

Tempest Tower Wind Turbine
Little Orton, Cumbria

Report on an Archaeological Watching Brief

Planning Ref: 1/13/0739
Grid Ref: NY 3452 5521



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Looking south along the excavated area through the morning mist.

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Planning Ref: 1/13/0739

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TABLE OF CONTENTS

Acknowledgements	1
Executive Summary	2
1. Introduction	3
1.1 Project Background.....	3
1.2 Site Location.....	3
1.3 Aims and Objectives.....	3
2. Archaeological Background	4
2.1 Archaeological Context.....	4
2.1.1 Late Prehistoric to Romano-British.....	4
2.1.2 Early Medieval.....	4
2.1.3 Medieval, Post-medieval and Modern.....	4
2.2 Potential Significance.....	4
3. Policy and Guidance Framework	5
3.1 Legislation.....	5
3.2 Policy.....	5
3.2.1 National.....	5
3.2.2 Local.....	6
3.3 Guidance.....	6
3.3.1 National.....	6
4. Methodology	8
4.1 Pre-Fieldwork.....	8
4.2 Fieldwork.....	8
4.3 Post-Fieldwork.....	8
4.4 Chronology.....	8
4.5 Quality Assurance.....	8
4.6 Assumptions and Limitations.....	9
4.7 Copyright.....	9
5. Results and Discussion	10
5.1 General Stratigraphy.....	10
5.2 Archaeological and Palaeoenvironmental Features.....	10
5.3 Conclusions.....	11
6. Sources	12
6.1 Bibliography.....	12
Appendix 1 – Figures	13
Appendix 2 – Written Scheme of Investigation	18



LIST OF FIGURES

Fig. 1 Site location.....	14
Fig. 2 Site plan showing extent of monitored area and section of pit feature F004.....	15
Fig. 3 Light orange glacial till (underlying substrate) is revealed beneath a loamy topsoil.....	16
Fig. 4 Small pit feature F004 after half sectioning.....	16
Fig. 5 Modern field drain F014.....	17
Fig. 6 Late clay-filled trench F018.....	17

LIST OF TABLES

Table 1 Legislation relating to cultural heritage in planning.....	5
Table 2 Key passages of NPPF in reference to cultural heritage (archaeology).....	6
Table 3 Key passages of Carlisle District Local Plan in reference to cultural heritage (archaeology).....	6
Table 4 National guidance documentation consulted.....	7
Table 5 Contexts and features identified during monitoring.....	11
Table 6 Sampling strategy for investigation of cut features.....	18
Table 7 Outline of scientific and palaeoenvironmental sampling strategy.....	20
Table 8 Proposed specialist input to post-fieldwork stages.....	23



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EXECUTIVE SUMMARY

This report details the results of a programme of archaeological monitoring undertaken on land to the west of Tempest Tower, Little Orton, Cumbria during groundworks for the erection of a single wind turbine and associated infrastructure. The area of groundworks comprised a 4m wide access track from existing trackways, the turbine base and two crane pads. No previous work had been undertaken on the site, but monitoring was conditioned due to the presence of scheduled cropmark sites of late prehistoric or Romano-British date less than 500m to the south of the turbine site.

Of the anthropogenic features recorded during monitoring, all but one represented field drains of a likely 20th century date. A single small pit was recorded cut into the underlying substrate, though the fill contained no artefacts or ecofacts with which to ascribe a date or function to the feature. No artefacts or ecofacts were noted within the topsoil other than late 20th century ceramics, which were not retained.



1. INTRODUCTION

1.1 PROJECT BACKGROUND

This report has been prepared by Solstice Heritage on behalf of Messrs Martin and H&H Land to outline the results of an archaeological watching brief. The watching brief has been requested by the Historic Environment Officer at Cumbria County Council (CCC) as a condition of planning permission for the construction of a single wind turbine and associated infrastructure on land west of Tempest Tower, Little Orton, Cumbria.

1.2 SITE LOCATION

The proposed development is situated west of Tempest Tower, Little Orton, Cumbria, c.2.5km west of the edge of Carlisle, Cumbria, centred at grid reference NY34525521 (Fig. 1). The groundworks comprised the turbine base and the associated access and infrastructure (two crane pads).

1.3 AIMS AND OBJECTIVES

An archaeological watching brief is defined as:

“A formal programme of observation and investigation conducted during any operation carried out for non-archaeological reasons. This will be within a specified area or site on land, intertidal zone or underwater, where there is a possibility that archaeological deposits may be disturbed or destroyed. The programme will result in the preparation of a report and ordered archive” (IfA 2008a, 2).

The overarching aim of the watching brief was:

- To ensure that significant archaeological remains were not destroyed without first being adequately recorded.

The objectives of the watching brief were:

- To record, excavate and environmentally sample any archaeological deposits of significance observed during the groundworks
- To establish the date, character and significance of any archaeological and palaeoenvironmental deposits, including in relation to other similar features within the area
- To ensure there is a permanent record of the work undertaken deposited with the local Historic Environment Record (HER) and made available online
- To ensure all work is undertaken in compliance with the Code of Conduct of the Institute for Archaeologists (IfA) (2000), the IfA Standard and Guidance for Watching Briefs (revised 2001), and the Regional Statement of Good Practice.

2. ARCHAEOLOGICAL BACKGROUND

2.1 ARCHAEOLOGICAL CONTEXT

As set out in the WSI, a short piece of desk-based research was undertaken to provide the necessary context for the monitoring work. The desk-based research was focussed principally on the Cumbria Historic Environment Record (HER) but also included other sources were relevant.

2.1.1 LATE PREHISTORIC TO ROMANO-BRITISH

The most significant archaeological remains within the immediate vicinity of the site relate to the later prehistoric or Romano-British periods. The general similarity of rural (likely native) settlement types across these periods make attribution of unexcavated or unevaluated remains problematic. There are two Scheduled Monuments within the 2km study area:

- Orton Moss Enclosures (National Heritage List 1007253) - c.300m to the south of the proposed turbine there are a series of cropmark enclosures dated by form to the Iron Age or Romano-British periods.
- Sceughmire Enclosures (National Heritage List 1007254) - c.850m south-east of the proposed turbine there are two rectilinear enclosures, again identified as cropmarks from aerial photography. The main enclosure is associated with a double trackway and it is possible that the slighter of the two enclosures represents a small part of a more extensive associated field system.

In the immediate vicinity of the Orton Moss enclosures, the HER also records the following:

- Moor House, Lough House Enclosure (HER 3773) - a small enclosure of indeterminate date or form less than 50m to the north of the scheduled enclosure complex.
- Orton Moss Enclosures (HER 406) - The boundary of the heritage asset as recorded in the HER is significantly larger than the boundary of the scheduled area. This represents the likelihood that the complex of enclosures is larger than identified by the scheduling, and it is not uncommon for this to be the case.

2.1.2 EARLY MEDIEVAL

There are two heritage assets recorded in the HER for the early medieval period - both finds of stone sculpture now stored at the Tullie House Museum in Carlisle rather than in-situ archaeological deposits, though still significant in suggesting the presence of Anglo-Scandinavian or Early Norman activity in the area. The HER records that Collingwood suggested that these two pieces indicate the presence of an unknown early medieval ecclesiastical building in the area. The two recorded features are:

- The Bow Stone (HER 423) - a piece of monumental sculpture decorated with vine pattern, cross and sword. Originally suggested as Roman work it is considered more likely to be early medieval or medieval in origin.
- Coffin Find from Kirkstead (HER 466) - a sculpted stone coffin or trough featuring vine work similar to the Bow Stone. Recorded as being poor quality 8th century Anglian or 11th-12th century Anglian Revival and not Roman as originally catalogued.

2.1.3 MEDIEVAL, POST-MEDIEVAL AND MODERN

The majority of other heritage assets in the immediate vicinity of the proposed development date to the post-medieval and Modern periods, with the potential that some of the extensive, though largely ploughed-out, ridge and furrow has its origins in medieval land allotment and agricultural processes. The nearest heritage asset to the proposed turbine site, other than the northernmost extent of the Orton Moss enclosures noted above, is Tempest Tower itself: a Grade II Listed Building (National Heritage List 1031807) constructed in 1875 by the local landowner James Sibson and including an ornamental entrance in the style of a pele tower.

A rapid assessment of available historic mapping was also undertaken. A number of pre-19th century pictorial maps depicted a settlement at Orton, but provided no specific detail about the development site. Consultation of historic Ordnance Survey mapping showed that the field configuration has been the same since the 1st Edition in the 1860s, with the only noticeable change being the removal of a single dividing fenceline in the late 19th century, possibly contemporary with the construction of Tempest Tower.



3. POLICY AND GUIDANCE FRAMEWORK

3.1 LEGISLATION

National legislation which applies to the consideration of cultural heritage within development and the wider planning process is set out in Table 1 below.

Title	Key Points
Ancient Monuments and Archaeological Areas Act 1979 (amended by the National Heritage Act 1983 and 2002)	Scheduled Monuments, as defined under the Ancient Monuments and Archaeological Areas Act (1979), are sites which have been selected by a set of non-statutory criteria to be of national significance. Where scheduled sites are affected by development proposals there is a presumption in favour of their physical preservation. Any works, other than activities receiving class consent under The Ancient Monuments (Class Consents) Order 1981, as amended by The Ancient Monuments (Class Consents) Order 1984, which would have the effect of demolishing, destroying, damaging, removing, repairing, altering, adding to, flooding or covering-up a Scheduled Monument require consent from the Secretary of State for the Department of Culture, Media and Sport.
Planning (Listed Building and Conservation Areas) Act 1990	Buildings of national, regional or local historical and architectural importance are protected under the Planning (Listed Buildings and Conservation Areas) Act 1990. Buildings designated as 'Listed' are afforded protection from physical alteration or effects on their historical setting.
Hedgerows Regulations 1997	The Hedgerow Regulations (1997) include criteria by which hedgerows can be regarded as historically important (Schedule 1 Part III).

Table 1 Legislation relating to cultural heritage in planning

3.2 POLICY

3.2.1 NATIONAL

The principal instrument of national planning policy within England is the National Planning Policy Framework (NPPF) (CLG 2012) which outlines the following in relation to cultural heritage within planning and development:

Paragraph	Key Points
7	Contributing to protecting and enhancing the historic environment is specifically noted as being a part of what constitutes 'sustainable development' – the "golden thread" which, when met, can trigger presumption in favour.
17	A core planning principle is to "conserve heritage assets in a manner appropriate to their significance, so that they can be enjoyed for the contribution to the quality of life of this and future generations".
128	During the determination of applications "local planning authorities should require an applicant to describe the significance of any heritage assets affected, including any contribution made by their setting". This information should be proportionate to the significance of the asset and only enough to "understand the potential impact of the proposal on their significance".

129	Paragraph 129 identifies that Local planning authorities should identify and assess the particular significance of any heritage asset that may be affected by a proposal (including by development affecting the setting of a heritage asset) taking account of the available evidence and any necessary expertise.
132	It is noted that significance – the principal measure of inherent overall heritage worth – can be harmed or lost through development within its setting. Heritage assets are an irreplaceable resource and any adverse effects require “clear and convincing justification” relative to the significance of the asset in question.
135	At paragraph 135 it states that the effect of an application on the significance of a non-designated heritage asset should be taken into account in determining the application. In weighing applications that affect directly or indirectly non designated heritage assets, a balanced judgement will be required having regard to the scale of any harm or loss and the significance of the heritage asset.
139	At paragraph 139 it states that non-designated heritage assets of archaeological interest that are demonstrably of equivalent significance to scheduled monuments, should be considered subject to the policies for designated heritage assets.
141	In paragraph 141 amongst other matters it states that planning authorities should require developers to record and advance understanding of the significance of any heritage assets to be lost (wholly or in part) in a manner proportionate to their importance and the impact, and to make this evidence (and any archive generated) publicly accessible. However, the ability to record evidence of our past should not be a factor in deciding whether such loss should be permitted.

Table 2 Key passages of NPPF in reference to cultural heritage (archaeology)

3.2.2 LOCAL

The local planning policy relevant to this project principally comprises saved policies from the Carlisle District Local Plan (Carlisle City Council 2008). The key policy in relation to heritage is LE8 reproduced in Table 3 below.

Policy	Summary
LE8	On land for which there is no archaeological information, but where there are reasonable grounds for believing remains to be present, the City Council will ensure that the archaeological aspects of development proposals are examined and evaluated before planning applications are determined. Planning permission will not be granted without adequate assessment of the archaeological implications.

Table 3 Key passages of Carlisle District Local Plan in reference to cultural heritage (archaeology)

3.3 GUIDANCE

3.3.1 NATIONAL

During the assessment and preparation of this document, the following guidance documents have been referred to, where relevant:

Document	Key Points
National Planning Practice Guidance (NPPG) (CLG 2014)	The Department for Communities and Local Government (CLG) released the guidance to NPPF in March 2014 in a 'live' online format which, it is intended can be amended and responsive to comment, particular as case law develops in relation to the implementation of NPPF. In relation to cultural heritage the NPPG follows previous guidance in wording and 'keys in' with, in particular, extant English Heritage guidance documents. The NPPG references many similar terms to the previous PPS5 Practice Guidance.
Conservation Principles, Policies and Guidance (EH 2008)	This document sets out the guiding principles of conservation as seen by English Heritage and also provides a terminology for assessment of significance upon which much that has followed is based.
Standard and Guidance for Archaeological Watching Briefs (IfA revised 2008a)	This document represents non-statutory industry best practice as set out by the Institute for Archaeologists. This work has been undertaken to these standards, as subscribed to by Solstice Heritage.

Table 4 National guidance documentation consulted

4. METHODOLOGY

4.1 PRE-FIELDWORK

Prior to commencement of fieldwork the CCC Historic Environment Record (HER) was consulted to provide a rapid assessment of the existing archaeological resource for the immediate area of the site (results summarised above). All relevant sources held at the HER were consulted for an area of up to 2km radius from the development location.

4.2 FIELDWORK

The footprint of the turbine base, crane pads and associated trackway infrastructure, illustrated on Fig. 2 below, were excavated on Tuesday 4th-Wednesday 5th November 2014. All groundworks were monitored by a suitably qualified archaeologist, and a toothless ditching bucket was used for removal of all overburden.

Where archaeological features and deposits were encountered, these were to be recorded to the standards outlined in the relevant IfA Standard and Guidance. All features and deposits were to be recorded on pro-forma record sheets, drawn in plan and section at a suitable scale, and photographed. In addition to any specific features or deposits, a general record of stratigraphy was made on pro-forma record sheets.

Prior to fieldwork a full Written Scheme of Investigation (WSI) (Brightman 2014) was prepared and submitted to the local authority archaeologist. The methodological sections of this document have been included as Appendix 2 below.

4.3 POST-FIELDWORK

The primary site archive comprises site records and digital photography on cd. This has been used to compile this report, which will be deposited with the local HER in hard copy and digital format as the principal record of the monitoring work undertaken. Given the absence of archaeological features, deposition and preservation of the limited paper archive with a suitable local repository museum is not considered suitable, as outlined in the WSI. An OASIS record has been completed for this work, including a digital version of this report, the reference for which is **solstice1-190650**.

In the absence of any material culture, faunal or human remains, or deposits of palaeoenvironmental significance no further work was required to catalogue, process or assess such remains for integration within the report and archive. The procedures and strategy that would have been followed had such remains been encountered is set out within the earlier WSI and included in Appendix 2 below.

4.4 CHRONOLOGY

Where chronological and archaeological periods are referred to in this WSI, the relevant date ranges are broadly defined as follows:

- Palaeolithic (Old Stone Age): 1 million – 12,500 BP (Before present)
- Mesolithic (Middle Stone Age): 10500 – 4000 BC
- Neolithic (New Stone Age): 4000 – 2200 BC
- Bronze Age: 2400 – 700 BC
- Iron Age: 800 BC – AD 43
- Roman/Romano-British: AD 43 – 410
- Anglo-Saxon/Anglo-Scandinavian: AD 410 – 1066
- Medieval: AD 1066 – 1485
- Post-medieval: AD 1485 – 1750
- Industrial: AD 1750 – 1900
- Modern: AD 1900 – Present

4.5 QUALITY ASSURANCE

Solstice Heritage commits all fieldwork and post-fieldwork assessment, analysis, reporting and dissemination



to be undertaken to the standards stipulated by the Institute for Archaeologists (IfA) as is outlined in Appendix 2 below. The project has been managed and fieldwork undertaken by Jim Brightman, who is a fully accredited member of the IfA (MIfA level).

4.6 ASSUMPTIONS AND LIMITATIONS

Data and information obtained and consulted in the compilation of this report has been derived from a number of secondary sources. Where it has not been practicable to verify the accuracy of secondary information, its accuracy has been assumed in good faith. All statements and opinions arising from the works undertaken are provided in good faith and compiled according to professional standards. No responsibility can be accepted by the author/s of this report for any errors of fact or opinion resulting from data supplied by any third party, or for loss or other consequence arising from decisions or actions made upon the basis of facts or opinions expressed in any such report(s), howsoever such facts and opinions may have been derived.

4.7 COPYRIGHT

Solstice Heritage will retain the copyright of all documentary and photographic material under the Copyright, Designs and Patent Act (1988).

5. RESULTS AND DISCUSSION

5.1 GENERAL STRATIGRAPHY

The uppermost deposit across the site was a homogenous clayey loam topsoil (**001**) with a maximum observed thickness of c.0.4m. The well-sorted nature of the deposit suggests a former ploughsoil, though the field is currently under pasture. There were some fragmentary sherds of 20th century pottery observed in the more-disturbed areas close to the field boundaries, though this was not retained.

The basal deposit encountered across site was a clay till (**002**) (Fig. 3). The deposit was typical of sub-glacially derived clays with poor sorting and mixed-sized clasts within a mottled clay matrix that incorporated pockets of coarser sediment. All archaeological features observed were cut into this till substrate.

5.2 ARCHAEOLOGICAL AND PALAEOENVIRONMENTAL FEATURES

Of eight anthropogenic features observed, the only one of potential archaeological interest was a small pit feature of indeterminate function (**F004**) (Fig. 4). The feature measured c.0.6m x c.0.39m in plan with a maximum depth of c.0.2m. The fill of the pit was a relatively homogenous dark clayey silt containing some medium rounded stones and a redeposited lump of natural clay substrate. No artefacts or ecofacts were recovered from the feature.

The remaining seven anthropogenic features (**F006 - F018**) were all interpreted as field drains representing recent (likely 20th century) agricultural activity (e.g. Fig. 5). Features **F006-F016** were all of a relatively uniform form being c.0.25-0.3m square in cross section. Field drain **F006** ran parallel to the field boundary and contained a 20th century ceramic drainage pipe. Field drains **F008-F016** all ran parallel to each other and at right-angles to **F006**, and although none contained ceramic pipe at the points sampled, their arrangement suggests contemporaneity with **F006**. The final feature observed was a straight, clay-filled trench with a width of c.0.7m and a square section suggestive of a machine-cut drainage or pipe trench (Fig. 6). This feature (**F018**) cut three of the field drains and so is also most likely to be a 20th century drainage cut or similar.

In addition to the anthropogenic features described above, five amorphous cut features, distributed relatively evenly across the area of monitoring, were sampled. They were irregular in fill and cut and most likely represented the remains of root systems of former trees or shrubs. Similar features have been observed by the author on previous excavations and demonstrated to be natural in origin.

Context No.	Description	Date
001	Homogenous topsoil present across site.	-
002	Clay substrate - lowest deposit observed.	-
003	Fill of small undated pit feature F004.	Uncertain
004	Cut of (003).	Uncertain
005	Fill of field drain trench parallel to field boundary.	Post-medieval to Modern
006	Cut of (005).	Post-medieval to Modern
007	Fill of one of a series of parallel field drains at right-angles to F006.	Post-medieval to Modern
008	Cut of (007).	Post-medieval to Modern
009	Fill of one of a series of parallel field drains at right-angles to F006.	Post-medieval to Modern
010	Cut of (009).	Post-medieval to Modern
011	Fill of one of a series of parallel field drains at right-angles to F006.	Post-medieval to Modern
012	Cut of (011).	Post-medieval to Modern
013	Fill of one of a series of parallel field drains at right-angles to F006.	Post-medieval to Modern
014	Cut of (013).	Post-medieval to Modern
015	Fill of one of a series of parallel field drains at right-angles to F006.	Post-medieval to Modern

Context No.	Description	Date
016	Cut of (015).	Post-medieval to Modern
017	Fill of clay-filled trench cutting F008 and F010.	Modern
018	Cut of (017).	Modern

Table 5 Contexts and features identified during monitoring

5.3 CONCLUSIONS

The features observed during monitoring suggest extensive modern land drainage, most likely within the 20th century and potentially extending back into the end of the 19th, though no artefactual evidence corroborates this. A single small pit feature demonstrates some historic activity, though a lack of dating evidence precludes any firm conclusions. Given that evidence of more-recent activity appears to survive well as cut features, the lack of any remains relating to the extensive late prehistoric or Romano-British enclosures to the south suggests that the focus of settlement from this period did not extend far to the north. This interpretation must remain tentative, however, as the area monitored only represents a small window into this landscape.

6. SOURCES

6.1 BIBLIOGRAPHY

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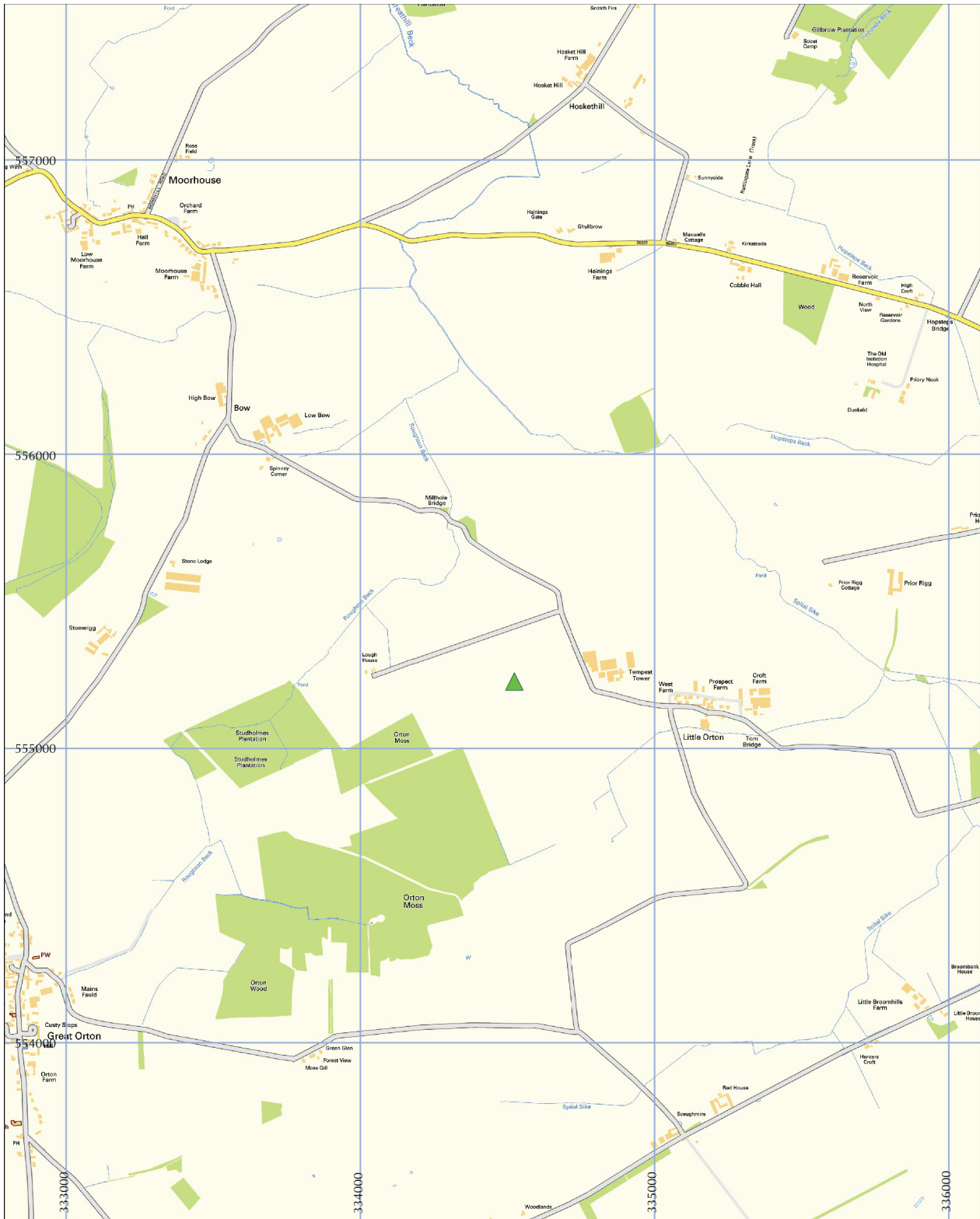
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APPENDIX 1 – ADDITIONAL FIGURES





<p>Project</p> <p>Tempest Tower Wind Turbine Little Orton, Cumbria</p> <p>Archaeological Watching Brief</p>	<p>Legend</p> <p> Turbine Location</p>	<p>Solstice Heritage Crabtree Hall Business Centre Little Holtby Northallerton North Yorkshire DL7 9NY www.solsticeheritage.co.uk</p> 	
<p>Drawn</p> <p>Fig. 1 Site Location</p>	<p>0 0.25 0.5 0.75 1 km</p>  <p>Ordnance Survey data © Crown copyright and database right 2014.</p>	<p>Drawn</p> <p>JB</p>	<p>Date</p> <p>Nov 2014</p>



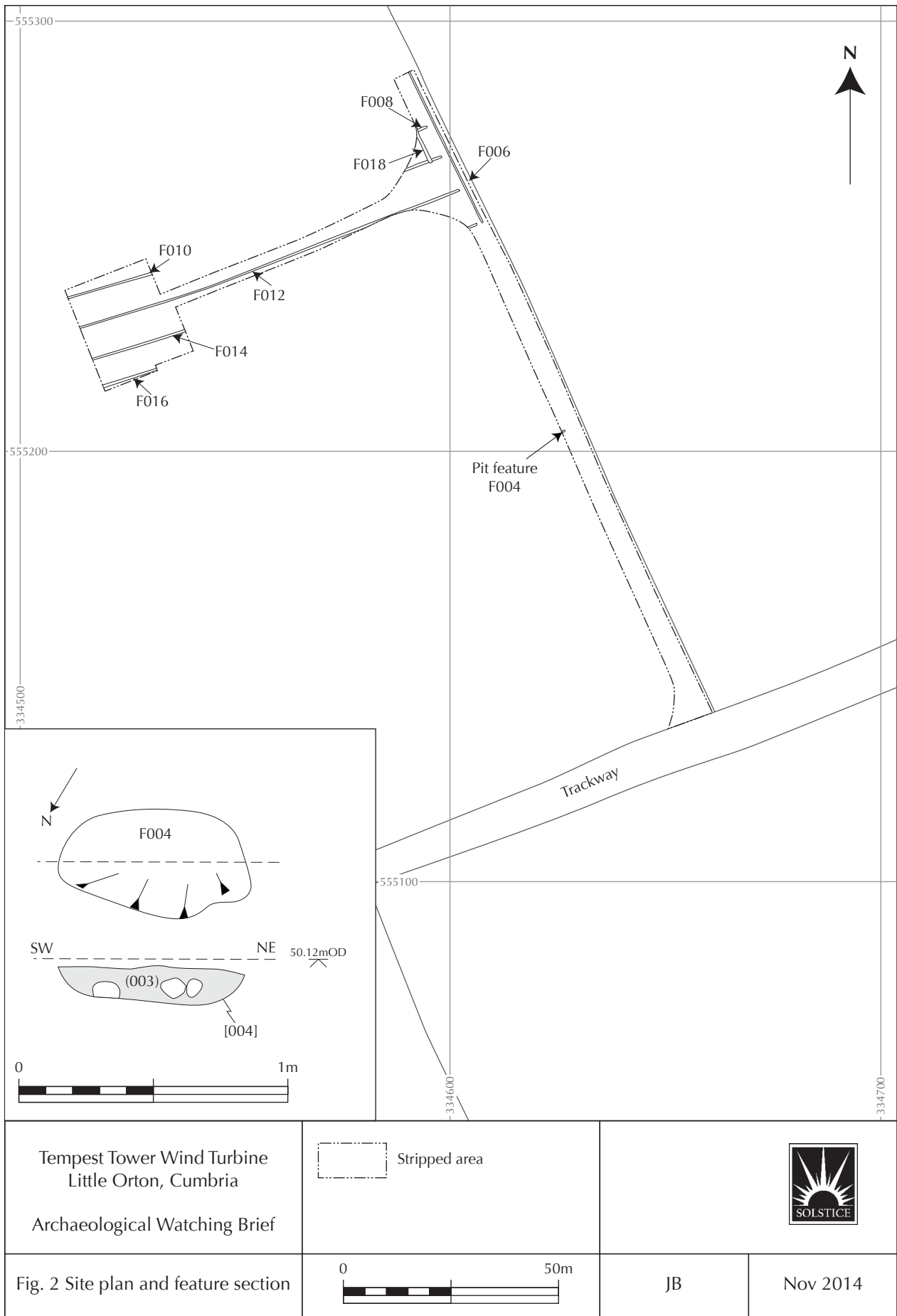




Fig. 3 Light orange glacial till (underlying substrate) is revealed beneath a loamy topsoil



Fig. 4 Small pit feature F004 after half sectioning (scale 1m)



Fig. 5 Modern field drain F014 looking south-west across the open area of the turbine base and crane pad (scale 1m)



Fig. 6 Late clay-filled trench F018 (in line with camera viewpoint) cutting modern field drains (right angles to shot) (scale 1m)

APPENDIX 2 – WRITTEN SCHEME OF INVESTIGATION

Only the methodology, resources and programming section of the WSI are included within this appendix in order to prevent unnecessary repetition.

ARCHAEOLOGICAL MONITORING

All groundworks will be monitored by a suitably qualified archaeologist and all mechanical excavation will be undertaken with a toothless bucket. Where archaeological or palaeoenvironmental features or deposits are encountered, groundworks will halt and suitable time will be afforded to the archaeologist to investigate, sample and record such remains. Equally the archaeologist will aim to minimise disruption to the programme of groundworks through good working practice.

Where standing structures are encountered, their full extent within the area of monitoring will be exposed and recorded. Where cut features are exposed, they will be cleaned and delimited as much as is practicable within the area of monitoring and investigated using the sampling strategy outlined in Table 6 below. Where cut features contain material culture or palaeoenvironmental remains of significance then they will be subject to a more rigorous sampling strategy, usually included 100% excavation of fill material and palaeoenvironmental sampling as detailed below.

Size/Nature of Feature	Minimum percentage of fill excavated and sampled
Cut feature less than c.1m in diameter or equivalent area	50%
Cut feature greater than c.1m in diameter or equivalent area	25% or until form, function and date can be adequately characterised
Linear features	10% in 1m slots evenly spaced along the length of the features though focussing on junctions and relationships with other features where present. Minimum sample of 2m length where the linear feature is less than 20m in total length.

Table 6 Sampling strategy for investigation of cut features.

RECORDING METHODOLOGY

All archaeological features will be recorded on *pro-forma* sheets creating a primary written record that will be accompanied by drawn and photographic records. A site diary giving a summary of each day's monitoring will also be maintained including overall interpretive observations.

A drawn record will be compiled of all features, including plan and section/profile illustrations, at a suitable scale (usually 1:10, 1:20 or 1:50) depending on the complexity and significance of the remains.

The photographic record of the monitoring will be undertaken in high-resolution digital format. Photographs will be taken of all archaeological and palaeoenvironmental features in addition to general site photography locating the individual features in their wider context.

The total area of groundworks will be located and tied to the National Grid at a scale of 1:2500 or 1:1250 as practical. All features will be located accurately within this area and their height also accurately recorded above Ordnance Datum. The same level of accuracy will be applied to measuring the respective heights of the top and base of excavations.

SMALL FINDS

Given the relatively small size of the area to be monitored, all small finds will be initially retained and bagged by context for assessment at the post-fieldwork stage. Should an unexpected quantity of material be uncovered that is deemed to be of little significance then this will be noted but not retained, subject to the agreement of the Historic Environment Officer.

Small finds will be handled, packed and stored in accordance with the guidelines in *First Aid for Finds* (Watkin-



son and Neal 1998).

In the event that finds of 'treasure' are uncovered then the local Coroner will be informed and the correct procedures will be followed as outlined under the *Treasure Act 1996*.

The contact details for the coroner local to this work are:

Mr David Roberts
HM Coroner for Cumbria (North/West)
Unit 5D/5E Lakeland Business Park
Cockermouth
Cumbria
CA13 0QT
01900 706902

HUMAN REMAINS

In the event of human remains being uncovered, including evidence of cremations, these will be initially left in situ, protected and covered from view. Should removal of the remains be deemed necessary then a licence will be obtained from the Ministry of Justice (MoJ) prior to excavation proceeding. Exhumation of human remains will proceed in accordance with the MoJ licence and all health and safety regulations and guidance.

SCIENTIFIC AND PALAEOENVIRONMENTAL SAMPLING STRATEGY

AIM OF THE SAMPLING STRATEGY

Given the uncertainty of the presence or level of archaeological remains likely to be encountered as part of this monitoring, the general aim of the scientific and palaeoenvironmental sampling strategy is:

- To provide information on the nature of human activity and the past environment in the immediate area, in relation to the archaeological deposits uncovered during the project.

OVERVIEW

The table below provides an overview of the basic sampling strategy. Sampling levels and feature-specific approaches may vary from this broad outline in accordance with the characteristics and potential of individual features to address the aims and objectives outlined above. Should the nature of archaeological remains observed during the course of fieldwork be markedly different to that anticipated, then modifications to this sampling strategy will be agreed with the DCC Senior Archaeologist. Sampling and assessment methodologies will follow best practice as set out in relevant guidance documents, including *Environmental Archaeology* (English Heritage 2011).

Potential Data	Botanical Macrofossils		Pollen, Foraminifera	Radiocarbon Dating	Archaeometallurgy/ Industrial Residue
	Bulk (flotation)	Min. Excavated Sample			
Sample Type	Min. Sample Size	Min. Excavated Sample	Monolith/ Subsample	Individual	Bulk (residue)
Feature or Context Type					
Structural or occupational features (isolated or with little observed palaeoenvironmental potential)	-	50%	-	Individual samples where observed during excavation and suitable sample recovered from bulk flotation	-
Structural or occupational features (concentrated, containing material culture, or with demonstrable palaeoenvironmental potential)	40 litre or 100% of excavated fill	100%	Subsample of single fill or monolith sample of stratigraphy where suitable		40 litre or 100% of excavated fill
Isolated pit features (Prehistoric to Early Medieval containing material culture)		100%			
Isolated pit features (medieval containing material culture)		100%			
Isolated pit features (Post-medieval containing material culture)		50%		-	
Isolated pit features < c. 1m in diameter or equivalent area (undated or with little observed palaeoenvironmental potential)	-	50%		-	
Isolated pit features > c. 1m in diameter or equivalent area (undated or with little observed palaeoenvironmental potential)	-	25%		-	
Linear features (associated with structural or occupational features)	40 litre or 100% of excavated fill	10% or 2m if less than 20m in total length	Monolith sample of preserved stratigraphy where suitable (e.g. laminated ditch deposits)	Individual samples where observed during excavation and suitable sample recovered from bulk flotation	40 litre or 100% of excavated fill
Linear features (isolated)	-			-	-
On-site processing methods	On-site flotation using graduated sieves with a minimum of 500 micron mesh		None beyond approved storage and packaging methods	None beyond approved storage and packaging methods	Residue from on-site flotation

Table 7 Outline of scientific and palaeoenvironmental sampling strategy

HEALTH AND SAFETY

All archaeological work will be undertaken in a safe manner in compliance with the Health and Safety at Work Act 1974. A full risk assessment will be undertaken in advance of the commencement of work, a copy of which will be available on site for the duration of the fieldwork. Solstice Heritage has a full Safety, Health and Environment Policy which can be supplied upon request.

EXTENSIVE REMAINS AND/OR SIGNIFICANT FINDS

In the event of discovery of archaeological remains which are more extensive and/or significant than could reasonably have been anticipated then the following procedure will be followed:

- The archaeological remains will be fenced off and no machinery or contractors other than project archaeologists will operate in the area.
- The client, Historic Environment Officer and any other key stakeholders will be informed and an agreement will be reached on any amendments to the methodology and project scope.
- Where required, a modified WSI, or addendum to this document, will be prepared and agreed with all stakeholders.

POST-FIELDWORK METHODOLOGY

SMALL FINDS PROCESSING

All finds will be processed and catalogued in line with standard guidance documents including First Aid for Finds (Watkinson and Neal 1998), the Standard and Guidance for the Collection, Documentation, Conservation and Research of Archaeological Materials (IfA 2008b) and Archaeological Archives: A Guide to Best Practice in Creation, Compilation, Transfer and Curation (Brown 2007).

SPECIALIST ASSESSMENT AND ANALYSIS

After processing artefacts and ecofacts will be quantified and assessed to provide an overview of their potential to meet the aims and objectives of the project. This will be undertaken, where necessary, by a relevant specialist, as set out below, and will include a statement on the potential and requirement for further analysis. Where extensive analysis is recommended and justified by the potential of the assemblage or sample then this will be undertaken after agreement with the client and Historic Environment Officer.

REPORTING

Following completion of any specialist assessment and analysis, all information will be synthesised in a project report, which will include as a minimum:

- Planning application number and site grid reference on front cover
- OASIS reference number
- A non-technical summary of results
- Introduction
- Dates of project
- Aims and method statement
- Legislative, policy and guidance framework
- Results of rapid desk-based assessment
- Tabular summary of data outlining all archaeological deposits, features, classes and numbers of artefacts and spot dating of significant finds
- Specialist reports (where necessary) including quantification of recovered finds
- Discussion of results
- Illustrative digital photography
- Location plan of the site of at least 1:10000 scale related to the national grid

- Extent plan of the area of monitoring at a suitable and recognised scale positioning all archaeological and palaeoenvironmental features and deposits in relation to the national grid
- Plans and section of all archaeological features at a suitable scale
- Above Ordnance Datum (aOD) levels on plans and incorporated into the text
- A copy of this WSI as an appendix

Any variation to the minimum requirements above will be approved in advance in writing by the Historic Environment Officer.

One bound paper copy and one digital copy of the report will be supplied to the client, and two bound paper copies and one digital copy of the final report will be supplied to the Historic Environment Officer within two months of the completion of fieldwork, subject to the need for specialist assessment and analysis.

ARCHIVING

Within 6 months of the completion of all post-fieldwork stages of the project, a full archive will be compiled and deposited with a local recipient museum, in this case Tullie House, Carlisle. The archive will be compiled in accordance with the Standard and Guidance for the Creation, Compilation, Transfer and Deposition of Archaeological Archives (IfA 2009b). The archive and all material contained in it will be compiled according to the guidelines of the recipient museum, and will include as a minimum:

- A list of archive contents, by box if required
- Hard copies of all relevant project documentation
- Digital material created for the project
- Artefacts and ecofacts for which there is a reason for retention (e.g. inherent significance, potential for future analysis).

Deposition of any material culture will be agreed prior to commencement of work with the legal owner and the recipient museum, and contact has already been made with Tullie House Museum. Final deposition arrangements and any amendments to this specification will be confirmed in writing to the Historic Environment Officer, and confirmation of deposition will also be confirmed to the client and Historic Environment Officer.

Should there be no material archive arising from the project then, as a minimum, the project report will be submitted to the Cumbria HER in hard copy and digital format as specified above, and project details and a copy of the report will be made available through OASIS (see below).

OASIS

Solstice Heritage is registered with the Online Access to Index of Archaeological Investigations (OASIS) Project and fully supports all project documentation and records being made available through the OASIS website. Upon completion of the post-fieldwork reporting and archiving, an OASIS record will be completed, and a copy of the project report will be uploaded. The OASIS reference for this project is: **solstice1-176048**.

PUBLICATION AND DISSEMINATION

A summary report of the findings of the project will be submitted to a suitable regional or national journal within one year of the completion of fieldwork. In the event that formal publication and/or wider dissemination is deemed necessary, then a suitable format will be agreed with the client and the Historic Environment Officer. This may include a digital download document made freely available or publication in a local, regional or national journal.

EXTENSIVE REMAINS AND/OR SIGNIFICANT FINDS

In the event of discovery of archaeological remains which are more extensive and/or significant than could reasonably have been anticipated then this will require a more detailed post-fieldwork approach. Should this be required, a suitable and proportionate post-fieldwork methodology will be agreed with the client and the Historic Environment Officer upon completion of fieldwork, including a suitable level of publication and/or dissemination as noted above.



RESOURCES AND PROGRAMMING

FIELDWORK STAFF

The project will be managed by Jim Brightman of Solstice Heritage. Jim holds full accredited professional membership of the Institute for Archaeologists (IfA) at MfA level. It is anticipated that the fieldwork will also be undertaken by Jim Brightman, though in the event of a change, details of fieldwork staff will be confirmed in writing to the Historic Environment Officer prior to commencement.

POST-FIELDWORK STAFF

The post-fieldwork reporting and archiving will also be undertaken by Jim Brightman as the lead project archaeologist.

SPECIALIST INPUT

Should specialist input be required for assessment and analysis at post-fieldwork stage, then it is intended that the following specialists be used:

Specialism	Specialist	Company/Institution
Lithics	Spencer Carter	Independent specialist
Prehistoric pottery	Dr Clive Waddington	ARS Ltd
Romano-British Pottery	Chris Howard-Davies	Oxford Archaeology North (OAN)
Roman brick/tile	Alex Croom	Tyne and Wear Archives & Museums
Early glasswork	Dr Hilary Cool	Barbican Research Associates
Medieval/Post-medieval pottery	Dr Chris Cumberpatch	Independent specialist
Archaeometallurgy	Dr Gerry McDonnell	Independent specialist
Clay pipe	Dr Susie White	University of Liverpool
Industrial/later glasswork	Chris Howard-Davies	OAN
Industrial/later brickwork	Ian Miller	OAN
Industrial/later metalwork	Chris Scott	ARS Ltd
Conservation of artefacts	Jennifer Jones	Archaeological Services Durham University (ASDU)
Botanical macrofossils	Dr Charlotte O'Brien	ASDU
Pollen	Dr Charlotte O'Brien	ASDU
Human remains	Dr Malin Holst	York Osteoarchaeology
Faunal remains	Louisa Gidney	ASDU
All dating techniques	Dr Gordon Cook	Scottish Universities Environmental Research Centre (SUERC)

Table 8 Proposed specialist input to post-fieldwork stages

This list is subject to change depending on individual availability of specialists and the specific requirements of the archaeological and palaeoenvironmental remains uncovered during the course of fieldwork.

FIELDWORK PROGRAMME

The dates have not yet been set for the commencement of fieldwork. A minimum of one week's notice of commencement of groundworks will be given to the Historic Environment Officer.

POST-FIELDWORK PROGRAMME

The post-fieldwork process will commence immediately upon completion of the fieldwork. Unless a more in-depth post-fieldwork process has been agreed as an addendum to this document, then a report will be compiled within two months, subject to any required specialist input. An OASIS record will be completed and any archive will be deposited within six months of the completion of the post-fieldwork phase.

MONITORING

The CCC contact for monitoring of the project will be:

Jeremy Parsons
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Cumbria County Council
County Offices
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Cumbria
LA9 4RQ
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