

An Archaeological Watching Brief at Hardwick Hall Estate, Derbyshire



View of Hardwick Hall from the west.

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Report undertaken for the National Trust

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Archaeological Research
Services Ltd

An Archaeological Watching Brief at Hardwick Hall Estate, Derbyshire

Archaeological Research Services Ltd Report 2018/162



September 2018

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Executive Summary

Project Name: Hardwick Hall Biomass, Derbyshire
Site Code: HHL 18
Planning Authority: Bolsover District Council
Planning Ref: 17/00553/FUL and 17/00554/LBC
Bedrock Geology: Dolostone of the Cadeby Formation
NGR: SK 46225 63655
Date of Fieldwork: July 2018 – September 2018
Date of Report: September 2018

Archaeological Research Services Ltd was commissioned by the National Trust to undertake an archaeological watching brief during the installation of a wood-chip Biomass Boiler, a new rangers store building and heating network adjacent to Hardwick Hall, a listed Country House Grade I listed Hardwick Hall (NHLE 1051617) owned by the National Trust .

The objective of the archaeological watching brief was to ensure that any archaeological features exposed during the excavation works associated with the excavation of the heating-network pipe trench would be fully recorded and interpreted and that any remains disturbed would be recovered.

The watching brief recovered extensive evidence of post-medieval landscaping. Made ground / landscaping layers were observed in several areas. The complete absence of subsoil on site is likely to be evidence of removal of soils and flattening of the grounds. In the garden area behind the listed cottages on the estate, modern brought-in garden soil was observed to overlie a former top soil deposit, which contained butchered animal bones and 17th century pottery. In this deposit, evidence of butchery was uncovered. Additionally, along the main road running north to south through the Estate, deposits interpreted as the original hard core foundations of the road were discovered.

1 Introduction

1.1 Circumstances of the Project

1.1.1 Archaeological Research Services Ltd was commissioned by the National Trust to undertake an archaeological watching brief during the installation of a wood-chip Biomass Boiler and associated heating network adjacent to Hardwick Hall, granted by the Bolsover District Council to allow for the proposed scheme (17/00553/FUL and 17/00554/LBC) subject to condition. Condition number 3 of the consent required that:

“3) No development shall take place until a written scheme of investigation (WSI) for archaeological work has been submitted to and approved by the local planning authority in writing. For land that is included within the WSI, no development shall take place other than in accordance with the agreed WSI, which shall include the statement of significance and research objectives; and:

*a) The programme and methodology of site investigation and recording and the nomination of a competent person(s) or organisation to undertake the agreed works
b) The programme for post-investigation assessment and subsequent analysis, publication and dissemination and deposition of resulting material. This part of the condition shall not be discharged until these elements have been fulfilled in accordance with the programme set out in the WSI.”*

1.1.2 Archaeology is a material consideration in the planning process under paragraph 141 of the *National Planning Policy Framework (NPPF)* (DCLG 2012), which outlines a requirement *to record and enhance understanding of the significance of any heritage assets to be lost during the proposed development in a manner proportionate to their importance, and to make this evidence (and any archive generated) publicly accessible.*

1.1.3 This document represents the results of the Archaeological Watching Brief. The Watching Brief was undertaken by Adam Lodoen, Assistant Project Officer at Archaeological Research Services Ltd. The project was managed by Reuben Thorpe, Senior Project Manager at Archaeological Research Services Ltd.

1.2 Site Location and Description

1.2.1 Set in 440 acres of Grade I listed parks and gardens, Hardwick Hall is situated approximately 10km north-west of Mansfield. The heating network stretches from the Grade I listed Hardwick Hall (NHLE 1051617), heading south past a range of other listed buildings, including the Grade I listed Hardwick Old Hall (NHLE 1052337).

1.2.2 The site is located within the parkland of the Hardwick Hall Estate, centred at NGR SK 46225 63655 (Figure 1).

1.3 Landform Topography and soils

1.3.1 The underlying solid geology of the site is comprised of Dolostone of the Cadeby Formation, sedimentary bedrock formed approximately 252 to 272 million years ago in the Permian Period, when the local environment was previously dominated by shallow carbonate seas. There are no superficial deposits (BGS 2018).

1.3.2 The soils of the site are classified as belonging to the Aberford Soil Association (511a), which are typical brown calcareous soils (SSEW 1983). These soils form as Permian Jurassic and Eocene limestone and are characterised as *'shallow, locally brashy well drained calcareous fine loamy soils over limestone. Some deeper calcareous soils in*

1.4 Historical and Archaeological Background

1.4.1 In the 12th century Hardwick was under the manor of Stainsby and from the 13th century was held by tenure. By the end of the 13th century it was considered a manor in its own right and held by the Hardwick family. The Old Hall, built in the early 16th century, and the whole estate was bought by Bess of Hardwick from her brother James in 1583. Bess then spent several years substantially remodelling the old Hall but in 1590 work begun on the new Hall, with the Old Hall being retained for additional accommodation. Completed in 1597 the new Hall is believed to have been designed by Robert Smythson and is regarded as one of the finest examples of Elizabethan architecture. Following the death of Bess the estate passed into the hands of the dukes of Devonshire, through Bess' marriage to William Cavendish. Following this, the Old Hall slowly fell into disrepair and in 1740 was partially demolished. In 1950, after the death of the tenth Duke of Devonshire, the estate was given to the Treasury in partial settlement of the estate, then transferred to the National Trust in 1959.

1.4.2 The Grade II listed garden walls and lodges that enclose the gardens to the west and south of the Hall are believed to have been built around the late 16th century. The walled area to the west of the Hall has a gateway that allows access to the West Court. The gardens have been altered and embellished throughout the centuries but the basic layout does not seem to have changed.

1.3.4 A range of Grade II listed cottages (NHLE 1108998) situated around a courtyard id located 300m south of the new Hall. To the east of these stand a range of outbuildings and stables (NHLE 1051634).

2 Aims and Objectives

2.1 Regional Research Aims and Objectives

2.1.1 Research objectives and overarching research themes relevant to the site were identified in the *East Midlands Heritage: An Updated Research Agenda and Strategy for the Historic Environment of the East Midlands* (Knight *et al.* 2012), notably the following.

- Investigations at the site have potential to address include exploring the developments in estate and garden design and their landscape context.
- The East Midlands preserves numerous estates where a grand mansion sits at the centre of a tract of private land. Particular attention should be paid to the impact of other land holdings and economic interests. (Knight *et al.* 2012, 113).

2.2 The Watching Brief

2.2.1 The objective of the archaeological watching brief was to ensure that any archaeological features exposed during the excavation of the heating-network pipe trench would be fully recorded and interpreted and that any remains disturbed would be recovered. To excavate, where appropriate, and record the nature, extent and date

of any buried archaeological remains exposed during the construction of the heating-network pipe trench.

3 Methodology

3.1 Professional Standards

3.1.1 The archaeological supervision, recording and reporting was undertaken in accordance with the Chartered Institute for Archaeologists (CIfA) Code of Conduct (2014a) and Standards and Guidelines for Archaeological Watching Briefs (2014b). The recording followed standard conventions set out by the Museum of London Archaeological Service (MoLAS 2002).

3.2 Coverage

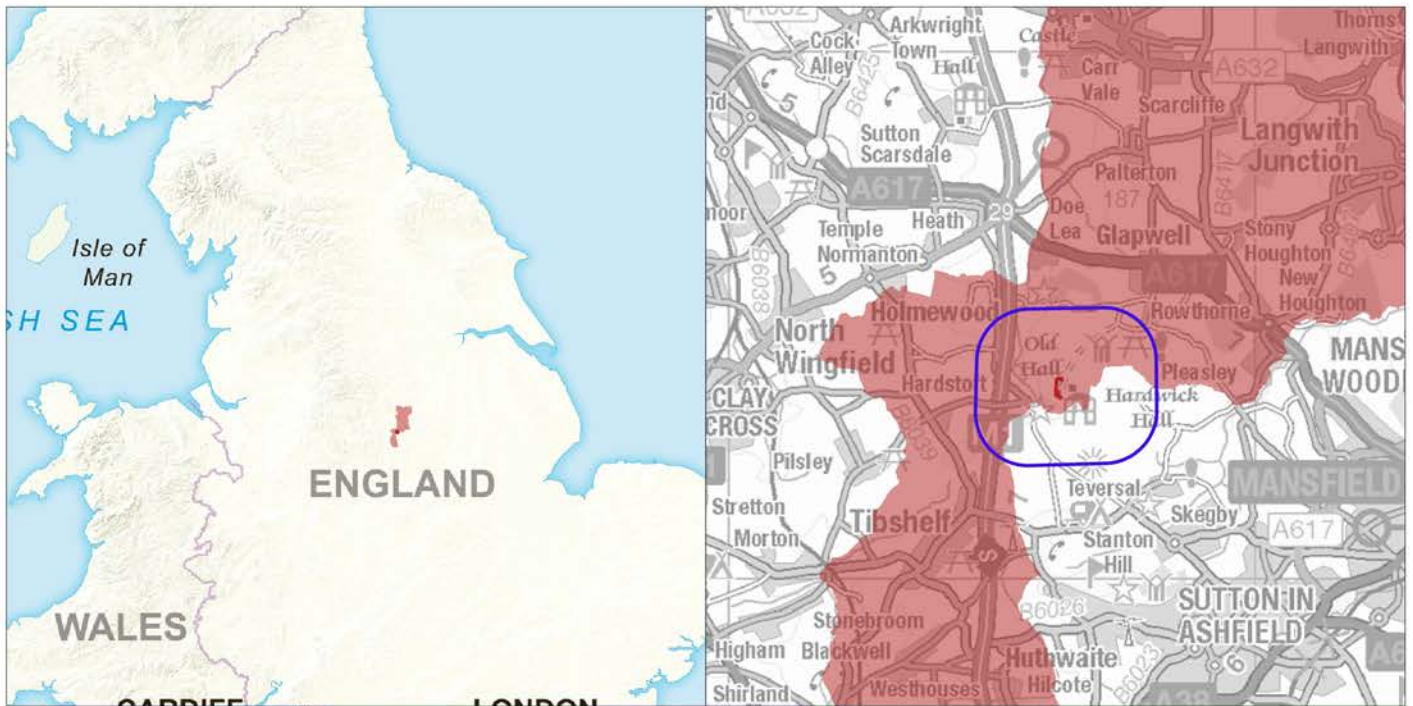
3.2.1 The main trench (Figure 2) extended from behind the Great Barn (currently the National Trust restaurant at Hardwick Hall), towards the north for c. 75m, before turning to the north-west, north of a group of listed cottages (NHLE 1108998). After running for 40 meters in this direction, the trench moves to the north again, running west of the formal gardens at Hardwick Hall and east of the Old Hall. The trench then turns to the north-east into the Orchard north of Hardwick Hall before turning south again, into the car park in front of the National Trust offices at Hardwick Hall. Finally, the pipe trench enters the basement of the Hall from the north end and the National Trust offices from the west part.

Some trenching work also took place at in the back gardens of the listed cottages, and it was also necessary to penetrate the walls and floors of the listed cottages and of the National Trust offices.

3.3 The Watching Brief

3.3.1 Excavation of the pipe trench was carried out using a mechanical excavator fitted with a toothless ditching bucket under constant archaeological supervision.






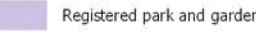
3.3.2 The trench was generally excavated to a depth of 1.0m below ground level.



Site name: Hardwick Hall
 Date: February 2018
 Drawn by: EC
 Scale: Varies

**Figure 1:
 Site location**

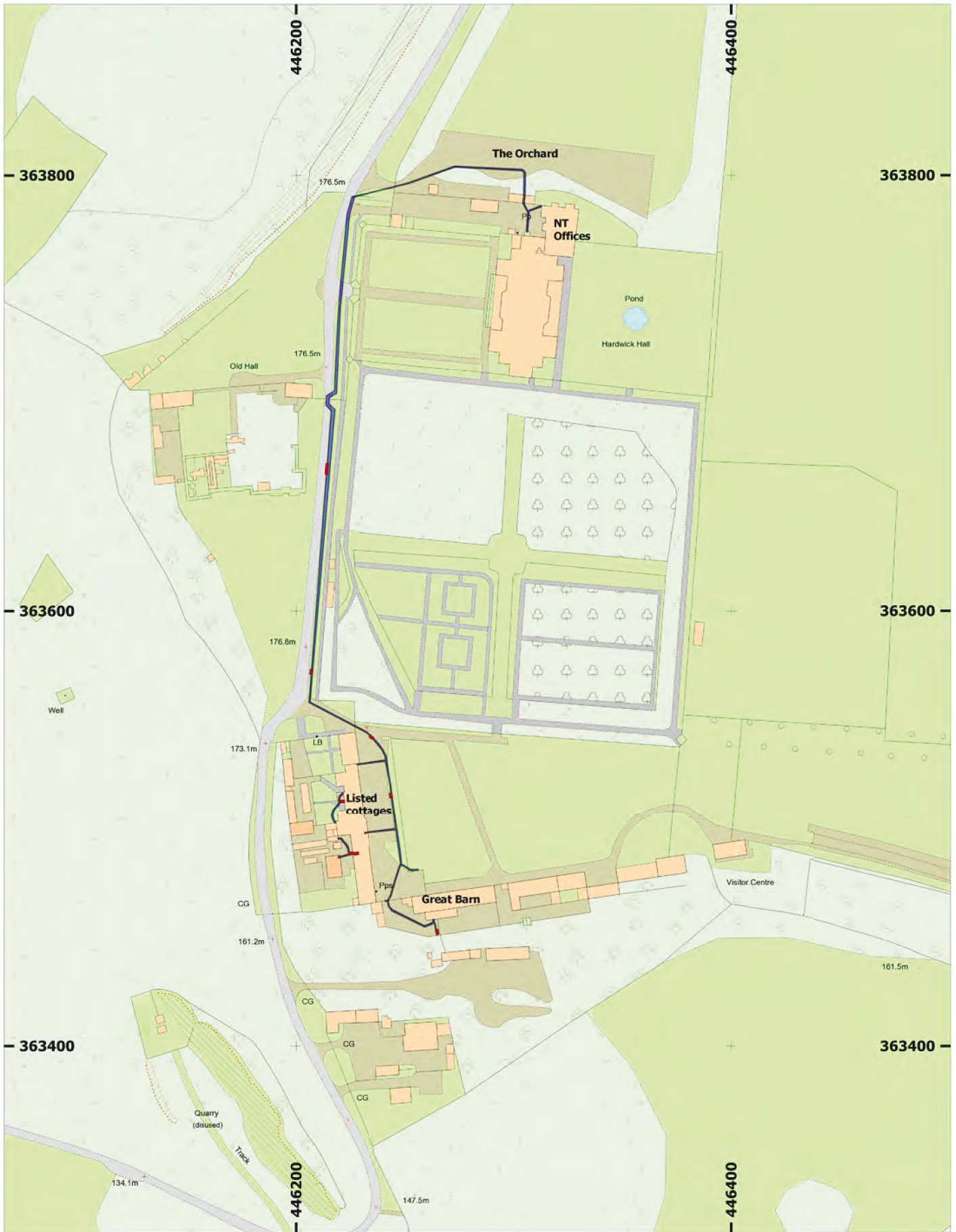
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- | | |
|---|---|
| Listed buildings | |
|  Bolsover District |  Grade I |
|  Approximate Site boundary |  Grade II |
| |  Grade II* |
| |  Registered park and garden |



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Site name: Hardwick Hall
 Date: September 2018
 Drawn by: EC / AL
 Scale: 1:2351 @ A4

 Heating-network pipe trench



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Figure 2:
Location of heating pipe trench

4 Results

4.1 The general soil sequence for the site consisted of topsoil (1) overlying sandstone bedrock (2). Subsoil was not present anywhere along the route of the pipeline.



Figure 3. Trench excavation behind the Great Barn (the current National Trust restaurant) (Scale 2 x 1m in 0.5m gradations)

4.2 In the area south of the Great Barn (currently used as the back yard of the National Trust restaurant) (Figure 3), the ground level was found to have been raised and levelled. The general soil sequence here consisted of a modern asphalt surface (3) overlying gravel hard core (4) overlying made ground (5). The raising of the ground surface here was presumably done to construct the yard itself. Apart from modern services, no archaeological features or artefacts were observed or recovered in this area, and the made ground in this area therefore remains undated. However, it likely dates to the construction of the Great Barn or later.

4.3 In the area north of the Great Barn and east of the listed cottages, there was a complete absence of archaeological deposits and features, with the exception of modern services close to the cottages. The soil sequence in this area consisted of topsoil (1) overlying sandstone bedrock (2) (Figure 5).



Figure 4. Trench excavation north of the Great Barn, with the listed cottages visible on the left hand side



Figure 5. Section 2, looking east (Scale 1 x 1m in 0,5m gradations)

4.4 In the area situated immediately to the north of the listed cottages, thick layers of made ground ((9), (10), and (11)) were observed to overlie a thin layer of black silt (12) which in turn was overlying the natural geology (2).



Figure 6. Made ground north of the listed cottages (Scale 1 x 1m in 0,5m gradations)

4.5 Trenching was carried out in two different areas in the gardens behind the listed cottages (Figure 2). The southern area is currently largely occupied by greenhouses,

garden huts and flower beds owned by the National Trust. The northern area is currently a garden of one of the listed cottages.

4.6 In the southern garden area, a gravel surface (13) and modern garden soil (14) was present by the west wall of the cottages. These two modern deposits were overlying a layer of silt overlying a layer of silt (15) which also contained some sandstone rubble (Figure 18. Location of sections 1-6

/ Section 4). In the area further to the west, the ground was observed to have been completely reduced down to natural geology (2). No further archaeological observations were made in this area.



Figure 7. The pipe trench in the southern garden area, looking south (Scale 2 x 1m in 0,5m gradations)

4.7 In the northern garden area, an original garden soil or buried top soil (21) was discovered underneath a modern brought-in garden soil (34). Deposit (21) contained the base of a single Blackware vessel dated from the 17th century, and an assemblage of animal bone exclusively from large mammals including cattle and an equid (horse/mule/donkey). The animal bone assemblage probably represents butchery waste products.

4.8 Further north in the northern garden area, the topsoil (1) directly overlay a thick layer of orange clay (22) (Figure 9). This is probably a natural deposit, but may represent made ground and redeposited natural.

4.9 Where the pipe trench runs parallel to the modern road running north to south between Hardwick Hall and Hardwick Old Hall, a layer of lime mixed with smaller sandstones (c.0.20m in diameter) (20) was observed in the south part of the east facing section for a length of 4.85m (Figure 12, Figure 20 / Section 6).



Figure 8. Excavations in the northern garden area



Figure 9. Clay deposit (22) in northern garden area

4.10 Where the walls and floors of the listed cottages were penetrated the modern concrete floor (16) was found to rest on top of the original floor. This comprised sandstone slabs laid on bed (17 / (24). The sandstone slab floor was bonded in lime mortar (18) and rested directly on a thin layer of silt construction trample (19) which overlay the geological natural (2).



Figure 10. Section 5 - penetration through the wall and floor in the former stable building



Figure 11. Deposit (20) visible in the east facing section of the pipe trench (Scale 1 x 1m in 0,5m gradations)

4.11 A further deposit (25) consisting of large, presumably worked blocks of sandstone were observed in the east facing section of the pipe trench further to the north for a length of north for a length of c.34m (Figure 12,

Figure 19. Location of sections 3, 7 and 8

/ Section 8). These stones were situated directly on top of the natural geology (2) but below the top soil (1). Deposits (20) and (25) were interpreted as part of the original hard core of the road.



Figure 12. A deposit of large flat sandstones (25) visible in the east facing section of the pipe trench (Scale 1 x 2m in 0,5m gradations)

4.12 In the car park area outside the National Trust Offices at Hardwick Hall (**Error! Reference source not found.**) the modern car park surface (28) overlay a layer of gravel hard core (29) which in turn overlay a layer of made ground (30) that in turn overlay the natural bedrock (2). In the fill (27) of a modern drain [26] two bricks dating to the first half of the 20th century were recovered, one marked "Hardwick", the other marked "Sherwood Colliery"(Figure 13 and Figure 14).



Figure 13. Modern frogged brick inscribed "Hardwick"



Figure 14. Modern frogged brick inscribed "Sherwood Colliery"



Figure 15. Excavations outside the National Trust offices (Scale 2x 1m in 0,5m gradations)

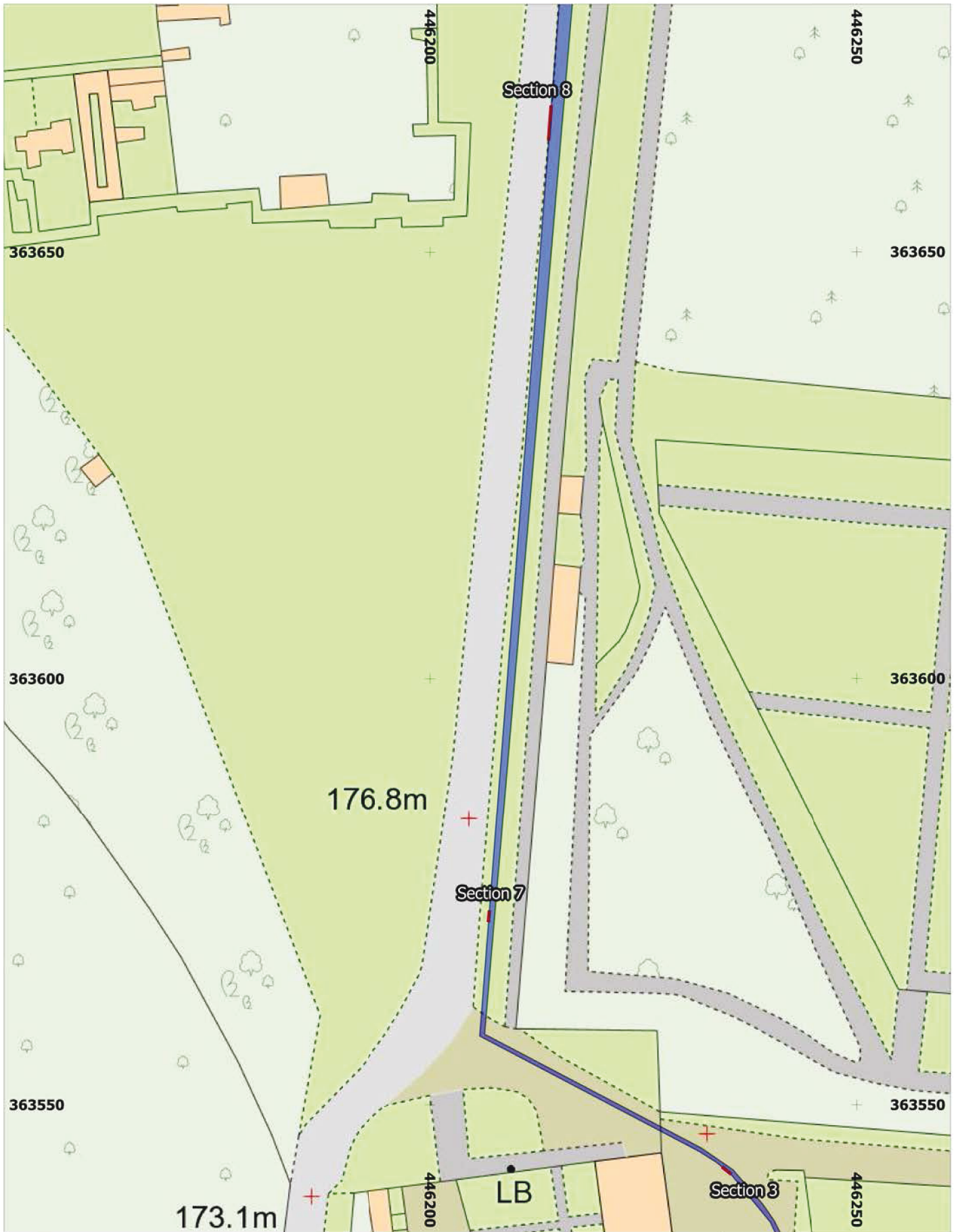
4.13 In the Orchard area north of Hardwick Hall, a gravel surface (32) covered most of the area (Figure 16 and figure 17). This probably represents the extent of a modern car park. This deposit was overlying a buried former top soil (33) which was directly overlying the bedrock geology (2).



Figure 16. Gravel surface (32) in the Orchard (Scale 1 x 1m in 0,5m gradations)



Figure 17. The excavations in the Orchard (Scale 1 x 1m in 0,5m gradations)



Site name: Hardwick Hall
 Date: September 2018
 Drawn by: AL
 Scale: 1:300@A4

 Pipe trench
 Sections



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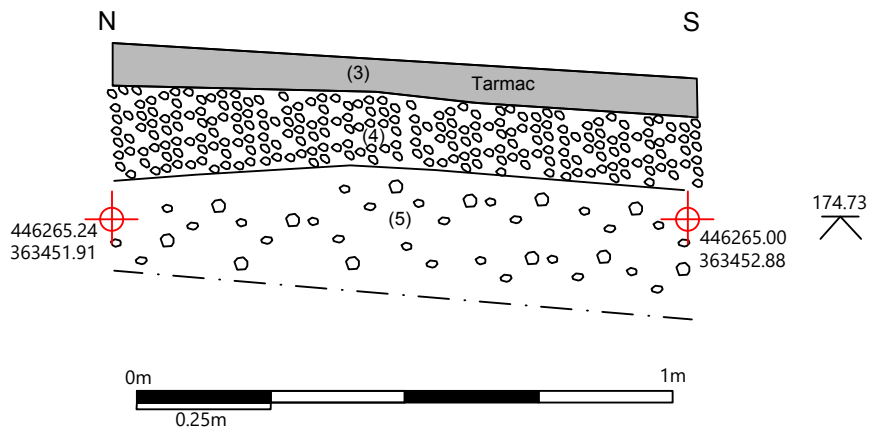
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Figure 19:
Location of sections 3, 7 and 8

Section 1. West Facing section of trench in yard behind NT restaurant



Section 2. East Facing section through soil layers.

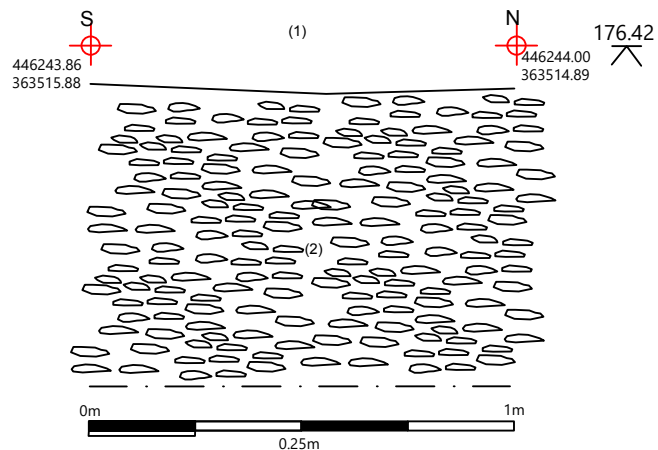




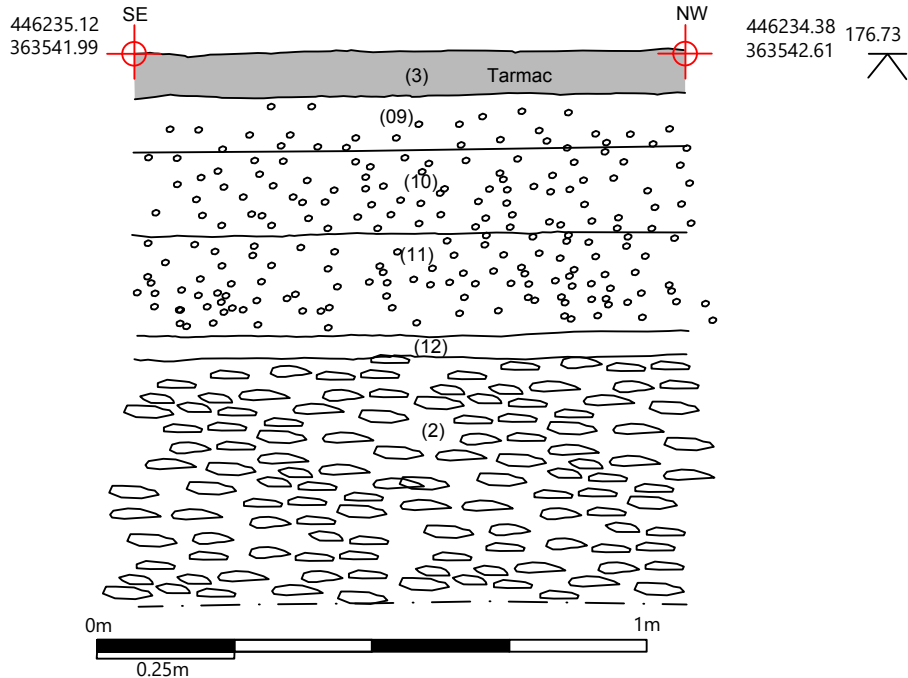


Figure 20. Sections 1-4
Scale: As shown

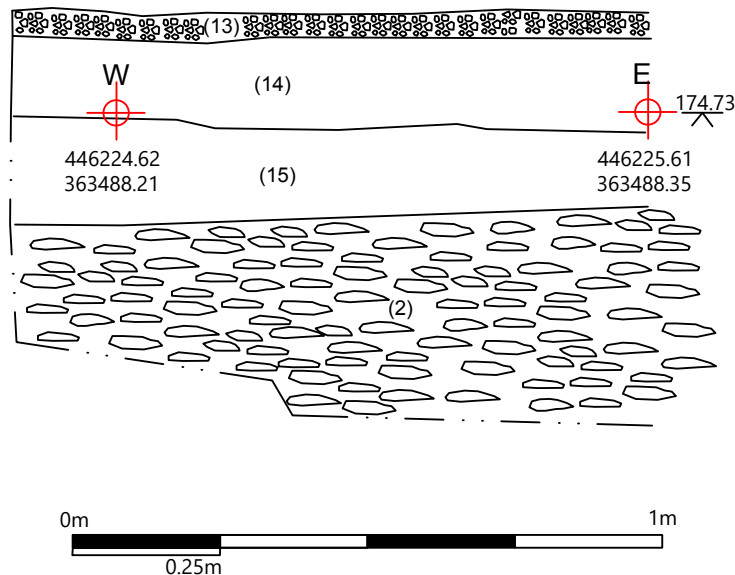
Key:

-  Tarmac surface
-  Gravel
-  Natural sandstone geology
-  174.73 Above Ordnance Datum (aOD) level (m)

Section 3. North East Facing section through soil layers



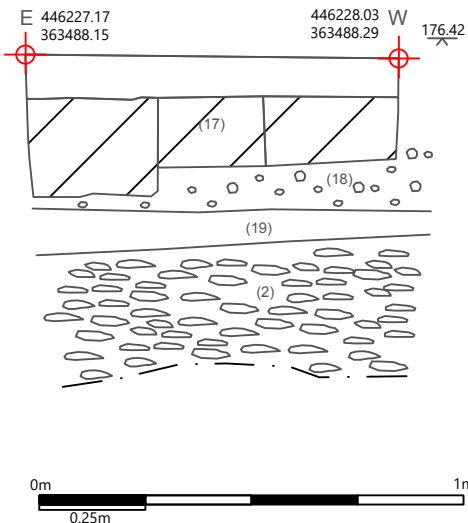
Section 4. South Facing section through soil layers.



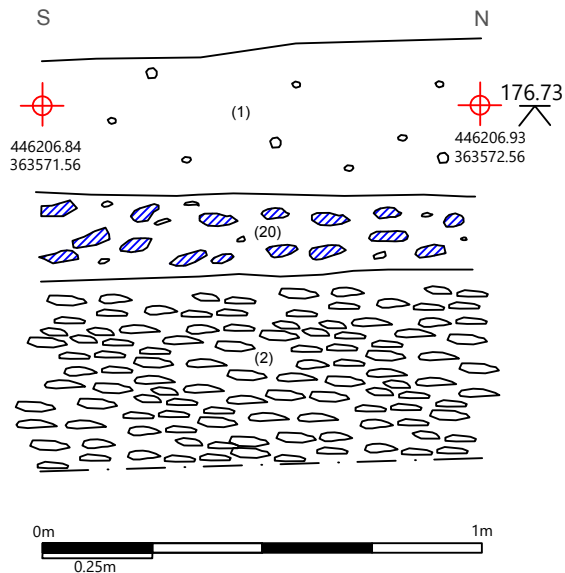
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Section 5. North Facing section through floor in cottage (former stable).



Section 6. East-facing section of trench by main road



Section 7: W Facing Section of Trench in Cottage Garden

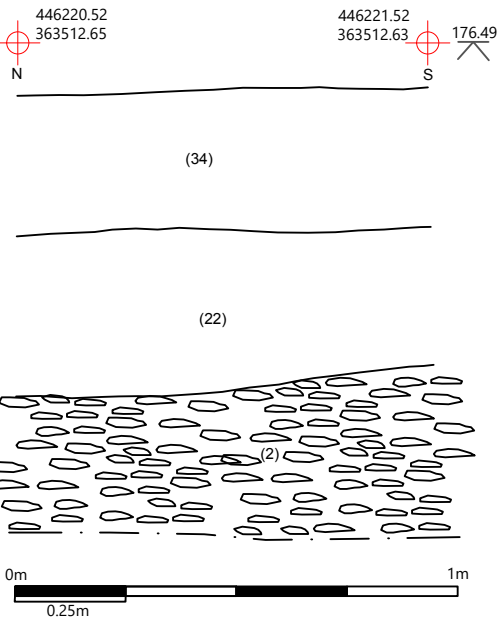





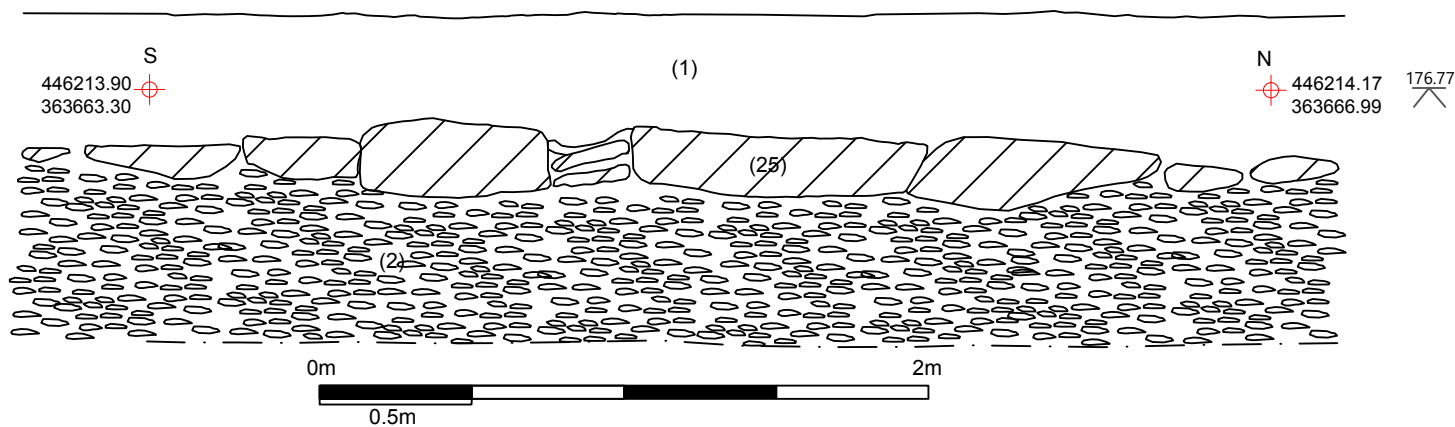


Figure 21. Sections 5-10
Scale: As shown

Key:

-  Worked sandstone blocks
-  Gravel
-  Natural sandstone geology
-  Limestone
-  174.73 Above Ordnance Datum (aOD) level (m)

Section 8: E Facing Section of Large Stones in Section



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5 Finds Assessment

5.1 The Pottery

C.G. Cumberpatch BA PhD

5.1.1 The base of a single Blackware vessel was examined by the author on 7th September 2018. It was recovered from an excavation at Hardwick Hall (context 21) and specifically from a deposit interpreted as garden soil associated with cottages of post-medieval date.

5.1.2 The sherd, which weighed 104 grams, consisted of part of the base of a cylindrical vessel with a small foot, irregularly rilled lower body and part of the attachment for a handle. The fabric was a hard and dark red in colour with a fine, slightly granular appearance with occasional fine grains of quartz visible at x10 magnification.

5.1.3 The vessel most probably originated from Ticknall in South Derbyshire and resembles a sherd illustrated by Spavold and Brown (2005: Appendix 2; Figure 54) from Site 24 in the village. A 17th century date is suggested for the sherd.

5.1.4 The sherd should be deposited in the appropriate local museum or finds depository on the completion of the project where it will be available for further study in the future.

5.2 Animal remains

Milena Grzybowska

Material and methods

5.2.1 The material consisted of over 280.1 grams of hand-collected animal bone derived from a garden soil (21) associated with the post-medieval cottages. The analysis follows *Guidelines for best practice* (Baker and Worley 2013, English Heritage).

5.2.2 Specimens were identified to species or a broader taxonomic group. The state of surface preservation was scored using a five stage system (poor, bad, moderate, good, and excellent). Estimation of age was based on the wear on mandibular teeth. Root etching, burning and gnawing was recorded. Fused bones and permanent teeth were measured.

Results

A complete inventory of animal bone is presented in Table 1.

Taxon	Element	Side	Zone (Dobney 1988)	Measurements (Driesch 1976)	Wgt.	Preserv.	Mandibular wear (Grant 1982)	Taphonomy
Equid	Scapula	R	1,2,3,4,5	GLP 71.6 Gp 60.8 BG 50.1 SLC 56.6	108.8	Excellent	n/a	Fresh brake (zone 4,5)
Cattle	Mandible	R	1,6	M3 Length 36.4 M3 Breadth 16.0	98.4	Excellent	K	Cut (lingual aspect of zone 6)
Cattle	Mandible	L	1,3,4,5,6	n/a	44.9	Excellent	MWS: 3 m3C M1 E	Gnawing
Cattle	1 st phalanx	-	1,2,3	GL 63.2 GLpe 59.6 SD 28.4	28.0	Excellent	n/a	-

Table 1. Inventory of animal bone, garden soil (21) (wgt. – weight, preserv. – preservation).

The animal bone assemblage consists of remains of exclusively large mammals, including cattle and an equid (horse/mule/donkey). Mandibular wear of cattle indicates presence of a juvenile (2 months old) and an old adult individual. The elements are of low utility suggesting it represent butchery waste products.

6 Discussion and summary

6.1 Landscaping

6.1.1 Made ground was observed in the service yard behind the Great Barn (currently the National Trust restaurant at Hardwick Hall), the area just to the north of the listed cottages, and in the car park outside the National Trust offices. Imported garden soil was observed, in the gardens, behind the listed cottages and the orange clay deposit in this area may represent made ground. Additionally, the complete absence of subsoil in the area may constitute evidence of removal of soils and flattening of the grounds, particularly in the courtyard area north the Great Barn and in the Orchard.

6.1.2 The made ground in the car park outside the National Trust Offices probably dates to the 19th to early 20th century. The made ground in this area was found to cover an airbrick in the office building (which is a late extension to Hardwick Hall), and a trench for a modern sewage pipe that was cutting through the made ground was found to contain bricks dating from the early 20th century.

6.1.3 The earliest garden soil (21), which was recorded behind the listed cottages, contained pottery dating to the 17th century, roughly of the same date as the listed cottages themselves. The deposition of these imported garden soils, in this area, must therefore date to the 17th century or later.

6.1.4 The presumed negative landscaping events (the presumed removal of soils and the flattening of the grounds) cannot be dated.

6.2 Road Hard Core

6.2.1 Along the road running north to south between the old and new Hall, the likely hard core of the original road (deposits (20) and (25)) was discovered in the west part of the pipe trench. No material was retrieved that could date these deposits, but the road may be of the same date as the New Hall, since it runs parallel to the wall of the formal gardens of the New Hall.

6.3 Other

6.3.1 The frogged brick marked “Hardwick” discovered in a modern sewage trench in outside the National Trust offices presumably comes from brickworks directly associated with Hardwick Hall Estate. It is possible that these were located somewhere on the Estate itself.

6.3.2 The finds from the garden soil (21) from behind the listed cottages indicate that butchery took place on site in the 17th century.

9 Archive

9.1 All materials arising from these archaeological works will be supplied to the National Trust in standard archiving boxes upon completion of the project. The National Trust will assume responsibility for the archiving of this material and accessioning it into the Hardwick Hall Estate collection and archive. Copies of the submitted final report will be deposited with the Derbyshire HER.

9.2 Copyright on the deposited material will either be assigned to the archive, or the archive will be licensed to use the material, in perpetuity; this licence would allow the archive to reproduce material, including for use by third parties, with the copyright owner suitably acknowledged.

9.3 A PDF copy of the final report will also be uploaded as part of the OASIS online record (<http://ads.ahds.ac.uk/project/oasis/>) for submission to the National Trust HBSMR.

9.4 The Derbyshire County Archaeologist will be notified of the final deposition of the archive.

10 Publicity, Confidentiality and Copyright

10.1 Any publicity will be handled by the client.

10.2 The National Trust will retain copyright of all documentary and photographic material generated from these works but will fully acknowledge the authorship by Archaeological Research Services Ltd of this report. Full credit will be given, where appropriate, by the National Trust to the origin of ideas or interpretations drawing from this report.

11 Statement of Indemnity

11.1 All statements and opinions contained within this report arising from the works undertaken are offered in good faith and compiled according to professional standards. No responsibility can be accepted by the author/s of the report for any errors of fact or opinion resulting from data supplied by any third party, or for loss or other

consequence arising from decisions or actions made upon the basis of facts or opinions expressed in any such report(s), howsoever such facts and opinions may have been derived.

12 Acknowledgements

12.1 Archaeological Research Services Ltd would like to thank all those involved with the archaeological project, especially Mick Little, Rosalind Buck, Rachael Hall, and Paul Mortimer of the National Trust for commissioning the work, and for providing advice and support throughout the project.

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Appendix I: Context Register

An Archaeological Watching Brief at Hardwick Hall Estate, Derbyshire

Context	Type/Interpretation	Description / Processual Interpretation	Thickness /extent (feature = length x width x depth)	Depth to top (BGL)	Height of top m aOD
1	Deposit/Topsoil	Midgrey silt with common inclusions of small stones / In situ soil formation	(Td) 0.3m	0	176.26m
2	Deposit/Geological	Red sandstone and sand / In situ soil formation	(d) 0.7m (obs.)	0.3m	177.00
3	Deposit/Surface	Dark grey / black asphalt / Construction	(d) 0.08asphaltm	0	175.01m - 176.07m
4	Deposit/Hard core	Pink / grey gravel / Construction	(d) 0.20m	0.08m	174.93m - 175.99m
5	Deposit	Dark greyish brown silt with common inclusions of gravel / Construction	(d) 0.7m (obs.)	0.3m	174.7m-175.8m
6	Structure / Represents modern clay water pipe.	N-S aligned linear feature aligned / Water pipe / Use	(w) 0.22m	1m	Not Recorded
7	Cut / Represents construction cut for victorian culvert/sewage pipe.	Linear construction cut with near vertical sides, barely visible on surface / Construction	(d) 1.1m	0m	Not Recorded

An Archaeological Watching Brief at Hardwick Hall Estate, Derbyshire

Context	Type/Interpretation	Description / Processual Interpretation	Thickness /extent (feature = length x width x depth)	Depth to top (BGL)	Height of top m aOD
8	Deposit / Backfill of pipe trench [7]	Medium red clay with frequent gravel inclusions / Construction	(d) 0.3m	0m	Not Recorded
9	Deposit / Represents hardcore foundation for road.	Coarse grey gravel layer / Construction	(d) 0.1m	0.08	176.55m
10	Deposit / Represents hardcore foundation of road.	Coarse orange gravel / Construction	(d) 0.15m	0.18m	176.40m
11	Deposit / Represents hardcore foundation of road.	Coarse brownish mid grey gravel / Construction	(d) 0.23m	0.33m	176.22m
12	Deposit / Represents hardcore foundation of road.	Thin layer of black silt overlying natural bedrock (2) / Construction	(d) 0.04m	0.56m	176.18m
13	Deposit / Represents modern gravel surface/path.	Coarse grey gravel layer separated from contexts below by builders membrane / Construction	(d) 0.04m	0.05m	174.90m

An Archaeological Watching Brief at Hardwick Hall Estate, Derbyshire

Context	Type/Interpretation	Description / Processual Interpretation	Thickness /extent (feature = length x width x depth)	Depth to top (BGL)	Height of top m aOD
14	Deposit / Represents soil brought in to build up levels next to cottages.	Dark grey silt with common inclusions of gravel, across full extent of garden / Construction	(d) 0.13m	0.05m	174.86m
15	Deposit / Represents landscaping layer.	Medium greyish mid brown silt with common inclusions of sandstone fragments, gravel and modern brick fragments / Construction	(d) 0.13m - 0.18m	0.17m	174.72m
16	Structure / Represents the concrete surface of store room.	Concrete surface across extent of store room. / Construction	(d) 0.1m	0m	176.42m
17	Deposit / Represents original floor surface of Elizabethan cottage/store room.	Sandstone layer made up of hand chiselled sandstone blocks, 0.20m-0.30m thick and 0.30m-0.50m wide / Construction	(d) 0.23 to 0.15m	0.1m	175.32m

An Archaeological Watching Brief at Hardwick Hall Estate, Derbyshire

Context	Type/Interpretation	Description / Processual Interpretation	Thickness /extent (feature = length x width x depth)	Depth to top (BGL)	Height of top m aOD
18	Deposit / Represents foundation layer for original floor of Elizabethan cottage.	Light yellowish brown lime mortar / Construction	(d) 0.22m to 0.03m	0.14m to 0.34m	176.28m
19	Deposit / Represents foundation layer.	Fine very dark/black silt layer / Construction	(d) 0.08m	0.36m	176.06m
20	Deposit / Represents foundation layer/ hardcore.	Medium yellowish white limestone/sandstone layer with abundant inclusions of sandstone / Construction	(d) 0.2m (w) 4.60m	0.35m	176.53m
21	Deposit / Represents soil associated with cottages containing large stones and domestic rubbish.	Medium dark brownish grey sandy silt deposit with inclusions of large pebble/organic matter / Construction	(d) variable between 0.1m and 0.5m	0m	176.33m

An Archaeological Watching Brief at Hardwick Hall Estate, Derbyshire

Context	Type/Interpretation	Description / Processual Interpretation	Thickness /extent (feature = length x width x depth)	Depth to top (BGL)	Height of top m aOD
22	Deposit/ Levelling up.	Medium mid orange well sorted clay / Construction	(d) 0.5m	0.30m	176.07m
23	Not used	N/A	N/A	N/A	N/A
24	Not used	N/A	N/A	N/A	N/A
25	Deposit / Represents original hardcore for road.	Deposit of worked sandstone running parallel to modern road / Construction	(d) 0.2m to 0.3m (w) 33.7m	0.43m	176.15
26	Cut / Represents modern 20th century sewage trench.	NE-SW aligned linear feature with vertical sides / Construction	(l) 5m (d) 1m (w) 0.30m	0.10m	177.14m
27	Deposit / Represents backfill of modern 20th century sewage trench.	Grey silt and gravel and early 20th century bricks / Construction	(l) 5m (d) 1m (w) 0.30m	0.12m	177.14m
28	Deposit / Represents modern car park surface.	Grey asphalt surface / Construction	(d) 0.12m	0	177.30m

An Archaeological Watching Brief at Hardwick Hall Estate, Derbyshire

Context	Type/Interpretation	Description / Processual Interpretation	Thickness /extent (feature = length x width x depth)	Depth to top (BGL)	Height of top m aOD
29	Deposit / Represents car park hardcore.	Thin layer of gravel underlying asphalt surface / Construction	(d) 0.06m	0.12m	177.18m
30	Deposit / Represents brought in layer of silt used to raise and level yard surface.	Layer of fine black silt covering extent of car park area / Construction	(d) 0.12m	0.18m	177.12m
31	Deposit / Represents material brought in to build up and level the yard surface.	Fine mid brown clay layer / Construction	(d) 0.12m	0.30m	177.00m
32	Deposit / Represents former gravel surface for the former car park surface.	Layer of coarse grey compacted gravel. / Construction	(d) 0.20m	0	177.20

An Archaeological Watching Brief at Hardwick Hall Estate, Derbyshire

Context	Type/Interpretation	Description / Processual Interpretation	Thickness /extent (feature = length x width x depth)	Depth to top (BGL)	Height of top m aOD
33	Deposit / Represents former (buried) topsoil.	Greyish dark brown silt with frequent rooting present / In Situ Soil formation	(d) 0.15m	0.20m	177.00m
34	Deposit / Represents modern garden soil	Medium brownish grey sandy silt / Construction	0.33m	0	176.39m

Appendix II: Written Scheme of investigation

**Hardwick Hall Estate, Derbyshire
Archaeological Supervision, Recording and Reporting**

Written Scheme of Investigation

2018



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www.archaeologicalresearchservices.com

Prepared on behalf of: National Trust
Date of compilation: March 2018
Compiled by: Emma Cooper
Planning Reference: 17/00553/FUL and
17/00554/LBC
Local Authority: Bolsover District Council
Site central NGR: SK 46225 63655

1 INTRODUCTION

1.1 This Written Scheme of Investigation (WSI) has been prepared by Archaeological Research Service Ltd (ARS Ltd) for the National Trust. It details a scheme of works for an archaeological supervision, recording and reporting on a proposed development at Hardwick Hall. The development involves the installation of a wood-chip Biomass Boiler, a new rangers store building and heating network adjacent to Hardwick Hall.

1.2 Planning permission has been granted by the Bolsover District Council to allow for the proposed scheme (17/00553/FUL and 17/00554/LBC) subject to condition. Condition number 3 of consent requires that:

“3) No development shall take place until a written scheme of investigation (WSI) for archaeological work has been submitted to and approved by the local planning authority in writing. For land that is included within the WSI, no development shall take place other than in accordance with the agreed WSI, which shall include the statement of significance and research objectives; and:

a) The programme and methodology of site investigation and recording and the nomination of a competent person(s) or organisation to undertake the agreed works

b) The programme for post-investigation assessment and subsequent analysis, publication and dissemination and deposition of resulting material. This part of the condition shall not be discharged until these elements have been fulfilled in accordance with the programme set out in the WSI.”

1.3 This document comprises the WSI and outlines the nature of the archaeological work to be undertaken by Archaeological Research Services Ltd (ARS Ltd) on behalf of the National Trust at Hardwick Hall in accordance with guidance from the Derbyshire County Archaeologist.

1.1.4 The aim of the programme of works is, in line with the National Planning Policy Framework (NPPF) paragraph 141 (DCLG 2012), to record and enhance understanding of the significance of any heritage assets to be lost during the proposed development in a manner proportionate to their importance, and to make this evidence (and any archived generated) publically accessible.

2 BACKGROUND

2.1 Site Location and Geology

2.1.1 The site is located within the parkland of the Hardwick Hall Estate, centred at NGR SK 46225 63655 (Figure 1).

2.1.2 The underlying solid geology of the site is comprised of Dolostone of the Cadeby Formation, sedimentary bedrock formed approximately 252 to 272 million years ago in the Permian Period, when the local environment was previously dominated by shallow carbonate seas. There are no superficial deposits (BGS 2018).

2.1.3 The soils of the site are classified as belonging to the Aberford Soil Association (511a), which are typical brown calcareous soils (SSEW 1983). These soils



form as Permian Jurassic and Eocene limestone and are characterised as ‘*shallow, locally brashy well drained calcareous fine loamy soils over limestone. Some deeper calcareous soils in colluvium.*’ (CU 2018).

2.2 Historical and Archaeological Background

2.2.1 Set in 440 acres of Grade I listed parks and gardens, Hardwick Hall is situated approximately 10km north-west of Mansfield. The PDA stretches from the Grade I listed Hardwick Hall (NHLE 1051617), heading south past a range of other listed buildings, including the Grade I listed Hardwick Old Hall (NHLE 1052337).

2.2.2 In the 12th century Hardwick was under the manor of Stainsby and from the 13th century was held by tenure. By the end of the 13th century it was considered a manor in its own right and held by the Hardwick family. The Old Hall, built in the early 16th century, and the whole estate was bought by Bess of Hardwick from her brother James in 1583. Bess then spent several years substantially remodelling the old Hall but in 1590 work begun on the new Hall, with the Old Hall being retained for additional accommodation. Completed in 1597 the new Hall is believed to have been designed by Robert Smythson and is regarded as one of the finest examples of Elizabethan architecture. Following the death of Bess the estate passed into the hands of the dukes of Devonshire, through Bess’ marriage to William Cavendish. Following this, the Old Hall slowly fell into disrepair and in 1740 was partially demolished. In 1950, after the death of the tenth Duke of Devonshire, the estate was given to the Treasury in partial settlement of the estate, then transferred to the National Trust in 1959.

2.2.3 The Grade II listed garden walls and lodges that enclose the gardens to the west and south of the Hall are believed to have been built around the late 16th century. The walled area to the west of the Hall has a gateway that allows access to the West Court. The gardens have been altered and embellished throughout the centuries but the basic layout does not seem to have changed.

2.2.4 A range of Grade II listed cottages (NHLE 1108998) situated around a courtyard is located 300m south of the new Hall. To the east of these stand a range of outbuildings and stables (NHLE 1051634).

2.2.5 To the south-west of the proposed boiler room site stand three Grade II listed buildings that all relate to the Estate’s mid-19th century sawmill: a joiners shop (NHLE 1335391), a shed built in 1861 (NHLE 1372650) and the actual sawmill and engine house (both NHLE 1108999).

3 AIMS AND OBJECTIVES

3.1 Regional Research Aims and Objectives

3.1.1 Research topics identified in the *East Midlands Heritage: An Updated Research Agenda and Strategy for the Historic Environment of the East Midlands* (Knight *et al.* 2012) that investigations at the site have potential to address include exploring the developments in estate and garden design and their landscape context.



- ◆ The East Midlands preserves numerous estates where a grand mansion sits at the centre of a tract of private land. Particular attention should be paid to the impact of other land holdings and economic interests. (Knight *et al.* 2012, 113).

3.2 Archaeological Supervision, Recording and Reporting

3.2.1 The principal aim of the programme of archaeological work is to recover and record any potential archaeological remains associated with Hardwick Hall Estate and earlier history/development. Any remains will be recorded and analysed during the course of development as part of an archaeological supervision, recording and reporting.

3.2.2 The following objective will contribute towards accomplishing this aim.

- ◆ To excavate, where appropriate, and record the nature, extent and date of any buried archaeological remains exposed during the construction of the new boiler house and heating-network pipe trench.

4 RECORDING AND REPORTING

4.1 Professional Standards

4.1.1 The archaeological supervision, recording and reporting will be undertaken in accordance with the Chartered Institute for Archaeologists (CIfA) Code of Conduct (2014a) and Standards and Guidelines for Archaeological Watching Briefs (2014b). The records will follow standard conventions set out by the Museum of London Archaeological Service (MoLAS 2002).

4.1.2 All site operations will be carried out in a safe manner in accordance with ARS Ltd's health and safety policy and in compliance with the requirements and subsequent amendments still in force of the Health and Safety at Work Act 1974. A risk assessment will be prepared before commencement on site.

4.2 Coverage

4.2.1 The site of the archaeological supervision, recording and reporting covers the ground works associated with the construction of the new boiler house and heating-network pipe trench (Figure 2).

4.3 Methodology

4.3.1 ARS Ltd will provide a suitably qualified and experienced archaeologist during ground works on the site who will be fully appraised of the archaeological potential of the site. All relevant ground works will be undertaken by a suitable mechanical excavator fitted with a toothless ditching bucket. The archaeologist will be given the opportunity to stop site work in order to investigate potential archaeological features and adequate time will be allowed for recording any such features.

4.3.2 If significant archaeological features are identified during those works requiring planning approval, the Derbyshire County Archaeologist and National Trust



Archaeologist will be notified. Regular updates on the progress of works will be provided to both the Derbyshire County Archaeologist and the National Trust Archaeologist.

4.3.3 Where archaeological features and/or deposits are identified during the archaeological supervision, recording and reporting, then a sufficient quantity of the said features will be investigated by hand to allow their date, nature and degree of survival to be ascribed.

4.3.4 Any human remains discovered will initially be left *in situ* and, if removal is deemed necessary, this will be undertaken in accordance with the relevant Ministry of Justice regulations and in discussion with the Derbyshire County Archaeologist and National Trust Archaeologist.

4.3.5 Finds of "treasure" will be reported to the Coroner in accordance with the Treasure Act (DCMS 2008) procedures. The Portable Antiquities Liaison Officer will also be notified.

HM Coroner:
Dr. Robert Hunter
5-6 Royal Court
Basil Close
Chesterfield
Derbyshire
S41 7SL
Tel: 01246 273058

Finds Liaison Officer:
Alastair Willis
Derby Museum and Art Gallery
The Strand
Derby
Derbyshire
DE1 1BS
Tel: 01332 641 903

4.3.6 ARS Ltd will ensure that heavy plant or machinery will not be operated in the immediate vicinity of archaeological remains until the remains have been recorded. Contractors and plant operators will be notified that any observations of archaeological remains must be reported immediately to the archaeologist on site. Regular contact will be ensured between ARS Ltd. and the site project manager to ensure that ARS Ltd. is kept up to date with site works and given the chance to respond appropriately and in line with the Derbyshire County Archaeologist requirements.

4.4 Recording

4.4.1 The site will be accurately tied into the National Grid and located on a 1:2500 or 1:1250 map of the area. The site will be recorded in accordance with CIfA guidance and the ARS Ltd field recording manual.

4.4.2 A full and proper record (written, graphic and photographic as appropriate) will be made for all work, using pro-forma record sheets and text descriptions appropriate to the work. A plan of the excavated areas will be maintained, features noted and section lines recorded. All drawings will be carried out at an appropriate scale and all contexts will be recorded using a single context recording system. Sample representative levels will be taken to record the maximum depth of excavation and /or natural should no archaeological features be uncovered.



4.4.3 For brick structures, the record will include details of brick dimensions and type (handmade/machine-made, plain/frogged), mortar (colour, composition, hardness) and the extent of structures (number of courses, thickness in skins).

4.4.4 The stratigraphy of the site will be recorded even where no archaeological deposits have been identified.

4.4.5 Where stratified deposits are encountered, a 'Harris' matrix will be compiled.

4.4.6 All archaeological deposits and features will be recorded with above ordnance datum (aOD) levels.

4.4.7 Site photography will be in high resolution (7 megapixel or greater) colour DSLR photography. Photography will include images of the general site, images of the excavation area and photographs of individual features and groups of features. All photographs will include a suitable photographic scale (where appropriate) and will be recorded on a photographic register with the subject and direction of each image.

5 FINDS PROCESSING AND STORAGE

5.1 All finds processing, conservation work and storage of finds will be carried out in accordance with the ClfA (2014c) *Standard and Guidance for the collection, documentation, conservation and research of archaeological materials* and the UKIC (1990) *Guidelines for the Preparation of Archives for Long-Term Storage*.

5.2 Artefact collection and discard policies will be appropriate for the defined purpose in discussion with the National Trust Archaeologist, who will retain and curate the site archive as an addition to the Hardwick Hall Estate collection and archive.

5.3 Bulk finds which are not discarded will be washed and, with the exception of animal bone, marked. Marking and labelling will be indelible and irremovable by abrasion. Bulk finds will be appropriately bagged, boxed and recorded. This process will be carried out no later than one month after the end of the excavation.

5.4 All small finds will be recorded as individual items and appropriately packaged (e.g. lithics in self-sealing plastic bags and ceramic in acid-free tissue paper). Fragile objects will be specially packaged and textile, painted glass and coins stored in appropriate specialist systems. This process will be carried out within two days of the small find being excavated.

5.5 During and after the excavation all objects will be stored in appropriate packaging materials and storage conditions to ensure minimal deterioration and loss of information (including controlled storage, correct packaging, and regular monitoring, immediate selection for conservation of vulnerable material). All storage will have appropriate security provision.

5.6 The deposition and disposal of artefacts will be agreed with the National Trust.



5.7 All retained artefacts and ecofacts will be cleaned and packaged in accordance with the requirements of the National Trust.

6 REPORT

6.1 Following completion of the archaeological works ARS Ltd will produce a report which will include:

- ◆ Non-technical executive summary
- ◆ Introductory statement
- ◆ Aims and purpose of the project
- ◆ Methodology
- ◆ A location plan showing excavated areas and archaeological features with respect to nearby fixed structures and roads
- ◆ Illustrations of all archaeological features with appropriately scaled and geo-referenced hachured plans and sections
- ◆ An objective summary statement of results
- ◆ Conclusions
- ◆ Supporting data – tabulated or in appendices
- ◆ Index to archive and details of archive location
- ◆ References
- ◆ Statement of intent regarding publication
- ◆ Confirmation of archive transfer arrangements
- ◆ A copy of the WSI and OASIS form.

6.2 A digital draft of the report resulting from the archaeological supervision, recording and reporting will be supplied to the Derbyshire County Archaeologist and the National Trust Archaeologist for comment before the report is finalised within four weeks of the completion of the fieldwork.

6.3 Following approval of the report, ARS Ltd will supply the National Trust with four hard copies and four digital copies of the final report.

6.4 One bound copy of the final report accompanied by a digital copy of the report in PDF/A format, on disk, will be deposited with the Derbyshire Historic Environment Record (HER). A copy of the report will be uploaded as part of the OASIS record for online access via the Archaeological Data Service.

7 MONITORING ARRANGEMENTS

7.1 The project will be initiated in consultation the National Trust Archaeologist and notice will be given at least one week prior the commencement of works to the Derbyshire County Archaeologist.



Steve Baker
County Archaeologist
Conservation, Heritage and Design Service
Derbyshire County Council
Shand House
Dale Road South
Matlock
Derbyshire
DE4 3RY
Tel: 01629 539773

7.2 ARS Ltd will liaise with the Derbyshire County Archaeologist at regular intervals throughout the course of the work. In all instances the National Trust Archaeologist will be updated at regular intervals on the progress of the works.

7.3 All reasonable access will be afforded to the Derbyshire County Archaeologist, or her representative, for the purposes of monitoring the archaeological mitigation.

8 TIMETABLE, STAFFING AND RESOURCES

8.1 The outline timetable for the works is as follows. This will be updated by email as the project progresses.

Task No	Task	Proposed Start Date
1	Archaeological supervision and recording	March 2018
2	Report and archiving	April 2018

8.2 The Project Manager for the watching brief will be Reuben Thorpe Senior Project Manager at ARS Ltd. The Fieldwork Project Officer will be Caitlin Halton, Tom Parker PCIfA or Adam Loeden, Assistant Projects Officers at ARS Ltd, or another of ARS Ltd's suitably qualified and experienced archaeologists.

8.3 Specialist analyses will be carried out by appropriately qualified specialists as detailed subject to availability.

- ◆ Flint and prehistoric pottery: Dr Clive Waddington MCIfA or Dr Robin Holgate MCIfA
- ◆ Romano-British pottery: Dr Phil Mills MCIfA
- ◆ Samian Ware: Dr Gwladys Monteil
- ◆ Medieval and post-medieval pottery: Dr Chris Cumberpatch or Dr Robin Holgate MCIfA
- ◆ Clay pipes, glass and metalwork: Mike Wood MCIfA



- ◆ Plant macrofossils and charcoals: Luke Parker
- ◆ Human and animal bone: Milena Grzybowska
- ◆ Radiocarbon dating: Prof Gordon Cook (SUERC)
- ◆ Finds conservation: Vicky Garlick (Durham University)

9 ARCHIVE DEPOSITION

9.1 Deposition Guidelines

9.1.1 All materials arising from these archaeological works will be supplied to the National Trust in standard archiving boxes upon completion of the project. The National Trust will assume responsibility for the archiving of this material and accessioning it into the Hardwick Hall Estate collection and archive. Copies of the submitted final report will be deposited with the Derbyshire HER.

9.1.2 Copyright on the deposited material will either be assigned to the archive, or the archive will be licensed to use the material, in perpetuity; this licence would allow the archive to reproduce material, including for use by third parties, with the copyright owner suitably acknowledged.

9.1.3 At the start of work (immediately before fieldwork commences) an OASIS online record <http://ads.ahds.ac.uk/project/oasis/> will be initiated and key fields completed on Details, Location and Creators forms. All parts of the OASIS online form will be completed for submission to the National Trust. This will include an uploaded .pdf version of the entire report (a paper copy will also be included within the archive).

9.1.4 Written confirmation of the archive transfer arrangements, including a date (confirmed or projected) for the transfer, will be included as part of the final report.

9.1.5 The Derbyshire County Archaeologist will be notified of the final deposition of the archive.

10 GENERAL ITEMS

10.1 Health and Safety

10.1.1 All work will be carried out in accordance with The Health and Safety at Work Act 1974. Specific health and safety policies exist for all our workplaces and all staff employed will be made aware of the policy and any relevant issues. The particular risks involved with this project will be assessed, recorded and relevant mitigation measures put in place as part of a full risk assessment, which will be compiled in advance of fieldwork and will be read and signed by all on-site operatives. ARS Ltd retains Citation as its expert health and safety consultants.

10.2 Insurance Cover

10.2.1 ARS Ltd has full insurance cover for employee liability (£10 million) public liability (£5 million), professional indemnity (£2 million) and all-risks cover.



10.3 Community Engagement

10.3.1 In consultation with National Trust staff, any opportunities for engaging visitors in any archaeological finds during the course of the works should be explored, for example guided site tour and/or dissemination of information via ARS Ltd's and the Hardwick Hall Estate's websites and local media.

10.4 Changes to the Written Scheme of Investigation

10.4.1 Changes to the approved methodology or programme of works will only be made with prior written approval of the Derbyshire County Archaeologist and the National Trust Archaeologist.

10.5 Publication

10.5.1 If significant archaeological remains are recorded, a summary of the project with, if appropriate, selected drawings, illustrations and photographs will be prepared for publication in online, journal or monograph form as appropriate. Additional popular articles will also be produced for local and/or national magazines as appropriate. The final form of the publication is to be agreed with the planning archaeologist and the client dependent on the results of the fieldwork.

10.6 Publicity and Copyright

10.6.1 Any publicity will be handled by the client. The National Trust will retain the copyright of all documentary and photographic material under the Copyright, Designs and Patent Act (1988).

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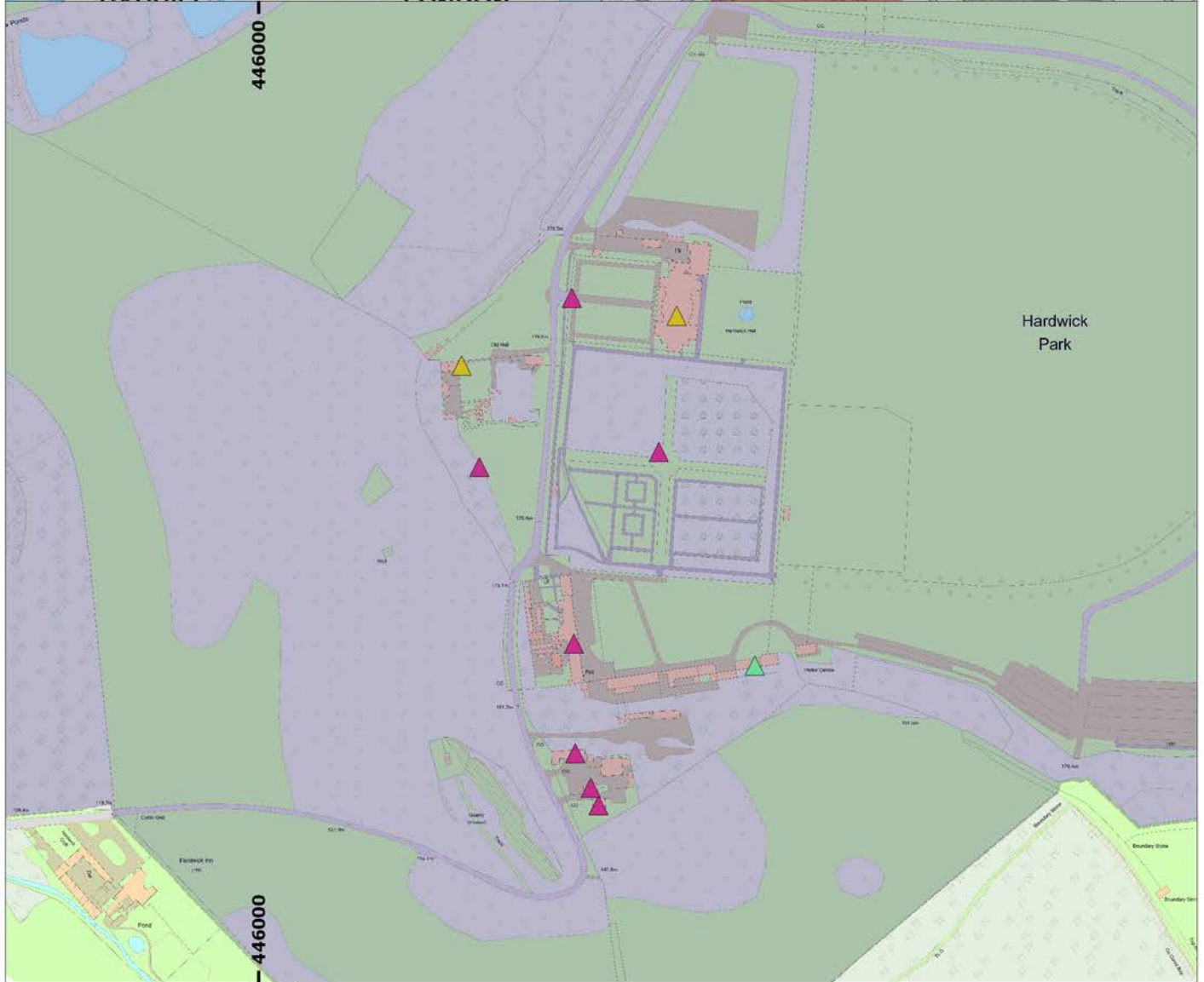
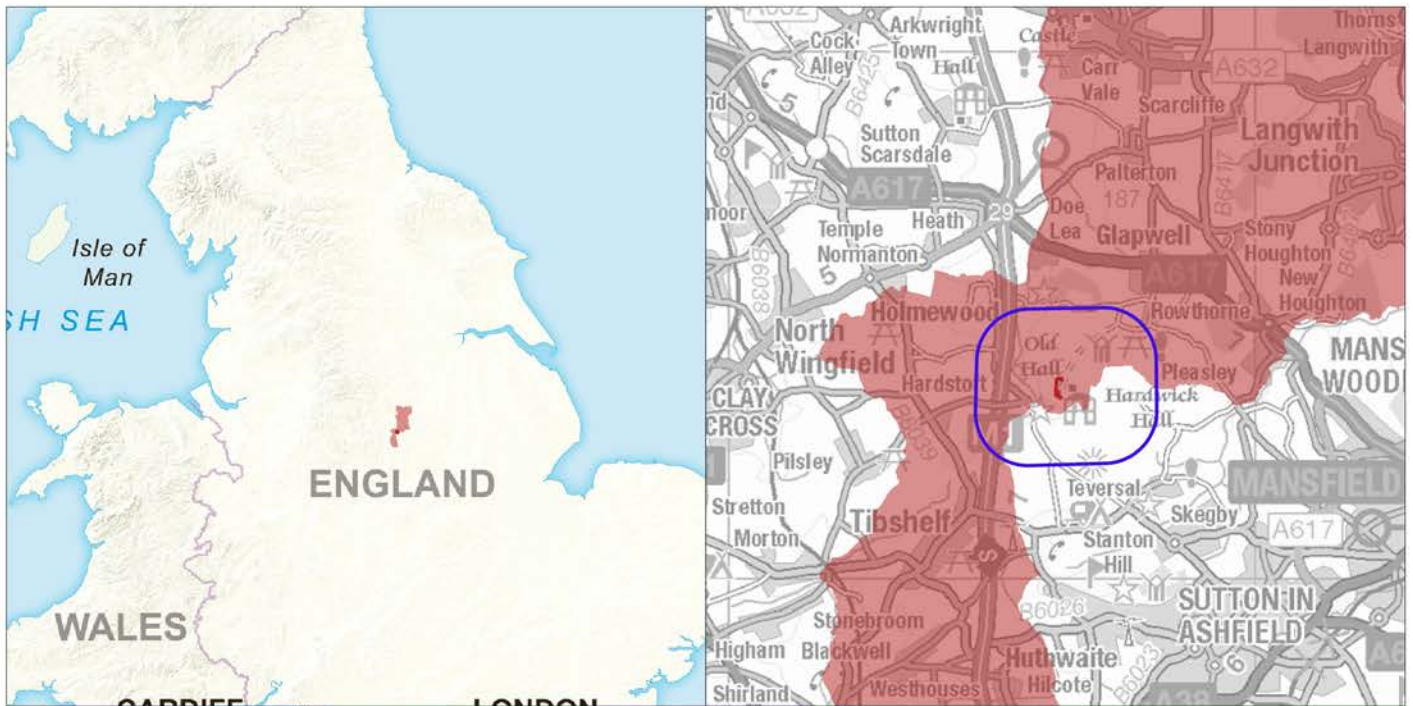


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FIGURES





Site name: Hardwick Hall
 Date: February 2018
 Drawn by: EC
 Scale: Varies

**Figure 1:
 Site location**

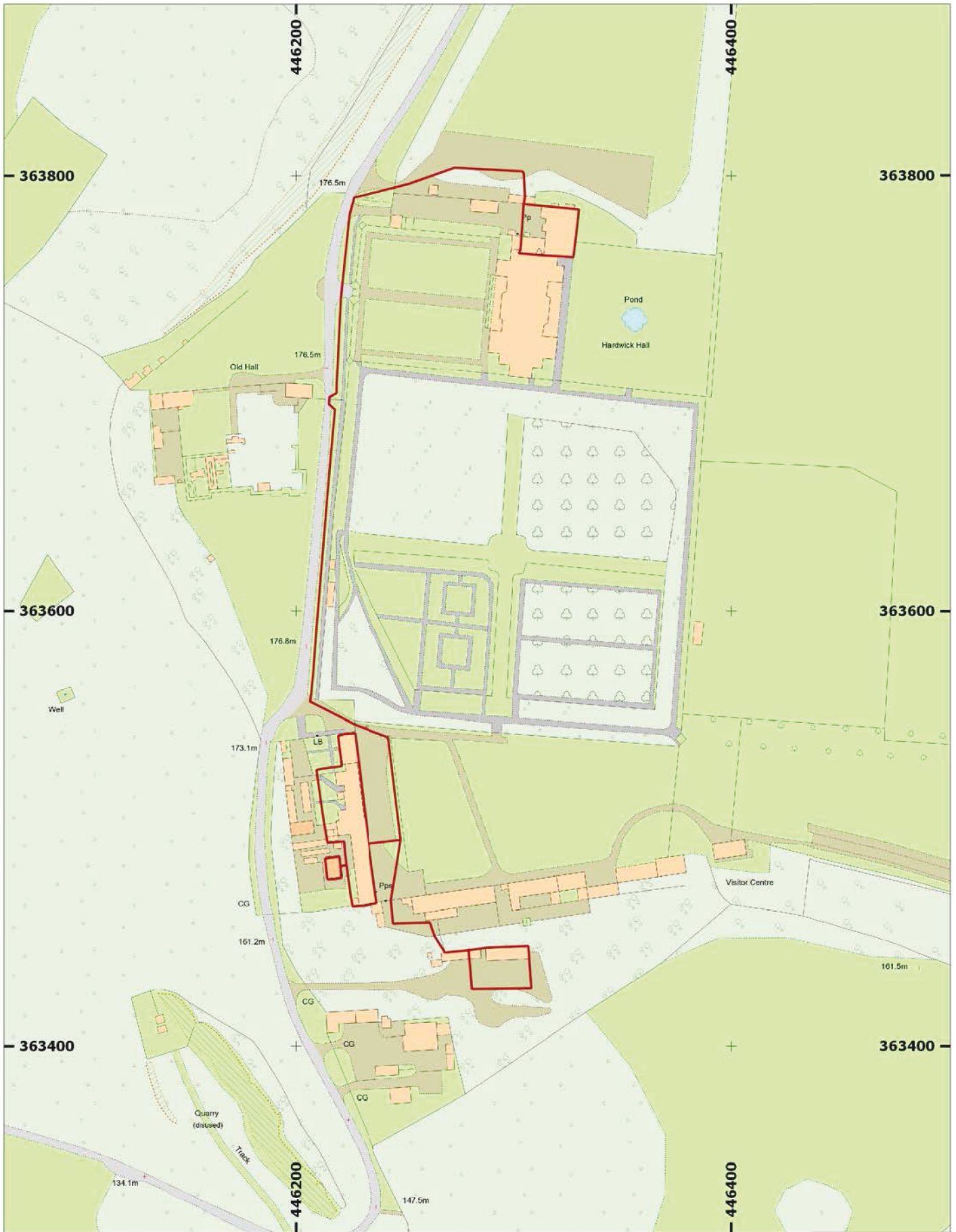
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- | | |
|---------------------------|----------------------------|
| Listed buildings | |
| Bolsover District | Grade I |
| Approximate Site boundary | Grade II |
| | Grade II* |
| | Registered park and garden |



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Site name: Hardwick Hall
 Date: March 2018
 Drawn by: EC
 Scale: 1:2351 @ A4

— Proposed Pipeline Route



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Figure 2:
Walking Brief Location

Appendix III: OASIS

OASIS DATA COLLECTION FORM: England

[List of Projects](#) | [Manage Projects](#) | [Search Projects](#) | [New project](#) | [Change your details](#) | [HER coverage](#) | [Change country](#) | [Log out](#)

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OASIS ID: archaeol5-328761

Project details

Project name	An Archaeological Watching Brief at Hardwick Hall Estate, Derbyshire
Short description of the project	In March 2018 Archaeological Research Services Ltd was commissioned by the National Trust to undertake an archaeological watching brief in relation to a development at Hardwick Hall Estate, Derbyshire involving the installation of a wood-chip Biomass Boiler, a new rangers store building and heating network adjacent to Hardwick Hall. The objective of the archaeological watching brief was to ensure that any archaeological features exposed during the excavation works associated with the excavation of the heating-network pipe trench would be fully recorded and interpreted and that any remains disturbed would be recovered. The watching brief discovered extensive evidence of post-medieval landscaping. Made ground / landscaping layers were observed in several areas. The complete absence of subsoil on site likely constitutes evidence of removal of soils and flattening of the grounds. In the garden area behind the listed cottages on the estate, modern brought-in garden soil was observed to overlie a former top soil deposit, which contained butchered animal bones and 17th century pottery. In this deposit, evidence of butchery was uncovered. In addition to this, along the main road running north to south through the Estate, deposits interpreted as the original hard core foundations of the road were discovered.
Project dates	Start: 09-07-2018 End: 05-09-2018
Previous/future work	Not known / Not known
Any associated project reference codes	HHL18 - Sitecode
Any associated project reference codes	17/00553/FUL - Planning Application No.
Type of project	Recording project
Monument type	ROAD Post Medieval
Monument type	GARDEN Post Medieval
Significant Finds	POT None
Significant Finds	NONE None
Investigation type	"Watching Brief"
Prompt	Planning condition

Project location

Country	England
Site location	DERBYSHIRE BOLSOVER AULT HUCKNALL HARDWICK HALL
Postcode	S44 5QJ
Study area	0 Square metres

Site coordinates SK 46255 63655 53.16771063275 -1.308006721028 53 10 03 N 001 18 28 W Point

Project creators

Name of Organisation Archaeological Research Services Ltd

Project brief originator Derbyshire County Council

Project design originator Archaeological Research Services Ltd

Project director/manager Reuben Thorpe

Project supervisor Adam Lodoen

Type of sponsor/funding body National Trust

Name of sponsor/funding body National Trust

Project archives

Physical Archive recipient National Trust

Physical Contents "Animal Bones","Ceramics"

Digital Archive Exists? No

Paper Archive recipient National Trust

Paper Media available "Drawing","Section"

Project bibliography 1

Publication type Grey literature (unpublished document/manuscript)

Title An Archaeological Watching Brief at Hardwick Hall Estate, Derbyshire

Author(s)/Editor(s) Lodoen, A.

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OASIS:

Please e-mail [Historic England](#) for OASIS help and advice

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