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PARKHILL RECLAMATION LIMITED

SHORTWOOD QUARRY

ARCHAEOLOGICAL AND CULTURAL ASSESSMENT

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PARKHILL RECLAMATION LIMITED

SHORTWOOD QUARRY

ARCHAEOLOGICAL AND CULTURAL ASSESSMENT

Prepared by:

P Reeves Senior Archaeologist _____

Approved by:

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1 INTRODUCTION

1.0 Wardell Armstrong were instructed in May 1998 by Ms A Dugdale of Parkhill Reclamation Limited to undertake an archaeological assessment of Shortwood Quarry.

1.1 The site is situated within the parish of Pucklechurch to the east of Bristol in the county of South Gloucestershire.

1.2 The site has a long history associated with the extraction of coal from the East Bristol Coalfield and from the nineteenth century was dominated by the Shortwood brick and tile works. The area is recognised as one of industrial landscape importance.

2 BASELINE CONDITIONS

2.1 The purpose of the assessment is to highlight features or areas within the proposed development plan that may lead to archaeological constraints in the planning process (Ref. DWG 1).

2.2 The assessment was undertaken following the methodology outlined in the Project proposal appended (Appendix 1) at the end of this report.

3 METHODOLOGY

3.1 The assessment was undertaken using the following resources.

- the Sites and Monuments Record (SMR) for South Gloucestershire located at Kingswood, Bristol.

- cartographic documents located at the Bristol Record Office, Tobacco Warehouse, Hotwells, Bristol and extracts from ordnance survey maps provided by Parkhill Estates Ltd.
- bibliographic references obtained from Bristol Central Library, Clifton, Bristol.
- place and fieldname evidence.
- a site walkover
- a geophysical survey undertaken by GeoQuest Associates (a full methodology of the system employed is detailed in Appendix 4)
- discussions with the County Archaeologist, David Haigh.

4 ARCHAEOLOGICAL ASSESSMENT

SMR (entries within the proposed development area)

4.1 Details for entries on the SMR for the area of land owned by Ibstock Brick Company were requested from South Gloucestershire. Those sites falling within the area of proposed development are discussed below.

4.2 Within the areas highlighted for proposed landfill or clay storage the SMR yielded four entries, one marks the course of a Roman Road, the remaining three relate to coal mining activity. The entry for the Shortwood brick and tile works is noted but as this site is now totally demolished is not discussed in depth. The area of proposed development contains no Scheduled Ancient Monuments (SAM) or Listed Buildings (LB). The numbers used to identify sites are taken directly from the South Gloucestershire numbering system.

4.3 SMR 1353 describes the Roman road running north-south through the proposed development site. The road passes through the former clay pit, south past Linden lea

(now demolished) continuing south beyond the boundaries of the site. The road is threatened in two areas by the proposed development. Within the area of the clay pit the Roman road has almost certainly been removed, the road is extant to the east of Linden Lea. Due to the construction of settlement lagoons within this area, any remaining evidence of this feature will be lost.

4.4 SMR 6089 marks the site of Chaffhouse Pit a former colliery recorded as occupied by James Plumley in the 1845 Tithe Map Apportionment, the site lies to the north of Shortwood House. The site is recorded as lying under the brickworks, subsequently demolished and therefore all surface features has been removed. The proposal plan indicates that the area this site formerly occupied is not to be used for clay storage or landfill.

4.5 SMR 6270 marks the site of an unnamed coal pit located to the south of Shortwood Farm. The SMR indicates that the mound observed on site at this point may mark a capped mineshaft. The site lies within one of the areas designated for clay storage. The actual site of the mine shaft will not be affected.

4.6 SMR 2412 marks the site of the former Shortwood brick and tile works, the buildings have all been demolished and the landscape altered through levelling and mounding of debris. Quarrying prior to the proposed landfill will have little or no impact on the archaeology it is already demolished.

SMR (entries adjacent to the development area)

4.7 It is not intended in this assessment to outline in detail the other entries lying adjacent to the site. Of the twelve entries on record all are related to the mining of coal and all are recorded as post-medieval some possibly sited on earlier centres of coal and/or iron ore extraction. The current development proposals pose no direct

impact on any of these sites and if the existing hedgerows bordering the assessment area are left in situ the development poses no visual impact.

4.8 Taken individually the SMR entries are not of particular importance, Brandy Bottom Colliery (SMR 1354) is the exception, but when considered as a group they illustrate an industrial landscape that is remarkably complete. A portion of this historic industrial landscape will be removed when sites within the development area are landfilled.

Cartographic evidence

4.9 The earliest map consulted was the Plan of the Parish of Pucklechurch in the county of Gloucester printed in 1843 (reference BRO EP/A/32/30). A tracing of the Tithe Map is reproduced as Drawing No 2, the apportionment giving field numbers, names, tenants and landowners is provided in Appendix II.

4.10 The list of field names in Appendix II indicates the amount of coal mining that was and had taken place in the Shortwood area. Barton is vernacular speech for a yard therefore colliery and barton describes a pit and associated coal yard.

4.11 When comparing the field boundaries only two fields conform exactly to their 1843 boundaries, Waters Ground (Field 136) and Rough Ground (Field 182).

4.12 Three fields are of particular interest because they reflect the past history of Shortwood. Poyntz Hill (Field 191) and Port of Poyntz Mead (Field 120) were owned by Francis Poyntz, custodian of Kingswood Forest in 1509. Pickpocket (Field 149) is a reference to the former outlaws to be found in Kingswood Forest, a place infamous for highwaymen, vagabonds and rustlers.

4.13 Shepherds plan of eighteenth century mines that had been abandoned (not reproduced) records ten abandoned mines in the area.

4.14 The 1st Edition Ordnance Survey map shows Shortwood Farm, Shortwood House, Shortwood brick works, Ivanhoe (the house occupied by the manager of the brick works), the row of cottages known as the Rosary and Parkfield Colliery all extant. Three small clay pits are shown lying adjacent to the brickworks, Parkfield Colliery and Shortwood Colliery. An air shaft (presumably of another colliery) is shown to the south of Shortwood Farm on the western side of Cattybrook Road. The Railway is built and a branch of it extends into the Brick Works Ref Dwg 3.

4.15 The 1902 Second Edition OS Map shows Shortwood Colliery disused but two smaller coal pits have been grouped under the name Shortwood Collieries. The brick works, now named Shortwood brick and tile works have expanded, a Tramway has been built connecting the works to the colliery and to the much enlarged clay pit. Parkfield Colliery though much expanded is annotated as disused. The shaft to the south of Southwood Farm is marked, two other shafts are now annotated as old Ref Dwg 4.

4.16 The 1922 OS map revision shows much the same as the Second Edition. The clay pit sited adjacent to the brick works has enlarged, the clay pit associated with the Shortwood Collieries appears to be being worked with two branches of the tramway leading into it. The airshaft to the south of Shortwood Farm is indicated has having a substantial spoil tip around it Ref Dwg 5.

4.17 The 1932 OS revision shows the Shortwood Collieries as disused the associated clay pit is no longer served by the tramway. The clay pit adjacent to the brick and tile works has expanded further and contains a lake. The air shaft to the south of

Shortwood Farm is shown as a spoil tip with no reference to the shafts existence Ref Dwg 6).

4.18 The 1955 OS Edition with revisions made in 1969 show no working mines in the area. The Shortwood brick and tile works are now called the works Ref Dwg 7.

4.19 The 1972 1:10,000 maps shows the brick and tile works as disused, some of the earlier mine shafts are not recorded. A single length of tramway extends into the disused clay pit, the extents of which are defined by a dotted line only. Parts of the brick works have been demolished. The line of the Roman road is shown (Ref Dwg 8).

4.20 The 1992 1:10,000 OS map shows little change to that of 1972, the extents of the clay pit are not shown at all and the largest of the brick works buildings have been demolished Ref Dwg 9).

4.21 Overall the maps show a bustling industrial landscape originally based on coal extraction going into decline. By 1932 all the coal mines are disused, the brick and tile works have ceased to operate by 1972.

Bibliographic study

4.22 There are no particular bibliographic references that discuss Shortwood, the area exists within the former Royal Forest of Kingswood. One of the earliest mentions of the forest is in an Anglo-Saxon charter written in AD960. The Anglo-Saxon Chronicle records the murder of King Edmund at Pucklechurch in 940. The Royal Forest of Kingswood may well be Anglo-Saxon in origin as part of the lands belonging to the palace at Pucklechurch. The Saxon Kings Edwy and Edgar are recorded as living at Pucklechurch.

4.23 King John is the first monarch recorded as building a hunting lodge in the forest and it is during his reign that the forests decline begins. A charter dated to AD1228 orders the disafforestation of Kingswood, the forest is to be converted into a chase thereby making the hunting and chasing of game easier.

4.24 During the thirteenth century references are made to the extraction of sea-coal in the Pucklechurch area. In 1261, the earliest reference to the highwaymen and robbers that were to haunt the ancient forest is made.

4.25 During the reign of Edward I, the use of coal is forbidden. This law temporarily halted expansion of the shallow mines developing in the area, however it accelerated the rate at which the tree cover was removed.

4.26 In the sixteenth century, Henry VIII may have parcelled land for coalmines and in 1509 Francis Poyntz (to be followed by his son Sir Anthony Poyntz in 1529) is made Custodian of Kingswood Forest.

4.27 On 11 March 1608, King James 1 grants `all coalworks, coal pits, mines of sea coal, stone, coke and slate to be found in the forest of Kingswood to a Captain Fitzgerald for the annual rent of £40. The grant contains a covenant not to `hurt timber, wood or underwood'.

4.28 The surveyor John Norden recording the area in 1615 notes that `the herbage daily is impaired by castings of their coalmines over manic places of the forest'. This passage gives some indication to the amount of coal extraction taking place within the former Royal Forest.

4.29 By the beginning of the eighteenth century the shallow coal pits were being replaced by shaft mines. Brandy Bottom Pit was sunk in the early 1800's on what is now the site of the disused Parkfield South Colliery. Brandy Bottom was leased to the owners of Parkfield Colliery (later to become Parkfield North), Wethered, Cossham and Wethered in 1850 to aid in the latters ventilation and water pumping.

4.30 In 1870, Parkfield is recorded as yielding 4,790,310 tons of coal and was estimated to have 100,000,000 tons in reserve.

4.31 In 1860 the Cattybrook Brick Company was founded by Charles Richardson. A memorandum dated 4 January 1890, appended to the original lease of 1881, notes an agreement between the Chester Master family and the brickworks. The agreement states that the works is not to dig below fifty feet and that all coal must be used in the brickmaking process. Cattybrook provided some nineteen million of the seventy six and a half million bricks used in the construction of the Severn Tunnel.

4.32 The later part of the nineteenth century and early twentieth century history of the site has been discussed in the section dealing with cartographic evidence.

Fieldname evidence

4.33 The majority of the fieldnames are references to either former mining activity or are very basic acreage descriptives. Exceptions to this pattern have been discussed under the heading cartographic evidence. The field names appear in an appendix at the end of this assessment.

Site walkover

4.34 The site visit was undertaken on a well lit afternoon and walked twice clockwise and anticlockwise beginning near the row of cottages known as the Rosary. The discussion points are located on drawing no. 1.

4.35 A - this area of the former brick works was covered by a thick levelled layer of the demolition debris from the works. The layer of bricks and brick dust covers any evidence of former activity.

4.36 B - marks a flat and featureless field, even though freshly mown no earthworks or cropmarks indicating archaeological activity were observed.

4.37 C - marking the major complex of the brick works has been scraped clean of features, a large pile of clay sits in the centre of the area. Toward the northern end of the site, the brick floors of the former brickwork buildings are visible. Amongst the demolition debris of bricks the occasional metal fitting and tram rail is observed. some walls stand to a height of 1 metre at the northern edge of this area, their function remains unknown due to the screening effect of abundant vegetation.

4.38 D - marks a brick and rubble strewn track leading down into the extant clay pit. Some of the material from the demolition of the brickworks is strewn across the area.

4.39 E, F, G and H mark fields containing no obvious archaeological features. Fields E and G contain underground monitors of some kind.

4.40 I - this field dips toward the edge of the clay pit and contains many slight irregularities in its surface. The northern part of the field is very overgrown with scrubby grass. There exists a noticeable difference in height when exiting into field H and closer inspection of the drop suggests field I has been covered with a layer of landfill.

4.41 J - no archaeological features were observed but parts of the field had similar characteristics to those observed in I and has possibly been landfilled at some point (or levelled up).

4.42 K - the western triangle of this field shows evidence of having been a garden (site of demolished Linden Lea). The Roman road is seen very clearly as a wide linear band running north-south through the approximate centre of the field.

4.43 L and M - no obvious archaeological features were observed in either field. M was not fully investigated due to the presence of livestock.

4.44 N and O - no obvious archaeological features were observed in either field..

Geophysical Survey

4.45 A geophysical survey was undertaken in three areas within the proposed development site. Area 1 comprised a large pasture field, west of the derelict Shortwood Farm: Area 2 was a small paddock south of Shortwood Farm; Area 3, was a field of pasture to the east of Shortwood House and the site of the now demolished Linden Lea. Area 3 in particular, was surveyed in order to locate any features associated with the Roman road, suggested as passing through the centre of the field. As a result a number of archaeological anomalies were detected. The full geophysical report is presented as Appendix 4.

4.46 In Area 1, a pattern of regular spaced linear anomalies consistent with agricultural activity were recorded on a north-north-west to south-south-east alignment. These probably represent the denuded remains of a ridge and furrow field system. This appears to be demarked at its southern limit by a former field boundary, characterised by a tree bole or pit alignment and a possible wall.

4.47 Area 2 recorded a pattern of three linear strips of intense magnetic activity, probably indicating buried ferrous pipes. The northern third of the field is covered by a random magnetic pattern suggesting a deposit of brick rubble. A weak signal detected 10m to the east of the rubble spread, describes a arc of approximately 6m in diameter. This may be interpreted as a poorly preserved ring ditch.

4.48 Within Area 3, no trace of the Roman road was recorded, however the survey revealed a number of weak positive anomalies which are consistent with ring ditches of 10-15m diameter. A further curvilinear anomaly was recorded, possibly a silted ditch of an enclosure as extending beyond the survey area. To the east of the projected road line a strong geophysical disturbance may represent an area of burning or a large silted ditch. This reading appears to form the northern limit of a deposit of stony material, possibly the ploughed out remains of the Roman road. The linear stony spread appears top aligned on a north-south axis, rather than the conjectured north-east south-west alignment of the road.

5 SUMMARY

5.1 The area of proposed development contains no Scheduled Ancient Monuments or Listed Buildings. The area contains three entries recorded on the Sites and Monuments Record which are related to the extraction of coal, the fourth entry is a Roman road.

5.2 The boundary, or pale, of a deer park is thought to exist within the area assessed (personal comment) but the exact location could not be found either in the SMR or on the ground.

5.3 No historic boundaries could be detected within the area assessed.

5.4 The history of the proposed development site is dominated by elements of the coal industry, although no single site (within the proposed development area) is of major importance, the group and diversity of activity at the sites makes the area an important industrial landscape.

5.5 As a result of the geophysical survey a number of sites of potential archaeological significance have been recorded. These include a number of potential ring ditch features and what may be the ploughed out remains of a Roman road.

6 CONCLUSION

6.1 The greater part of the development proposals will have no impact on the archaeological content of the site. Most of the earlier industrial activity and associated sites has been removed by demolition and landscaping.

6.2 The only archaeological features likely to be affected lie within the clay stocking areas, these features are not of national importance and are not scheduled.

6.3 There is no physical threat to Brandy Bottom Colliery, also known as Parkfield South, by the proposed landfill development. Additionally the site Chaff House Pit and the site of the unnamed coal pit to the south of Shortwood Farm will not be disturbed. If the hedges and trees are retained in the northern part of the site, there will be no visual impact on the colliery.

6.4 The siting of the leachate lagoons poses a threat to the anomalies identified during the geophysical survey.

7 MITIGATION

7.1 Discussions were held with the County Archaeologist regarding the possible impacts posed by the proposed development plans. During liaison, the brief for an archaeological evaluation (Appendix III) was discussed.

7.2 The two principle sites in the area have been removed from the evaluation. The proposed development does not threaten South Parkfield Colliery and the Shortwood brick works have been demolished.

7.3 The County Archaeologist is requesting a detailed document based research report and earthwork survey in an attempt to piece together the industrial landscape history of the site before it is landfilled David Haigh has requested a photographic record of the dwelling known as Ivanhoe (which lies within the area of proposed landfill), this is the only built remains of the Shortwood brick and tile works still standing. This building was originally constructed as the brickworks manager's house.

7.4 It is proposed that, due to the results of the initial geophysical survey, an additional geophysical survey will be undertaken in the remainder of the field east of Linden Lea, in which the lagoons are to be positioned. A survey of the triangular field to the north of Linden Lea, where it is proposed that the reed beds are to be sited, will also be surveyed. This will highlight areas where there is no archaeological presence, to assist in the final siting of the lagoons and reed beds and permit a fuller mitigation strategy to be formulated should archaeological deposits be compromised .

7.6 Field I, requested to be surveyed by the County Archaeologist, David Haigh, is not suitable for geophysical survey due, as discussed in 4.40, to the presence of extensive landfill and overburden.

7.5 Sample excavations shall only occur if significant findings are made either during the detailed document research, the earthwork survey or during the additional geophysical survey. If, as a result, it is impossible to relocate the relevant part of the development to avoid areas of archaeological interest, sample excavations will be undertaken in agreement with the County Archaeologist, David Haigh.

8 BIBLIOGRAPHY

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Doughty M & Ward O - 1975 - Shortwood Brickworks. B1AS Journal Vol 8 1975.

Mags C - 1969 - The Bristol and Gloucester Railway and the Avon and Gloucestershire Railway.

Mills R L - 1998 - Parkfield South Colliery, Shortwood Brickworks, Pucklechurch, South Gloucestershire (Preliminary Site Assessment).

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Various maps as detailed throughout the assessment. Notes, letters and observations contained in the Sites and Monuments Record held at Kingswood, South Gloucestershire.

Our Ref: PR/CC/D28/4922/19 Date: 7 May 1998

PARKHILL ESTATES LIMITED

ARCHAEOLOGICAL DESK-BASED ASSESSMENT

SHORTWOOD

SOUTH GLOUCESTERSHIRE

1 INTRODUCTION

Wardell Armstrong have been invited by Ms A Dugdale, Parkhill Estates Ltd, to prepare a proposal and costs for an archaeological desk-based assessment with regard to the above site at Shortwood, South Gloucestershire. This proposal has been produced in accordance with the *Management of Archaeological Projects* (English Heritage, 1991) and with the principles laid down in the Institute of Field Archaeologists Standards in British Archaeology: Archaeological Desk-Based Studies (1993).

This proposal is submitted based on documents and drawings supplied by Parkhill Estates Ltd.

This proposal sets out:

- Wardell Armstrong's resources;
- how Wardell Armstrong would approach and undertake the archaeological survey;
- the timetable and staffing;
- relevant experience.

2 WARDELL ARMSTRONG RESOURCES

Wardell Armstrong is a major mining, minerals, engineering and environmental consultancy. The Firm's headquarters are located at Newcastle-under-Lyme, Staffordshire and regional offices located in London, Newcastle-upon-Tyne, Leigh, Cardiff, Sheffield and the West Midlands.

Wardell Armstrong is a Professional Partnership without limited liability and has no connection or affiliation with any other firm or organisation. The Firm offers a comprehensive range of consultancy services encompassing a wide range of multi-disciplinary engineering and environmental services, to public and private sector clients and has a complement of 23 Partners, 23 Associates and 8 Senior Consultants, supported by over 180 professional, technical and administrative staff.

The Firm's professionally qualified and experienced staff comprise the following broad technical disciplines: Ground and Civil Engineering, Environmental Assessment, Geology, Geotechnics, Landscape Architecture and Mineral Surveying.

An Environmental Consultancy Unit which is fully integrated with the engineering capabilities of the Firm employs specialist scientists, offering a wide range of services in environmental monitoring and the assessment of environmental quality.

3 APPROACH

This assessment would be approached in the following main stages:

- desk-based search of archival, photographic and documentary information;
- field survey;
- assessment of information;
- consultations;
- reporting.

4 METHODOLOGY

Desk-based assessment: The following sources of information would be consulted where available:

- Sites and Monuments Record (SMR) for South Gloucestershire;
- historic documents (eg. charters, registers, estate papers);
- cartographic documents (eg. early maps, tithe maps, estate plans, O.S. maps);
- aerial photographs;
- place and field-name evidence;
- pictorial documents (eg. engravings, photographs);
- secondary sources (eg. published local studies, local knowledge).

Field survey A survey of the site will be undertaken with the aim of locating sites identified from the desk-based assessment, and identifying potential sites not previously recorded.

Consultations Preliminary findings and implications will be discussed with Parkhill Estates Limited and the Gloucestershire County Archaeologist, prior to the submission of the final report.

Reporting The final report will contain the following:

- a description of the methodology used in undertaking the archaeological assessment;
- a description of sites found within the study area and its vicinity;
- a tabulated catalogue of sites cross-referenced to maps of appropriate scale;
- identification of potential impacts on archaeological deposits;
- recommendations for further evaluation work;
- a bibliography of sources of evidence used in the assessment;
- maps, plans and photographs as appropriate;
- appendices containing a copy of this project proposal and relevant correspondence.

5 TIMESCALE

The anticipated timetable would result in the production of the final report within one week of the commencement of the field survey.

Staff time for the various stages of this project are estimated as follows:

	person days
Desk-based assessment and consultations	1
Field survey	1
Analysis and report	1

6 STAFFING

All work will be undertaken by Peter Reeves, Senior Archaeologist of Wardell Armstrong. His *Curriculum Vitae* is appended. Additionally, the diverse nature of the Firm's activities allows in-house consultations on relevant subjects such as soils, geology, ecology and surveying.

7 RELEVANT EXPERIENCE

Peter Reeves has a broad-based experience of all periods of British archaeology gained over a period of eighteen years. With Wardell Armstrong he has undertaken numerous archaeological assessments on behalf of developers including advising on possible mitigation measures. As a former employee at English Heritage, Peter Reeves also has a broad knowledge of curatorial and conservation issues.

APPENDIX II

Apportionment of Pucklechurch Tithe Map 1843

Field No	Field Name	Use	Tenant	Owner
189	Top Field	Pasture	Daniel Reedwell	Andrew Drummond
193	Part of the Jacobite	Pasture and Wood		
194	Part of the Jacobite	Arable		
130	Unnamed	Unnamed	Evan Jeffries & Samuel Waters	
191	Poyntz Hill	Pasture	David Lewis	
120	Part of Poyntz Mead	Pasture	Charles Binchall	
133	Colliers Hill	Pasture	Thomas Boucher & John Haskins	David Lewis
136	Waters Ground	Pasture		
140	House & Gardens	-		
141	Orchard	Pasture & Orchard		
142	Garden	Garden		
143	Nearhill	Pasture		
147	Homeground	Pasture		
153	Tanners Mead	Arable		
179	Withy Bed	Withies		
180	Broad Mead	Arable		
181	The Nine Acres	Arable		
182	Rough Ground	Arable		
183	New Leaze	Arable		
178	Limekiln Hill	Pasture	Edward Hobson	
134	Coalpit Barton and Road		William Walters & Samuel Reynolds	
135	Coalpit Barton	Pasture		
137	Paddock	Pasture		
138 & 139	Cottage & Garden			

148	Coalpit and Barton		William Walters & Samuel Reynolds	David Lewis
184	Coalpit Field	Arable	Sarah Evans	George Evans & Sarah Evans
185	Garden	Arable		
186	Garden	Arable		
195	Coalpit Field	Arable		
187	Coal Pit and Yard	Homestead	Evans Jeffries & Samuel Waters	
131	Shortwood Close	Pasture	Samuel Ovens	Leasee under Earl of Radnor (Samuel Ovens)
188	Pasture	Pasture		
190	Lower Hill	Pasture		
192	Upper Hill	Pasture		
122	Coalpit and Barton		Evan Jeffries & Samuel Waters	As above (Hannah Withey)
121	Coalpit Ground	Pasture	William Waters & Samuel Reynolds	
149	Pickpocket	Pasture	John Haskins	Heather Rich
150	Part of Pickets Hill	Arable		
145	Esquire Hathaways Hill	Pasture		Sir John Smythe (Baronet)
146	Esquire Hathaways Hill	Pasture		
132	Part of Shortwood Paddock	Pasture	William Waters & Samuel Reynolds	Dean and Chapter of Wells (John Swayne)

BRIEF FOR AN ARCHAEOLOGICAL EVALUATION - SHORTWOOD BRICKWORKS, PUCKLECHURCH, SOUTH GLOUCESTERSHIRE.

CONTACT: David Haigh, Archaeology & Conservation Officer, Environment & Conservation 01454 863464; Fax: 01454 863545

1 INTRODUCTION

1.1 There is currently a proposal to develop an area of land known as the Shortwood Brickworks, Pucklechurch, S. Gloucestershire. The site lies to the south of the M4 Motorway, north of the Bristol Ring Road, and west of Pucklechurch. The site comprises both rough open ground and arable land, and the industrial remains associated with mining and quarrying carried out within this area.

1.2 The brick works and adjacent colliery at S Parkfield has been the subject of an initial archaeological recording exercise carried out by the Bristol Industrial Archaeology Society. Several other archaeological sites have also been identified on the Sites and Monuments Record as falling within the area proposed for development.

1.3 In view of the potential archaeological implications of development within this area, the proposals it has been deemed necessary to request that an archaeological evaluation of the area is carried out prior to the determination of this application in accordance with the guidelines laid down in Planning Policy Guidance Note 16 (DoE 1990) and Avon County Structure Plan (Third Alteration) Policy BE4A, and Emersons Green Development Brief 1995, Section 9.7.

2. AIMS AND OBJECTIVES:

2.1 The aim of the evaluation is to provide information that will enable an informed and reasonable planning decision to be taken regarding the archaeological provision for the areas affected by the proposed development.

2.2 The objectives will be:

a) To locate any archaeological and industrial archaeological features and deposits likely to be affected.

b) To assess the survival, quality, condition and significance of any archaeological and industrial archaeological features, deposits and structures within the study area.

c) To identify and recommend options for the management of the archaeological resource, including any further archaeological provision where necessary.

3. REQUIREMENTS.

3.1 In order to achieve the objectives outlined in paragraphs 2.2 and 4.2 (below) the evaluation shall comprise documentary research, field survey geophysical survey and sample excavation.

3.2 DOCUMENTARY RESEARCH:

A search of all relevant documentary sources (printed and manuscript) for the study area shall be undertaken, including primary records where necessary including mining and quarry archives cartographic and aerial photographic sources. This shall be used as the basis for

(a) compiling a brief history of the development and land use within the study area based upon a thorough assessment of the available sources,
(b) to locate any previously unrecorded archaeological features,
(c) to elucidate all archaeological and historic landscape features and buildings within the study area.

The Council's Sites & Monuments Record and the appropriate County Record Offices and other archival sources shall be consulted as required. All sources consulted (published or otherwise) shall be cited. All archaeological features recorded on air photographs shall be accurately plotted using appropriate correction methods as part of this survey.

3.3 FIELD SURVEY:

Assess the size, extent and nature of any surviving earthwork remains within the study area and undertake an appropriate level of archaeological recording. Prepare a phased interpretation of the history of the site where possible, and identify the relationship of the earthworks and structures to adjoining landscapes. All survey plots should be located relative to the National Grid, and levelled relative to Ordnance Datum, and to permanent features in the immediate vicinity of the site, if it is envisaged that further archaeological work may be required on the site.

3.4 GEOPHYSICAL SURVEY:

A geophysical assessment of the site may be required. The assessment should be undertaken by means of the geophysical examination of areas to be agreed in detail with the Council's Archaeological Officer and the potential developers of the site following completion of the documentary assessment and field survey. Prior discussion on the nature of the methods and techniques proposed for the examination will be necessary. It is appreciated that, while these will indicate the general scale of the proposed work, it is in the nature of archaeological evaluation that there should be the possibility for modification of the details of a geophysical study during the course of the work as new information is revealed. Constraints due to live services, public rights of way, major sources of interference etc., should be accounted for in the project design, and the impact of these constraints on the survey results should be addressed in the final report.

The evidence revealed in the survey should be recorded by written, drawn, photographic and all other appropriate means. The archaeological structures and deposits implied by the anomalies should be recorded by plans at an appropriate scale. All plots of geophysical information should be located relative to the National Grid, and to permanent features in the immediate vicinity of the site, if it is envisaged that further archaeological work may be required on the site.

3.5 EXCAVATION:

Sample excavation may also be required. A strategy for the excavation shall be agreed in advance with The Archaeology & Conservation Officer, South Gloucestershire Council, and shall be based upon the results of the documentary research the geophysical evaluation and the field survey. The excavated sample shall comprise a maximum of 2% of the total study area.

3.5 All excavation shall be limited to the top of significant archaeological deposits. Further full or partial excavation of selected deposits shall be undertaken only where essential for achieving the objectives of the evaluation exercise.

3.6 A full graphic, photographic and written record of the findings will be made. Individual contexts will be recorded on separate context sheets within a context register. All plans and section drawings shall be drawn at an appropriate scale. Drawn records will be related to Ordnance Survey datum and published boundaries where appropriate. Photographic records will be at a minimum 35mm format and include both black and white and colour.

3.7 All archaeological objects, artefacts, industrial waste and faunal remains will be recovered and related to the context from which they derive wherever possible. Provision shall also be made for the sampling of deposits for environmental and technological evidence where appropriate.

4. BUILDING RECORDING:

4.1 A number of industrial buildings and structures and associated workers dwellings etc. survive within the proposed development area resulting from the industrial development of the collieries and brick making that took place here. It is necessary to undertake a programme of assessment and recording in order to allow proper consideration to be made of the implications of the proposed development and any associated programme of repairs that may be sought upon these structures.

4.2 The objectives will be:

a) To produce a detailed architectural assessment of the development of the industrial buildings and ancillary structures including workers dwellings and the surviving farmsteads identifying the surviving historic phases of the buildings on a series of phased elevation drawings and plans. It is anticipated that the works of analysis and interpretation will require detailed recording of the surviving historic fabric and is likely to involve the use of rectified photography.

c) To identify and accurately record surviving architectural and historic features within these structures buildings. These features should be recorded in sufficient detail as to enable the preparation of an appropriate scheme of restoration. This will include the preparation of detailed survey drawings showing the extent of surviving fabric and those areas where replacement detailing can be accurately reconstructed.

d) To assess the importance of these surviving structures and to set them in their local and national context.

4.3 All surviving building remains within the development area shall be surveyed at an appropriate scale which should be no less than 1:20 unless otherwise agreed. It is anticipated that external elevations will be recorded using rectified photography. Detailed phased survey drawings shall be prepared where appropriate showing all breaks in construction, changes in masonry including mortar type and pointing, and detailing to all openings should be recorded. Detailed large scale drawings will be

produced where the repair or reconstruction of missing or damaged fabric is proposed as part of the works associated with the current planning applications.

4.4 Photographic recording of the interior and exterior of each building; with detailed photography of individual features which warrant such attention. The site archive is to include black & white photographs taken using a medium or large format camera and colour photographs using 35mm camera.

4.5 Preparation of interpretative drawings illustrating the structural development of the buildings within the development site and their relationship to the industrial processes taking place within the vicinity.

4.6 The results of the investigation will be submitted in an illustrated and bound report which will include:-

a) Written assessments of the specific objectives defined in paragraphs 2.2 and 4.2.

b) A full written description and interpretation of the results of the investigation.

c) A narrative and interpretative account of any structures showing a complex history of development and alteration.

d) It will be fully illustrated with drawings to an appropriate scale showing location, extent and detailing of each architectural feature.

e) Any documentary research/historical analysis shall be supported by copies of relevant historic plans and documents. All sources consulted shall be cited.

4.7 The site archive shall comprise all the data recovered during fieldwork and shall be quantified, ordered and indexed and will be internally consistent. It shall also contain a summary of the nature and quantity of the collected data; a full site matrix; a summary account of the context record; a summary of the artefact record; and a summary of the environmental record.

4.8 The results of the evaluation will be submitted in an illustrated and bound report which will include:-

a) Written assessments of the specific objectives defined in paragraph 2.2.

b) A full written description and interpretation of the results of all elements of the evaluation.

c) A narrative and interpretative account of any excavated stratigraphic and structural evidence.

d) It will be fully illustrated with drawings to an appropriate scale showing location, trench layout, recorded features and deposits, and section drawings.

e) Any documentary research/historical analysis shall be supported by copies of relevant historic maps and documents such as aerial photographs. All sources consulted shall be cited.

4.9 Copies of the report should be deposited with the local authority case officer (1 copy), the local library or museum, (1 copy), the Council's Sites & Monuments Record, the National Archaeological Record of the Royal Commission for the Historical Monuments of England, (1 copy). A full copy of the report should be prepared and offered for publication in an appropriate journal within 12 calendar months of the publication of the final report.

5. CONDITIONS AND ARRANGEMENTS.

5.1 In response to the project brief, contractors are expected to submit a written scheme of investigation to the Archaeology & Conservation Officer, South Gloucestershire Council detailing their intended scheme of work, proposed working methods, report format and content, timescales and staffing levels (including any specialist sub-contractors). Levels of professional competence in appropriate areas shall be demonstrated.

5.2 All archaeological work is to be carried out under the direct supervision of an appropriately qualified archaeologist. Normally this person will be formally recognized by the Institute of Field Archaeologists in appropriate areas of competence.

5.3 The code of conduct of the Institute of Field Archaeologists will be adhered to.

5.4 The archaeological Contractor is to ensure that all necessary precautions are taken in accordance with the requirements of the Health & Safety at Work Act and the current CDM Regulations where appropriate.

5.5 Prior to the commencement of the project the Archaeological Contractor shall contact the local Area Museums Council an agree arrangements for the eventual deposition of the site archive with any finds from the assessment in the appropriate Area Museums Council designated museum. Responsibility for obtaining the owner(s) permission for deposition of finds shall lie with the Contractor.

5.6 The project shall be monitored throughout by the Archaeology & Conservation Officer of South Gloucestershire Council. To facilitate this the Archaeological Contractor shall advise the Archaeological officer in advance of the date of commencement and duration of the on-site work.

5.7 The Archaeological Contractor shall ensure that any excavations are backfilled and the ground surface restored to its original profiles as required by the site owner.

DAVID HAIGH,
ARCHAEOLOGY &
CONSERVATION OFFICER

ENVIRONMENT & CONSERVATION SECTION
SOUTH GLOUCESTERSHIRE COUNCIL
15TH MAY 1998

GEOPHYSICAL SURVEY OF AREAS IN THE VICINITY OF SHORTWOOD FARM, SOUTH GLOUCESTERSHIRE

A programme of research carried out on behalf of

Wardell Armstrong

by

GeoQuest Associates

1 INTRODUCTION

1.1 This report presents the results of geophysical surveys which have been carried out in three areas adjoining Shortwood Farm about 2km NE of Mangotsfield in South Gloucestershire. The aim of the study was to provide further information concerning sub-surface archaeological features prior to a proposed programme of quarry development (Figure 1).

1.2 The research was carried out by GeoQuest Associates on behalf of Wardell Armstrong (WA) according to instructions supplied by Mr Peter Reeves of WA.

1.3 The Ordnance Survey 1:10,000 (1992 Series) shows the course of a Roman road passing NNE through the field immediately E of Linden Lea (Figure 1). This feature highlighted the archaeological potential of the study area, although the condition of the road and possible associated features (eg. settlement and cemeteries) were both uncertain. A programme of detailed geophysical survey has therefore been carried out in sample transects designed to map the course of the road and characterise the archaeological extent of associated sub-surface features.

2 SURVEY LOCATION, LANDUSE, TOPOGRAPHY AND GEOLOGY

2.1 The study areas are situated in three fields: Area 1 comprised a large pasture field, with pond, west of the derelict Shortwood Farm; Area 2 consisted of a small paddock of rough grass south of the farm; Area 3 was situated in a field of pasture east of Shortwood House and the site of Linden Lea (now demolished). The total area of investigation was approximately 0.8ha.

2.2 At the time of survey (22/11/98) the ground was well drained with no areas of bare soil. A linear ridge, suggestive of a shallow pipe, was noted traversing Area 2.

2.3 Information provided by the British Geological Survey indicates that the solid geology beneath the study areas consists of Carboniferous sedimentary rocks. A large working quarry is located immediately north of Shortwood House. There are no rock outcrops in any of the survey areas.

2.4 Area 3 is generally level while Areas 1 and 2 are gently undulating with evidence for a number of linear earthwork features (of possible archaeological interest) in Area 1.

3 THE GEOPHYSICAL SURVEYS

3.1 Field Methods

3.1.1 Measurements of vertical geomagnetic field gradient were recorded using a Geoscan FM36 fluxgate gradiometer fitted with an ST1 sample trigger. A zig-zag traverse scheme was employed and data were logged in grid units of 20x20m at 1.0x0.5m intervals, thus providing 800 measurements per grid. Appendix A provides further information about the technique.

3.1.2 Each survey grid was fixed in relation to a baseline whose position relative to features shown on the Ordnance Survey was established using an optical square and tapes.

3.1.3 Data were downloaded on-site into an IBM Thinkpad laptop computer for processing, printing and storage. These data were subsequently transferred to a laboratory computer for further processing, interpretation and archiving.

3.2 Data Processing

3.2.1 The GeoQuest InSite® Windows software was used to process the geophysical data and to produce a continuous tone grey-scale image of the data at a scale of 1:1000. These results are shown in Figure 2 on a plan that has been digitised from a 1:4000 map supplied by WA. A convention is used that shows positive magnetic anomalies as dark grey and negative magnetic anomalies as light grey. Figure 2 includes a key which relates the grey-scale intensities to anomaly values in nano Tesla per metre.

3.2.2 The following basic processing steps were applied to the data:

Removal of striping artifacts in the geomagnetic images caused by alternating changes in level between zig-zag traverses.

Removal of Random 'Spikes' present in the geomagnetic data due to small ferrous objects or fired stone on or near the ground surface. This process replaces spikes with the mean of near-neighbours.

DeShear corrects for apparent shear in strong geomagnetic anomalies surveyed by zig-zag traversing.

Correction for drift in magnetometer calibration with time.

Adjustment of grid mean values to achieve an optimum match along the lines of contact between data grids.

Interpolation of the data, using a bilinear function, to generate a regular mesh of values at 0.25 x 0.25m intervals.

3.2.3 The geophysical images were printed on a Hewlett Packard HP650C Designjet plotter with 256 grey shades and 600 dpi resolution. A sigmoid function was used to map the data to printed grey tones since this provides a measure of contrast equalisation.

Appendix B provides more information about data processing and itemises the algorithms that were applied to produce the grey-scale images in Figure 2.

4 INTERPRETATION

4.1 Key to Figures

4.1.1 A number of significant anomalies have been detected in the data and these are presented on a 1:1000 geophysical interpretation plan using coded colours and patterns (Figure 3). The following types of anomaly have been distinguished:

Green — Significant regions of anomalously high magnetic field gradient which might be associated with high susceptibility, soil-filled structures such as *pits* and *ditches*.

Blue — Areas of anomalously low magnetic field gradient, corresponding to features of low magnetic susceptibility, such as concentrations of sedimentary rock *rubble* .

Red — Strong *dipolar magnetic anomalies* (paired negative-positive) which may reflect *steel pipelines* or *dumps* of material with very high susceptibility. Smaller examples are almost certainly due to near-surface iron objects such as *horseshoes* and have been ignored in the subsequent archaeological interpretation.

4.1.2 A 1:1000 archaeological interpretation plan is presented in Figure 4.

4.2 Discussion

4.2.1 Geomagnetic anomalies within Areas 1 and 3 are weak, while very strong anomalies were detected in Area 2. The lack of surface ferrous litter has aided the detection of subsoil features of archaeological interest.

4.2.2 The northern third of Area 1 is characterised by a pattern of regularly spaced positive lineations, oriented NNW. These anomalies are consistent with the silted furrows of a ridge and furrow farming regime: the spacing between the furrows is about 4m.

4.2.3 The southern limit of the inferred ridge and furrow in Area 1 is marked by an intriguing pattern of uniformly spaced positive magnetic anomalies arranged in several rows. It seems possible that these anomalies mark the positions of tree holes or post pits along a former field boundary. An area of low magnetic susceptibility on the midline of these anomalies is consistent with a stone wall footing or track (**f1**, Figure 4).

4.2.4 Within Area 2 the geophysical survey has detected three linear chains of intense magnetic dipoles that suggest the presence of buried ferrous pipes (f2). Indeed, one of these anomalies is oriented NNE coinciding with the axis of the linear ridge described in section 2.2 above. A random pattern of magnetic dipoles has also been mapped to the north of these pipelines suggesting that this part of the field contains a deposit of brick rubble or ferrous litter (f3).

4.2.5 An extremely weak, arcuate, positive magnetic anomaly has been detected 10m E of the rubble deposit described above and may provide evidence for a poorly preserved ring ditch (f4). This feature appears to be about 6m in diameter.

4.2.6 Geophysical survey of Area 3 was designed to test for the presence of the Roman road and associated features. To achieve this purpose the survey block was elongated along the field boundary to establish the entry point of the road into the field. The area was then enlarged NE in an attempt to trace the continuation of the road along its presumed axis. However, as can be seen in Figure 2, the geophysical data provide no evidence for the existence of the road, with a notable absence of significant anomalies along the course suggested by the Ordnance survey (dot-dashed line, Figures 1-4).

4.2.7 Within Area 3 the survey has detected several weak, positive, arcuate anomalies that are consistent with ring ditches with diameters of 10-15m (f5). A further curvilinear positive anomaly may reflect a silted ditch that forms part of an enclosure extending beyond the survey area (f6).

4.2.8 The most intense geophysical disturbance mapped in Area 3 consists of a strong positive anomaly immediately E of the projected road line. This feature probably reflects a large silted ditch or area of burning (f7) that appears to form the northern limit of a deposit of stoney material (possible ploughed out road surface?).

5 SUMMARY AND CONCLUSIONS

5.1 A programme of geophysical investigation has been carried out at Shortwood Farm, Mangotsfield, in order to locate features of archaeological interest. Three samples areas were investigated, totalling 0.8ha. One area was specifically located to detect the conjectured course of a Roman road.

5.2 Geophysical evidence has been obtained, (in the form of intense dipolar anomalies), to suggest that several ferrous pipes are located in the paddock immediately SE of Shortwood Farm.

5.3 A linear pattern of geophysical anomalies west of the Farm is thought to reflect an old field boundary. Evidence for ploughed-out ridge and furrow has been found north of this presumed boundary.

5.4 The geophysical survey has been unable to confirm the presence of a metalled Roman road in the position suggested by the Ordnance Survey. An area of noisy geophysical terrain east of this axis may reflect a rubble deposit derived from ploughing of the Roman road.

5.5 Several geophysical features suggestive of prehistoric ring ditches have been detected by the survey.

6 CREDITS

Survey: M. J. Noel PhD, FRAS, V. Noel
Report: M. J. Noel
Date: 26th November 1998

APPENDIX A

PRINCIPLES OF GEOMAGNETIC SURVEYING

Geomagnetic prospecting detects subsurface features in terms of the perturbations or 'anomalies' that they induce in the Earth's magnetic field. In contrast to resistivity, seismic or electromagnetic surveying, no energy is injected into the subsoil and hence this is one of a class of *passive* geophysical techniques that includes gravity and thermal surveying. In an archaeological setting two types of magnetic anomalies can be distinguished:

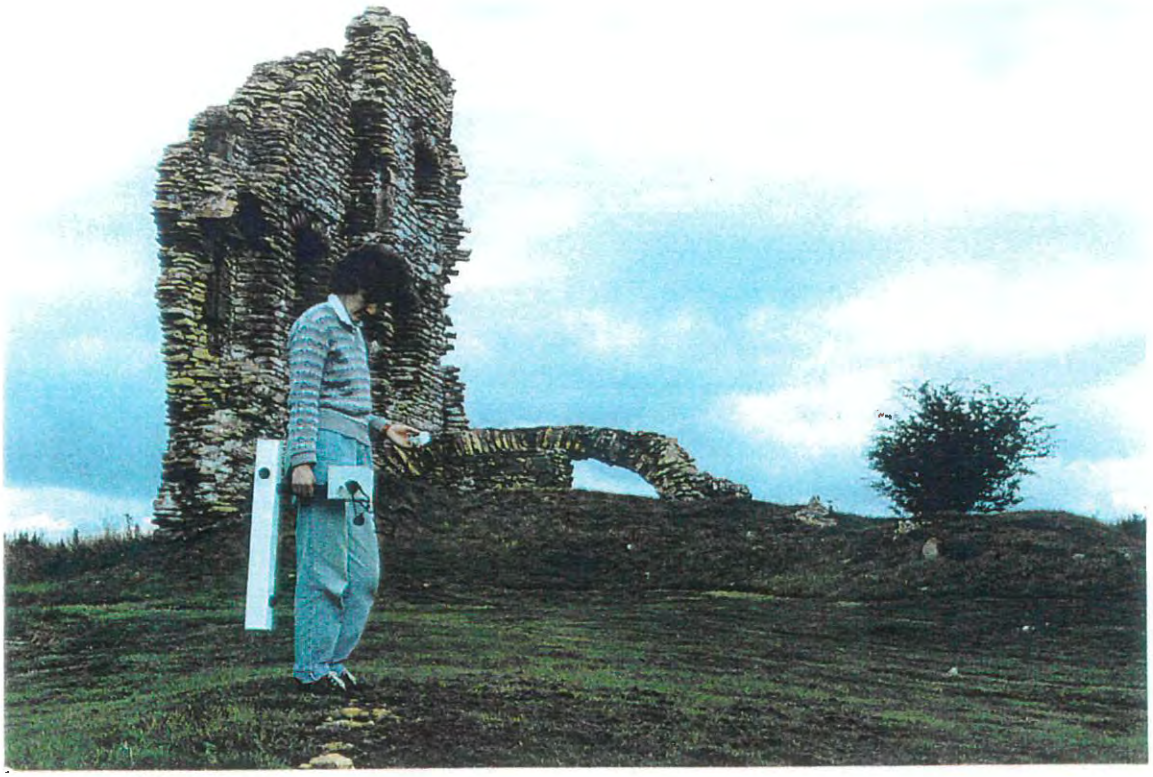
1 Anomalies arising from variations in *magnetic susceptibility* which will modulate the component of magnetisation *induced* in the subsurface by the Earth's magnetic field. For most archaeological sites, this is the dominant factor giving rise to geomagnetic anomalies. In general, susceptibility is relatively weak in sediments, such as sandstones and enhanced in igneous rocks and soils, especially those which have been burnt or stratified with organic material.

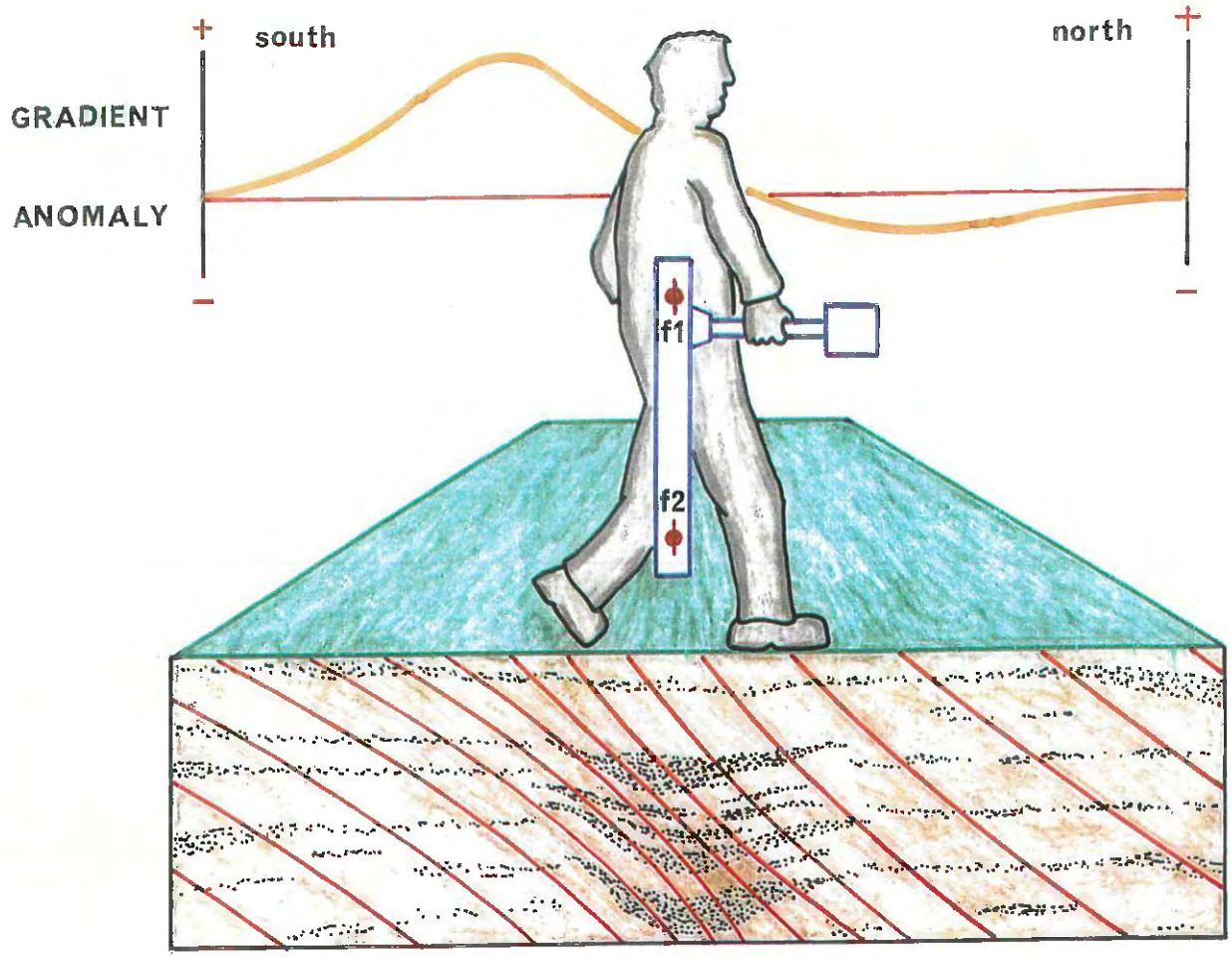
2 Anomalies due to large, *permanently magnetised* structures. Such permanent magnetisation or 'remanence' arises when earth materials are heated to above ~600°C and cooled in the geomagnetic field. Thus kilns and hearths are often detected as strong permanent magnets causing highly localised anomalies that dominate effects due to background susceptibility variations. Remanence can result from other physical and chemical processes but these give rise to anomalies that are usually unimportant for geophysical prospecting.

There are several approaches towards the practical measurement of geomagnetic anomalies. In this study measurements were made using a Geoscan FM36 fluxgate gradiometer which records the change with height in the vertical component of the Earth's magnetic field, as shown overleaf. This method has the advantage of being insensitive to diurnal variations while the Geoscan instrument also benefits from an integrated data logger. Note that in mid northern latitudes the magnetic anomaly will be asymmetric with the main peak displaced to the south of the archaeological feature. Thus, a ditch filled with a soil of enhanced susceptibility, for example, will generate a positive anomaly to the south, mirrored by a weak negative anomaly north of the feature. When portrayed as an area map of grey tones this gives rise to a 'shadowing' or pseudo relief effect which must be borne in mind when making an archaeological interpretation.

Two techniques can be used to survey gridded areas using the fluxgate magnetometer. In the parallel method the instrument is used to scan the area along traverses which are always in the same direction. This method minimises 'heading errors' due to operator and instrument magnetisation but is time consuming. The alternative zig-zag method is significantly faster and suitable for areas where anomalies are large compared to these and other sources of error.

MAGNETIC SURVEYING





APPENDIX B
DATA PROCESSING

PROCESSING THE SURVEY DATA

The geophysical images contained in this report were prepared within Microsoft Windows® using the **InSite®** software published by GeoQuest Associates. Geophysical images were then placed onto a map which was digitised from the Ordnance Survey, edited and then plotted using a computer aided drafting (CAD) system and colour inkjet printer.

Data were downloaded from the meter to a portable computer in the field for storage, visualisation and quality control (QC) assessment. These data were then transferred to a laboratory computer for final processing, printing and archiving.

A number of process steps have been applied to the geophysical data obtained during the survey and those which have been used are linked to the main flow path by arrows. Steps were applied in the order shown and are designed to reduce artifacts in the data and enhance geophysical features of archaeological interest. The following sections describe each step in more detail.

REMOVE STRIPING

Reduces a data artifact comprising alternating changes in level in readings logged along zig-zag traverses. This artifact is common in fluxgate magnetometer data. InSite uses a proprietary algorithm to reduce this error.

INFILL SMALL BLANK AREAS

Fills isolated blank data cells with the mean of near-neighbours or a suitable approximation entered manually. Small blank areas will have been logged if it was not possible to obtain a geophysical reading over, for example, a manhole cover in the case of a resistivity survey.

REMOVE SPIKES

Replaces isolated, anomalously high or low values with the mean of near neighbours or a suitable approximation entered manually. 'Spike' readings are commonly associated with ferrous litter or poor electrical contact in the case of geomagnetic and resistivity data, respectively.

REDUCE WALK HARMONICS

Reduces a regular oscillation in traverse data caused by walking movements of the operator during a geomagnetic survey. InSite employs a fast Fourier transform to determine the optimum amplitude and phase of the walk-induced harmonic which is then subtracted from each traverse.

REDUCE SHEAR ARTIFACTS

Corrects for apparent shear in geomagnetic anomalies surveyed by zig-zag traversing in a geomagnetic survey. The shearing effect arises from the interaction of the operator + magnetometer with the geomagnetic field and also from the lag in the instrument response to changes in the field. InSite uses a proprietary algorithm to reduce this error.

CORRECT FOR METER DRIFT

Corrects for a linear drift in the meter calibration with time. Such drift is a common problem with fluxgate magnetometers, particularly during periods of rapid air temperature change. InSite uses least-squares regression on the mean of data along each traverse to estimate the change in calibration level across each grid. This gradient is then removed from the data.

ADJUST GRID MEAN LEVELS

Adjusts for differences in the mean level in data grids due to changes in instrument calibration (fluxgate magnetometer survey) or alteration in remote electrode spacing (resistivity survey).

INTERPOLATE AND COMBINE

Combines grids to form an array of regularly-spaced data on a square mesh. InSite uses bilinear interpolation to accomplish this.

LOW PASS FILTER

If this process task is indicated then a 3x3 or 5x5 boxcar filter has been used to smooth the data and reduce noise or 'speckle' seen in the original image.

HIGH PASS FILTER

If this process task is indicated then a 3x3 or 5x5 filter, with appropriate coefficients, has been used to pass short-wavelength information into the resulting image.

EDGE DETECT FILTER

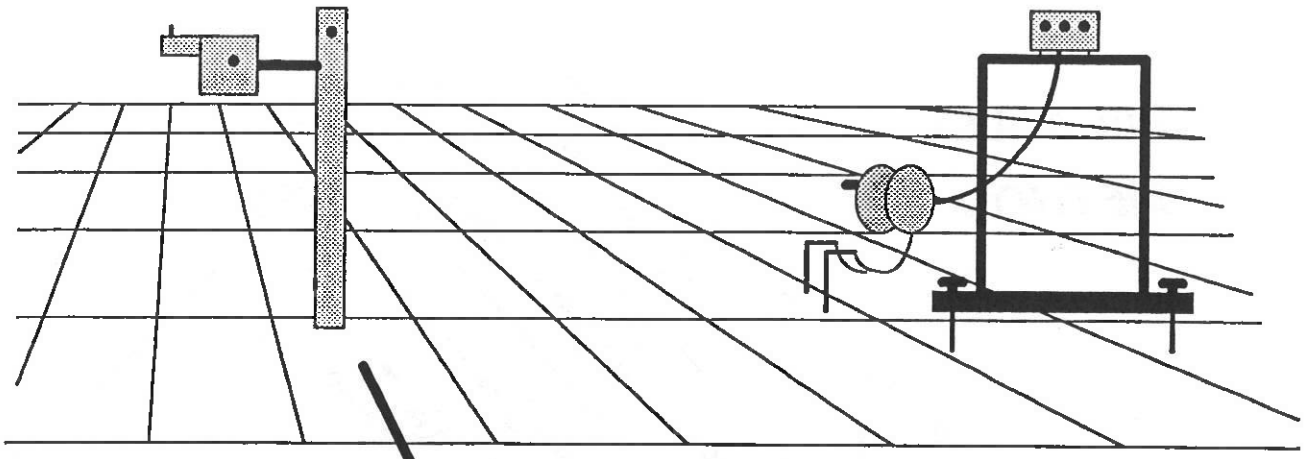
Signifies that a Sobel, Laplace or other specialised filter has been applied to enhance significant lateral transitions in the geophysical image.

DIRECTIONAL FILTER

This filter is equivalent to illuminating the data from one direction to produce a pseudo-relief image. Directional filtering is usually employed to aid the identification of subtle anomalies in resistivity data. This filter highlights features trending at right angles to the direction of illumination.

NOTE

GeoQuest Associates can supply the geophysical images presented in this report in a variety of digital formats for visualisation on microcomputers running Microsoft Windows. These formats include the TIFF, BMP and PCX standards. Please complete the request form at the rear of this report if you would like to receive such image files.



FIELD PC

LAB PC

QC

DATA ARCHIVE

IMAGE RAW GRID DATA

REMOVE STRIPING

REMOVE SPIKES

REPORT FIGURE 2

INTERPOLATE AND COMBINE

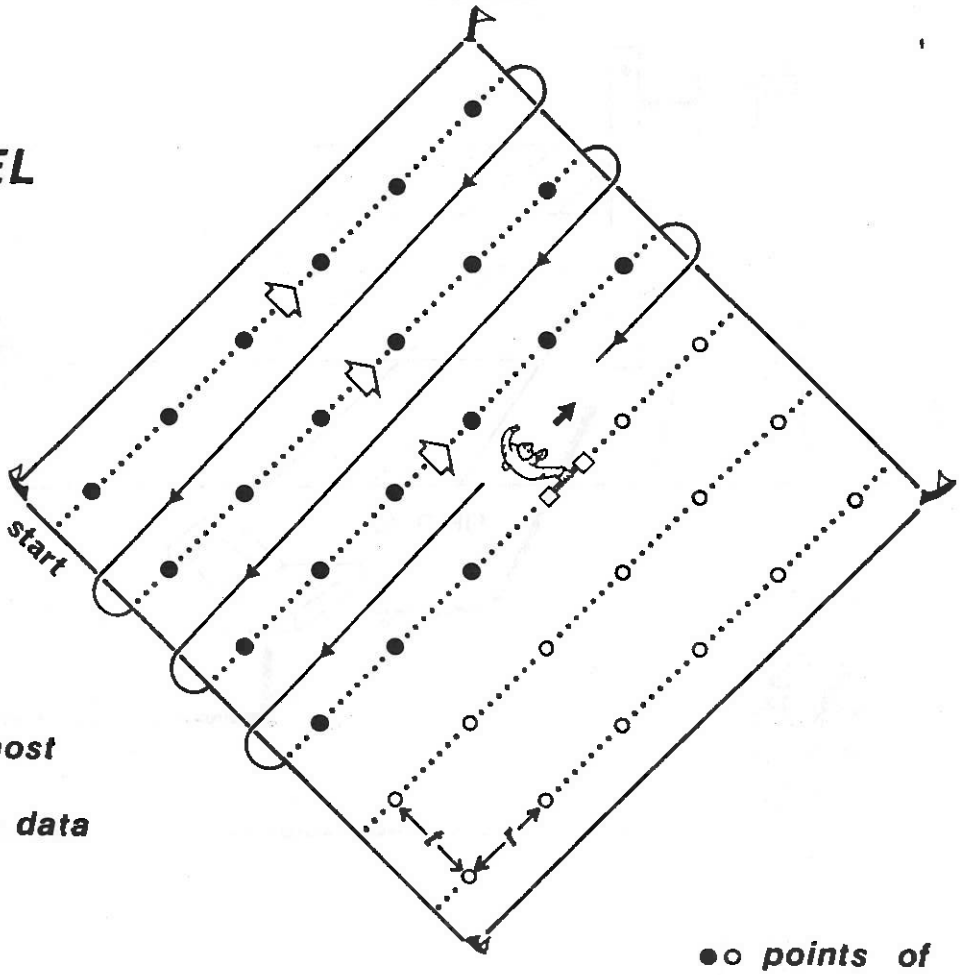
ADJUST GRID MEAN LEVELS

CORRECT FOR METER DRIFT

REDUCE SHEAR ARTIFACTS

SURVEY SCHEMES

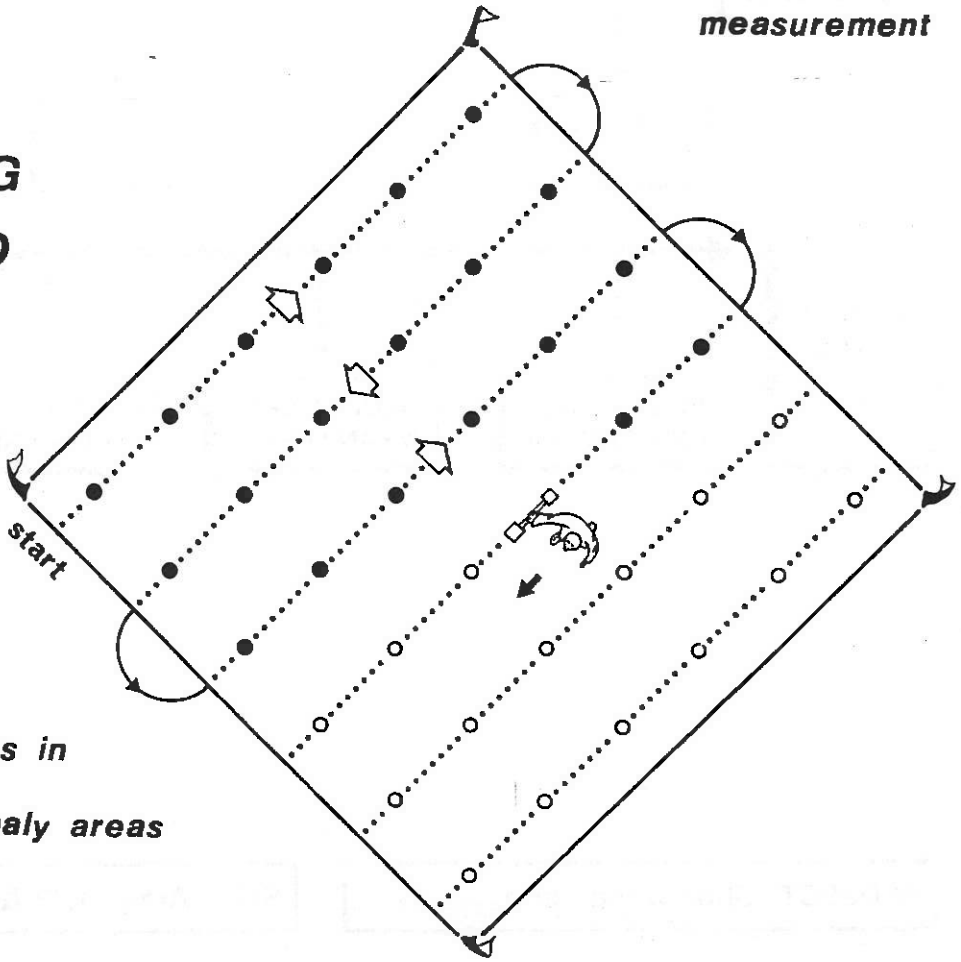
PARALLEL METHOD



slower but minimises most errors in the data

●○ *points of measurement*

ZIG-ZAG METHOD



suitable for rapid surveys in strong anomaly areas

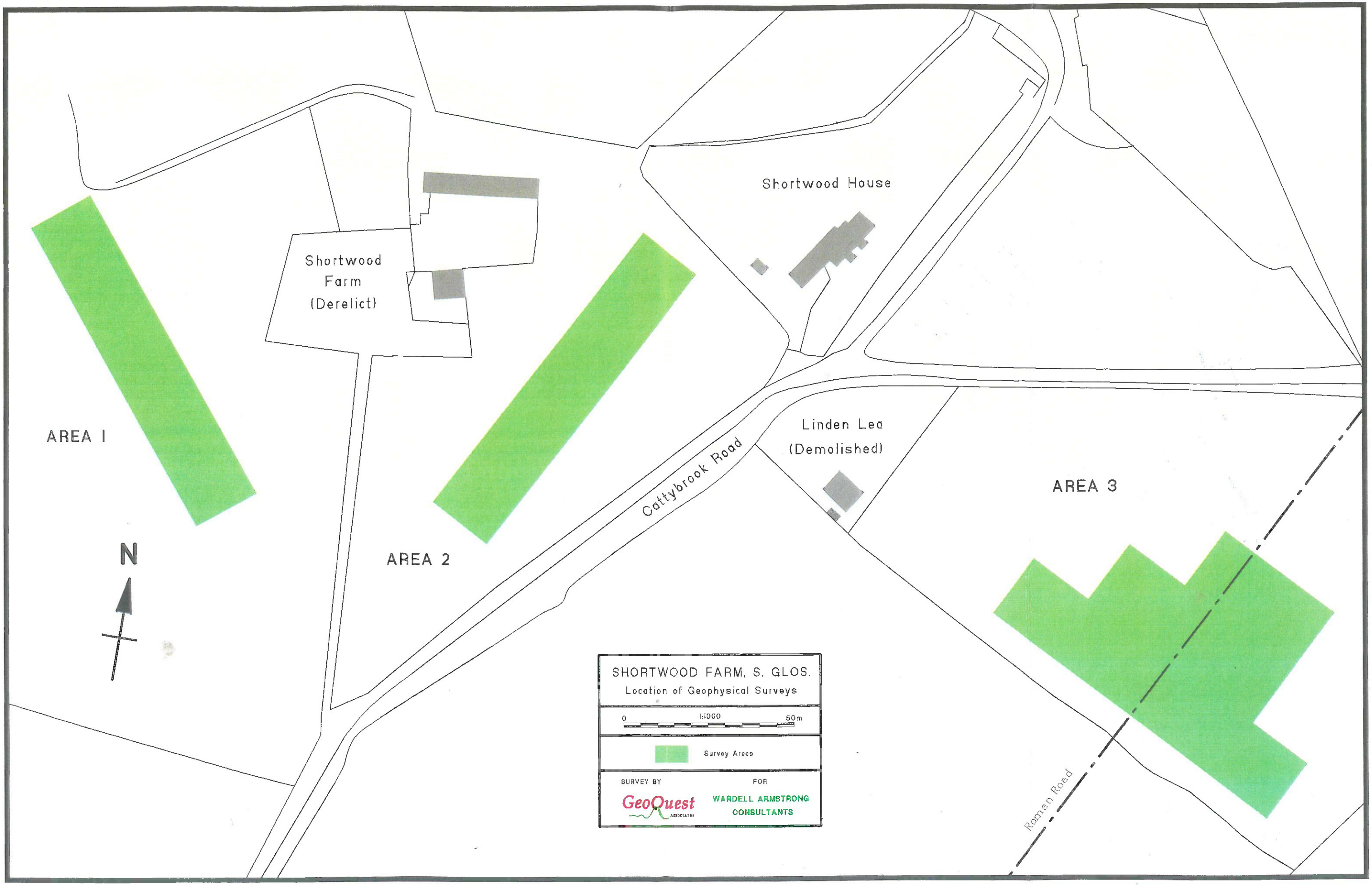

Shortwood House
Shortwood Farm (Derelict)
AREA 1
AREA 2
AREA 3
Linden Lea (Demolished)
Cattybrook Road
Roman Road
N
SHORTWOOD FARM, S. GLOS.
Location of Geophysical Surveys
0
1:1000
50m
Survey Areas
SURVEY BY
GeoQuest ASSOCIATES
FOR
WARDELL ARMSTRONG CONSULTANTS

FIGURE 1

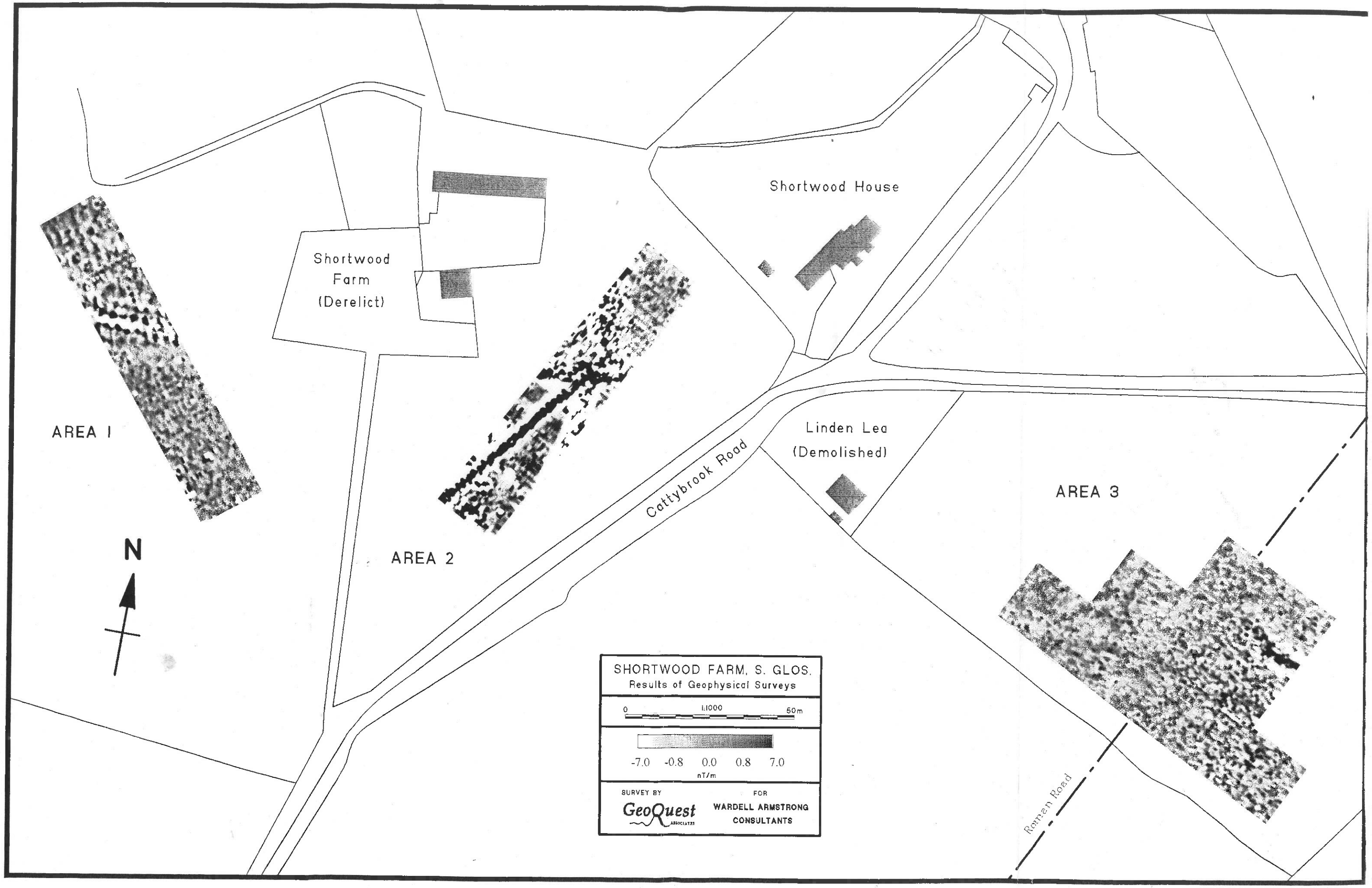

Shortwood House
Shortwood Farm (Derelict)
AREA 1
AREA 2
AREA 3
Linden Lea (Demolished)
Cattybrook Road
Roman Road
N
SHORTWOOD FARM, S. GLOS.
Results of Geophysical Surveys
0
1:1000
50m
-7.0 -0.8 0.0 0.8 7.0
nT/m
SURVEY BY
GeoQuest ASSOCIATES
FOR
WARDELL ARMSTRONG CONSULTANTS

FIGURE 2

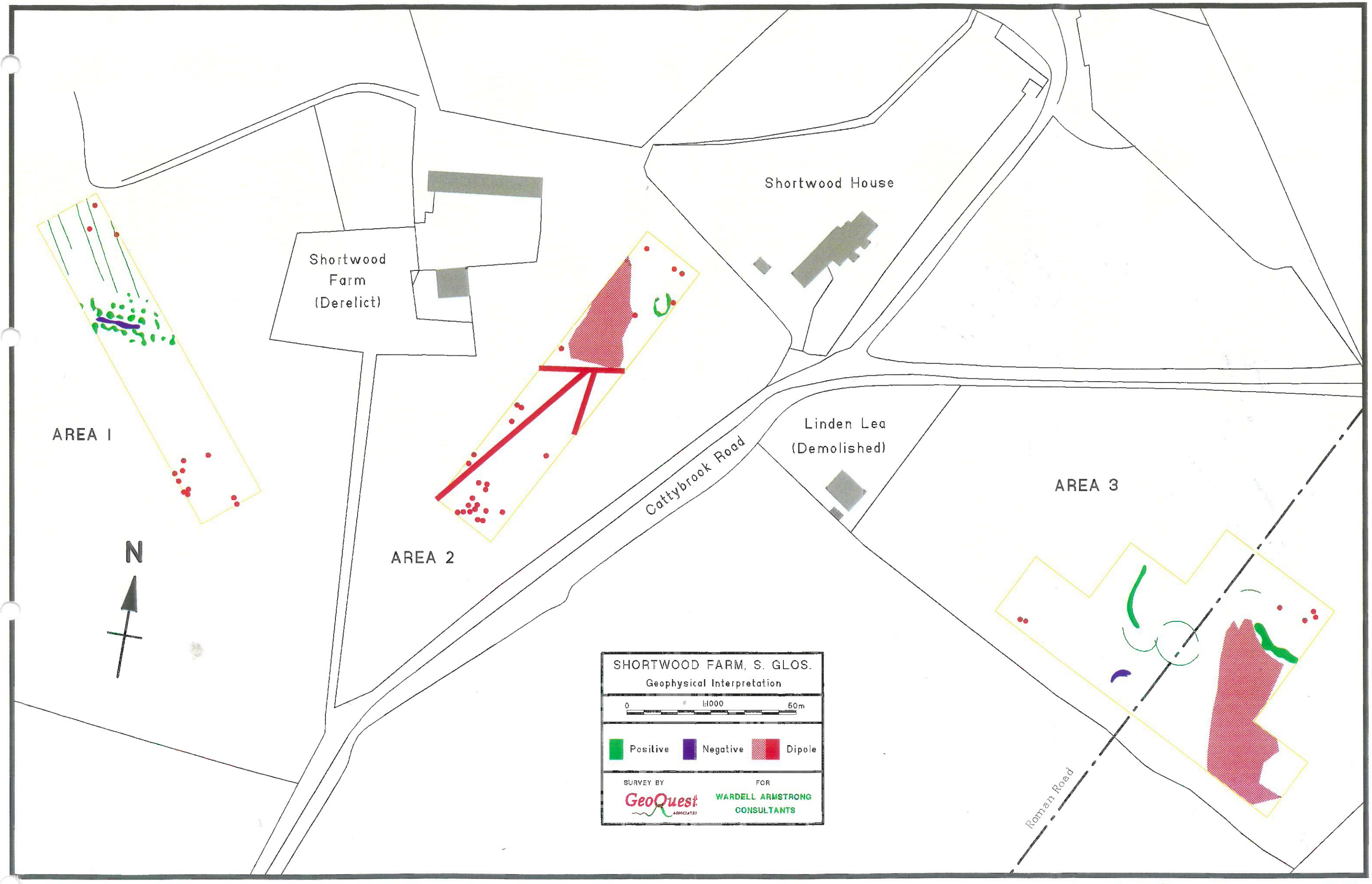

Shortwood House
Shortwood Farm (Derelict)
Linden Lea (Demolished)
Cattybrook Road
AREA 1
AREA 2
AREA 3
N
Roman Road
SHORTWOOD FARM, S. GLOS.
Geophysical Interpretation
0
1:1000
50m
Positive
Negative
Dipole
SURVEY BY
GeoQuest
ASSOCIATES
FOR
WARDELL ARMSTRONG
CONSULTANTS

FIGURE 3

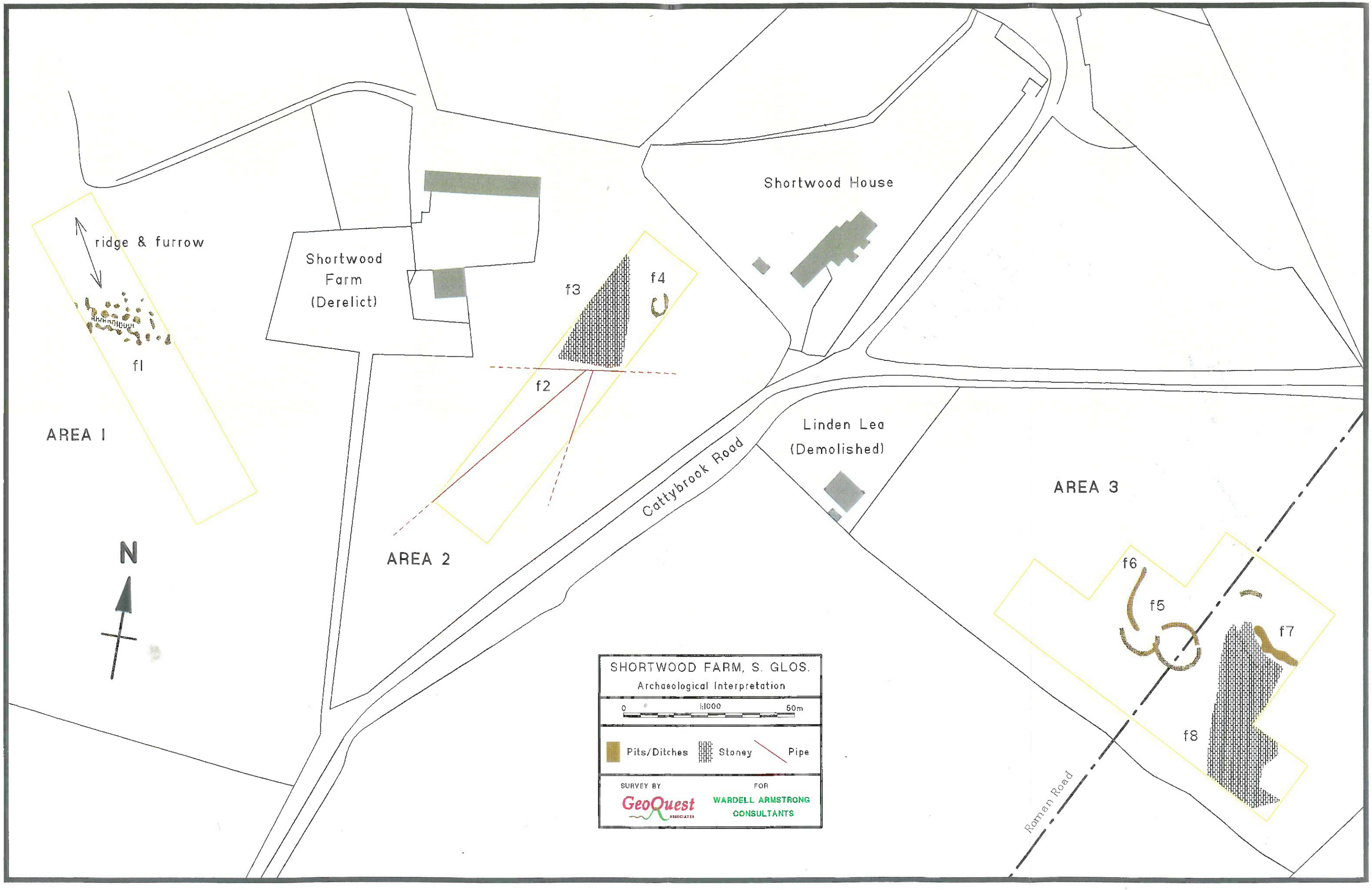

ridge & furrow
f1
AREA 1
Shortwood Farm (Derelict)
f3
f4
f2
AREA 2
Shortwood House
Linden Lea (Demolished)
Cattybrook Road
AREA 3
f6
f5
f7
f8
Roman Road
N
SHORTWOOD FARM, S. GLOS.
Archaeological Interpretation
0
1:1000
50m
Pits/Ditches
Stoney
Pipe
SURVEY BY
GeoQuest ASSOCIATES
FOR
WARDELL ARMSTRONG CONSULTANTS

FIGURE 4

13/2

GEOPHYSICAL SURVEYS IN THE VICINITY OF SHORTWOOD FARM, SOUTH GLOUCESTERSHIRE
- PHASE 2 -

A programme of research carried out
on behalf of

Wardell Armstrong

by

GeoQuest Associates

1 INTRODUCTION

1.1 This report presents the results of a second phase of geophysical survey which has been carried out on land at Shortwood Farm, *ca.*2km east of Mangotsfield, in South Gloucestershire. The aim of the study was to provide further information concerning sub-surface archaeological features, particularly the location of a Roman road, prior to a proposed programme of quarry development (Figure 1).

1.2 The first phase of geophysical survey was carried out by GeoQuest Associates in November 1998 and one of the primary aims of that research was to try to confirm the presumed course of a Roman road to the east of Shortwood Farm (GeoQuest Associates, 1998). Although some geomagnetic anomalies were detected in that area the results proved inconclusive with regard to the Roman road.

1.3 This second phase of research was again carried out by GeoQuest Associates on behalf of Wardell Armstrong (WA) according to instructions supplied by Mr Peter Reeves of WA. It was intended to undertake geophysical surveys of three fields for this phase of the project, however, it was not possible to survey in the small enclosure that formerly housed Linden Lea due to the presence of trees and undergrowth, standing water and brick/concrete rubble. The northern corner of Area 2 was also under a considerable depth of standing water at the time of fieldwork (11-13/3/99) and so was not surveyed.

2 SURVEY LOCATION, LANDUSE, TOPOGRAPHY AND GEOLOGY

2.1 The survey areas comprise two pasture fields immediately east of Shortwood House, one on either side of a lane. Both fields are generally level at a mean altitude of *ca.*65m AOD. Area 3 covered *ca.*1.5ha while Area 4 measured *ca.*0.5ha, providing a total survey area of *ca.*2.0ha.

2.2 Information provided by the British Geological Survey indicates that the solid geology beneath the study area consists of Carboniferous sedimentary rocks which are overlain by clay. There are no rock outcrops in either of the survey areas.

3 THE GEOPHYSICAL SURVEYS

3.1 Field Methods

3.1.1 Measurements of vertical geomagnetic field gradient were recorded using a Geoscan FM36 fluxgate gradiometer fitted with an ST1 sample trigger. A zig-zag traverse scheme was employed and data were logged in grid units of 20x20m at 1.0x0.5m

intervals, thus providing 800 measurements per grid. Appendix A provides further information about the technique.

3.1.2 Each survey grid was fixed in relation to a baseline whose position relative to features shown on the Ordnance Survey was established using tapes.

3.1.3 Data were downloaded on-site into a Toshiba Satellite 110CT laptop computer for processing, printing and storage. These data were subsequently transferred to a laboratory computer for further processing, interpretation and archiving.

3.2 Data Processing

3.2.1 The GeoQuest InSite® Windows software was used to process the geophysical data and to produce a continuous tone grey-scale image of the data at a scale of 1:1000. These results are shown in Figure 2 on a plan that has been digitised from a 1:4000 map supplied by WA. A convention is used that shows positive magnetic anomalies as dark grey and negative magnetic anomalies as light grey. Figure 2 includes a key which relates the grey-scale intensities to anomaly values in nano Tesla per metre.

3.2.2 The following basic processing steps were applied to the data:

Removal of striping artifacts in the geomagnetic images caused by alternating changes in level between zig-zag traverses.

Removal of Random 'Spikes' present in the geomagnetic data due to small ferrous objects or fired material on or near the ground surface. This process replaces spikes with the mean of near-neighbours.

DeShear corrects for apparent shear in strong geomagnetic anomalies surveyed by zig-zag traversing.

Correction for drift in magnetometer calibration with time.

Adjustment of grid mean values to achieve an optimum match along the lines of contact between data grids.

Interpolation of the data, using a bilinear function, to generate a regular mesh of values at 0.25 x 0.25m intervals.

3.2.3 The geophysical images were printed on a Hewlett Packard HP650C Designjet plotter with 256 grey shades and 600 dpi resolution. A sigmoid function was used to map the data to printed grey tones since this provides a measure of contrast equalisation. Appendix B provides more information about data processing and itemises the algorithms that were applied to produce the grey-scale images in Figure 2.

4 INTERPRETATION

4.1 Key to Figures

4.1.1 A number of significant anomalies have been detected in the data and these are presented on a 1:1000 geophysical interpretation plan using coded colours and patterns (Figure 3). The following types of anomaly have been distinguished:

Green Significant regions of anomalously high magnetic field gradient which might be associated with high susceptibility, soil-filled structures such as *pits* and *ditches*.

Blue Areas of anomalously low magnetic field gradient, corresponding to features of low magnetic susceptibility, such as concentrations of sedimentary rock *rubble* .

Red Strong *dipolar magnetic anomalies* (paired negative-positive) which may reflect *steel pipelines* or *dumps* of material with very high susceptibility. Smaller examples are almost certainly due to near-surface iron objects such as *horseshoes* and have been ignored in the subsequent archaeological interpretation.

4.1.2 A 1:1000 archaeological interpretation plan is presented in Figure 4.

4.2 Area 3 Discussion

4.2.1 This survey covered the whole of the field, thus including the location of the 'Area 3' survey from the first fieldwork phase of this project. Many anomalies of probable archaeological interest have been detected.

4.2.2 Although the anomalies are very weak and discontinuous, it appears that the survey has detected evidence for the Roman road within this field. A negative magnetic anomaly, indicating an increased concentration of stone, traverses the field in a NNE direction. This anomaly, which measures *ca.*3m in width, corresponds almost exactly with the course of the Roman road as shown on Ordnance Survey maps. Immediately to the east of this feature a row of positive magnetic anomalies has been detected. These anomalies reflect relative increases in high magnetic susceptibility materials and almost certainly indicate the presence of humic-rich deposits within the remains of a ditch. The weak and diffuse nature of these anomalies suggests that the road has been quite seriously damaged over the years, presumably by ploughing. A Roman road would typically be flanked by ditches on both sides, however, in this instance only one of the ditches appears to have survived. Part of this ditch was identified in the first phase of survey (**f6** in that report) but its interpretation was limited by the physical size of the survey area.

4.2.3 A significant change in the magnetic 'texture' of this survey area is evident in the western corner of the field. Two rows of evenly spaced positive magnetic anomalies have been detected either side of a negative magnetic lineation. These anomalies are identical in nature to those detected in Area 1, 200m to the west during Phase 1 (**f1**) of the project (GeoQuest Associates, 1998). The anomalies are again interpreted as tree holes or post pits flanking a trackway, together forming a substantial land boundary. The geomagnetic terrain to the east of the boundary is generally very smooth in comparison with that to the west where the whole area is covered by small dipolar magnetic anomalies. These anomalies reflect objects with very high magnetic susceptibility such as near-surface ferrous litter or bricks/tiles.

4.2.4 Several arcuate positive magnetic anomalies have again been detected in the central part of this area. It is likely that these anomalies could represent the remains of soil-filled ring ditches.

4.2.5 One of the most intense geophysical features in this field comprises a curvilinear positive magnetic anomaly, identified as **f7** in Phase 1 of the survey. This anomaly almost certainly reflects high magnetic susceptibility materials, perhaps burnt or fired, within a substantial ditch.

4.2.6 The survey has detected several more, weaker positive magnetic lineations across the site with different orientations. These ditch features may have served a variety of purposes and are not necessarily contemporary. At least one ditch, which has been mapped traversing the site east-west, appears to be cut by the Roman road, indicating that it is an earlier feature, perhaps an Iron Age field boundary. Two parallel ditches that have been detected towards the north of the survey probably flank a former track or droveway.

4.2.7 A concentration of intense dipolar magnetic anomalies has been detected along the eastern limit of the survey area, in particular an intense L-shaped lineation. These anomalies are thought to represent relatively recent structural remains perhaps comprising brick or even reinforced concrete features.

4.3 Area 4 Discussion

4.3.1 It has not been possible to identify the remains of the Roman road in the eastern part of this field. It may be that the road has been completely destroyed here or that the magnetic effects of nearby telegraph poles and a large metal trough have overshadowed any weaker anomalies that may otherwise have been detected.

4.3.2 A cluster of large intense dipolar magnetic anomalies has been detected near the centre of this small field. These anomalies could indicate the site of an intense fire or a considerable quantity of buried ferrous debris. Immediately to the south of this feature another intense dipolar magnetic anomaly indicates the location of a recent, steel-capped borehole.

4.3.3 Three parallel chains of small, intense positive magnetic anomalies have been detected in the southeastern part of the field. The rows of anomalies are spaced *ca.*6m apart and almost certainly reflect land drains comprising many short lengths of fired clay pipe.

5 SUMMARY AND CONCLUSIONS

5.1 A second phase of geophysical investigation has been carried out at Shortwood Farm, Mangotsfield, in order to further characterise features of archaeological interest. Two fields have been investigated, totalling 2.0ha, and various features of probable archaeological interest have been detected.

5.2 The Roman road shown on Ordnance Survey maps has almost certainly been identified aligned NNE in Area 3, the larger field, together with the remains of one of its ditches. This feature has not been detected in the field to the north.

5.3 Several ditch features have been detected in Area 3. Some of these features would almost certainly have been field boundaries while others may have formed smaller enclosures. Two possible former trackways have also been identified in this area. At least some of these features appear to be pre-Roman, perhaps forming part of an Iron Age landscape of farmsteads and field systems.

6 CREDITS

Survey: DN Hale, N Boldrini
Graphics: MJ Noel
Report: DN Hale
Date: 16th March 1999

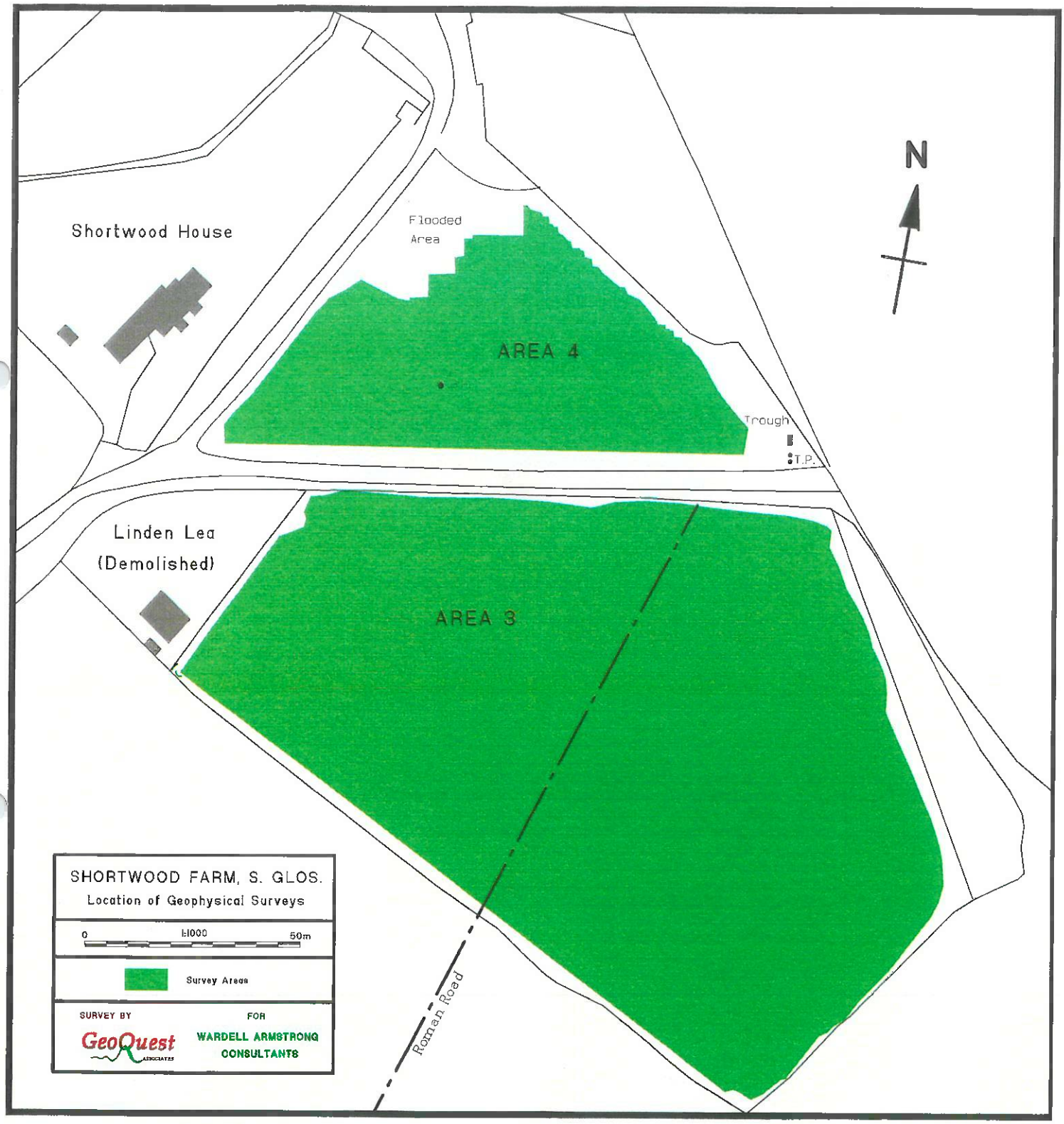

Shortwood House
Flooded
Area
AREA 4
Trough
T.P.
N
Linden Lea
(Demolished)
AREA 3
Roman Road
SHORTWOOD FARM, S. GLOS.
Location of Geophysical Surveys
0
1:1000
50m
Survey Areas
SURVEY BY
GeoQuest
ASSOCIATES
FOR
WARDELL ARMSTRONG
CONSULTANTS

FIGURE 1

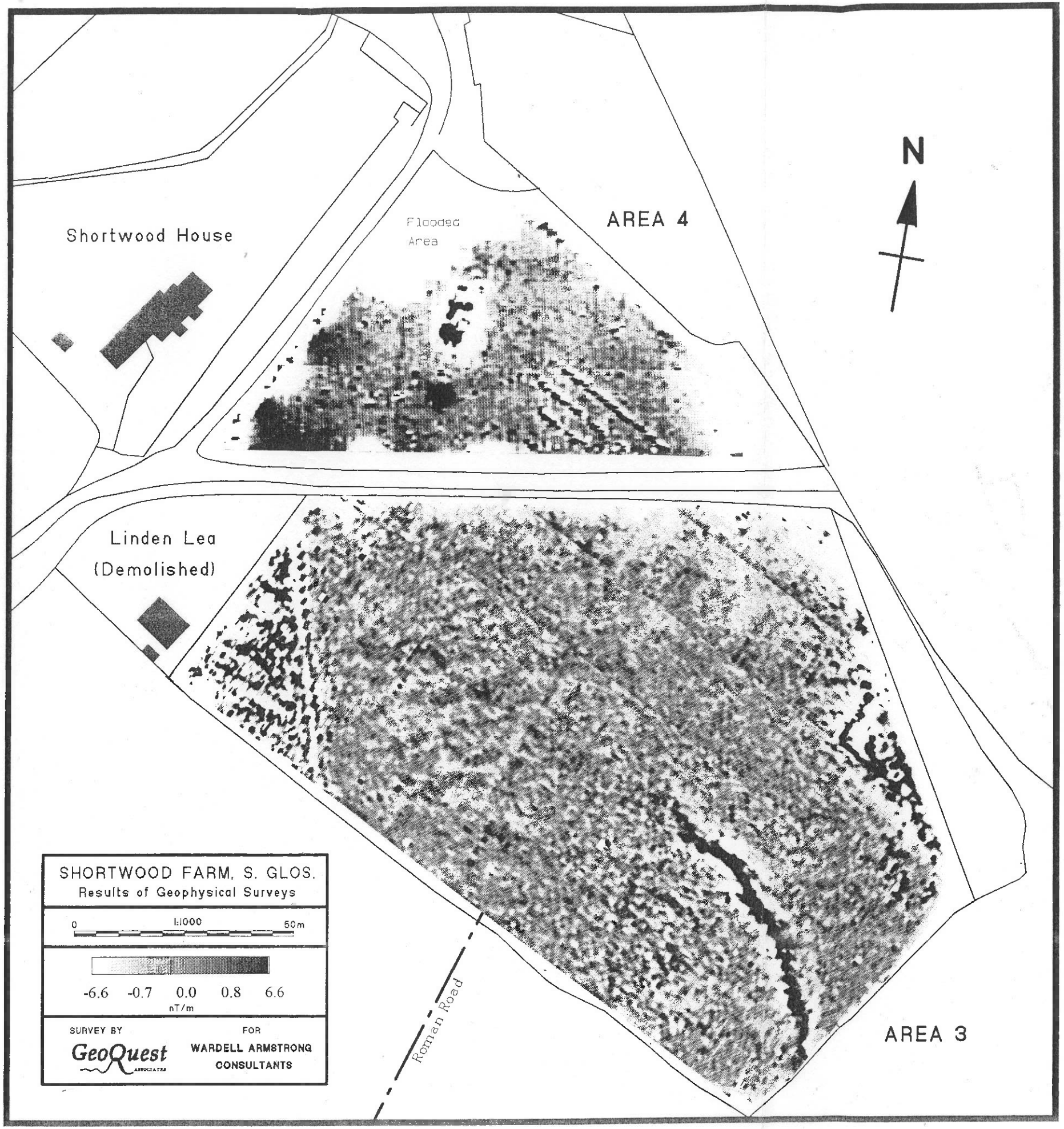

Shortwood House
Flooded Area
AREA 4
N
Linden Lea
(Demolished)
Roman Road
AREA 3
SHORTWOOD FARM, S. GLOS.
Results of Geophysical Surveys
0
1:1000
50m
-6.6 -0.7 0.0 0.8 6.6
nT/m
SURVEY BY
GeoQuest
ASSOCIATES
FOR
WARDELL ARMSTRONG
CONSULTANTS

FIGURE 2

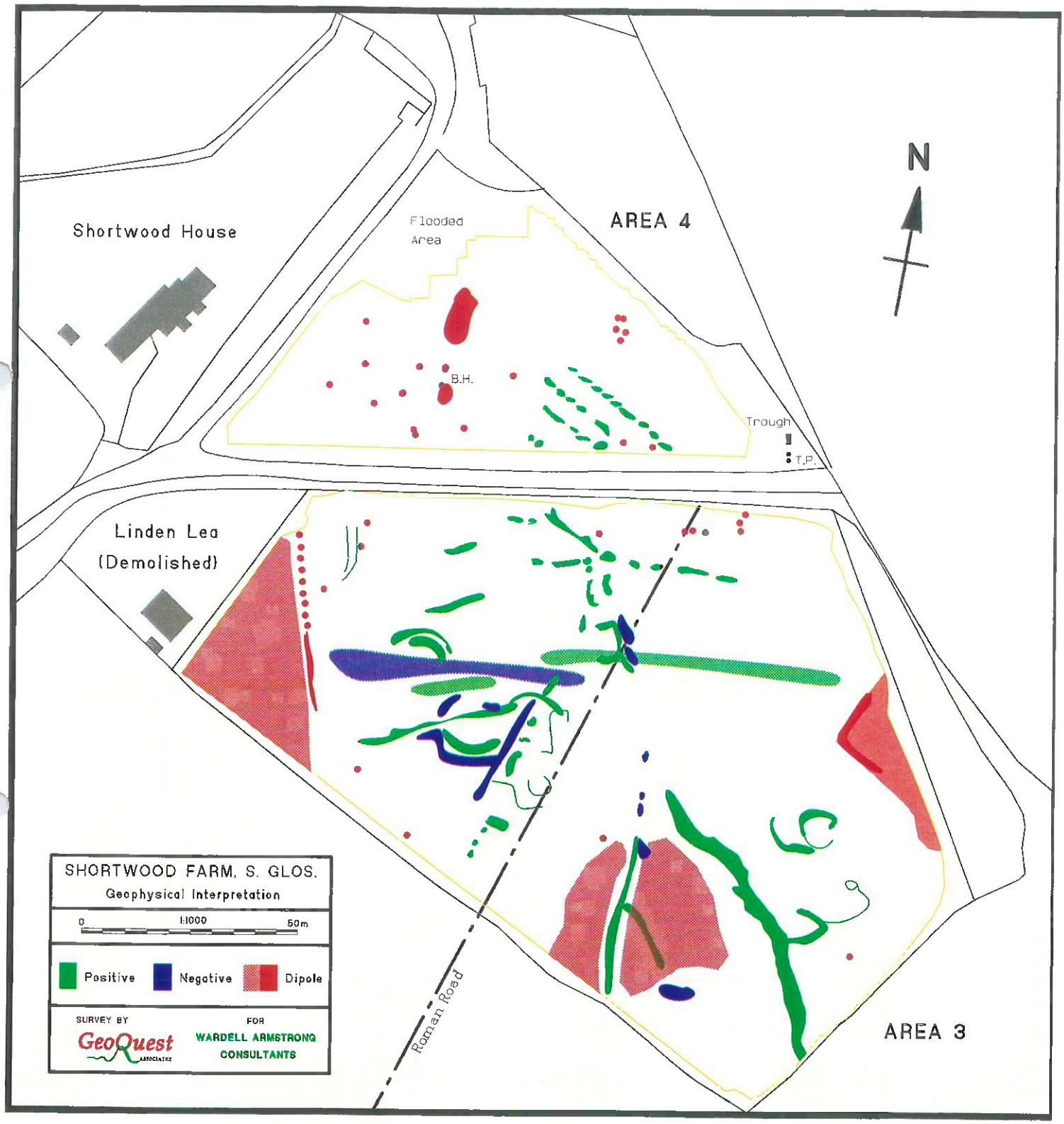

Shortwood House
Flooded Area
AREA 4
N
B.H.
Trough
T.P.
Linden Lea
(Demolished)
Roman Road
AREA 3
SHORTWOOD FARM, S. GLOS.
Geophysical Interpretation
0
1:1000
50m
Positive
Negative
Dipole
SURVEY BY
GeoQuest
ASSOCIATES
FOR
WARDELL ARMSTRONG
CONSULTANTS

FIGURE 3

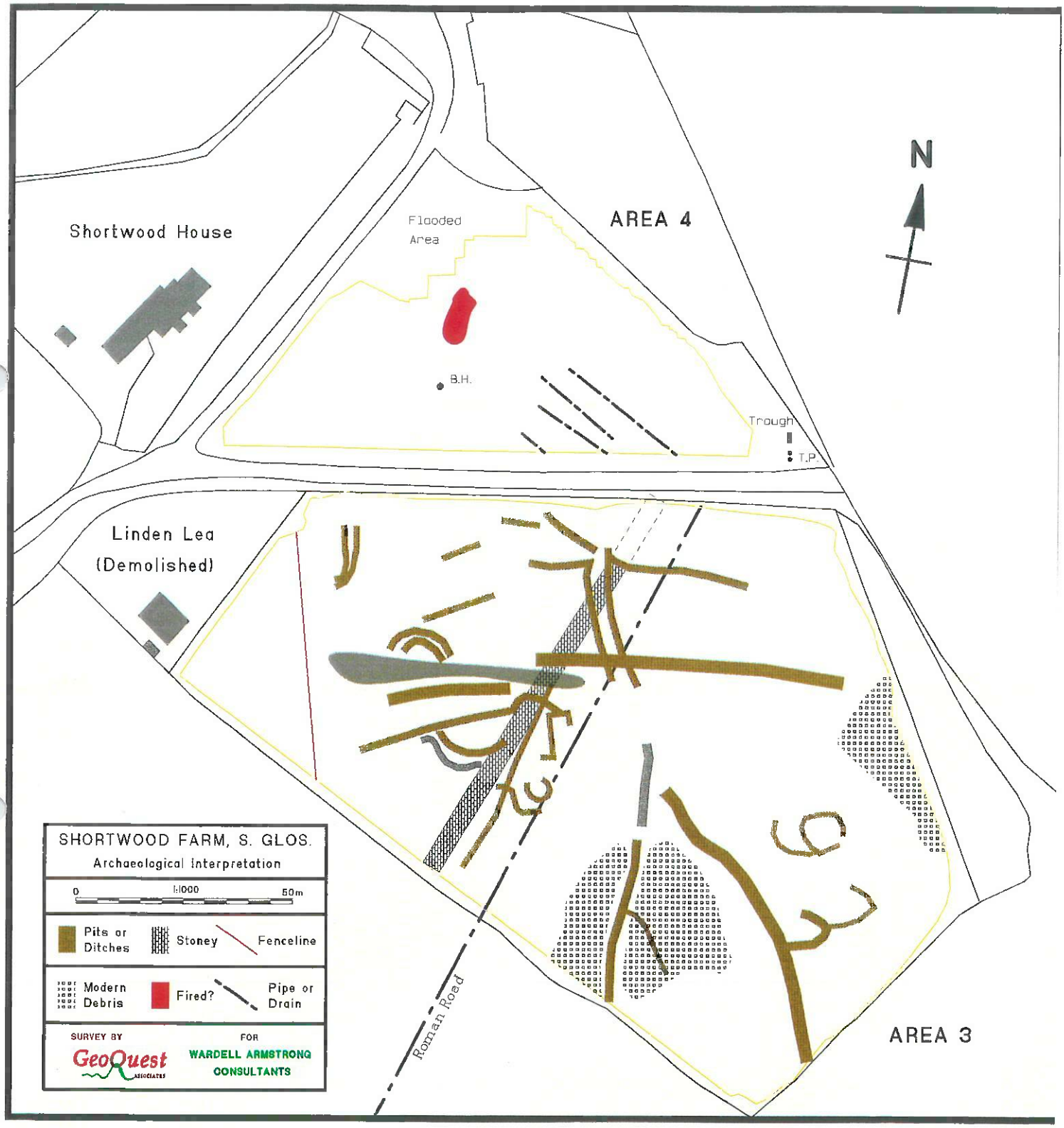

Shortwood House
Flooded Area
AREA 4
N
B.H.
Trough
T.P.
Linden Lea
(Demolished)
SHORTWOOD FARM, S. GLOS.
Archaeological Interpretation
0
1:1000
50m
Pits or Ditches
Stoney
Fenceline
Modern Debris
Fired?
Pipe or Drain
SURVEY BY
GeoQuest
ASSOCIATES
FOR
WARDELL ARMSTRONG
CONSULTANTS
Roman Road
AREA 3

FIGURE 4

APPENDIX A
PRINCIPLES OF GEOMAGNETIC SURVEYING

Geomagnetic prospecting detects subsurface features in terms of the perturbations or 'anomalies' that they induce in the Earth's magnetic field. In contrast to resistivity, seismic or electromagnetic surveying, no energy is injected into the subsoil and hence this is one of a class of *passive* geophysical techniques that includes gravity and thermal surveying. Two types of magnetic anomalies can be distinguished:

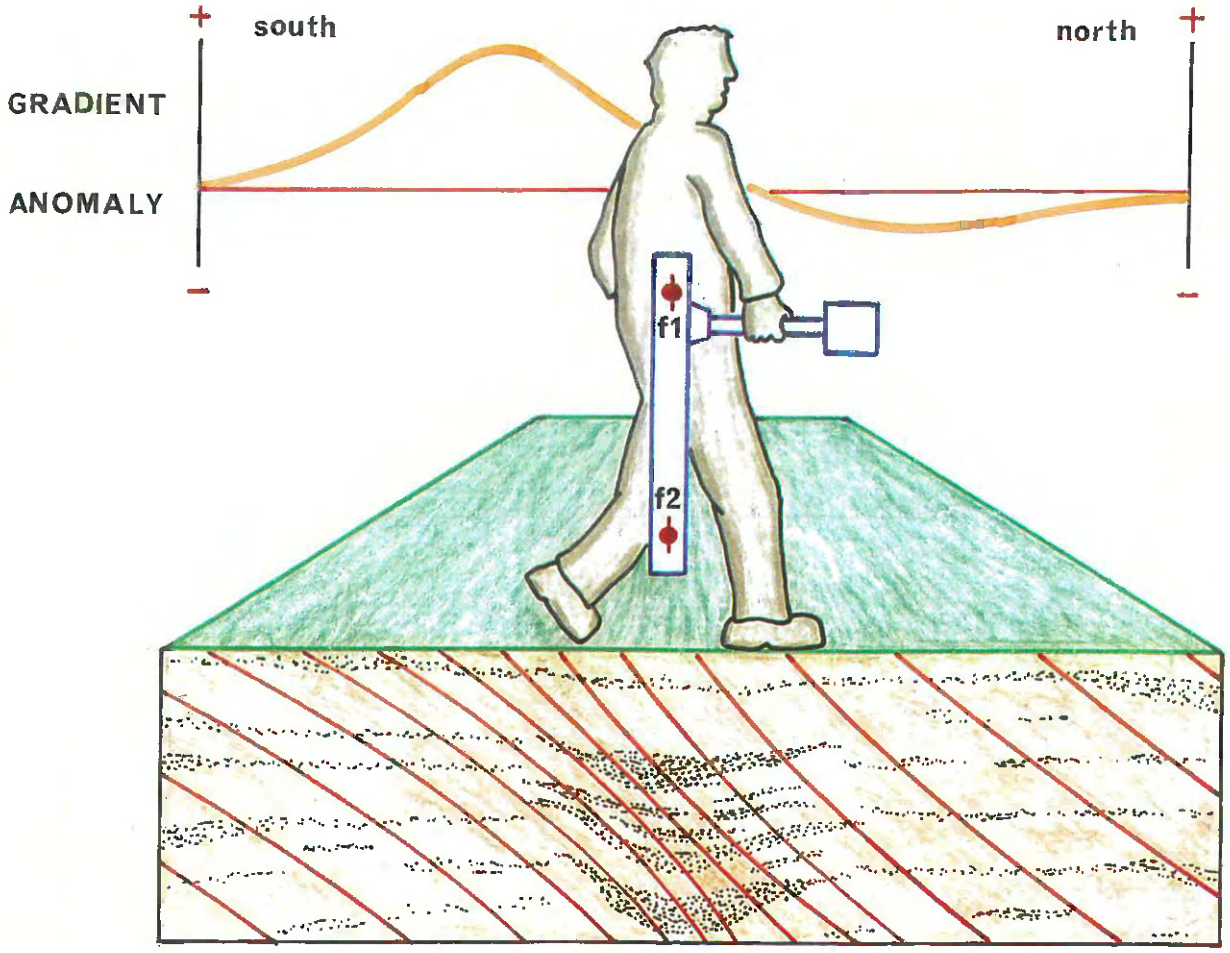
1 Anomalies arising from variations in *magnetic susceptibility* which will modulate the component of magnetisation *induced* in the subsurface by the Earth's magnetic field. For most archaeological sites, this is the dominant factor giving rise to geomagnetic anomalies. In general, susceptibility is relatively weak in sediments, such as sandstones and enhanced in igneous rocks and soils, especially those which have been burnt or stratified with organic material.

2 Anomalies due to large, *permanently magnetised* structures. Such permanent magnetisation or 'remanence' arises when earth materials are heated to above ~600°C and cooled in the geomagnetic field. Thus kilns and hearths are often detected as strong permanent magnets causing highly localised anomalies that dominate effects due to background susceptibility variations. Remanence can result from other physical and chemical processes but these give rise to anomalies that are usually unimportant for geophysical prospecting.

There are several approaches towards the practical measurement of geomagnetic anomalies. In this study measurements were made using a Geoscan FM36 fluxgate gradiometer which records the change with height in the vertical component of the Earth's magnetic field, as shown overleaf. This method has the advantage of being insensitive to diurnal variations while the Geoscan instrument also benefits from an integrated data logger. Note that in mid northern latitudes the magnetic anomaly will be asymmetric with the main peak displaced to the south of the archaeological feature. Thus, a ditch filled with a soil of enhanced susceptibility, for example, will generate a positive anomaly to the south, mirrored by a weak negative anomaly north of the feature. When portrayed as an area map of grey tones this gives rise to a 'shadowing' or pseudo relief effect which must be borne in mind when making an archaeological interpretation.

Two techniques can be used to survey gridded areas using the fluxgate magnetometer. In the parallel method the instrument is used to scan the area along traverses which are always in the same direction. This method minimises 'heading errors' due to operator and instrument magnetisation but is time consuming. The alternative zig-zag method is significantly faster and suitable for areas where anomalies are large compared to these and other sources of error.

MAGNETIC SURVEYING



APPENDIX B
DATA PROCESSING

PROCESSING THE SURVEY DATA

The geophysical images contained in this report were prepared within Microsoft Windows® using the InSite® software published by GeoQuest Associates. Geophysical images were then placed onto a map which was digitised from the Ordnance Survey, edited and then plotted using a computer aided drafting (CAD) system and colour inkjet printer.

Data were downloaded from the meter to a portable computer in the field for storage, visualisation and quality control (QC) assessment. These data were then transferred to a laboratory computer for final processing, printing and archiving.

A number of process steps have been applied to the geophysical data obtained during the survey and those which have been used are linked to the main flow path by arrows. Steps were applied in the order shown and are designed to reduce artifacts in the data and enhance geophysical features of archaeological interest. The following sections describe each step in more detail.

REMOVE STRIPING

Reduces a data artifact comprising alternating changes in level in readings logged along zig-zag traverses. This artifact is common in fluxgate magnetometer data. InSite uses a proprietary algorithm to reduce this error.

INFILL SMALL BLANK AREAS

Fills isolated blank data cells with the mean of near-neighbours or a suitable approximation entered manually. Small blank areas will have been logged if it was not possible to obtain a geophysical reading over, for example, a manhole cover in the case of a resistivity survey.

REMOVE SPIKES

Replaces isolated, anomalously high or low values with the mean of near neighbours or a suitable approximation entered manually. 'Spike' readings are commonly associated with ferrous litter or poor electrical contact in the case of geomagnetic and resistivity data, respectively.

REDUCE WALK HARMONICS

Reduces a regular oscillation in traverse data caused by walking movements of the operator during a geomagnetic survey. InSite employs a fast Fourier transform to determine the optimum amplitude and phase of the walk-induced harmonic which is then subtracted from each traverse.

REDUCE SHEAR ARTIFACTS

Corrects for apparent shear in geomagnetic anomalies surveyed by zig-zag traversing in a geomagnetic survey. The shearing effect arises from the interaction of the operator + magnetometer with the geomagnetic field and also from the lag in the instrument response to changes in the field. InSite uses a proprietary algorithm to reduce this error.

CORRECT FOR METER DRIFT

Corrects for a linear drift in the meter calibration with time. Such drift is a common problem with fluxgate magnetometers, particularly during periods of rapid air temperature change. InSite uses least-squares regression on the mean of data along each traverse to estimate the change in calibration level across each grid. This gradient is then removed from the data.

ADJUST GRID MEAN LEVELS

Adjusts for differences in the mean level in data grids due to changes in instrument calibration (fluxgate magnetometer survey) or alteration in remote electrode spacing (resistivity survey).

INTERPOLATE AND COMBINE

Combines grids to form an array of regularly-spaced data on a square mesh. InSite uses bilinear interpolation to accomplish this.

LOW PASS FILTER

If this process task is indicated then a 3x3 or 5x5 boxcar filter has been used to smooth the data and reduce noise or 'speckle' seen in the original image.

HIGH PASS FILTER

If this process task is indicated then a 3x3 or 5x5 filter, with appropriate coefficients, has been used to pass short-wavelength information into the resulting image.

EDGE DETECT FILTER

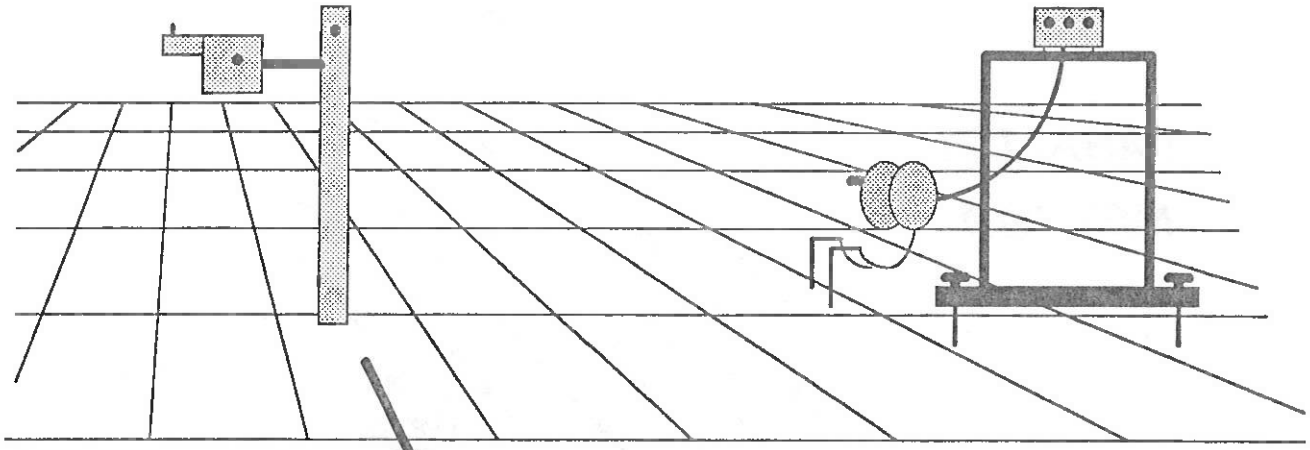
Signifies that a Sobel, Laplace or other specialised filter has been applied to enhance significant lateral transitions in the geophysical image.

DIRECTIONAL FILTER

This filter is equivalent to illuminating the data from one direction to produce a pseudo-relief image. Directional filtering is usually employed to aid the identification of subtle anomalies in resistivity data. This filter highlights features trending at right angles to the direction of illumination.

NOTE

GeoQuest Associates can supply the geophysical images presented in this report in a variety of digital formats for visualisation on microcomputers running Microsoft Windows. These formats include the TIFF, BMP and PCX standards. Please complete the request form at the rear of this report if you would like to receive such image files.



FIELD PC

LAB PC

QC

DATA ARCHIVE

IMAGE RAW GRID DATA

REMOVE STRIPING

REMOVE SPIKES

REPORT FIGURE 2

INTERPOLATE AND COMBINE

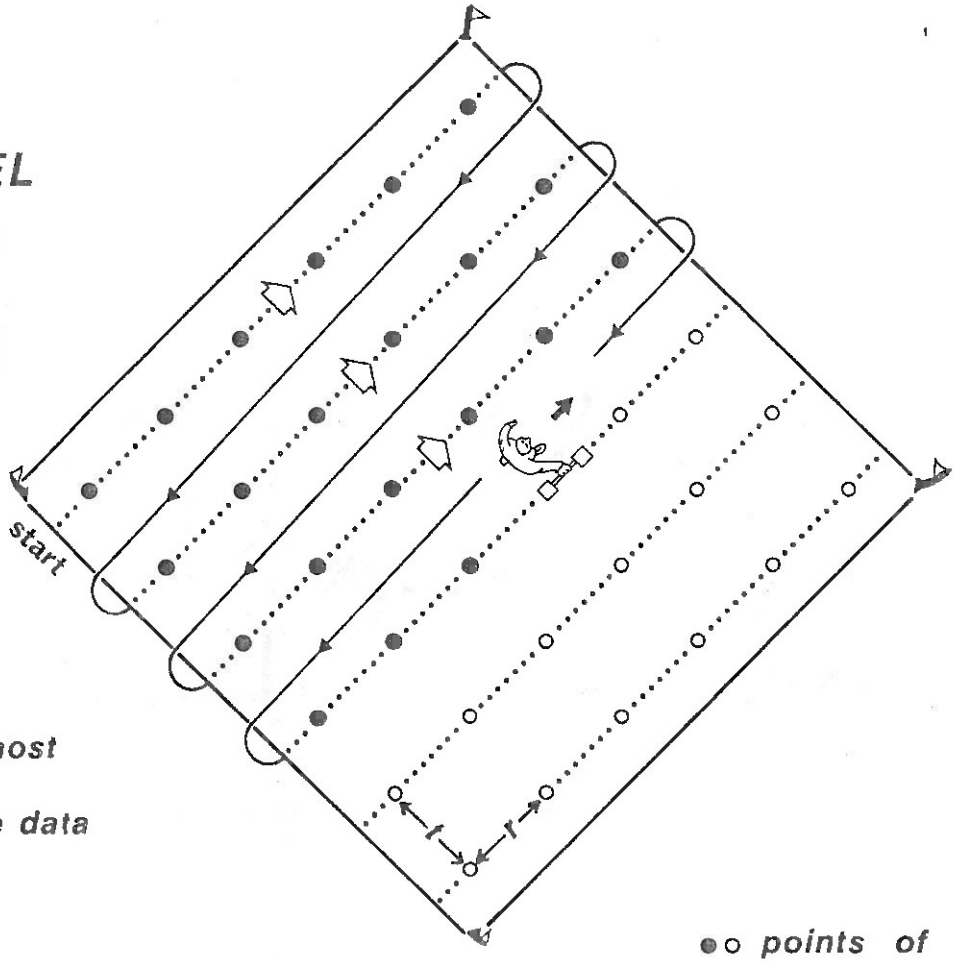
ADJUST GRID MEAN LEVELS

CORRECT FOR METER DRIFT

REDUCE SHEAR ARTIFACTS

SURVEY SCHEMES

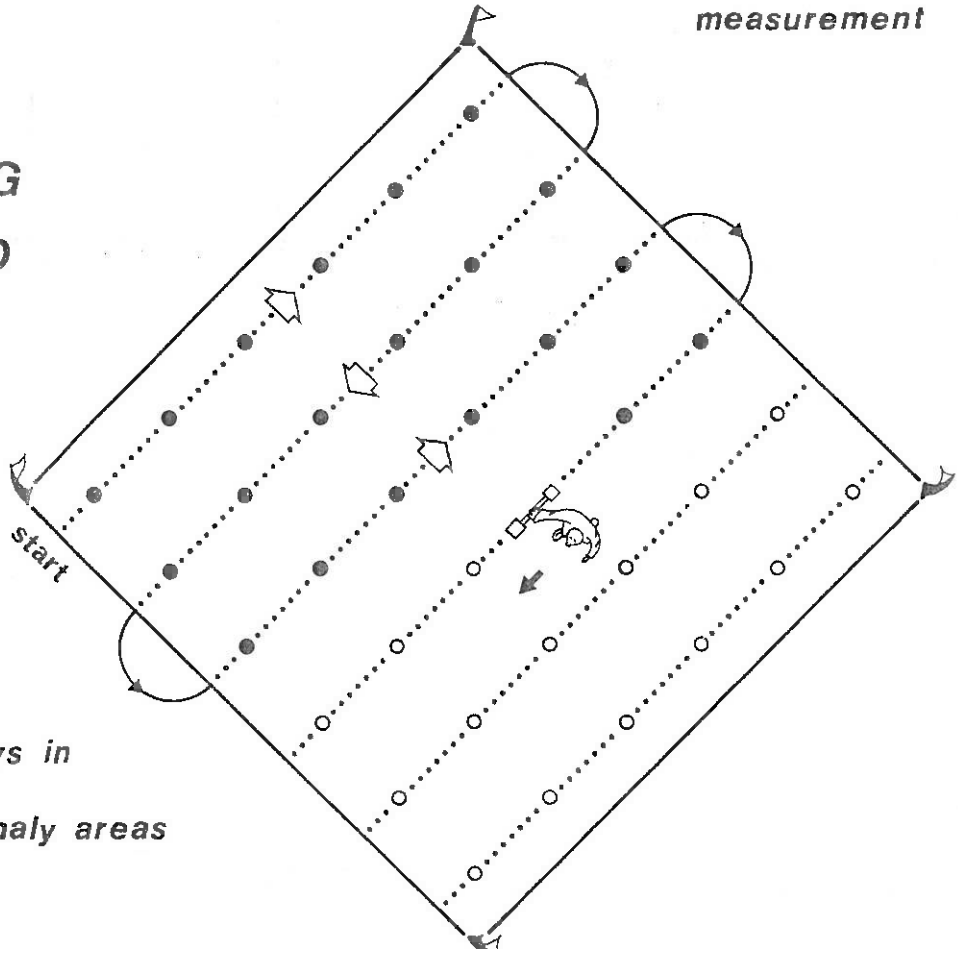
PARALLEL METHOD



slower but minimises most errors in the data

●○ *points of measurement*

ZIG-ZAG METHOD



suitable for rapid surveys in strong anomaly areas

13/3

Shortwood Quarry, Pucklechurch, Bristol, South Gloucestershire

An Archaeological Evaluation

for Parkhill Reclamation Limited

by M J Saunders

Thames Valley Archaeological Services

Site Code PSB99/38

June 1999

Shortwood Quarry, Pucklechurch, Bristol, South Gloucestershire
An Archaeological Evaluation

by M John Saunders

Report 99/38

Introduction

This report documents the results of an archaeological field evaluation carried out at Shortwood Quarry, Pucklechurch, Bristol, South Gloucestershire (NGR ST 68040 76650) (Fig 1). The work was commissioned by Ms Christine House of Wardell Armstrong, Lancaster Building, High Street, Newcastle-under-Lyme, Staffordshire, ST5 1PQ on behalf of their client Parkhill Reclamation Limited.

The development proposals are for a landfill site and as a consequence an archaeological assessment was required in order to highlight features or areas within the proposed development area that might lead to archaeological constraints in the planning process. This assessment was undertaken by Wardell Armstrong in December 1998 (Reeves 1998). A programme of geophysical survey was also requested and this was conducted by GeoQuest Associates in November 1998. In addition, a programme of archaeological work in the form of a field evaluation was requested by the archaeological advisor to the Local Planning Authority.

This is in accordance with the Department of the Environment's Policy and Planning Guidance Note, *Archaeology and Planning* (PPG 16 1990). The field investigation was carried out to a specification approved by Mr David Haigh, County Archaeologist for South Gloucestershire. The fieldwork was undertaken by Matt Fricker and M John Saunders between the 14th and 19th of June 1999 and the site code is PSB99/38.

Location, Topography and Geology

The site is located to the east of Bristol, within the parish of Pucklechurch, in the County of South Gloucestershire, and forms part of the planning application area. It comprises two parcels of land towards the end of Cattybrook Road, both of which are currently farmland with the crop in the southernmost field having been recently harvested (Fig 2). Both slope gently downwards from east to west with a mean height of 74.50m above Ordnance Datum. According to geological maps the site lies on clay with limestone (BGS 1962). This was confirmed in the evaluation trenches. The general area of the site lies within the East Bristol Coalfield and

has for a considerable time been associated with coal extraction. The Shortwood brick and tile works is close by and the area is considered to be of industrial landscape importance.

Archaeological Background

The Desk-top Study

The desk-top study (Reeves 1998) covered the whole of the planning application area and other land owned by the applicants. It found that, although the development area contained no Scheduled Ancient Monuments or Listed Buildings, there were four entries listed on the Sites and Monuments Record. Three of these were related to coal extraction and the fourth was a Roman road. The study concluded that the main importance of the development area was that it contained elements of the coal industry making it an important industrial landscape.

The Geophysical Survey

The geophysical survey undertaken by GeoQuest Associates did not detect the line of the Roman Road in either of the two fields but did identify a number of possible anomalies. In the northernmost field a large positive anomaly was detected that could be metalliferous or due to burning and might possibly be the site of an early kiln. A number of possible linear features and ring ditch enclosures were detected in the field to the south together with a patch of rubble lying to the east of the projected line of the Roman road, which might define the ploughed out line of the road.

Objectives and Methodology

The purpose of the evaluation was to determine the presence/absence, extent, condition, character, quality and date of any archaeological deposits within the area of development. This was to be achieved by digging six trenches varying in length from 15m to 40m. These were to be positioned in those locations where geophysical anomalies had been recorded and also to confirm the presence of the Roman road (Fig 3). All the trenches were to be excavated under close archaeological supervision using a JCB mechanical excavator fitted with a toothless bucket. Should any certain or possible archaeological features or deposits be present the surfaces of the machined trenches were to be hand cleaned using the appropriate tools. Following the excavation and recording of features the spoilheaps were to be monitored for finds and the trenches efficiently backfilled.

A complete list of trenches giving lengths, breadths, depths and a description of sections and geology is given in Appendix 1. A list of features is given in Appendix 2.

Results

Trench 1

Trench 1 was 14.10m long and orientated east-west across the large positive anomaly identified in the northernmost field. The stratigraphy consisted of 0.20m of turf and topsoil onto stiff brown clay. A large concentration of burnt material was located at the west end of the trench between 0.70m and 6.40m. This comprised ash, clinker, coal, slag, brick and tile fragments and burnt stones. This deposit (55) was machined off in spits to a depth of 0.52m where undisturbed natural clay was encountered. No evidence of a pottery kiln either in the form of structure or artefacts (pottery wasters) was found and no structural elements were present which might have related to coal mining activities. A stone-filled field drain was present crossing the trench at 12.60m. No finds were recovered from the spoilheaps.

Trench 2 (Plate 1)

Trench 2 was 21.50m long and positioned approximately east–west in the eastern corner of the northernmost field to try and locate the course of the Roman road. The stratigraphy consisted of 0.25m of turf and topsoil over 0.30m of subsoil onto stiff reddish-brown sandy clay. From 18m to the eastern end of the trench a road surface (56) was located (Fig 4). This consisted of undressed stone of varying sizes set in a hard reddish sandy matrix which had then been sealed by a layer of silt (57), probably hillwash, and its position conformed with that shown on maps as being the line of the Roman road. No dating evidence in the form of pottery or other finds was recovered either during hand cleaning of the surface or from the spoilheaps. Three stone-filled field drains were present at 2.80m, 8.90m and 14.80m. Two possible postholes and a stakehole were also examined but proved to be the product of root activity and not archaeological in origin.

Trench 3

Trench 3 was 14.50m long and orientated north–south in the eastern part of the more southerly field. This was positioned in order to test for the presence of a large east–west linear feature identified by the geophysical survey. The stratigraphy consisted of 0.27m of turf and topsoil onto stiff orange-brown clay natural. A possible posthole at 3.40m was hand cleaned and examined but proved to be a patch of coal fragments and not archaeological in origin. No trace of a large east–west ditch was observed and, in order to confirm its absence,

the base of the trench was further removed in spits. No linear feature was present. A single sherd of yellow glazed post-Medieval pottery was recovered from the topsoil at 13.5m.

Trench 4

Trench 4 was 14.50m long and orientated approximately north–south to test for the presence of a geophysical anomaly, possibly an enclosure and stockade. This varied in depth from 0.36m to 0.70m and the stratigraphy consisted of 0.32m of turf and topsoil onto stiff brown clay natural. Occasional lenses of coal fragments were present at the base of the topsoil, probably spread by ploughing. A possible small posthole was hand cleaned and examined but found to be a coal patch and not a cut feature. No evidence for the existence of archaeological features was found and no finds were recovered during machining of the trench or from the spoilheaps.

Trench 5

Trench 5 was 39.60m long and orientated approximately south-west – north-east to test for the existence of a linear feature and rubble spread identified by the geophysical survey. It varied in depth from 0.34m to 0.44m and the stratigraphy consisted of 0.20 – 0.23m of turf and topsoil onto stiff dark reddish-brown clay natural. A number of features were examined, two of which proved to be stone filled field drains at 4.50m and 7.80m. A narrow ditch (1) was found to cross the trench towards its north-east end. This had an average width of 0.60m and was 0.15m deep with a stony fill (Figs 4 and 5). No dating evidence was recovered for this feature and its dimensions and alignment were similar to that of the two field drains. It is possible that this also represented a field drain although the size of the stones within its fill was much smaller. A further band of stoney clay crossed the trench between 27.50m and 30.30m. This was machined off in spits to test whether this represented the linear feature recorded by geophysical survey but again this was not found to be the case. The natural clay in the south-western part of the trench, unlike the remainder, contained many small stones which may have caused the geophysical anomaly thought to be a rubble spread, possibly from the ploughed out Roman road. No artefacts were recovered from the trench or from the spoilheaps.

Trench 6 (Plate 2)

Trench 6 was 15.20m long and orientated approximately north-south to examine a further curvilinear geophysical anomaly. It varied in depth from 0.29m to 0.38m and the stratigraphy consisted of 0.19m of turf and topsoil onto stiff brown clay. Three features were present, two postholes (3 and 4) and a narrow ditch (2) (Figs 4 and 5). The postholes were both half obscured by the western side of the trench and were both very shallow. Posthole 3 was 0.13m in diameter and 0.05m deep and posthole 4 was 0.18m in diameter and 0.04m

deep. No finds were recovered from either feature. The ditch was 0.11m deep and averaged 0.50m wide, again with a stoney fill. No finds were recovered from this feature and as with ditch 1 in Trench 5, its nature and alignment suggest that this may also represent a field drain. No finds were recovered from the spoilheap.

Finds

Pottery

A single sherd of pottery was recovered from the topsoil in Trench 3. This has a sandy fabric with traces of yellow glaze on its outer surface and is post-Medieval in date.

Conclusion

Although the evaluation failed to confirm the existence of archaeological features shown as anomalies by the geophysical survey it was successful in locating the Roman road (SMR 1353) as projected on Ordnance Survey maps. Unfortunately, no artefacts were recovered from this feature or from the two small ditches and two postholes also found and they therefore remain undated. Although not depicted in Margary's 'Survey of Roman Roads in Britain' (Margary 1955) it may be a continuation of road 540, which runs from the lead mining areas of the Mendips and is thought to finish at Bitton, but which may continue north-eastwards, albeit in reduced size, to join with the Romanized Ridgeway route (542). This left Bath and ran north over Lansdown Hill keeping on the high ground of the Cotswolds, via Oldfield Gate, south of Dyrham Park and then continuing via Chavenage Green to Cirencester.

Should further evaluation of the western part of the southernmost of the two fields be required in the future, it should be possible to locate a further section of this road.

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Margary, I D, 1955, *Roman Roads in Britain*, 118, 128, 131, London

PPG 16, 1990, *Archaeology and Planning*, Department of the Environment Planning Policy Guidance Note 16, HMSO

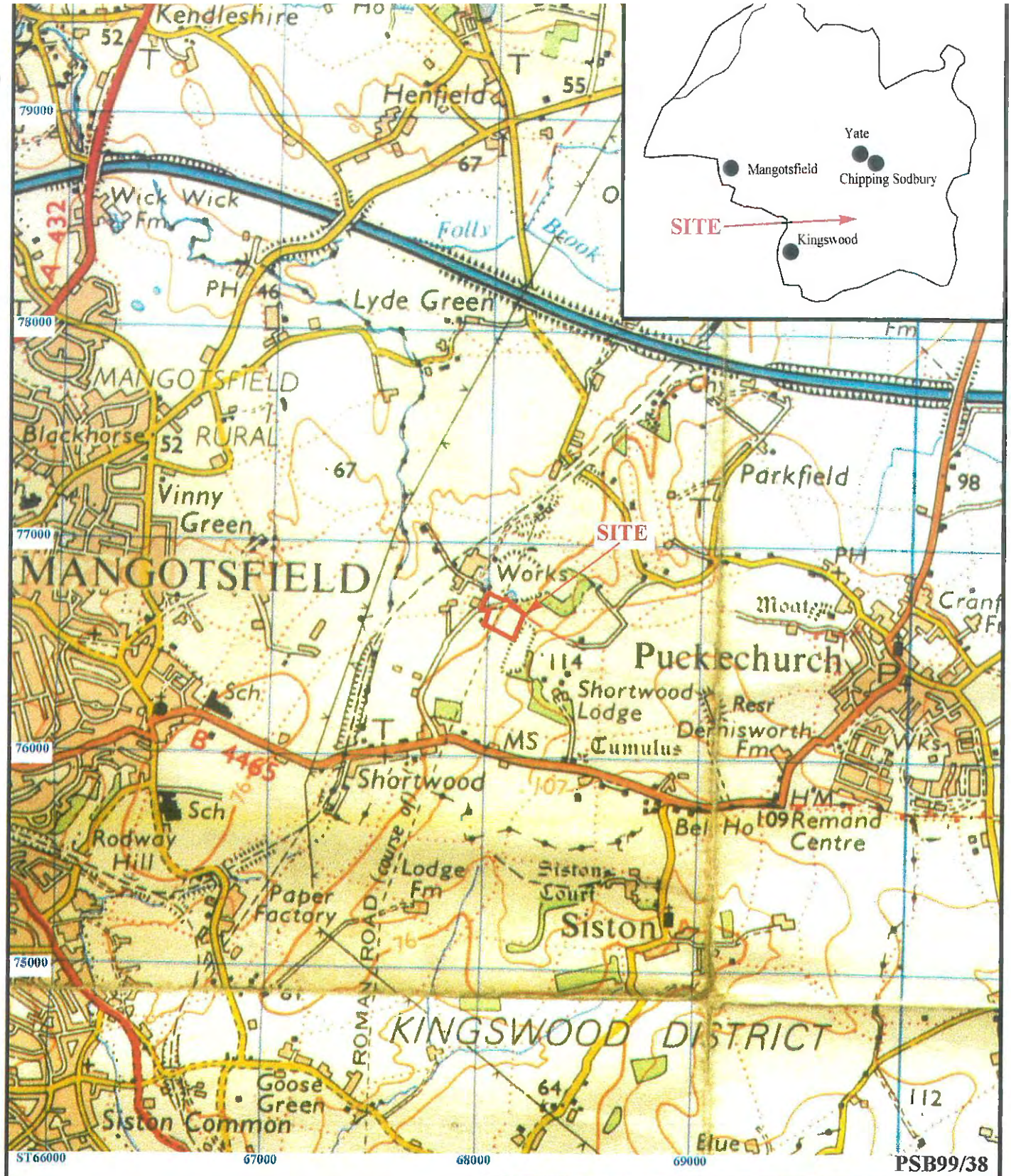
Reeves, P, 1998, Shortwood Quarry, Archaeological and Cultural Assessment, Wardell Armstrong report no. D:\CC\4922.19\arch.rep, Newcastle under Lyme

Appendix 1: Trench details

Trench no.	*Length (m)*	*Breadth (m)*	*Depth (m)*	*Comment*
1	14.10	1.4	0.29 (W) 0.47 (E)	0.20m of turf and topsoil onto stiff brown clay natural. Deposit of burnt material (55) comprising ash, clinker, brick and tile fragments from 0.70m to 6.40m. Field drain at 12.60m.
2	21.50	1.4	0.50 (W) 0.55 (E)	0.25m of turf and topsoil over 0.30m of subsoil onto stiff reddish-brown sandy clay natural. Stone road surface (56) from 18m to end of trench. Field drains at 2.80m, 8.90m and 14.80m.
3	14.50	1.4	0.35 (S) 0.60 (N)	0.27m of turf and topsoil onto stiff orange-brown clay natural.
4	14.50	1.4	0.70 (S) 0.36 (N)	0.32m of turf and topsoil onto stiff brown clay natural. occasional lenses of coal fragments at base of topsoil.
5	39.60	1.4	0.44 (SW) 0.34 (NE)	0.20 – 0.23m of turf and topsoil onto stiff dark reddish-brown clay natural. Field drains at 4.50m and 7.80m. Narrow ditch (1) at 31.70m and stone concentration from 27.50m to 30.30m.
6	15.20	1.4	0.29 (S) 0.38 (N)	0.19m of turf and topsoil onto stiff brown clay natural. Postholes at 6.10m (4) and 7.90m (3) and narrow ditch (2) at 9.10m.

Appendix 2 - List of features

Feature	*Fill/deposit*	*Trench no.*	*Description*
-	50	All trenches	Turf and topsoil
1	51	5	Narrow ditch
2	52	6	Narrow ditch
3	53	6	Posthole
4	54	6	Posthole
-	55	1	Deposit of burnt material
-	56	2	Stone road surface
-	57	2	Silt layer above 56
-	58	2	Subsoil
-	59	2	Compacted reddish sandy matrix within road surface



PSB99/38

Shortwood Quarry, Pucklechurch, Bristol, South Gloucestershire, 1999

Figure 1. Location of site within Pucklechurch and Gloucestershire.

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THAMES VALLEY ARCHAEOLOGICAL SERVICES

Shortwood Quarry, Pucklechurch, Bristol, South Gloucestershire, 1999

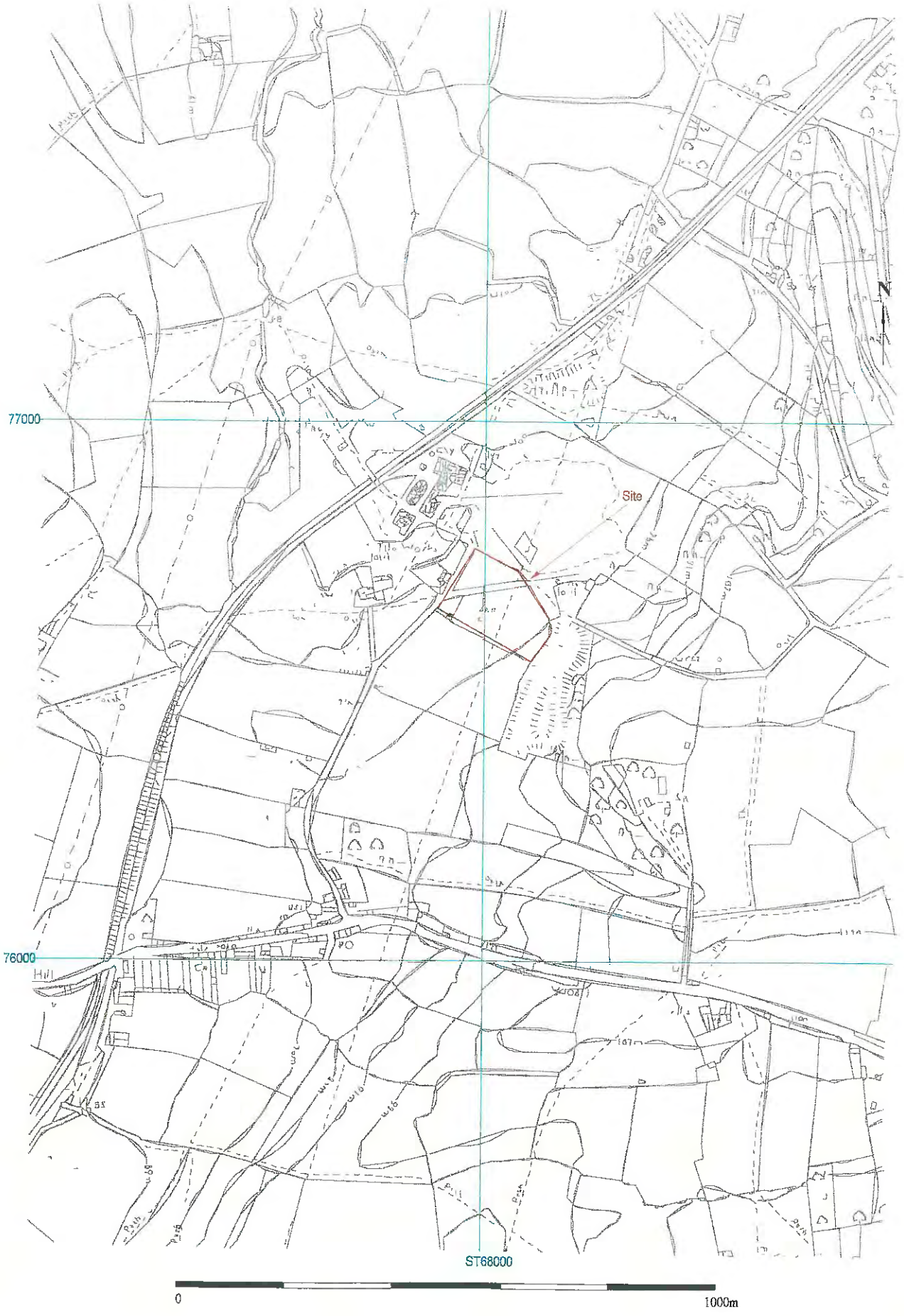


Figure 2. General location of site.

PSB99/38

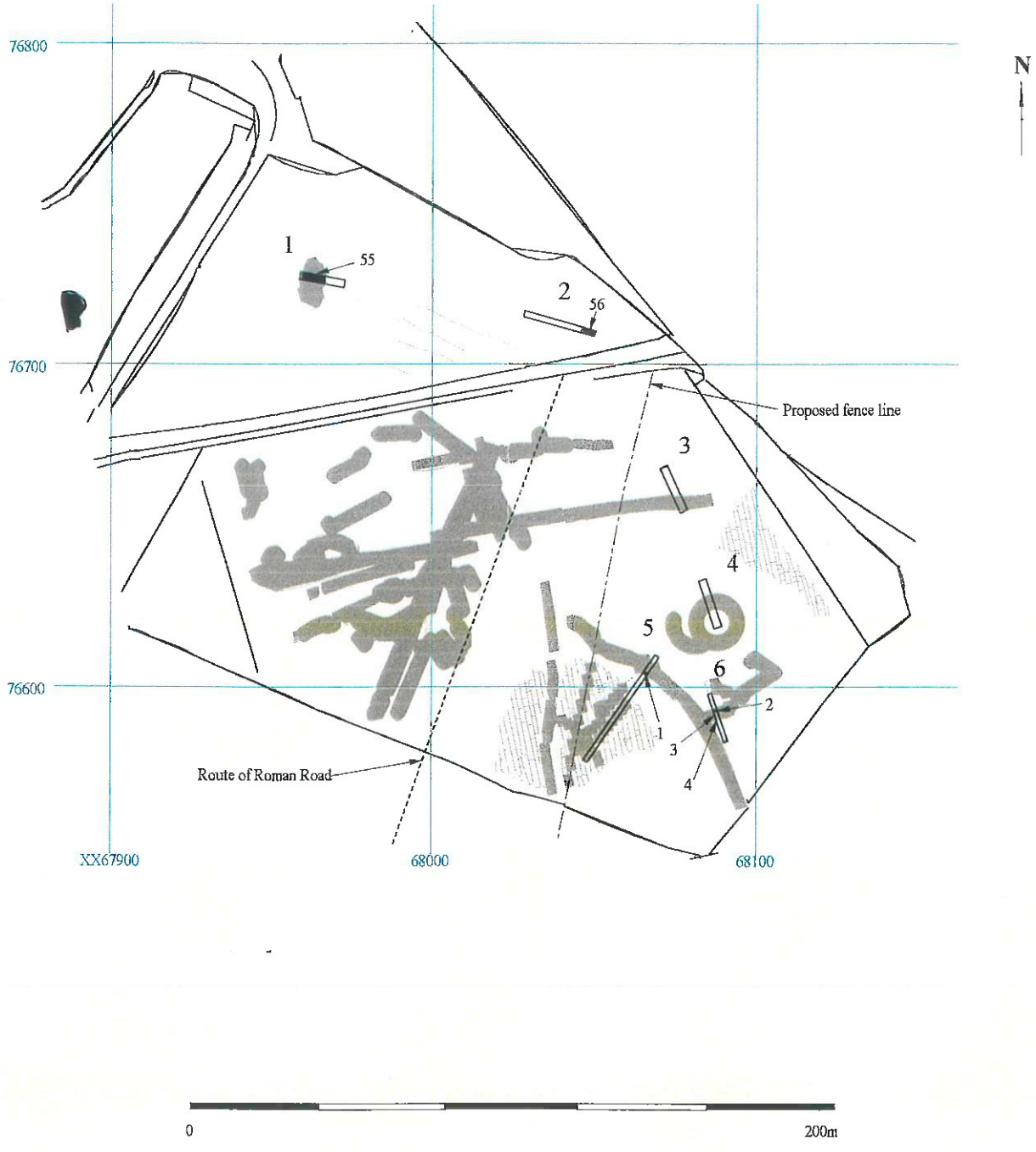


Figure 3. Trench location plan showing all archaeological features. PSB99/38

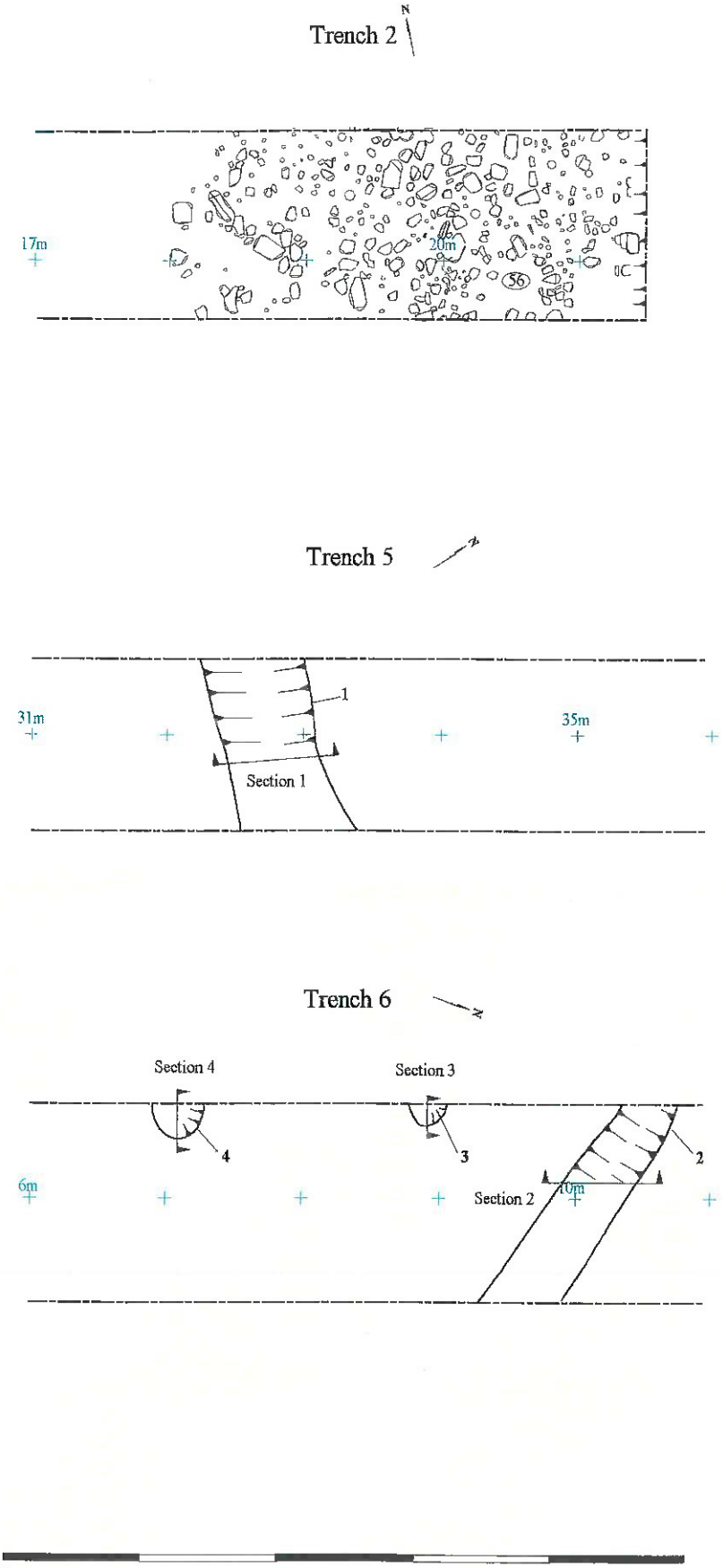


Figure 4. Plans of features in trenches 2, 5 and 6.

PSB99/38

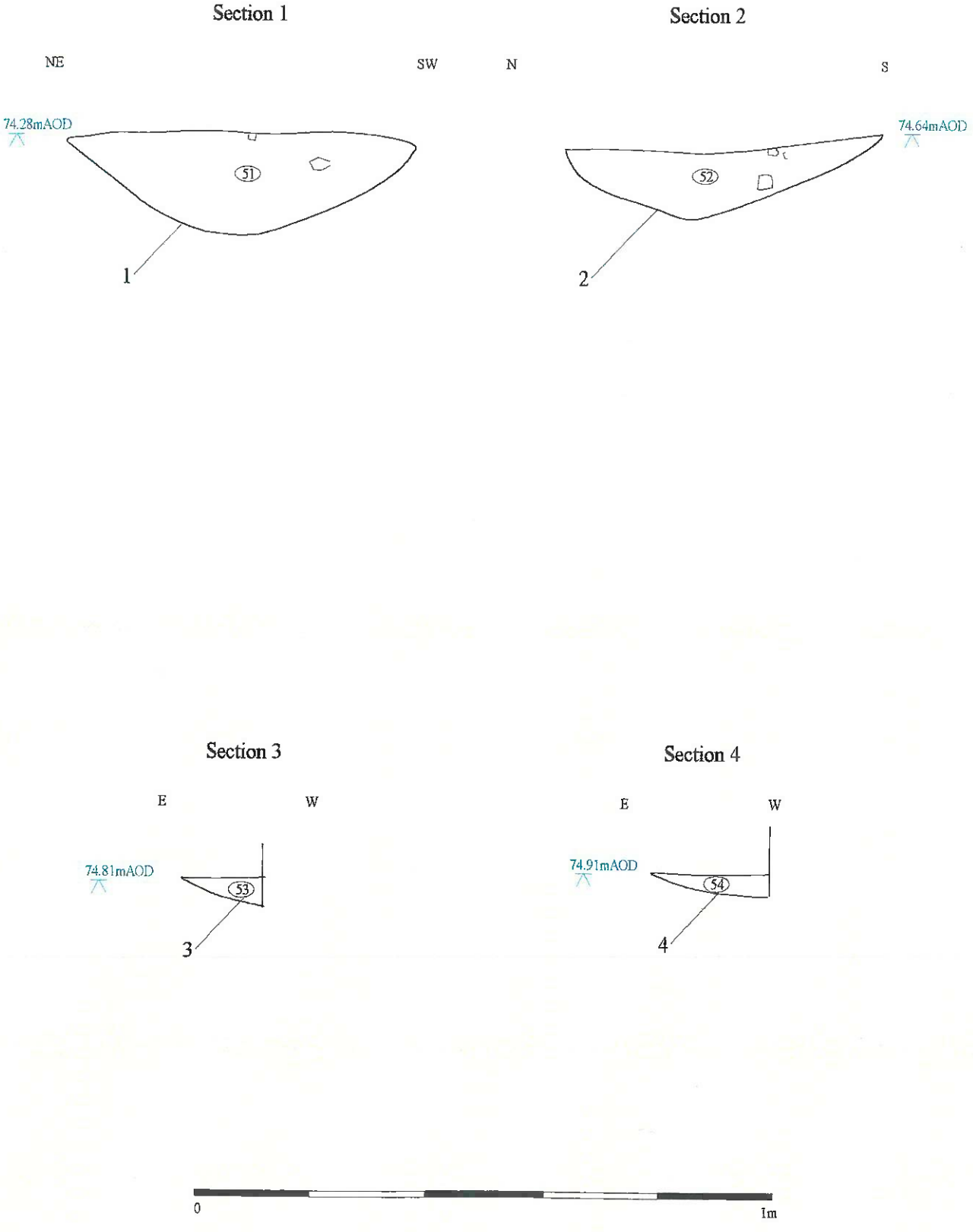


Figure 5. Sections.

PSB99/38

Plate 1. Trench 2 looking east, scales: 0.50m and 1m.

Plate 2. Trench 6 looking west, scales: 0.10m and 0.50m.

TIME CHART

	Calendar Years
Post Medieval	AD 1500
Medieval	AD 1066
Saxon	AD 410
Roman	AD 43
Iron Age	AD 0 BC 750 BC
Bronze Age: Late	1300 BC
Bronze Age: Middle	1700 BC
Bronze Age Early	2100 BC
Neolithic: Late	3300 BC
Neolithic: Early	4300 BC
Mesolithic: Late	6000 BC
Mesolithic: Early	10,000 BC
Palaeolithic: Upper	50,000 BC
Palaeolithic: Middle	70,000 BC
Palaeolithic: Lower	2,000,000 BC


13/4

ENGLISH HERITAGE

Ibstock Building Products Ltd
FAO Mr S Green
Property Manager (South)
Almondsbury
South Gloucestershire
BS12 4BX

Ref. : MPP16/ AA 80306/1

Date : 12th February 2001

MONUMENT NAME : Brandy Bottom Colliery, part of Parkfield Colliery
DISTRICT : SOUTH GLOUCESTERSHIRE
COUNTY : SOUTH GLOUCESTERSHIRE
MONUMENT NUMBER : 28872

)ear Mr Green

ANCIENT MONUMENTS AND ARCHAEOLOGICAL AREAS ACT 1979, AS AMENDED

I refer to our earlier letter which outlined a proposal to include the above-named monument in the Schedule compiled and maintained by the Secretary of State under Section 1 of the Ancient Monuments and Archaeological Areas Act 1979, as amended.

I can now report that the Secretary of State, having considered the proposal in consultation with English Heritage, has decided that the monument should be scheduled.

Accordingly I am requested by the Secretary of State to inform you that he has included the monument in the Schedule. A copy of the Schedule entry is enclosed. The area of the monument is shown on the enclosed 'Scheduled Monument' map extract.

The entry in the Schedule relating to the monument will be registered as a local land charge. As an additional precaution, however, we should be grateful if you would be good enough to draw the attention of any future owner, tenant r occupier to the existence of the monument and to its inclusion in the Schedule.

The monument will in due course be added to the published list of the monuments which have been included in the Schedule.

ACKNOWLEDGEMENT OF RECEIPT OF SCHEDULE ENTRY

I should be grateful if you would complete and return the enclosed acknowledgement of receipt form. If you have not already supplied the information, would you please confirm on the form your ownership/occupation of the monument and, if your interest is confined to part of the monument, would you please return the map extract attached to the form indicating the extent of your interest. Where appropriate would you also be kind enough to let me know the name and address of anyone whom you know, or believe, to own or

occupy a part of the monument, so that we may inform them of the scheduling also. A pre-paid envelope is enclosed for your use.

I enclose a guide for owners and occupiers of scheduled monuments which covers the main provisions of the Act. You will note that it is an offence under Section 2 of the Act to carry out, or to cause or permit anyone else to carry out, any of the following works:

a. any works resulting in the demolition or destruction of, or any damage to, a scheduled monument;

b. any works for the purpose of removing, repairing, or making any alteration or addition to a scheduled monument or any part of it;

c. any flooding or tipping operations on land in, on or under which there is a scheduled monument;

except in accordance with the consent of the Secretary of State. Failure to obtain such consent before works start can lead to prosecution, rendering the offender liable to a fine or, in extreme circumstances, to imprisonment. However, works which are urgently necessary in the interests of safety or health may be carried out without prior consent, provided that works are limited to the minimum measures immediately necessary, and that notice in writing of the need for the works is given to the Secretary of State, as soon as is reasonably practicable.

Certain defined works have been granted consent automatically by a form of permitted rights known as Class Consents under Section 3 of the Act. The current Class Consents are contained in the Ancient Monuments (Class Consents) Order 1994 which replaced the 1981 Order as amended in 1984.

More details explaining those activities which are eligible for Class Consent and those activities which require Scheduled Monument Consent are contained in the enclosed guide for owners and occupiers. This also includes details on the implications for domestic gardening works.

From time to time this consent may be revised or cancelled. If there is any doubt whether or not proposed works require specific Scheduled Monument Consent, advice and full details explaining how to apply for Scheduled Monument Consent may be obtained from the English Heritage Casework Team for your area or your local Field Monument Warden. You should note that the granting of planning or any other permission (including permitted development rights) for any development on the site of the monument does not remove the need to obtain Scheduled Monument Consent for any works or operations affecting the monument. Consent is also required for most archaeological excavations, an exception being any archaeological evaluation you might be asked to arrange by the Secretary of State in support of an application for Scheduled Monument Consent.

Your attention is also drawn to Section 42 of the Act which prohibits the use of a metal detector on the site of a scheduled monument and the removal from such a site of any object of archaeological or historical interest which has been discovered by the use of a metal detector, without the written consent of English Heritage. Your cooperation would be welcome in ensuring that anyone who asks your permission to use a metal detector on your land is aware of these provisions of the Act and of the fact that the monument has been scheduled. In addition, it would be appreciated if you could warn anyone entering your land for such a purpose of the existence of the monument, pointing out the site on the ground as it is shown on the map extract attached to the enclosed copy of the entry in the Schedule.

Finally, I should explain that English Heritage has at its disposal a number of architects, archaeologists and other experts trained in the execution of works on all types of monuments. Subject to the availability of staff and resources, English Heritage is willing to give whatever help and advice it can concerning the condition and beneficial management of scheduled monuments to their owners and occupiers. Such advice may also be available from a number of other sources, including private consultants, universities, and county councils. By their nature and protected status, scheduled monuments need special care when proposals for works are being considered, or even during routine maintenance, and we would therefore encourage you to seek professional advice at as early a stage as possible.

Please do not hesitate to contact me if I can be of any assistance.

Yours faithfully

RACHEL MCMILLAN
Scheduling Section
English Heritage

Encs: Schedule entry, 'Scheduled Monument' map extract, guide for owners and occupiers, receipt/ownership form, pre-paid envelope

DEPARTMENT FOR CULTURE, MEDIA AND SPORT BATCH NUMBER: 10912

FILE REFERENCE: AA 80306/1

SCHEDULE ENTRY COPY

ENTRY IN THE SCHEDULE OF MONUMENTS COMPILED AND MAINTAINED BY THE SECRETARY OF STATE UNDER SECTION 1 OF THE ANCIENT MONUMENTS AND ARCHAEOLOGICAL AREAS ACT 1979 AS AMENDED.

MONUMENT: Brandy Bottom Colliery, part of Parkfield Colliery

PARISH: PUCKLECHURCH

DISTRICT: SOUTH GLOUCESTERSHIRE

COUNTY: SOUTH GLOUCESTERSHIRE

NATIONAL MONUMENT NO: 28872

NATIONAL GRID REFERENCE(S): ST68197712

DESCRIPTION OF THE MONUMENT

The monument includes a 19th century steam powered colliery built on the site of an earlier 18th century colliery. It lies at the foot of a west-facing slope 2km east of the outskirts of Bristol in an area containing a number of springs and wells within the Bristol coalfield.
Sunk in the early 1800s, Brandy Bottom Colliery was owned by Lord Radnor. In the 1850s it was leased to the firm of Wethered, Cossham and Wethered, to assist the adjacent Parkfield Colliery which lay about 1km to the north east, in pumping and ventilation. Brandy Bottom then became known as Parkfield Colliery South, with a depth of 225yds according to Handel Cossham's note book. Brandy Bottom Colliery or Parkfield South was closed in 1936, and since then has been derelict.
It is unclear as to when coal was first dug east of the River Severn, but documentary evidence shows that it had been dug in Kingswood from at least the reign of Edward I, and by the 13th century it occurs regularly as an item in accounts. By 1679 the Kingswood area of Bristol had become such a typical colliery district that the coal pits were recommended to visitors to the neighbourhood as a sight worth viewing. One of the most important colliery owners in the Bristol mining district during the later 19th century was Mr Handel Cossham. Until his death in 1889 he was the controlling power in the management of the Kingswood and Parkfield Collieries, and the property of his company comprised in 1891, about 3000 acres of mineral freehold, with a daily output from the collieries from 700 to 1000 tons of steam and house coal, while employment was found, above and below ground, for on average 1500 people.
The site forms a rough triangle bounded by a disused railway cutting, about 2m deep, on the north west side. The railway served as a means of transporting coal from the colliery, and a sample is included in the scheduling. On the south side a spoil tip is included and marks the limit of the site on this side, and on the north east side a shallow ditch, believed to be a field drain, 0.5m deep and about 1m to 1.5m wide, defines its extent. At the north end of the site, near the railway line, is an unroofed brick building, which measures 3m by 2m, thought to be a weighbridge. Close to the weighbridge are

(Continued ..)

AUTHORISED BY: A R Middleton
On behalf of the Secretary of State for Culture, Media and Sport under batch no: 10912

Continued from previous page ..

DESCRIPTION OF THE MONUMENT (Continued)

the two halves of a large spoked iron wheel, about 6m in diameter, thought to be part of the headgear of a pit. This was imported from a coal mine in South Wales, but is included in the scheduling as it is of the same type as that used at Brandy Bottom, it relates to the technology of 19th century mines, and contributes to an understanding of this monument. About 40m to the south west of the weighbridge is a spoil tip approximately 60m long, 20m wide and 5m high, at the south end of which is a group of buildings including a chimney, engine house and workshop. These buildings are composed of brick and stone and are also unroofed. The chimney is about 40m high, and largely of brick although the lower 15m is of stone. The stonework of the other buildings stand to about 5m high.

To the south west of these and included in the same complex of buildings is a heapstead, beam engine house and boiler house. The heapstead stands to about 5m high, the first half in stone, the remainder in brick. The Cornish beam engine house is thought to retain its internal engine settings.

About 20m to the south west of this complex is the shaft, a fan house and a horizontal steam winding engine house, although nothing survives of the engine settings. Steam driven fans were common on 19th century and early 20th century collieries, although few standing examples now survive. The fan house at Brandy Bottom is brick built and contains a complete circular fan housing. Abutting the fan house, on its south side, is a second irregularly shaped spoil tip measuring 160m east-west by about 70m north-south and 5m to 6m high. Between the disused railway line and the main colliery buildings is a pond and the ruins of South Parkfield Cottage which are included in the scheduling. A building on the site of South Parkfield Cottage is shown on the 19th century map, and is therefore thought to be contemporary with the colliery. The function of the building is not known, but it was part of the colliery landscape. The pond is about 10m wide at its widest point and is 20m long, it appears to be a couple of metres deep and is marshy. At the north west end of the pond is a brick built culvert, with a corresponding stone built one at the other end. The pond is thought to have provided water for the steam driven engines of the colliery.

A number of features are excluded from the scheduling: these are the tarmac surface of the community forest path, sign posts and the metal post and wire fencing around the site buildings.

ASSESSMENT OF IMPORTANCE

Coal has been mined in England since Roman times, and between 8,000 and 10,000 coal industry sites of all dates up to the collieries of post-war nationalisation are estimated to survive in England. Three hundred and four coal industry sites, representing approximately 3% of the estimated national archaeological resource for the industry have been identified as being of national importance. This selection, compiled and assessed through a comprehensive survey of the coal industry, is designed to represent the industry's chronological depth, technological breadth and regional diversity. The term 'nucleated' is used to describe coal mines that developed as a result of increased capital investment in the 18th and 19th centuries. They are a

(Continued ..)

AUTHORISED BY: A R Middleton
On behalf of the Secretary of State for Culture, Media and Sport under batch no: 10912

Continued from previous page .. NATIONAL MONUMENT NO: 28872

ASSESSMENT OF IMPORTANCE (Continued)

prominent type of field monument produced by coal mining and typically consist of a range of features grouped around the shafts of a mine. The simplest examples contain merely a shaft or adit with associated spoil heap. Later examples are characterised by developed pit head arrangements that may include remains of engine houses for pumping and/or winding from shafts, boiler houses, fan houses for ventilating mine workings, offices, workshops, pithead baths, and transport systems such as railways and canals. A number of later nucleated mines also retain the remains of screens where the coal was sized and graded. Coke ovens are frequently found on or near colliery sites. Coal occurs in significant deposits throughout large parts of England and this has given rise to a variety of coalfields extending from the north of England to the Kent coast. Each region has its own history of exploitation, and characteristic sites range from the small, compact collieries of north Somerset to the large, intensive units of the north east. A sample of the better preserved sites, illustrating the regional, chronological and technological range of nucleated coal mines, together with rare individual component features are considered to merit protection.

The Brandy Bottom Colliery site contains the remains of a complete 19th century steam powered colliery. Amongst the standing buildings are a single storey twin cylinder horizontal steam winding engine house, a steam powered fan house, a Cornish beam engine house and a stone and brick built boiler chimney, with some of the buildings, for example the fanhouse, being rare survivals nationally. As a group these features demonstrate the spatial arrangement and workings of a late 19th century mine. It is very unusual for a site of this period to survive in such a complete form, and the undisturbed buried remains of engine bases, boiler settings and additional features will be present and represent considerable potential for the study of the coal mining industry in this area. The colliery is accessible to the public by virtue of a footpath and cycle way which run through the site, and is one of only a few sites remaining in this area which represent this once widespread industry. The Parkfield Collieries were only one of the firms with interests in the Bristol Coalfield, a coalfield which, in the late 19th century produced over 500,000 tons of coal, and had a significant impact on the economy of the Bristol area.

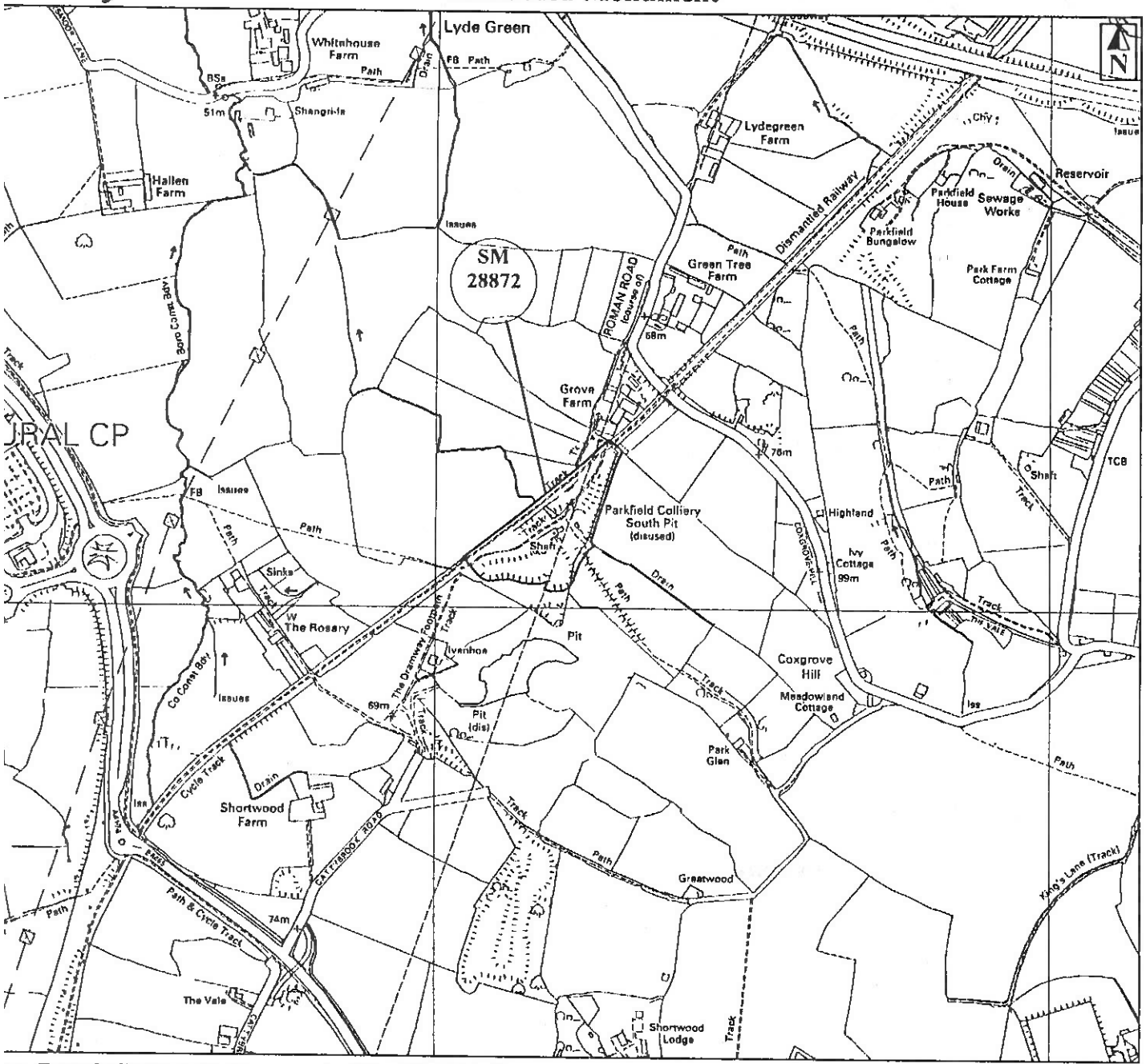
MAP EXTRACT

The site of the monument is shown on the attached map extract.

MONUMENT INCLUDED IN THE SCHEDULE ON 22nd January 2001

AUTHORISED BY: A R Middleton
On behalf of the Secretary of State for Culture, Media and Sport under batch no: 10912

Scheduled Monument



ıe: Brandy Bottom Colliery, part of Parkfield Collier···

Number: SM28872

County/UA: SOUTH GLOUCESTERSHIRE

District: SOUTH GLOUCESTERSHIRE

Parish: PUCKLECHURCH

Notes:
Monument NGR: ST68197712. For exclusions - see text record

For further information on this monument please contact English Heritage.

Map centred on NGR: ST6819477122

Boundary captured at: 10000

Map scale: 1:10,000

Extract from OS sheet(s): ST67NE

Key:

Confirmed
Unverified
Exclusion
Undefined

Sheet 1 of 1

Print date: 31 January 2001

ENGLISH HERITAGE
23 Savile Row, London W1S 2ET
Telephone 020 7973 3000 Fax 020 7973

JH41 28872
MPP45/ AA 80306/1

ACKNOWLEDGEMENT OF RECEIPT OF SCHEDULE ENTRY

Please help us by completing the following and returning it to English Heritage using the pre-paid envelope provided.

I acknowledge receipt of notification of scheduling.

I hereby confirm that

I am the owner
occupier
(please delete if not applicable)

of the whole of the area of the monument indicated on the attached map extract

of that part of the area of the monument which I have indicated on the attached map extract

Signed

Name

Address

Date

DETAILS OF OTHER PART OWNERS/OCCUPIERS

(PLEASE IGNORE THIS PART OF THE FORM IF IT IS INAPPROPRIATE OR IF YOU HAVE ALREADY SUPPLIED US WITH THE INFORMATION)

Name

Address

Name

Address

Name

Address