zone: 30 Survey corner coordinates (X/Y): Sensors: 2 @ 1 m spacing. Dummy Value: 32702 Northwest corner: 475785.089197283, 177339.220148746 т Southeast corner: 475985.029197283, 177198.560148746 m Dimensions Survey Size (meters): 370 m x 252 m Direction of 1st Traverse: 90 deg X&Y Interval: 0.13 m Collection Method: Parallel Source GPS Points: Active: 122319, Recorded: 122319 Sensors: (a) 1 m spacing. Dummy Value: 32702 Stats Max: 106.50 Dimensions Survey Size (meters): 200 m x 141 m Min: -95.23 Std Dev: 1.55 X&Y Interval: $0.13 \, m$ Mean: -0.68 Source GPS Points: Active: 45031, Recorded: 45031 Median: -0.77 Composite Area: 9.3084 ha Stats Surveyed Area: 4.2166 ha Max: 104.82 -107.15 Min: Sonning Quarry 3-4-23 A RAW.xcp Std Dev: 3.12 Filename: 0.20 Instrument Type: MLgrad Import Mean: Units: Median: 0.02 UTM Zone: 30 Composite Area: 2.8124 ha 1.4575 ha Survey corner coordinates (X/Y): Surveyed Area: Northwest corner: 475988.999644704, 177214.350052849 m Southeast corner: 476218.579644704, 176929.650052849 m Direction of 1st Traverse: 90 deg Parallel Collection Method: Sensors: 2 @ 1 m spacing. Dummy Value: 32702 Dimensions Survey Size (meters): 230 m x 285 m Processed data Filename: Sonning Quarry A.xcp Stats Max: 2.21 GPS based Proce6 -2.20 Min: Base Layer. Std Dev: 0.76Unit Conversion Layer (Lat/Long to UTM). Mean: 0.08 3 DeStripe Median Traverse: Median: 0.04 4 Clip from -2.00 to 2.00 Composite Area: 7.0116 ha DeStagger by: 20.00cm, Shift Positions 1.9679 ha Surveyed Area: DeStagger by: 20.00cm, Shift Positions 6 GPS based Proce5 Filename: Sonning Quarry F.xcp 1 Base Layer. Stats 2 Unit Conversion Layer (Lat/Long to UTM). 2.21 Max: DeStripe Median Traverse: 3 -2.20 Min: Clip from -2.00 to 2.00 Std Dev: 0.55 5 DeStagger by: 50.00cm, Shift Positions Mean: 0.01 Median. 0.00 Filename: Sonning Quarry B.xcp 3.4717 ha Composite Area: Stats 2.1642 ha Surveyed Area: 2 21 Max: -2.20 Min: GPS based Proce6 Std Dev: 0.83 Base Layer. 1 Mean: 0.07 Unit Conversion Layer (Lat/Long to UTM). 2 Median: 0.03 DeStripe Median Traverse: 3 Composite Area: 7.935 ha Clip from -2.00 to 2.00 4 Surveyed Area: 0.85587 ha DeStagger by: 20.00cm, Shift Positions DeStagger by: 20.00cm, Shift Positions 6 GPS based Proce4 1 Base Layer. Filename: Sonning Quarry G.xcp Unit Conversion Layer (Lat/Long to UTM). 2 Stats 3 DeStripe Median Traverse: Max: 2.21 4 Clip from -2.00 to 2.00 Min: -2.20 Std Dev: 0.58 Filename: Sonning Quarry C.xcp 0.00 Mean: Stats Median: 0.00 Max: 2.21 Composite Area: 11.713 ha Min -2.20 Surveyed Area: 6.3176 ha Std Dev: 0.89

16 1	0.05	
Median:	0.02	GPS based Proce6
Composite Area:	5.1801 ha	1 Base Laver.
Surveyed Area	2.6138 ha	2 Unit Conversion Laver (Lat/Long to UTM)
Surveyeu IIreu.	2.0100 // 4	2 DeStrine Median Traverse:
CDC hand Due of		<i>J Desiripe Median Traverse.</i>
GPS based Proces		4 Clip from -2.00 to 2.00
1 Base Layer.		5 DeStagger by: 20.00cm, Shift Positions
2 Unit Conversion	on Layer (Lat/Long to UTM).	6 DeStagger by: 20.00cm, Shift Positions
3 DeStripe Medi	ian Traverse:	
4 Clip from -2.0	0 to 2.00	Filename: Sonning Quarry H.xcp
5 DeStagger by:	50 00cm Shift Positions	State
5 Desiugger by.	50.00cm, Shiji 1 Ostitons	
		Max: 2.21
Filename:	Sonning Quarry D.xcp	Min: -2.20
Stats		<i>Std Dev:</i> 0.72
Max:	2.21	<i>Mean:</i> 0.07
Min·	-2.20	Median: 0.01
Std Dav:	0.74	Composite Area: 15808 ha
Manual Manual	0.74	
Mean:	0.04	Surveyed Area: 1.5/9 ha
Median:	0.02	
Composite Area:	3.3219 ha	GPS based Proce9
Surveyed Area:	1.6554 ha	1 Base Layer.
-		2 Unit Conversion Laver (Lat/Long to UTM)
CPS based Proced	,	2 DeStrine Median Traverse:
1 D I		J Desiripe Median Traverse.
1 Base Layer.		4 Clip from -2.00 to 2.00
2 Unit Conversion	on Layer (Lat/Long to UTM).	5 DeStagger by: 40.00cm, Shift Positions
3 DeStripe Medi	ian Traverse:	6 DeStagger by: 40.00cm, Shift Positions
4 Clip from -2.0	0 to 2 00	7 DeStagger by: 40 00cm Shift Positions
<i>i cup ji olii</i> 2.00	0.10 2.00	8 DeStagger by: 20.00em Shift Positions
T:1	с. : О. Е.	o Desiugger by. 20.00cm, shiji i ositions
Filename:	Sonning Quarry E.xcp	9 DeStagger by: 10.00cm, Shift Positions
Stats		
Max:	2.21	Filename: Sonning Quarry J.xcp
Min:	-2.20	Stats
Std Dav:	0.51	Max: 2.21
Marra	0.02	λ_{ini} 2.21
Mean:	0.02	Min: -2.20
Median:	0.01	Std Dev: 0.65
Composite Area:	10.443 ha	Mean: 0.00
Surveved Area:	4.2387 ha	Median: 0.01
		Composite Area: 4 3118 ha
CPS based Proces		Surveyed Area: 2 1420 ha
1 Dused Troceo		Surveyed Area. 2.1429 ha
1 Base Layer.		
2 Unit Conversion	on Layer (Lat/Long to UTM).	GPS based Proce5
3 DeStripe Medi	ian Traverse:	1 Rase Laver
4 Clip from -2.0	0 to 2.00	2 Unit Conversion Layer (Lat/Long to UTM)
5 DeStagger by:	10 00cm Shift Positions	2 Unit Conversion Layer (Lai/Long to UTM).
6 DeStagger by.	40.00cm, Shift Positions	3 DeStripe Median Traverse:
0 Destagger by:	40.00cm, Shiji Positions	4 Clip at 1.00 SD
7 DeStagger by:	40.00cm, Shift Positions	5 DeStagger by: 50.00cm, Shift Positions
	50.00cm, Shift Positions	
8 DeStagger by:		
8 DeStagger by:		Filmanna, Somning Quarmy 2 1 22 1 you
8 DeStagger by: Filename:	Souning Quarty K yen	Filename: Sonning Quarry 3-4-23 A.xcp
8 DeStagger by: Filename:	Sonning Quarry K.xcp	Filename: Sonning Quarry 3-4-23 A.xcp Stats
8 DeStagger by: Filename: Stats	Sonning Quarry K.xcp	Filename: Sonning Quarry 3-4-23 A.xcp Stats Max: 3.27
8 DeStagger by: Filename: Stats Max:	Sonning Quarry K.xcp 2.21	Filename: Sonning Quarry 3-4-23 A.xcp Stats Max: 3.27 Min: -3.12
8 DeStagger by: Filename: Stats Max: Min:	Sonning Quarry K.xcp 2.21 -2.20	Filename: Sonning Quarry 3-4-23 A.xcp Stats Max: 3.27 Min: -3.12 Std Dev: 0.55
8 DeStagger by: Filename: Stats Max: Min: Std Dev:	Sonning Quarry K.xcp 2.21 -2.20 0.93	Filename:Sonning Quarry 3-4-23 A.xcpStatsMax:Max:3.27Min:-3.12Std Dev:0.55Mam:0.02
8 DeStagger by: Filename: Stats Max: Min: Std Dev: Mean:	Sonning Quarry K.xcp 2.21 -2.20 0.93 0.07	Filename:Sonning Quarry 3-4-23 A.xcpStatsMax:Max:3.27Min:-3.12Std Dev:0.55Mean:0.03
8 DeStagger by: Filename: Stats Max: Min: Std Dev: Mean: Median:	Sonning Quarry K.xcp 2.21 -2.20 0.93 0.07 0.02	Filename:Sonning Quarry 3-4-23 A.xcpStatsMax:3.27Min:-3.12Std Dev:0.55Mean:0.03Median:0.01
8 DeStagger by: Filename: Stats Max: Min: Std Dev: Mean: Median:	Sonning Quarry K.xcp 2.21 -2.20 0.93 0.07 0.02	Filename: Sonning Quarry 3-4-23 A.xcp Stats Max: 3.27 Min: -3.12 Std Dev: 0.55 Mean: 0.03 Median: 0.01 Composite Area: 6.4326 ha
8 DeStagger by: Filename: Stats Max: Min: Std Dev: Mean: Median: Composite Area:	Sonning Quarry K.xcp 2.21 -2.20 0.93 0.07 0.02 2.7313 ha	Filename:Sonning Quarry 3-4-23 A.xcpStatsMax:3.27Min:-3.12Std Dev:0.55Mean:0.03Median:0.01Composite Area:6.4326 haSurveyed Area:3.3547 ha
8 DeStagger by: Filename: Stats Max: Min: Std Dev: Mean: Median: Composite Area: Surveyed Area:	Sonning Quarry K.xcp 2.21 -2.20 0.93 0.07 0.02 2.7313 ha 1.6034 ha	Filename:Sonning Quarry 3-4-23 A.xcpStatsMax:3.27Min:-3.12Std Dev:0.55Mean:0.03Median:0.01Composite Area:6.4326 haSurveyed Area:3.3547 ha
8 DeStagger by: Filename: Stats Max: Min: Std Dev: Mean: Median: Composite Area: Surveyed Area:	Sonning Quarry K.xcp 2.21 -2.20 0.93 0.07 0.02 2.7313 ha 1.6034 ha	Filename:Sonning Quarry 3-4-23 A.xcpStatsMax:3.27Min:-3.12Std Dev:0.55Mean:0.03Median:0.01Composite Area:6.4326 haSurveyed Area:3.3547 ha
8 DeStagger by: Filename: Stats Max: Min: Std Dev: Mean: Median: Composite Area: Surveyed Area: GPS based Proce 5	Sonning Quarry K.xcp 2.21 -2.20 0.93 0.07 0.02 2.7313 ha 1.6034 ha	Filename: Sonning Quarry 3-4-23 A.xcp Stats Max: 3.27 Min: -3.12 Std Dev: 0.55 Mean: 0.03 Median: 0.01 Composite Area: 6.4326 ha Surveyed Area: 3.3547 ha GPS based Proce4
8 DeStagger by: Filename: Stats Max: Min: Std Dev: Mean: Median: Composite Area: Surveyed Area: GPS based Proce5 L Base Lower	Sonning Quarry K.xcp 2.21 -2.20 0.93 0.07 0.02 2.7313 ha 1.6034 ha	Filename:Sonning Quarry 3-4-23 A.xcpStatsMax:3.27Min:-3.12Std Dev:0.55Mean:0.03Median:0.01Composite Area:6.4326 haSurveyed Area:3.3547 haGPS based Proce41Base Layer.
8 DeStagger by: Filename: Stats Max: Min: Std Dev: Mean: Median: Composite Area: Surveyed Area: GPS based Proce5 I Base Layer. 2 High Contents	Sonning Quarry K.xcp 2.21 -2.20 0.93 0.07 0.02 2.7313 ha 1.6034 ha	Filename:Sonning Quarry 3-4-23 A.xcpStatsMax:3.27Min:-3.12Std Dev:0.55Mean:0.03Median:0.01Composite Area:6.4326 haSurveyed Area:3.3547 haGPS based Proce41Base Layer.2Unit Conversion Layer (Lat/Long to UTM).
8 DeStagger by: Filename: Stats Max: Min: Std Dev: Mean: Median: Composite Area: Surveyed Area: Surveyed Area: GPS based Proce5 1 Base Layer. 2 Unit Conversio	Sonning Quarry K.xcp 2.21 -2.20 0.93 0.07 0.02 2.7313 ha 1.6034 ha	Filename:Sonning Quarry 3-4-23 A.xcpStatsMax:3.27Min:-3.12Std Dev:0.55Mean:0.03Median:0.01Composite Area:6.4326 haSurveyed Area:3.3547 haGPS based Proce411Base Layer.223DeStripe Median Traverse:
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 8 DeStagger by: Filename: Stats Max: Min: Std Dev: Mean: Median: Composite Area: Surveyed Area: GPS based Proce5 1 Base Layer. 2 Unit Conversia 3 DeStripe Media 4 Clip from -2.00 	Sonning Quarry K.xcp 2.21 -2.20 0.93 0.07 0.02 2.7313 ha 1.6034 ha on Layer (Lat/Long to UTM). ian Traverse: 0 to 2.00	Filename:Sonning Quarry 3-4-23 A.xcpStatsMax:3.27Min:-3.12Std Dev:0.55Mean:0.03Median:0.01Composite Area:6.4326 haSurveyed Area:3.3547 haGPS based Proce411Base Layer.2Unit Conversion Layer (Lat/Long to UTM).3DeStripe Median Traverse:4Clip at 1.00 SD
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 8 DeStagger by: Filename: Stats Max: Min: Std Dev: Median: Composite Area: Surveyed Area: GPS based Proce5 1 Base Layer. 2 Unit Conversion 3 DeStripe Media 4 Clip from -2.00 5 DeStagger by: Filename: Stats Max: Min: Std Dev: Mean: Median: 	Sonning Quarry K.xcp 2.21 -2.20 0.93 0.07 0.02 2.7313 ha 1.6034 ha on Layer (Lat/Long to UTM). ian Traverse: 0 to 2.00 20.00cm, Shift Positions Sonning Quarry L.xcp 2.21 -2.20 0.75 0.06 0.00	Filename:Sonning Quarry 3-4-23 A.xcpStatsMax:3.27Min:-3.12Std Dev:0.55Mean:0.03Median:0.01Composite Area:6.4326 haSurveyed Area:3.3547 haGPS based Proce411Base Layer.2Unit Conversion Layer (Lat/Long to UTM).3DeStripe Median Traverse:4Clip at 1.00 SDFilename:Sonning Quarry 3-4-23 B.xcpStatsMax:Max:3.03Min:-2.86Std Dev:0.70Mean:0.06Median:0.02Composite Area:5.2376 ha
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 8 DeStagger by: Filename: Stats Max: Min: Std Dev: Mean: Composite Area: Surveyed Area: GPS based Proce5 1 Base Layer. 2 Unit Conversid 3 DeStripe Media 4 Clip from -2.00 5 DeStagger by: Filename: Stats Max: Min: Std Dev: Mean: Median: Composite Area: Surveyed Area: 	Sonning Quarry K.xcp 2.21 -2.20 0.93 0.07 0.02 2.7313 ha 1.6034 ha on Layer (Lat/Long to UTM). ian Traverse: 0 to 2.00 20.00cm, Shift Positions Sonning Quarry L.xcp 2.21 -2.20 0.75 0.06 0.00 4.0245 ha 1.0285 ha	Filename:Sonning Quarry 3-4-23 A.xcpStatsMax:3.27Min:-3.12Std Dev:0.55Mean:0.03Median:0.01Composite Area:6.4326 haSurveyed Area:3.3547 haGPS based Proce411Base Layer.2Unit Conversion Layer (Lat/Long to UTM).3DeStripe Median Traverse:4Clip at 1.00 SDFilename:Sonning Quarry 3-4-23 B.xcpStats3.03Min:-2.86Std Dev:0.70Mean:0.06Median:0.02Composite Area:5.2376 haSurveyed Area:3.0461 ha
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- 1 Base Layer.
- Dase Layer.
 Unit Conversion Layer (Lat/Long to UTM).
 DeStripe Median Traverse:
 Clip from -2.00 to 2.00

- 5 DeStagger by: 40.00cm, Shift Positions
 6 DeStagger by: 20.00cm, Shift Positions

Filename: Sonning Quarry M.xcp

Stats	
Max:	2.21
Min:	-2.20
Std Dev:	0.57
Mean:	0.04
Median:	0.01
Composite Area:	6.7195 ha
Surveyed Area:	2.4454 ha

GPS based Proce6

- 1 Base Layer.
- Base Layer.
 Unit Conversion Layer (Lat/Long to UTM).
 DeStripe Median Traverse:
 Clip from -2.00 to 2.00
 DeStagger by: 40.00cm, Shift Positions
 DeStagger by: 20.00cm, Shift Positions

Filename:	Sonning Quarry N.xcp
Stats	
Max:	2.04
Min:	-1.89
Std Dev:	0.59
Mean:	0.03
Median:	0.01
Composite Area:	9.3084 ha
Surveyed Area:	4.2054 ha

- 2 Unit Conversion Layer (Lat/Long to UTM).
- 3 DeStripe Median Traverse:
 4 Clip at 1.00 SD

Filename:	Sonning Quarry 3-4-23 C.xcp
Stats	
Max:	4.08
Min:	-3.99
Std Dev:	0.74
Mean:	0.02
Median:	0.01
Composite Area:	2.7463 ha
Surveyed Area:	1.3836 ha

GPS based Proce4

1 Base Layer.

Dase Layer.
 Unit Conversion Layer (Lat/Long to UTM).
 DeStripe Median Traverse:
 Clip at 1.00 SD















































Plate 1. Field A looking north-west

Plate 2. Field B looking north-east.



Plate 3. Field C looking north-east.

Plate 4. Field D looking east.

Sonning Extension East, Sonning Eye Oxfordshire, 2023 Geophysical Survey (magnetic) Plates 1 to 4.



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Plate 5. Field E looking north-east

Plate 6. Field F looking north-east.



Plate 7. Field G looking south.

Plate 8. Field H looking south.

Sonning Extension East, Sonning Eye Oxfordshire, 2023 Geophysical Survey (magnetic) Plates 5 to 8.



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Plate 9. Field I looking west

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Sonning Extension East, Sonning Eye Oxfordshire, 2023 Geophysical Survey (magnetic) Plates 9.



TIME CHART

Calendar Years

Modern	AD 1901
Victorian	AD 1837
Post Medieval	AD 1500
Medieval	AD 1066
Saxon	AD 410
Roman	AD 43
Iron Age	AD 0 BC 750 BC
Bronze Age: Late	1300 BC
Bronze Age: Middle	1700 BC
Bronze Age: Early	2100 BC
Neolithic: Late	3300 BC
Neolithic: Early	4300 BC
Mesolithic: Late	6000 BC
Mesolithic: Early	10000 BC
Palaeolithic: Upper	30000 BC
Palaeolithic: Middle	70000 BC
Palaeolithic: Lower	2,000,000 BC
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