GEOPHYSICAL SURVEY OF LAND AT BRAYTON PARK ASPATRIA CUMBRIA

GEOPHYSICAL SURVEY REPORT
CP. NO: 890/09
06/05/2009

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Quality Assurance

This report covers works as outlined in the brief for the above-named project as issued by the relevant authority, and as outlined in the agreed programme of works. Any deviation to the programme of works has been agreed by all parties. The works have been carried out according to the guidelines set out in the Institute for Archaeologists (IfA) Standards, Policy Statements and Codes of Conduct. The report has been prepared in keeping with the guidance set out by North Pennines Archaeology Ltd on the preparation of reports.

REVISION SCHEDULE			
	01	**02**	**03**
PREPARED BY: **POSITION:** **DATE:**	Martin Railton Project Manager 05/04/09		
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SUMMARY

In April 2009, North Pennines Archaeology Ltd, commissioned by Mr Harry Wardy, undertook geophysical surveys of land at Brayton Park, Aspatria, Cumbria (centred on Ordnance Survey grid reference NY 1650 4240), prior to a proposed holiday lodge development at the site. The site is within the former grounds of Brayton Hall, which was built as a country house for the Lawson Family in 1800, and now survives as a ruin on the east side of Brayton Park.

There is the potential for archaeological remains to survive at the site, including features associated with the former grounds of Brayton Hall. A possible medieval or post-medieval deserted settlement, known as Breayton Deserted Settlement, is also recorded on the north side of Brayton Park, close to the northern part of the present survey area. A number of earthworks are also recorded in Brayton Park, on the south side of the survey area. A deer park was situated to the north, until this was disparked in 1798.

The objective of the geophysical surveys was to determine the presence/absence, nature and extent of potential archaeological features within the study area, and the presence/absence of any known modern features within the survey area, which may affect the results.

Geomagnetic survey covering *c*.6.5ha of land was conducted on the south side of Brayton Park, in an area presently used as a golf course. The geomagnetic survey proved effective in detecting a range of features at the site, including the remains of medieval ridge and furrow cultivation, and post-medieval features associated with the former grounds of Brayton Hall. These included the boundary of a bowling green, and former area of woodland. Possible structural remains, and a number of possible soil-filled ditches were also detected, but the date and nature of these is uncertain.

ACKNOWLEDGEMENTS

North Pennines Archaeology Ltd would like to thank Mr Harry Wardy, for commissioning the project, and for all assistance throughout the survey.

The geophysical surveys were undertaken by Kevin Mounsey and Mike McElligott. The report was written and illustrated by Martin Railton, Project Manager for NPA Ltd, who also managed the project.

1 INTRODUCTION

1.1 CIRCUMSTANCES OF THE PROJECT (FIGURES 1 & 2)

1.1.1 In April 2009, North Pennines Archaeology Ltd, undertook a geophysical survey of land at Brayton Park, Aspatria, Cumbria, at the request of Mr Harry Wardy (the client). This followed a proposal by the client for a holiday lodge development at the site, in an area presently used as a golf course (Figure 1). The site is within the former grounds of Brayton Hall, which was built as a country house for the Lawson Family in 1800, and now survives as a ruin on the east side of Brayton Park.

1.1.2 The survey area comprised *c*.6.5ha land within Brayton Park, focusing on the area of the proposed holiday lodge development (Figure 2). The survey area was situated on the southern part of the site, immediately to the east of the Brayton Park cafe and fish pond, on the west side of the golf course. The site is centred on Ordnance Survey grid reference NY 1650 4240.

1.1.3 There is the potential for archaeological remains to survive at the site, including features associated with the former grounds of Brayton Hall. A possible medieval or post-medieval deserted settlement, known as Breayton Deserted Settlement (HER 40907), is also recorded on the north side of Brayton Park, close to the northern part of the present survey area. A number of earthworks are also recorded in Brayton Park, on the south side of the survey area (HER 5918). A deer park was situated to the north (HER 5915), until this was disparked in 1798.

1.1.4 The objective of the geophysical surveys was to determine the presence/absence, nature and extent of potential archaeological features within the survey area, and the presence/absence of any known modern features within the survey area, which may affect the results.

1.1.5 This report outlines the results of the geophysical survey undertaken, and includes an interpretation of the geophysical survey results, in light of the archaeological and historical background of the site, with recommendations for further work where necessary.

2 METHODOLOGY

2.1 STANDARDS

2.1.1 The geophysical survey and reporting were consistent with the relevant standards and procedures of the Institute for Archaeologists (IfA 2002), and English Heritage Guidelines (English Heritage 2008).

2.2 GEOPHYSICAL SURVEYS

2.2.1 ***Technique Selection:*** geomagnetic survey was selected as the most appropriate technique, given the non-igneous environment, and the expected presence of cut archaeological features at depths of no more than 1.5m. This technique involves the use of hand-held gradiometers, which measure variations in the vertical component of the earth's magnetic field. These variations can be due to the presence of sub-surface archaeological features. Data were recorded by the instruments and downloaded into a laptop computer for initial data processing in the field using specialist software.

2.2.2 ***Field Methods:*** the geophysical study area measured *c.*6.5ha and was positioned to cover the area of the proposed holiday lodge development. A 30m grid was established across this area, and tied-in to known Ordnance Survey points using a Trimble 3605DR Geodimeter total station with datalogger.

2.2.3 Geomagnetic measurements were determined using a Bartington Grad601-2 dual gradiometer system, with twin sensors set 1m apart. It was expected that significant archaeological features at a depth of up to 1.5m would be detected using this arrangement. The survey was undertaken using a zig-zag traverse scheme, with data being logged in 30m grid units. A sample interval of 0.25m was used, with a traverse interval of 1m, providing 3600 sample measurements per grid unit. The data were downloaded on site into a laptop computer for processing and storage.

2.2.4 ***Data Processing:*** geophysical survey data were processed using ArchaeoSurveyor II software, which was used to produce 'grey-scale' images of the raw data. Positive magnetic anomalies are displayed as dark grey, and negative magnetic anomalies are displayed as light grey. A palette bar shows the relationship between the grey shades and geomagnetic values in nT.

2.2.5 Raw data were processed in order to further define and highlight the archaeological features detected. The following basic data processing functions were used:

Despike: to locate and suppress random iron spikes in the gradiometer data.

Clip: to clip data to specified maximum and minimum values, in order to limit large noise spikes in the geophysical data.

Destagger: to reduce the effect of staggered gradiometer data, sometimes caused by difficult working conditions, topography, or operator error.

Interpolate: to match the traverse and sample intervals in the gradiometer data.

2.2.6 ***Interpretation:*** four types of geophysical anomaly were detected in the gradiometer data:

positive magnetic: regions of anomalously high or positive magnetic data, which may be associated with the presence of high magnetic susceptibility soil-filled features, such as pits or ditches.

negative magnetic: regions of anomalously low or negative magnetic data, which may be associated with features of low magnetic susceptibility, such as stone-built features, geological features, land-drains or sub-surface voids.

dipolar magnetic: regions of paired positive and negative magnetic anomalies, which typically reflect ferrous or fired materials, including fired/ferrous debris in the topsoil, modern services, metallic structures, or fired structures, such as kilns or hearths.

diffuse magnetic: areas of diffuse or indistinct magnetic data, which may be associated with the presence of geological features or be caused by modern agricultural practices.

2.2.7 ***Presentation:*** the grey-scale image was combined with site survey data and Ordnance Survey data to produce the geophysical survey plan. A colour-coded geophysical interpretation diagram is provided, showing the locations and extent of positive, negative, dipolar, geomagnetic anomalies.

2.2.8 An archaeological interpretation diagram is provided, which is based on the interpretation of the geophysical survey results, in light of the archaeological and historical background of the site.

2.2.9 Trace plots of the unprocessed geophysical data are available if required.

2.3 ARCHIVE

2.3.1 The data archive for the geophysical survey has been created in accordance with the recommendations of the Archaeology Data Service (ADS 2001). This archive is currently held at the company offices at Nenthead, Cumbria.

2.3.2 One copy of the final report will be deposited with the County Historic Environment Record, where viewing will be available on request. The

project is also registered with the **O**nline **A**cces**S** to the **I**ndex of archaeological investigation**S** (**OASIS**), where a digital copy of the report will be made available.

2.3.3 The OASIS reference for this project is **northpen3-59019**.

3 BACKGROUND

3.1 LOCATION AND GEOLOGICAL CONTEXT

3.1.1 Brayton Park lies within the southern part of the Solway Basin, a broad lowland plain landscape, framed by the Cumbria High Fells to the south, the hills of the Scottish Borders to the north, and the Border Moors and forests to the northeast (Countryside Commission 1998, 19). The area is also situated on the southern edge of the Abbeytown Ridge, a relatively narrow tract of land stretching from Salta Moss at the western extent of the north-west Cumbrian coastal plain, to Wedholme Flow, some 20km to the north-east. The Abbeytown Ridge reaches heights of c.40m AOD and forms a significant topographic feature, defining the southern boundary of the Solway Plain.

3.1.2 The study area is approximately 1km to the east of the town of Aspatria, within the former parkland of Brayton Hall (NY 1650 4240). The site is located on a ridge of land, which rises to a peak on the south side of the study area. The land now forms part of the Brayton Park golf course, and contains a number of fairways, greens, bunkers, a small pond, and various copses of trees. The survey area forms a block of land to the east of the larger Brayton Park fish pond, access road, and club house/cafe.

3.1.3 The underlying geology comprises Permian and Triassic sandstones and mudstones (British Geological Survey 2001) with overlying Moraninic Drift, comprising glacial till. The overlying soils are known as Clifton soils, which are slowly permeable seasonally waterlogged reddish fine and couse loamy soils (SSEW 1980).

3.2 HISTORICAL CONTEXT

3.2.1 *Introduction:* this historical background is compiled mostly from secondary sources, and is intended only as a brief summary of the historical background specific to the study area. A number of online resources have also been consulted. References to the Cumbria County Council Historic Environment Record (HER) are included where known.

3.2.2 *Prehistoric:* the only confirmed evidence for prehistoric activity near Brayton Park comprises a number of isolated finds of Bronze Age date from the Aspatria area.

3.2.3 The Abbeytown Ridge is well-known for its archaeological potential; a number of cropmark sites along the ridge were first identified in the dry summer of 1975, and this led to an article by Higham and Jones that suggested that these cropmarks represented a buried late-prehistoric landscape. A possible oval cropmark has been identified to the west of

Brayton Park (HER 4405) which could potentially be a prehistoric (or later) enclosure.

3.2.4 *Roman:* there are no known Roman remains in the immediate vicinity of Brayton Park. The town lies inland from a series of Roman forts believed to be part of a coastal defense system associated with Hadrian's Wall. A Roman road linking the forts at Old Carlisle, Wigton and Maryport is believed to have run close to the town.

3.2.5 *Medieval:* It is likely that Aspatria has early medieval origins. The Church of St Kentigern (1846) in Aspatria contains a 10th to 11th century cross fragment and a 10th century hogback stone. Excavations of a round barrow on Beacon Hill to the north of the town in 1789 revealed a cist burial, and a variety of grave goods attributed to the Viking period. Further excavations were undertaken in 1997, ahead of the proposed construction of a telecommunications tower on the site of the barrow. These revealed two pits, one of which contained fragments of human bone and metalwork dating to the 10th century (Abramson 2000).

3.2.6 The Manor of Brayton lay to the east of Aspatria. There are a number of earthworks of possible medieval date in the vicinity of Brayton Park. The site of Little Broats Deserted Settlement (HER 40908) lies to the west of the site, between Brayton Park and Aspatria. There are also a number of medieval ridge and furrow earthworks nearby (HER 5917). Another possible medieval or post-medieval deserted settlement, known as Breayton Deserted Settlement (HER 40907), is recorded on the north side of Brayton Park, close to the northern part of the present survey area. A number of earthworks are also recorded in Brayton Park, on the south side of the survey area (HER 5918). A deer park was situated to the north (HER 5915), until this was disparked in 1798.

3.2.7 "The manor of Brayton gave name to a family, who were succeeded in its possession by a younger branch of the Salkelds. It was purchased of the coheiresses of the latter, in the early part of the last century, by Sir Wilfred Lawson, great-great-grandfather of the late Sir Wilfred Lawson, Bart., who died without issue in 1806. The title in consequence became extinct; and this estate, since the death of his widow (which happened in 1811), has passed under his will to Thomas, and on his death, in 1812, to Wilfred, younger sons of Thomas Wybergh, Esq. of Clifton Hall, in Westmorland, who married a sister of Lady Lawson's; Wilfred, who is as yet under age, has taken the name of Lawson. Brayton-house was much improved by the late baronet, by whom also the grounds were laid out, and extensive plantations made. The library, collected at a great expense, was particularly rich in works on natural history. Among the pictures are many of the best works of

living English masters, particularly Northcote and Reinagle. Until of late years Isel had been the chief residence of the Lawson family. It is now occupied by Thomas Wybergh, Esq. as guardian to his son Wilfred" (Lysons 1816).

3.2.8 *Post-medieval:* Brayton Hall (HER 5926) was built as a country house for the Lawson Family in 1800, and was used as their summer residence (Plate 1). The house was set in landscaped grounds and gardens, with a fish pond to the west (HER 5914). The hall was approached from the west, and the road (now visible as an earthwork) ran along the southern edge of the present survey area. The 1st Edition Ordnance Survey map of 1868 shows the layout of Brayton Hall and gardens, with Brayton Hall farm to the north, surrounded by areas of woodland and pasture. The pond is shown to the west in its present location. The road to the hall is indicated, along with another road to the farm, which crosses the present survey area aligned northeast to southwest. Two small buildings are shown to the north of the fishpond, one of which is believed to have been the former gardener's cottage (now the golf course club house/café). Areas of woodland occupied the northern and southern parts of the present survey area.

3.2.9 The house and grounds remained largely unchanged up to the time of the 4th Edition Ordnance Survey map of 1925. A bowling green was added to the northwest of the hall at the end of the 19th century, later used as a cricket ground. The hall was demolished in 1940, after being damaged by fire (www.lostheritage.org.uk), and now survives as a ruin.

3.2.10 *Modern:* An airfield was laid out in fields to the east of Brayton Hall, but this no longer survives (www.ads.ahds.ac.uk).

3.2.10 The golf course at Brayton Park was established in the 1980's, following removal of much of the former park woodland. The site of Brayton Hall is now occupied by a farm, and much of the original parkland is used as agricultural land. The original fish pond survives, and is situated to the west of the present survey area, but little now survives of the former landscape gardens.

3.3 PREVIOUS ARCHAEOLOGICAL WORK

3.3.1 No known previous archaeological works have taken place within the immediate vicinity of Brayton Park.

Plate 1: Brayton Hall as it looked in its heyday (www.lostheritage.org.uk)

4 THE GEOPHYSICAL SURVEY

4.1 INTRODUCTION

4.1.1 The geophysical survey was undertaken between 21st and 23rd April 2009. Geomagnetic survey was undertaken over *c*.6.5ha on the south side of Brayton Park, within the western part of the golf course (Figure 2). This area contained a number of features associated with the present golf course, including fairways, greens, sand-filled bunkers, marker posts, golf course furniture, a modern stone circle, a pond, and a large number of trees (Plate 2). A number of these areas could not be surveyed, including the pond, some fenced trees and the stone circle. The survey area was bounded by field boundaries consisting of post and wire fences to the west and south. A café was situated at the northwest corner of the survey area, surrounded by a concrete patio, which produced a strong dipolar anomaly in this area.

4.1.2 A number of earthworks were visible at the time of survey, including the earthwork remains of the original road to Brayton Hall, which ran east-west along the southern boundary of the survey area. A ridge of land on the south side of the survey area contained prominent ridge and furrow earthworks of probable medieval date (Plate 3). A number of earthwork banks were also noted crossing the survey area, which may be the remains of former field boundaries.

Plate 2: Breyton Park golf course, showing a modern stone circle on the east side of the survey area

Plate 3: The earthwork remains of medieval ridge and furrow cultivation, on the south side of the survey area

4.2 SURVEY RESULTS (FIGURES 3-5)

4.2.1 Small discrete dipolar magnetic anomalies were detected across the whole of the study area (Figure 3). These are almost certainly caused by fired/ferrous litter in the topsoil. These anomalies are indicated on the geophysical interpretation drawing (Figure 4), but not referred to again in the subsequent interpretation diagram (Figure 5). Potential archaeological features are numbered on the geophysical interpretation diagram, and referenced in the text.

4.2.2 A number of discrete dipolar magnetic anomalies were detected, which were associated with features forming the Brayton Park golf course. These included a regularly-spaced series of metal fairway markers on the north side of the survey area, aligned approximately east-west, and a signal post with bell on the southwest corner of the survey area. A number of discrete dipolar magnetic anomalies and negative magnetic anomalies were also detected, which related to the locations of sand-filled bunkers.

4.2.3 Two strong linear dipolar magnetic dipolar anomalies were detected on the north side of the survey area, which are almost certainly the locations of modern service pipes or electricity cables, supplying the golf course club house/café. A weak linear geomagnetic anomaly was also detected in this area, which may mark the location of a land drain or water pipe.

4.2.4 Two sub-square dipolar magnetic anomalies, measuring *c*.16m across, were detected on the northern edge of the survey area (1). These anomalies may

mark the locations of former buildings or other structural remains; however the nature of these features is uncertain.

4.2.5 A chain of strong dipolar magnetic anomalies was detected at the northeast corner of the survey area, defining a square area measuring 83m east-west and 70m north-south (2). These anomalies correspond to the exact location of a bowling green, as illustrated on the 3rd Edition Ordnance Survey map of 1900, and probably mark the location of a former iron fence or other boundary feature defining the green.

4.2.6 Immediately to the south of these were two irregular areas, which exhibited a high concentration of dipolar magnetic anomalies (3). These areas corresponded to a small area of former woodland, which is illustrated on the 1st Edition Ordnance Survey map of 1868 and the 2nd Edition Ordnance Survey map of 1883. This woodland was removed in the 20th century, and it is possible that the dipolar anomalies detected are the result of the removal of tree stumps, and subsequent backfilling with fired/ferrous material.

4.2.7 A parallel series of weak positive and negative linear magnetic anomalies were detected, aligned approximately east-west, which are interpreted as the remains of ridge and furrow cultivation of probable medieval date. On average the furrows were spaced between 5 and 7m apart. Similar features were detected on the east and west sides of the survey area, aligned approximately north-south. These differing alignments are probably a result of the varied topography of the site.

4.2.8 Three linear positive magnetic anomalies were detected on the south side of the survey area, aligned northeast to southwest and northwest to southeast (4). The nature of these features is uncertain, but it is possible that these anomalies mark the locations of soil-filled ditches or possibly former field boundaries.

4.2.9 A small number of weak linear positive magnetic anomalies were detected, which are interpreted as possible land drains. It is know that a number of stone culverts and stone-filled land drains cross the site, a number of which may have been detected by the geophysical survey.

4.2.10 A diffuse magnetic anomaly was detected towards the centre of the survey area, which corresponded to the site of a young copse. The client confirmed that this area had formerly been the site of a pond, which had recently been drained, back-filled, and planted with trees.

4.3 DISCUSSION

4.3.1 The geomagnetic survey has proved effective in detecting a range of potential archaeological features across the site, of possible medieval and post-medieval date.

4.3.2 The remains of former ridge and furrow cultivation, have been detected over the majority of the study area. These features are visible as earthworks on the south side of the site, however the survey has indicated that this cultivation was once much more extensive.

4.3.3 A number of the geophysical anomalies detected were associated with landscape features illustrated on historic Ordnance Survey maps of the site, and are therefore dated to the post-medieval period. These include a square bowling green, and an area of woodland, which is associated with the former parkland of Brayton Hall.

5 CONCLUSIONS

5.1 CONCLUSIONS

5.1.1 Geomagnetic surveys covering *c*.6.5ha of land have been conducted within Brayton Park, Aspatria covering the proposed location of a new holiday lodge development.

5.1.2 The geomagnetic survey proved effective in detecting a range of potential archaeological features at the site, including the remains of medieval ridge and furrow cultivation, and post-medieval features associated with the former grounds of Brayton Hall. Post-medieval features included the boundary of a former bowling green, and former area of woodland. A significant number of the geophysical anomalies detected were associated with the Brayton Park golf course, which occupied the site at the time of the survey. Possible structural remains, and a number of possible soil-filled ditches were also detected, but the date and nature of these is uncertain.

5.1.3 Given the results of the geophysical surveys it is possible that Cumbria County Council Historic Environment Service will recommend that the results of the geophysical survey are tested through the excavation of a number of trial trenches at the site, prior to the proposed development taking place.

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6.2 WEBSITES

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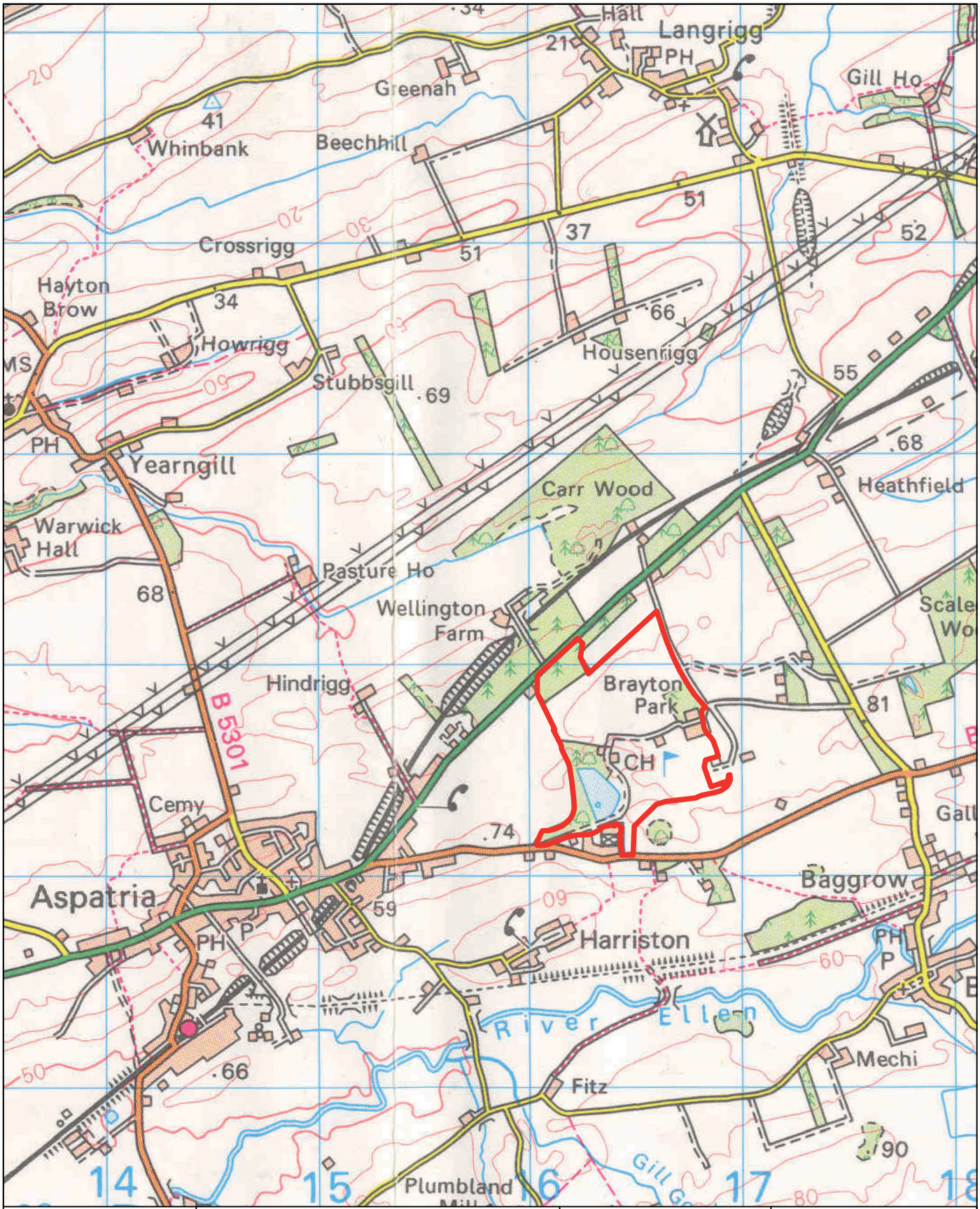
www.cumbria.gov.uk/planning-environment/countryside/historic-environment/HER-online.asp: 'Cumbria County Council HER Online'

www.ads.ahds.ac.uk: 'Archaeological Data Service'

www.pastscape.english-heritage.org.uk: 'National Monument Record Online'

www.british-history.ac.uk : 'British History Online'

APPENDIX 1: FIGURES



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North Pennines Archaeology Ltd
2009

outline of Brayton Park

Figure 1 : Site location

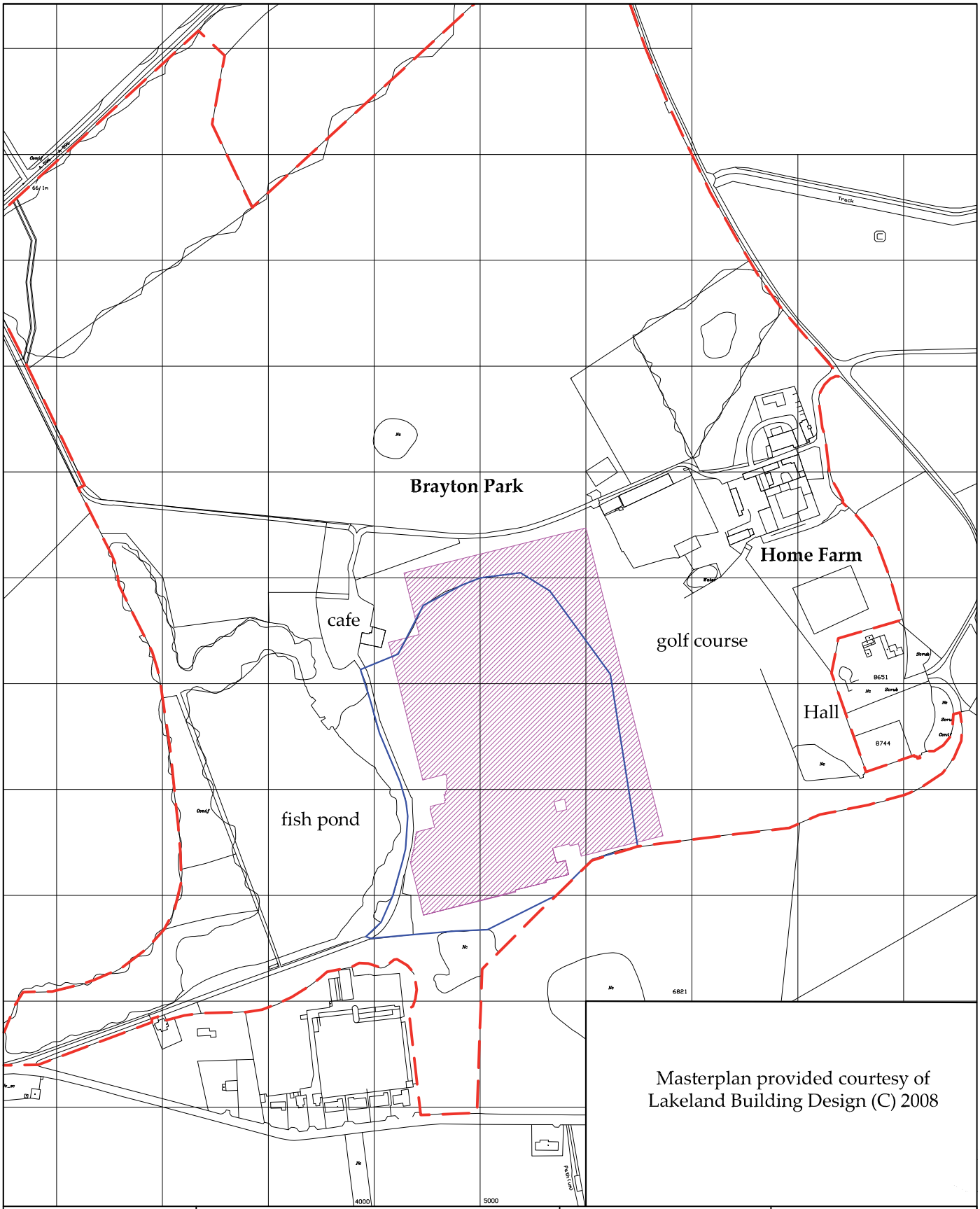

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FIGURE No:	2

site boundary
outline of proposed development area
geophysical survey area

Figure 2 : Location of the geophysical survey area and the proposed development area

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FIGURE NO:	3

outline of proposed development area

outline of geophysical survey area

Figure 3 : Geophysical survey

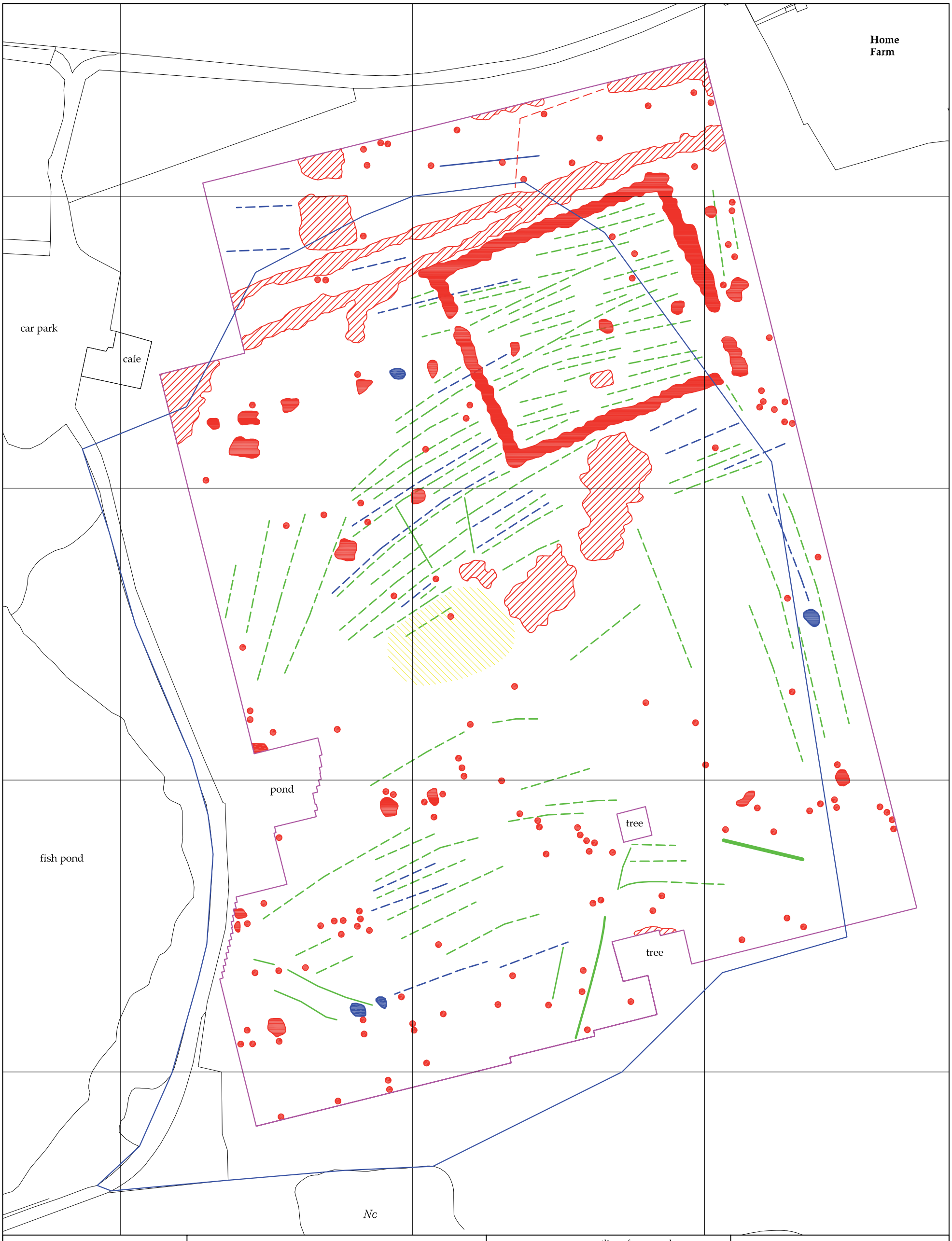

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FIGURE NO:	4

- outline of proposed development area
- outline of geophysical survey area
- positive magnetic anomaly
- negative magnetic anomaly
- dipolar magnetic anomaly
- diffuse magnetic anomaly

Figure 4 : Geophysical interpretation

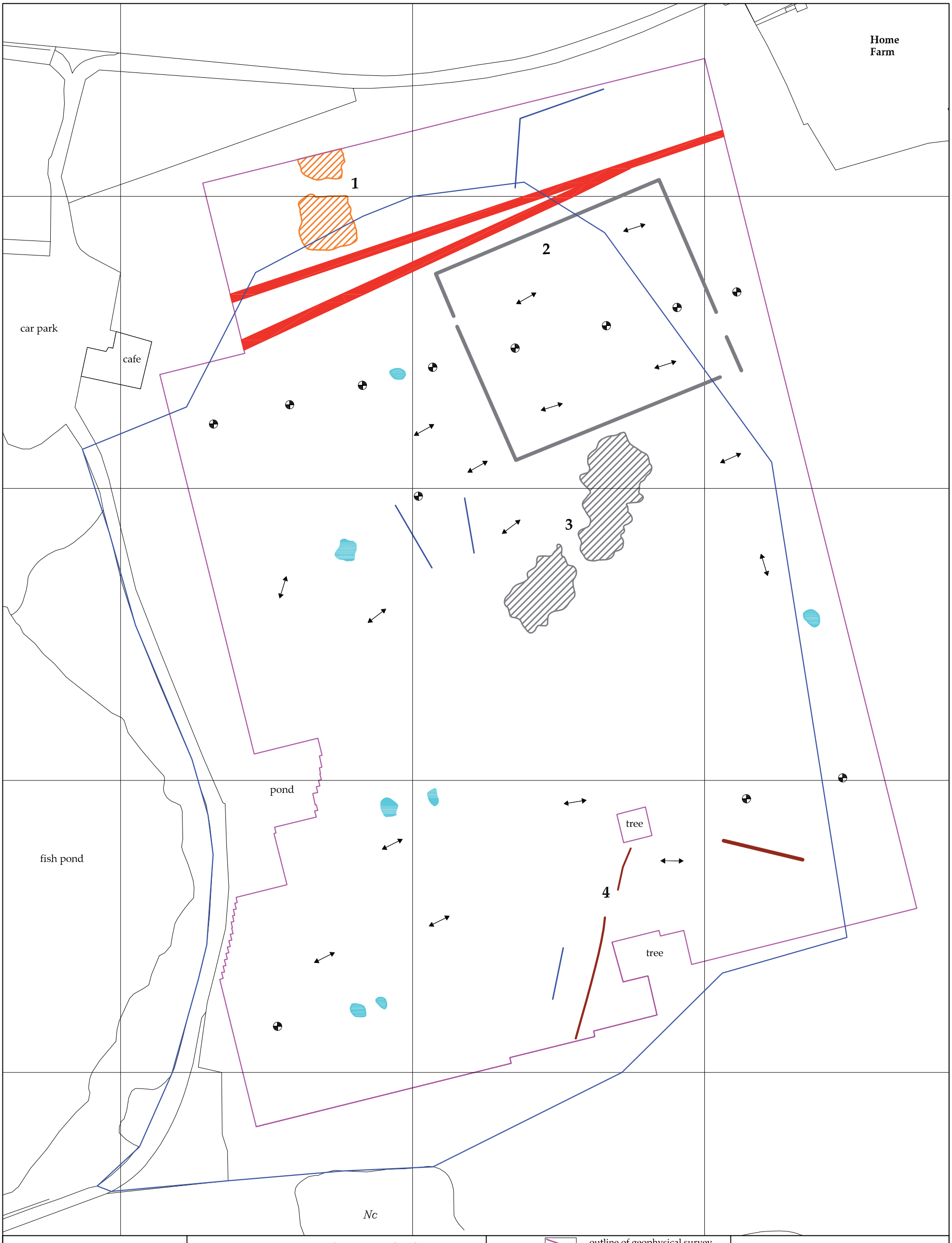

Figure 5 : Archaeological interpretation