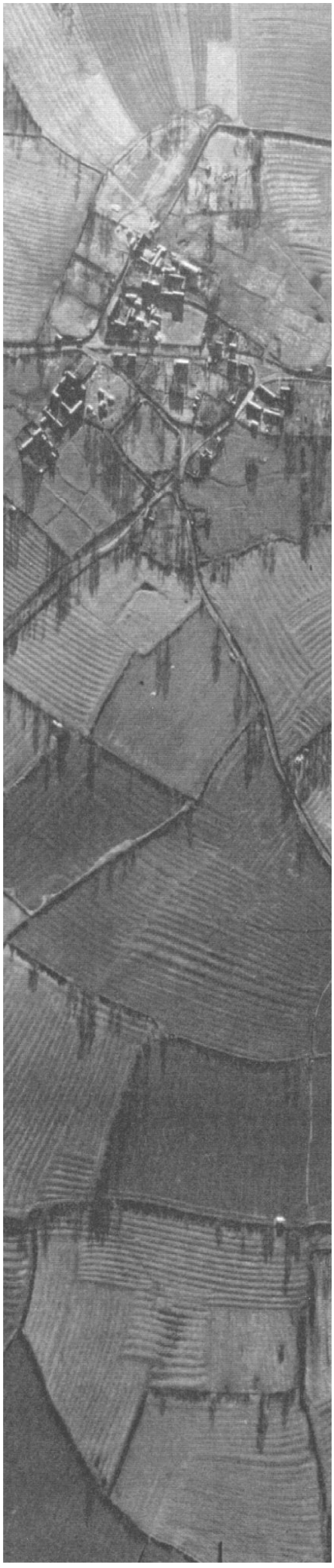


ARCHAEOLOGICAL SURVEYS LTD

GEOPHYSICAL SURVEY REPORT

Nailsea School, Golden Valley Site

Magnetometer Survey

for

North Somerset Council

David Sabin and Kerry Donaldson

June 2007

Ref. no. J185

ARCHAEOLOGICAL SURVEYS LTD

Nailsea School, Golden Valley site

Magnetometer Survey

for

North Somerset Council

Fieldwork by David Sabin and Richard Monks
Report by David Sabin and Kerry Donaldson

Survey date - **7th to 10th June 2007**
Ordnance Survey Grid Reference – **ST 4798 7048**

Archaeological Surveys Ltd
PO Box 2862, Castle Combe, Chippenham, Wiltshire, SN14 7WZ
Tel: 01249 782234 Fax: 0871 661 8804
Email: info@archaeological-surveys.co.uk
Web: www.archaeological-surveys.co.uk

Table of Contents

LIST OF FIGURES

LIST OF TABLES

SUMMARY

A magnetometry survey was carried out across a playing field located to the south of Golden Valley Primary School in Nailsea. The survey located a zone of positive and negative linear and rectilinear anomalies of uncertain origin. Although the form of these anomalies could be consistent with structural remains, the extensive coverage of these features and their scale may suggest former industrial activity such as crop workings (shallow linear quarries associated with coal extraction). A number of more discrete positive anomalies could be related to pit-like features that may also be associated with coal extraction. Within the south eastern part of the surveyed area a large zone of magnetic debris is located adjacent to a large ferrous object. This may also represent a response to material originating from industrial activity on the site although dumping should also be considered. Magnetic disturbance and debris were frequently encountered across the site and may obscure weak anomalies. Positive linear and curvilnear anomalies located across the site may be associated with cut features although their archaeological potential is uncertain.

1 INTRODUCTION

1.1 Survey background

1.1.1 Archaeological Surveys Ltd was commissioned by North Somerset Council to undertake a geophysical survey of a playing field owned by Nailsea School situated south of Golden Valley Primary School in Nailsea. The survey was requested as part of an assessment of the archaeological potential of the site and to investigate whether the area contains features associated with former coal mining. This survey follows similar investigations carried out at Nailsea School playing field (Archaeological Surveys, 2007).

1.2 Survey objectives and methods

1.2.1 The objective of the survey was to use magnetometry to locate geophysical anomalies that may be archaeological in origin and anomalies that may relate to former coal mining.

1.2.2 Magnetometry is an efficient and effective technique particularly suited to locating former 'cut features' such as pits and ditches. The technique may also respond to structural remains.

1.3 Site location

1.3.1 The site is located within playing fields to the east of Nailsea School in North Somerset at Ordnance Survey grid reference ST 47980 70480.

1.4 Site description and survey conditions

1.4.1 The geophysical survey covers an area of approximately 6 hectares and is currently used as a recreational area. The site is bounded to the north by the Golden Valley Primary School, with a sharp break of slope and a disused quarry site to the south. In the south eastern corner is a enclosed area, separated by a mature hedgerow and trees, this was not surveyed due to its use throughout the day for recreational purposes.

1.4.2 Within the playing field there are a number of modern ferrous objects likely to cause magnetic disturbance. These include inspection chamber covers, goal posts and other sports items.

1.4.3 Weather conditions during the survey were fine. The presence of modern ferrous features and the urban location of the site were expected to influence the quality of data recorded during the survey.

1.5 Site history and archaeological potential

1.5.1 Preserved remains of Elms Colliery are situated approximately 150m east of the survey site. The colliery is marked on Ordnance Survey mapping from the 19th century. No specific information or details on the archaeological potential of the site was made available to Archaeological Surveys Ltd.

1.6 Geology and soils

1.6.1 The underlying geology is on the junction of the Pennant Series within the Upper Coal Measures (BGS 1993). The soils are not mapped across the survey area due to the urban location of the site, however, they are likely to belong to the Neath association and are defined as typical brown earths (Soil Survey of England and Wales, 1983). Neath soils are well drained fine loamy soils over rock.

1.6.2 The geological and pedological conditions across the survey area are likely to produce moderate to good conditions for magnetic survey. The underlying geology where close to the surface may produce magnetic anomalies.

2 METHODOLOGY

2.1 Technical synopsis

2.1.1 Magnetometry survey records localised magnetic fields that can be associated with features formed by human activity. Iron minerals within the soil may become altered by burning and the break down of biological material; effectively the magnetic susceptibility of the soil is increased and the iron minerals become magnetic in the presence of the Earth's magnetic field. Accumulations of magnetically enhanced soils within features such as pits and ditches can produce magnetic anomalies that can be mapped during magnetic prospection.

2.1.2 Magnetic thermoremnance can occur when ferrous minerals have been heated to high temperatures such as in a kiln, hearth or associated with other industrial processes. On cooling, a permanent magnetisation may be acquired due to the presence of the Earth's magnetic field. Certain natural processes associated with the formation of some igneous and metamorphic rock may also result in magnetic thermoremnance.

2.1.3 The localised variations in magnetism are measured as sub-units of the Tesla which is a SI unit of magnetic flux density. These sub-units are nanoTeslas (nT) which are equivalent to 10^{-9} Tesla (T).

2.2 Equipment configuration, data collection and survey detail

2.2.1 The detailed magnetic survey was carried out using a Bartington Grad601-2 gradiometer. This instrument effectively measures a magnetic gradient between two fluxgate sensors mounted vertically 1m apart. Two sets of sensors are mounted on a single frame 1m apart horizontally. The instrument is extremely sensitive and is able to measure magnetic variation to 0.1nanoTesla (nT). All readings are saved to an integral data logger for analysis and presentation.

2.2.2 The instrument is operated according to the manufacturer's instructions with consideration given to the local conditions. An adjustment procedure is required prior to collection of data in order to balance the sensors and remove the effects of the Earth's magnetic field, further adjustment is required during the survey due to instrument drift often associated with temperature change. It is often very difficult to obtain optimum balance for the sensors due to localised magnetic vectors that can be associated with large ferrous objects, geological/pedological features, 'magnetic' debris within the topsoil and natural temperature fluctuations. Imperfect balance results in a heading error often visible as striping within the data; this can be effectively removed by software processing and generally has little effect on the data unless extreme. Archaeological Surveys use a non-magnetic tripod with an additional supporting structure to raise the instrument during the set-up procedure, this has been found to improve the sensor balance.

2.2.3 The Bartington gradiometer undergoes regular servicing and calibration which is carried out by the manufacturer. A current assessment of the instrument is shown in Table 1 below.

Date of calibration/service	21st May 2007
Sensor type	Bartington Grad - 01 – 1000 Nos. 084 and 085
Bandwidth	12Hz (100nT range) both sensors
Noise	<100pT peak to peak
Adjustable errors	<2nT

Table 1: Bartington fluxgate gradiometer sensor calibration results

The instrument was considered to be in good working order prior to the survey with no known faults or defects.

2.2.4 Data were collected at 0.25m centres along traverses 1m apart. The survey area was separated into 30m by 30m grids giving 3600 recorded measurements per grid. This sampling interval is very effective at locating archaeological features and is the recommended methodology for archaeological prospection (English Heritage, 1995).

2.2.5 The survey grids were set out to the Ordnance Survey OSGB36 datum using a Penmap RTK GPS. The GPS is used in conjunction with Leica's Smartnet service where positional corrections are sent via a mobile telephone link. Positional accuracy of around 10 – 20mm is possible using the system; setting out accuracy is considered likely to be better than 50mm.

2.3 Data processing and presentation

2.3.1 Magnetometry data downloaded from the Grad 601-2 data logger are analysed and processed in specialist software known as ArcheoSurveyor. The software allows greyscale and trace plots to be produced for presentation and display. Survey grids are assembled to form an overall composite of data (composite file) creating a dataset of the complete survey area. Appendix B contains specific information concerning the survey and data attributes and is derived directly from ArcheoSurveyor, this should be used in conjunction with information provided by Figure 02.

2.3.2 Only minimal processing is carried out in order to enhance the results of the survey for display. Raw data are always analysed as processing can modify anomalies. The following schedule sets out the data and image processing used in this survey:

- clipping of the raw data at ±30nT to improve greyscale resolution,
- clipping of processed data at ±3nT to enhance low magnitude anomalies,
- clipping of trace plots at ±100nT in order to minimise strong readings obscuring low magnitude responses,
- de-stagger is used to enhance linear anomalies,
- zero median/mean traverse is applied in order to balance readings along each traverse.

(Reference should be made to Appendix B for details on the order and specific attributes of the processing).

Data processing explanation notes:

Clipping

Clipping replaces the values outside the specified minimum and maximum with those values. The process is useful for displaying detail as extreme values are removed allowing greyscale shades to be allocated to a narrower range of values

which improves the definition of anomalies.

Zero Median/Mean Traverse
The median (or mean) of each traverse is calculated ignoring data outside a threshold value, the median (or mean) is then subtracted from the traverse. The process is used to equalise slight differences between the set-up and stability of gradiometer sensors and is used to remove striping.

De-stagger
Compensates for small positional errors within data collection by shifting the position of the readings along each traverse by a specified amount.

2.3.3 An abstraction and interpretation is offered for all geophysical anomalies located by the survey. A brief summary of each anomaly with an appropriate reference number is set out in list form within the results (Section 3) to allow a rapid assessment of features within the survey area. Where further interpretation is possible or where a number of possible origins should be considered, further more detailed discussion is set out in Section 4.

2.3.4 The main form of data display used in this report is the greyscale plot. Magnetic data are also displayed as a trace plot. Both 'raw' and 'processed' data have been shown followed by an abstraction and interpretation plot.

2.3.5 Graphic raster images in Bitmap format are initially prepared in ArcheoSurveyor. These images are combined with base mapping using AutoCAD LT 2007 creating DWG file formats. All images are externally referenced to the CAD drawing in order to maintain good graphical quality. Quality can be compromised by rotation of graphics in order to allow the data to be orientated with respect to grid north; this is considered acceptable as the survey results are effectively georeferenced allowing relocation of features using GPS, resection method etc.. A digital archive including raster images is produced with this report allowing separate analysis if necessary, see 2.4 below.

2.4 Archive

2.4.1 Survey results are produced in hardcopy using A4 for text and A3 for plots (all plots are scaled for A3). In addition, digital data created during the survey are supplied on CD. Further information on the production of the report and the digital formats involved in its creation are set out below.

2.4.2 This report has been prepared using the following software on a Windows XP platform:

- ArcheoSurveyor version 2.1.2.2 (geophysical data analysis),
- AutoCAD LT 2007 (report figures),
- JASC Paint Shop Pro 8 (image rotation),
- OpenOffice.org 2.2 Writer (document text),
- PDF Creator version 0.9 (PDF archive).

2.4.3 Digital data are supplied on CD ROM as the following files:

- ArcheoSurveyor grid and composite files for all geophysical data,
- CSV files for raw and processed composites,
- geophysical composite file graphics as Bitmap images,
- AutoCAD DWG files in 2000 and 2007 versions,
- report text as Word 2000 doc file,
- report text as rich text format (RTF),
- report text as PDF,
- PDFs of all figures.

2.4.4 The CD ROM structure is formed from a tree of directories under the title J185 Nailsea – CD. Directory titles include Data, Documentation, CAD and PDF. Multiple directories exist under Data and hold grid, composite and graphic files with CSV composite data held in export.

2.4.5 The CAD file contains externally referenced graphics that may be rotated, see 2.3.5, with separate A3 size layouts for each figure. Layouts are fixed using frozen layers and named views allowing straightforward plotting or analysis on screen. (Note – CAD files are prepared using AutoCAD's eTransmit function to produce a directory containing the digital drawing along with any externally referenced graphics which may need reloading).

3 RESULTS

3.1 General overview

3.1.1 Geophysical anomalies located can be generally classified as positive and negative linear anomalies of an uncertain origin, areas of magnetic debris and disturbance, strong discrete dipolar anomalies relating to ferrous objects and strong multiple dipolar linear anomalies relating to buried services or pipelines.

3.1.2 Survey conditions were generally considered to be good with low ground cover and fine weather conditions. However, the survey area is magnetically 'noisy' due to modern services, sports features, boundary fencing and other strong dipolar anomalies associated with modern ferrous objects. The presence of widespread magnetic 'noise' can have implications for the sensor adjustment procedure and may result in heading errors that appear as slight striping within the data; these are effectively removed during processing and have no influence on the effectivity of the technique.

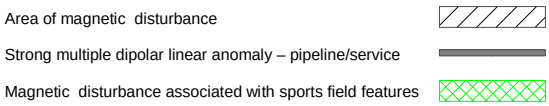
3.2 Magnetic anomalies

3.2.1 The listing of sub-headings below attempts to define a number of separate categories that reflect the range and type of features located during the survey. A basic explanation of the characteristics of the magnetic anomalies is set out for each category in order to justify interpretation.

Anomalies with an uncertain origin

The category applies to a range of anomalies where there is not enough evidence to confidently suggest an origin. A positive anomaly may relate to an increased depth of topsoil or magnetically enhanced soil within a cut feature, a negative anomaly may be a response to less enhanced material. Anomalies in this category may well be related to archaeologically significant features but equally, relatively modern features, geological/pedological features etc. should be considered.

Magnetic disturbance



The magnetic response is often strong and dipolar indicative of ferrous material and may be associated with extant above surface features such as wire fencing, cables, pylons etc.. Often a significant area around such features has a strong magnetic flux which may create magnetic disturbance – such disturbance can effectively obscure low magnitude anomalies if they are present.

Anomalies associated with magnetic debris

The response often appears as areas containing many small dipolar anomalies that may range from weak to very strong in magnitude. Magnetic debris often occurs where there has been dumping or ground make-up and is related to magnetically thermoremnant materials such as brick or tile or other small fragments of ferrous material. This type of response is occasionally associated with kilns, furnace structures, or hearths and may therefore be archaeologically significant. It is also possible that the response may be caused by natural material such as certain gravels and fragments of igneous or metamorphic rock. Strong discrete dipolar anomalies are responses to ferrous objects within the topsoil.

3.2.2 Anomalies with an uncertain origin

(1 & 2) - A complex system of positive and negative anomalies has been located across the survey area. These mainly linear anomalies appear to be related and are generally oriented north-north-west to south-south-east along the longest axis. The strongest responses with a rectilinear form are located towards the western half of the survey area (1) with several other faint positive and a negative linear anomaly with a similar axis located to the east (2). It is possible that these anomalies relate to cut features associated with former coal workings (crop workings) in the area which may have been relatively shallow in depth. The anomalies could also be

consistent with structural remains and enclosures.

(3) – Several discrete positive anomalies were located across the survey area. A number of these may be similar in origin or associated with anomalies (1). This type of response is often associated with cut pit-like features or former depressions.

(4) - Positive linear anomalies within the northern half of the survey area may relate to cut ditch-like features. It is not possible to ascertain the origin of the anomalies but they may represent a land enclosure.

(5) - Faint curvilinear anomalies close to the north eastern corner of the survey area and within the southern part of the site are of uncertain origin although may represent cut features.

(6) - Positive linear anomalies that are generally parallel with a north-west to south-east orientation are of uncertain origin although may be associated with former agriculture or drainage.

(7) – Negative linear anomalies cross the survey area with a north-west to south-east orientation and may be associated with agricultural drainage.

3.2.3 Anomalies associated with magnetic debris

(8) Patches of magnetic debris have been located that are likely to relate to magnetically thermoremnant and ferrous material. The debris may relate to areas of dumping.

(9) Close to the eastern edge of the survey area is a zone of magnetic debris. The strength of the anomalies would suggest a high ferrous content to the material. Anomaly (11) immediately adjacent to the north is likely to be associated with the debris.

(10) Located across the survey area are many strong discrete dipolar anomalies which are caused by relatively shallow ferrous objects.

3.2.4 Magnetic disturbance

(11) An area of magnetic disturbance caused by ferrous material or a large ferrous object can be seen situated to the north of anomaly (9) and may be associated with it.

(12) Other areas of magnetic disturbance are a response to modern features within and surrounding the survey area such as fencing and inspection chamber covers.

(13) The site contains several areas of magnetic disturbance caused by goal post sockets.

(14) A multiple dipolar linear anomaly partially extends across the northern part of the survey area. It is possible that this relates to some form of buried service/cable.

4 DISCUSSSION

4.1

4.1.1 The large zone of positive and negative linear anomalies located across the site, (anomalies 1 and 2), is unusual and has been classified as of uncertain origin. Negative response can be formed by the introduction of material into the topsoil or shallow subsoil that has a lower magnetic susceptibility than the natural topsoil/subsoil unit. Positive linear anomalies within this zone are formed by enhanced magnetic susceptibility relating to increased depth of soil within cut features. The layout of the linear anomalies within this zone could be consistent with former structural remains or earthworks particularly where negative response occurs, however, given the extensive extraction of coal across the region it is possible that the anomalies relate to crop working. This method of coal extraction can be very early (late medieval or earlier) and is achieved through the use of linear quarries up to 5m deep that follow coal outcropping at or near the surface. The quarries are backfilled as they progress which may result in material of low magnetic susceptibility, such as subsoil and rock, forming the negative anomalies located by the survey.

4.1.2 There is some evidence for possible former industrial activity within the eastern part of the survey area, this is supported by the presence of a large area of magnetic debris and magnetic disturbance from a large ferrous object, anomalies (9 & 11). The magnetic debris may be formed by magnetically thermoremnant material, such as brick, furnace remains, clinker, etc. or other fragments of ferrous material. In addition, 19th century Ordnance Survey mapping indicates a possible structure in the vicinity of these responses and it is tentatively suggested that this may be associated with Elms Colliery a short distance to the north.

4.1.3 Linear and curvilinear positive anomalies located across the site may represent cut features of archaeological potential. These responses are either weak or fragmented which has prevented confident interpretation.

5 CONCLUSION

5.1

5.1.1 The magnetometer survey located a widespread area of positive and negative linear and rectilinear anomalies that are of uncertain origin. There are also a number of more discrete possible pit-like anomalies within the survey area. These anomalies may be consistent with shallow coal extraction or crop working, however the possibility of former structures or earthworks should be considered.

5.1.2 A spread of magnetically thermoremnant material within the eastern part of the site

together with a strong response to a substantial ferrous object suggests some form of industrial activity in this area. The anomalies may be associated with an area of waste dumping.

5.1.3 Magnetic debris and disturbance is widespread across the site which may obscure subtle anomalies such as small pit-like features. Positive linear and curvilinear anomalies located across the site may be formed by cut features although their archaeological potential is difficult to establish due to their weak and fragmented nature.

6 REFERENCES

Archaeological Surveys Ltd, 2007. *Geophysical Survey Report, Nailsea School, North Somerset.* Unpublished client report.

British Geological Survey, 1977. *Geological Survey Ten Mile Map, South Sheet, First Edition (Quaternary)*, Scale 1:625 000.

British Geological Survey, 1993. *Bristol District, England and Wales Special Sheet, Solid and Drift Edition, One -Inch Series.*

English Heritage, 1995. *Geophysical survey in archaeological field evaluation. Research and Professional Service Guideline No.1.*

Soil Survey of England and Wales, 1983. *Soils of England and Wales, Sheet 5 South West England.*

Appendix A – basic principles of magnetic survey

Iron minerals are always present to some degree within the topsoil and enhancement associated with human activity is related to increases in the level of magnetic susceptibility and of magnetically thermoremnant material.

Magnetic susceptibility is an induced magnetism within a material when it is in the presence of a magnetic field. This can be thought of as effectively permanent due to the presence of the Earth's magnetic field.

Thermoremnant magnetism occurs when ferrous material is heated beyond a specific temperature known as the Curie Point. Demagnetisation occurs at this temperature with re-magnetisation by the Earth's magnetic field upon cooling.

Enhancement of magnetic susceptibility can occur in areas subject to burning and complex fermentation processes on biological material; these are frequently associated with human settlement. Thermoremnant features include ovens, hearths, and kilns. In addition thermoremnant material such as tile and brick may also be associated with human activity and settlement.

Silting and deliberate infilling of ditches and pits with magnetically enhanced soil can create an area of enhancement compared with surrounding soils and subsoils into which the feature is cut. Mapping enhanced areas will produce linear and discrete anomalies allowing an assessment and characterisation of hidden subsurface features.

It should be noted that areas of negative enhancement can be produced from material having lower magnetic properties compared to the topsoil. This is common for many sedimentary bedrocks and subsoils which were often used in the construction of banks and walls etc. Mapping these 'negative' anomalies may also reveal archaeological features.

Magnetic survey or magnetometry can be carried out using a fluxgate gradiometer and may be referred to as gradiometry. The gradiometer is a passive instrument consisting of two fluxgate sensors mounted vertically 1m apart. The instrument is carried about 30cm above the ground surface and the upper sensor measures the Earth's magnetic field as does the lower sensor but this is influenced to a greater degree by any localised buried field. The difference between the two sensors will relate to the strength of the magnetic field created by the buried feature. If no enhanced feature is present the field measured by both sensors will be similar and the difference close to zero.

There are a number of factors that may affect the magnetic survey and these include soil type, local geology and previous human activity. Situations arise where magnetic disturbance associated with modern services, metal fencing, dumped waste material etc., obscures low magnitude fields associated with archaeological features.

Appendix B – survey and data information

Raw magnetometry data

COMPOSITE
Filename: Mag-raw.xcp
Instrument Type: Grad 601 (Magnetometer)
Units: nT
Direction of 1st Traverse: 0 deg
Collection Method: ZigZag
Sensors: 2 @ 1.00 m spacing.
Dummy Value: 32702
Origin: One

Dimensions
Composite Size (readings): 1080 x 360
Grid Size: 30 x 30
X Interval: 0.25
Y Interval: 1

Stats
Max: 30.00
Min: -30.00
Std Dev: 6.96
Mean: -0.82

Processes: 2
1 Base Layer
2 Clip from -30 to 30

Source Grids: 66
1 Col:0 Row:2 grids\29.asg
2 Col:0 Row:3 grids\30.asg
3 Col:0 Row:6 grids\57.asg
4 Col:1 Row:0 grids\25.asg
5 Col:1 Row:1 grids\26.asg
6 Col:1 Row:2 grids\27.asg
7 Col:1 Row:3 grids\28.asg
8 Col:1 Row:6 grids\55.asg
9 Col:1 Row:7 grids\56.asg
10 Col:2 Row:0 grids\20.asg
11 Col:2 Row:1 grids\21.asg
12 Col:2 Row:2 grids\22.asg
13 Col:2 Row:3 grids\23.asg
14 Col:2 Row:4 grids\24.asg
15 Col:2 Row:5 grids\52.asg
16 Col:2 Row:6 grids\53.asg
17 Col:2 Row:7 grids\54.asg
18 Col:2 Row:8 grids\64.asg
19 Col:2 Row:9 grids\65.asg
20 Col:2 Row:10 grids\66.asg
21 Col:3 Row:1 grids\16.asg
22 Col:3 Row:2 grids\17.asg
23 Col:3 Row:3 grids\18.asg
24 Col:3 Row:4 grids\19.asg
25 Col:3 Row:5 grids\49.asg
26 Col:3 Row:6 grids\50.asg
27 Col:3 Row:7 grids\51.asg
28 Col:3 Row:8 grids\60.asg
29 Col:3 Row:9 grids\61.asg
30 Col:3 Row:10 grids\62.asg
31 Col:3 Row:11 grids\63.asg
32 Col:4 Row:1 grids\12.asg
33 Col:4 Row:2 grids\13.asg
34 Col:4 Row:3 grids\14.asg
35 Col:4 Row:4 grids\15.asg
36 Col:4 Row:5 grids\46.asg
37 Col:4 Row:6 grids\47.asg
38 Col:4 Row:7 grids\48.asg
39 Col:4 Row:8 grids\58.asg
40 Col:4 Row:9 grids\59.asg
41 Col:5 Row:1 grids\11.asg
42 Col:5 Row:2 grids\08.asg
43 Col:5 Row:3 grids\09.asg
44 Col:5 Row:4 grids\10.asg
45 Col:5 Row:5 grids\42.asg
46 Col:5 Row:6 grids\43.asg
47 Col:5 Row:7 grids\44.asg
48 Col:5 Row:8 grids\45.asg
49 Col:6 Row:1 grids\04.asg
50 Col:6 Row:2 grids\05.asg
51 Col:6 Row:3 grids\06.asg
52 Col:6 Row:4 grids\07.asg
53 Col:6 Row:5 grids\38.asg
54 Col:6 Row:6 grids\39.asg
55 Col:6 Row:7 grids\40.asg
56 Col:6 Row:8 grids\41.asg
57 Col:7 Row:2 grids\01.asg
58 Col:7 Row:3 grids\02.asg
59 Col:7 Row:4 grids\03.asg
60 Col:7 Row:5 grids\31.asg
61 Col:7 Row:6 grids\32.asg
62 Col:7 Row:7 grids\33.asg
63 Col:7 Row:8 grids\34.asg
64 Col:8 Row:6 grids\35.asg
65 Col:8 Row:7 grids\36.asg
66 Col:8 Row:8 grids\37.asg

Processed magnetometry data

COMPOSITE
Filename: Mag-proc.xcp

Stats
Max: 3.64
Min: -3.07
Std Dev: 1.69
Mean: 0.01

Processes: 15
1 Base Layer
2 Clip from -30 to 30
3 Search & Replace From: -10000 To: 10000 With: 32702 (Area: Top 164, Left 214, Bottom 174, Right 304)
4 Search & Replace From: -10000 To: 10000 With: 32702 (Area: Top 150, Left 290, Bottom 168, Right 347)
5 Search & Replace From: -10000 To: 10000 With: 32702 (Area: Top 120, Left 246, Bottom 145, Right 281)
6 Search & Replace From: -10000 To: 10000 With: 32702 (Area: Top 142, Left 282, Bottom 153, Right 321)
7 Search & Replace From: -10000 To: 10000 With: 32702 (Area: Top 127, Left 280, Bottom 141, Right 289)
8 Search & Replace From: -10000 To: 10000 With: 32702 (Area: Top 106, Left 211, Bottom 120, Right 263)
9 Search & Replace From: -10000 To: 10000 With: 32702 (Area: Top 129, Left 290, Bottom 142, Right 319)
10 Search & Replace From: -10000 To: 10000 With: 32702 (Area: Top 140, Left 320, Bottom 150, Right 342)
11 DeStripe Median Traverse: Grids: All
12 Clip from -5 to 5
13 De Stagger: Grids: All Mode: Both By: -1 intervals
14 Clip from -3 to 3
15 De Stagger: Grids: 36.asg 37.asg Mode: Both By: 1 intervals

Survey location

Archaeological Surveys Ltd

Geophysical Survey
Nailsea School, Golden Valley site

Map of survey area

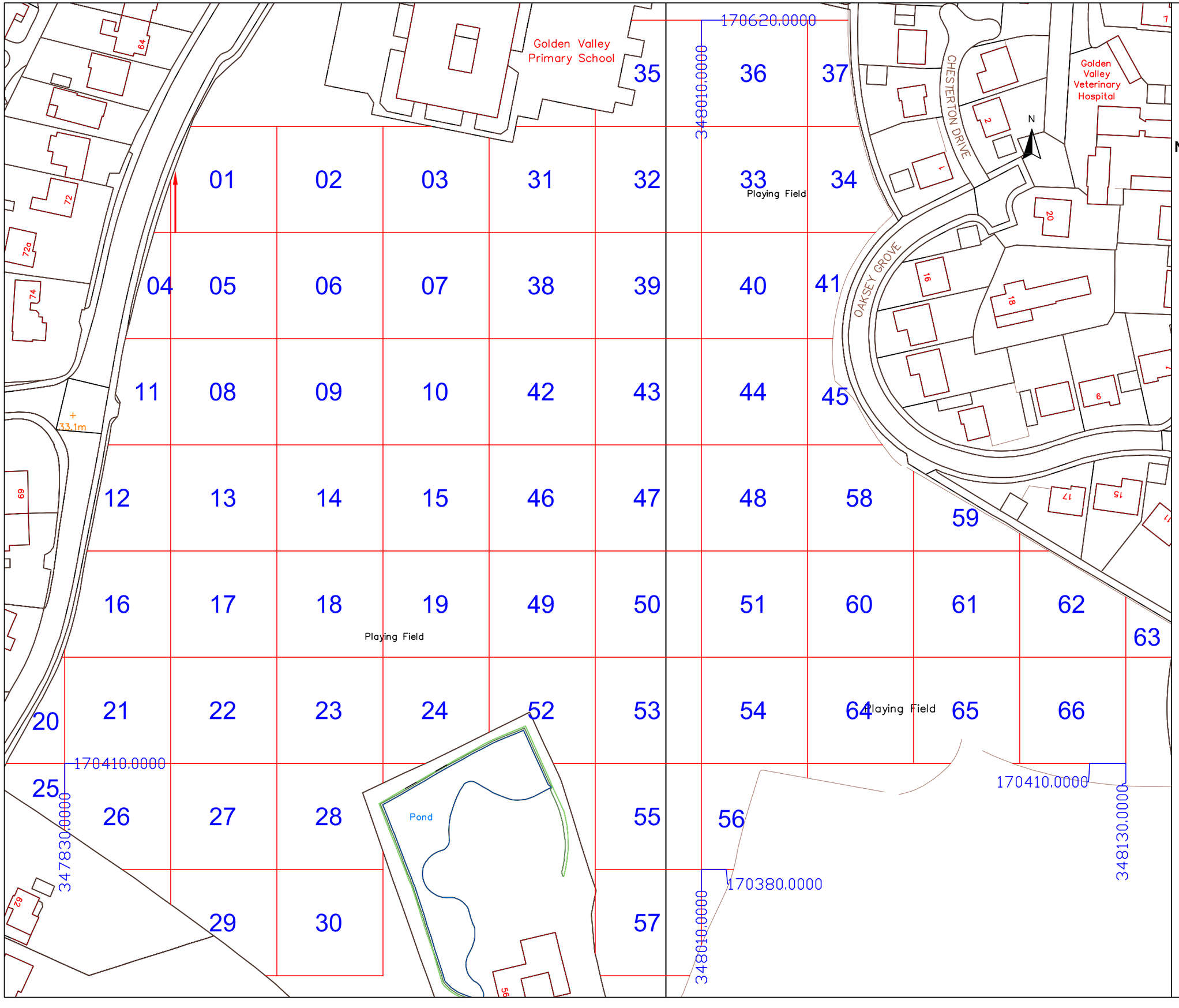
Survey location

Site centred on OS NGR
ST 47980 70480

SCALE 1:50 000

0km 1 2km

FIG 01



Archaeological Surveys Ltd

Geophysical Survey
Nailsea School, Golden Valley site

Referencing information

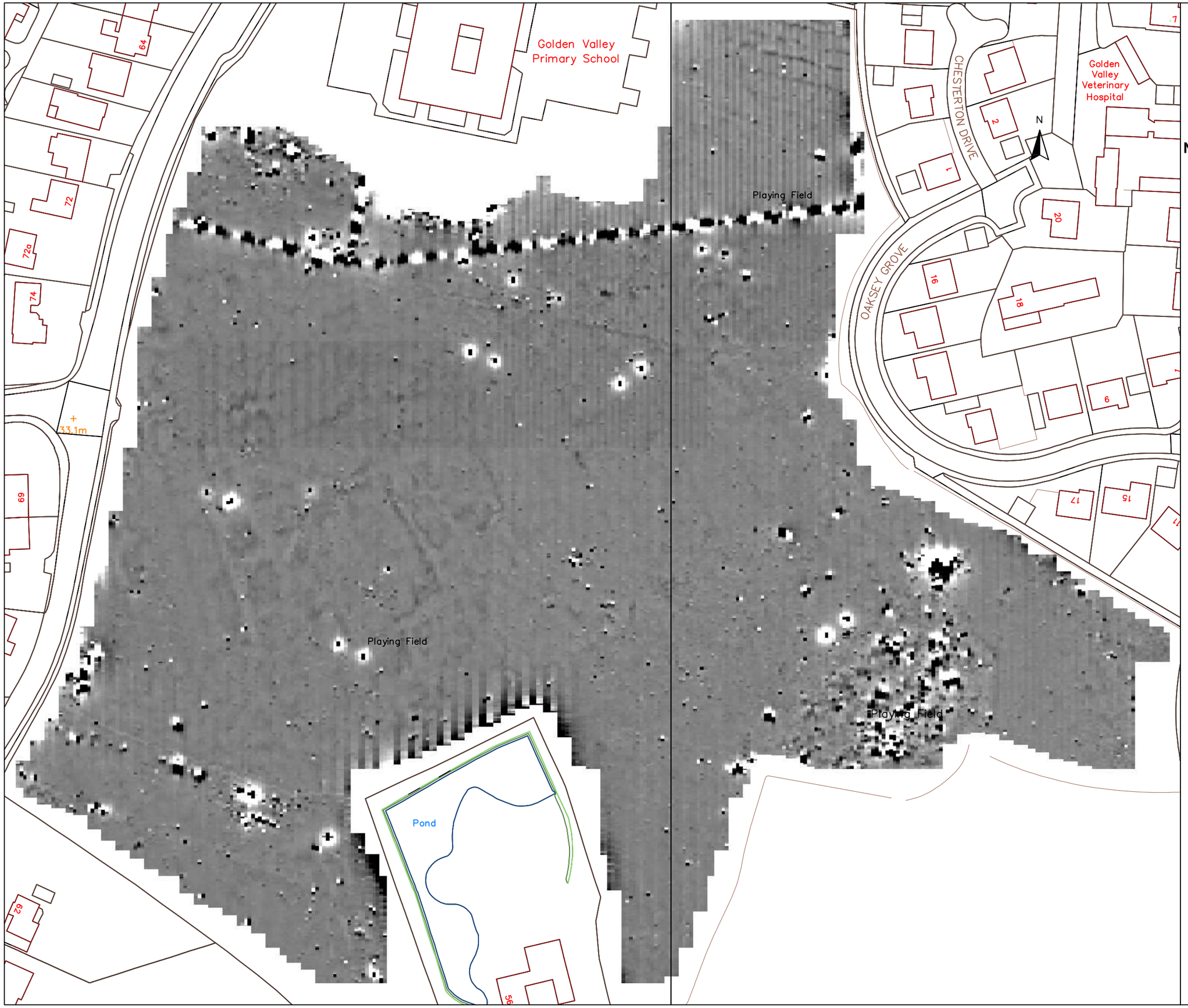
Based on OS coordinates (OSGB36)

Survey start and traverse direction

SCALE 1:1000

0m 10 20 30 40 50m

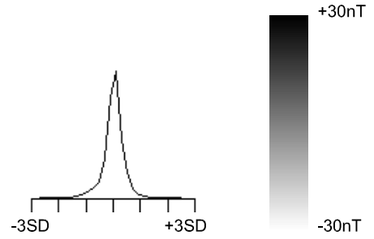
FIG 02



Archaeological Surveys Ltd

Geophysical Survey
Nailsea School, Golden Valley site

Greyscale plot of raw magnetometer data



SCALE 1:1000

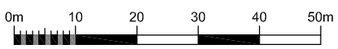


FIG 03

Golden Valley Primary School

Golden Valley Veterinary Hospital

CHESTERTON DRIVE

OAKSEY GROVE

Pond

+ 33.1m

64 72 72a 74 69 62 1 2 20 16 18 6 7 15 17

N

Archaeological Surveys Ltd

Geophysical Survey
Nailsea School, Golden Valley site

Traceplot of raw magnetometer data

+40nT — Approximately 20nT/ cm vertical displacement.

+20nT — Data has been clipped at ± 100nT.

0nT

-20nT

-40nT

SCALE 1:1000

0m 10 20 30 40 50m

FIG 04

Golden Valley Primary School

Playing Field

CHESTERTON DRIVE

OAKSEY GROVE

Golden Valley Veterinary Hospital

N

64

72

72a

74

69

62

+ 33.1m

1

2

20

16

18

6

17

15

Playing Field

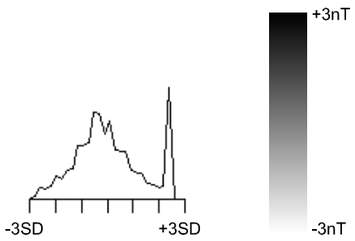
Playing Field

Pond

Archaeological Surveys Ltd

Geophysical Survey
Nailsea School, Golden Valley site

Greyscale plot of processed magnetometer data



SCALE 1:1000

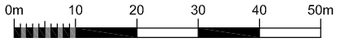


FIG 05

Golden Valley Primary School

Golden Valley Veterinary Hospital

CHESTERTON DRIVE

OAKSEY GROVE

Playing Field

Playing Field

Playing Field

Pond

+ 33.1m

N

Archaeological Surveys Ltd

Geophysical Survey
Nailsea School, Golden Valley site

Abstraction and interpretation of magnetometer anomalies

- Positive anomaly - of uncertain origin
- Negative anomaly - of uncertain origin
- Magnetic anomalies associated with sports field features (goalpost sockets etc)
- Magnetic debris - magnetically thermoremnant/ferrous material
- Magnetic disturbance from ferrous material
- Strong multiple dipolar linear anomaly - pipeline / cable / service
- Strong dipolar anomaly - ferrous object in topsoil

SCALE 1:1000

0m 10 20 30 40 50m

FIG 06