



making sense of heritage

WORTLEY TIN MILL, WORTLEY,
BARNESLEY,
SOUTH YORKSHIRE

Archaeological Desk-based Assessment and Survey



Ref: 87410.01
February 2013

 **wessex**
archaeology





**WORTLEY TIN MILL, WORTLEY,
BARNSELY,
SOUTH YORKSHIRE**

Archaeological Desk-based Assessment and Survey

Prepared for:
Hunshelf Parish Council

by
Wessex Archaeology
Unit R6, Riverside Block,
Sheaf Bank Business Park,
Prospect Road,
Sheffield.
S2 3EN

Project No: 87410.01

February 2013

DISCLAIMER

THE MATERIAL CONTAINED IN THIS REPORT WAS DESIGNED AS AN INTEGRAL PART OF A REPORT TO AN INDIVIDUAL CLIENT AND WAS PREPARED SOLELY FOR THE BENEFIT OF THAT CLIENT. THE MATERIAL CONTAINED IN THIS REPORT DOES NOT NECESSARILY STAND ON ITS OWN AND IS NOT INTENDED TO NOR SHOULD IT BE RELIED UPON BY ANY THIRD PARTY. TO THE FULLEST EXTENT PERMITTED BY LAW WESSEX ARCHAEOLOGY WILL NOT BE LIABLE BY REASON OF BREACH OF CONTRACT NEGLIGENCE OR OTHERWISE FOR ANY LOSS OR DAMAGE (WHETHER DIRECT INDIRECT OR CONSEQUENTIAL) OCCASIONED TO ANY PERSON ACTING OR OMITTING TO ACT OR REFRAINING FROM ACTING IN RELIANCE UPON THE MATERIAL CONTAINED IN THIS REPORT ARISING FROM OR CONNECTED WITH ANY ERROR OR OMISSION IN THE MATERIAL CONTAINED IN THE REPORT. LOSS OR DAMAGE AS REFERRED TO ABOVE SHALL BE DEEMED TO INCLUDE, BUT IS NOT LIMITED TO, ANY LOSS OF PROFITS OR ANTICIPATED PROFITS DAMAGE TO REPUTATION OR GOODWILL LOSS OF BUSINESS OR ANTICIPATED BUSINESS DAMAGES COSTS EXPENSES INCURRED OR PAYABLE TO ANY THIRD PARTY (IN ALL CASES WHETHER DIRECT INDIRECT OR CONSEQUENTIAL) OR ANY OTHER DIRECT INDIRECT OR CONSEQUENTIAL LOSS OR DAMAGE

COPYRIGHT

THIS REPORT MAY CONTAIN MATERIAL THAT IS NON-WESSEX ARCHAEOLOGY COPYRIGHT (E.G. ORDNANCE SURVEY, BRITISH GEOLOGICAL SURVEY, CROWN COPYRIGHT), OR THE INTELLECTUAL PROPERTY OF THIRD PARTIES, WHICH WE ARE ABLE TO PROVIDE FOR LIMITED REPRODUCTION UNDER THE TERMS OF OUR OWN COPYRIGHT LICENCES, BUT FOR WHICH COPYRIGHT ITSELF IS NON-TRANSFERRABLE BY WESSEX ARCHAEOLOGY. YOU ARE REMINDED THAT YOU REMAIN BOUND BY THE CONDITIONS OF THE COPYRIGHT, DESIGNS AND PATENTS ACT 1988 WITH REGARD TO MULTIPLE COPYING AND ELECTRONIC DISSEMINATION OF THE REPORT.

QUALITY ASSURANCE

SCHEME CODE	87410	ACCESSION CODE	N/A	CLIENT CODE	N/A
PLANNING APPLICATION REF.	N/A	NGR	SK 29375 98894		

VERSION	STATUS*	PREPARED BY	APPROVED BY	APPROVER'S SIGNATURE	DATE	FILE
1.0	E	AS/ JT	RON	<i>Richard O'Sullivan</i>	05/01/2013	S:\PROJECTS\87410 (WORTLEY TIN MILL, SHEFFIELD)\REPORTS
1.1	E	CH/ JT	RON	<i>Richard O'Sullivan</i>	08/01/2013	S:\PROJECTS\87410 (WORTLEY TIN MILL, SHEFFIELD)\REPORTS
1.2	E	JT	RON	<i>Richard O'Sullivan</i>	22/02/2013	S:\PROJECTS\87410 (WORTLEY TIN MILL, SHEFFIELD)\REPORTS
1.3	E	JT	RON	<i>Richard O'Sullivan</i>	01/03/2013	S:\PROJECTS\87410 (WORTLEY TIN MILL, SHEFFIELD)\REPORTS
1.4	F	JT	RON	<i>Richard O'Sullivan</i>	05/03/2013	S:\PROJECTS\87410 (WORTLEY TIN MILL, SHEFFIELD)\REPORTS

I= Internal Draft E= External Draft F= Final

**WORTLEY TIN MILL, WORTLEY,
BARNSELY,
SOUTH YORKSHIRE**

Archaeological Desk-based Assessment and Survey

Contents

Summary.....	v
Acknowledgements	vi
1 INTRODUCTION.....	1
1.1 Project Background.....	1
1.2 The Proposal	1
1.3 Site Location and Geology	1
2 METHODOLOGY.....	2
2.1 Aims and Scope.....	2
2.2 Study Area	2
2.3 Sources	2
2.4 Survey	3
2.5 Assessment Criteria	4
2.6 Chronology	5
2.7 Best Practice.....	5
2.8 Assumptions and Limitations.....	5
3 BASELINE RESOURCE.....	6
3.1 Introduction	6
3.2 Statutory and Local Heritage Designations	6
3.3 Historic Landscape	6
3.4 Archaeological and Historical Context.....	7
4 WORTLEY TIN MILL	9
4.1 Early Industrial Activity	9
4.2 The Cockshutt Connection.....	10
4.3 Development of the Tin Mill.....	11
4.4 Manufacturing Processes.....	14
5 PREVIOUS SURVEYS.....	15
5.1 South Yorkshire Industrial History Society Survey 1985.....	15
5.2 University of Sheffield Survey 2002-3	16
5.3 Additional Surveys	16
6 RESULTS OF SITE SURVEY	16
6.1 Introduction	16
6.2 Results.....	16
7 CONCLUSIONS.....	22
7.1 Summary	22
7.2 Statement of Condition.....	23
7.3 Statement of Significance	24
8 FUTURE WORK	24
8.1 Research Questions	24
9 REFERENCES.....	26
APPENDIX 1: GAZETTEER OF KNOWN HERITAGE ASSETS	28
APPENDIX 2: SOUTH YORKSHIRE INDUSTRIAL HISTORY SOCIETY SURVEY	31
APPENDIX 3: GAZETTEER OF SURVEYED ELEMENTS.....	35

**WORTLEY TIN MILL, WORTLEY,
BARNSELY,
SOUTH YORKSHIRE**

Archaeological Desk-based Assessment and Survey

List of Figures and Plates

Figure 1	Site Location
Figure 2	Heritage Assets
Figure 3	1746 Map of the lands belong to Wortley Forges
Figure 4	1796 Plan of the Township of Wortley
Figure 5	1801 Plan of the Wortley Estate in the Township of Hunshelf
Figure 6	1855 OS 1:10,560
Figure 7	1893 OS 1:2,500
Figure 8	1905 OS 1:2,500
Figure 9	Site survey incorporating 2002-3 University of Sheffield detail survey
Figure 10	Detail of the Tin Mill survey overlain onto 1893 OS 1:2,500 map
Figure 11	Figure showing areas of potential
Figure 12	Plate location plan
Plate 1	Volunteers working on clearing the mill site
Plate 2	Main working area: arched door lintel, with false 'keystone'
Plate 3	Main working area between Wheels 1 and 2
Plate 4	Main working area: 'cogged' stone
Plate 5	Curved head goit for Wheel 1 (114)
Plate 6	North elevation of 108 within forebay
Plate 7	South elevation of 108 , showing inlet, channel for shuttle and damage caused by vegetation
Plate 8	Detail of channel and numbered stones in 108
Plate 9	Masonry marks, a '3'
Plate 10	Masonry marks, a '5' (inverted) and '6'
Plate 11	South facing elevation of 107 , defining the presumed location of Wheel 2
Plate 12	Possible beam slot in west facing elevation of 107
Plate 13	Detail of void between 105 and 106 , showing stepped roof of goit between the dam and Wheel 3
Plate 14	Detail of 105 and 106 delineating presumed location of Wheel 3
Plate 15	Example of collapse of retaining wall 110
Plate 16	Example of revetment walls on hillside above the mill
Plate 17	Workers cottages (Courtesy of Hunshelf Parish Council)
Plate 18	19th century postcard from Soughley Bridge (Courtesy of Hunshelf Parish Council)

**WORTLEY TIN MILL, WORTLEY,
BARNSELY,
SOUTH YORKSHIRE**

Archaeological Desk-based Assessment and Survey

Summary

Wessex Archaeology was commissioned by Hunshelf Parish Council, through the East Peak Industrial Heritage Support Programme, to undertake an initial archaeological desk-based assessment and EH Level 2 survey of the site of Wortley Tin Mill, Wortley, South Yorkshire (hereafter 'the Site'; NGR 29375 98894).

The assessment was requested by the Hunshelf Parish Council to assess the nature, location, and relative significance of known and potential heritage assets at and in the vicinity of the Site, as part of a proposed community project to carry out an archaeological survey of the Site. It is intended that the results of the project will help to guide future conservation and management plans for the site.

Publicly accessible sources of primary and synthesised information were consulted to identify heritage assets within a 1km Study Area around the Site, in order to provide a context for the discussion and interpretation of the known and potential heritage resource.

Of specific interest for this report are the buildings and structures relating to the water management and activities of the Wortley Tin Mill, which occupied the Site from at least 1743, becoming disused some time before 1870. The mill may have been built on the site of an earlier slitting mill and is thought to be the least undeveloped 18th century British tinplate site. A detailed description of the site in the 1750s survives in the travel journal of contemporary Swedish industrialist R. R. Angerstein. His account describes the making of tinned products at the site, with the tinning-process itself described in detail.

The project included a non-intrusive Level 2 survey of the extant structures, focusing mainly on the Tin Mill complex itself. The Survey revealed that although three wheels were in use at the site, it is unlikely that these operated at the same time.

The former mill buildings are thought to have been demolished during the late 19th and early 20th centuries, however, the Site has never been redeveloped and a number of visible features remain including former mill buildings and associated water management system, and other associated buildings.

The tin mill within the Site is believed to be one of the earliest such operations outside of Wales. Its subsequent reuse as a rolling mill in the 19th century appears to have not significantly altered the works, and despite its subsequent demolition it may represent the least impacted early tin plate works in Britain. The Site is therefore considered to be of **regional significance**.

The Site is overgrown with mature trees, some of which are pulling apart the fabric of the remains. The state of the Site is considered to be **poor** and **declining**.

**WORTLEY TIN MILL, WORTLEY,
BARNSELY,
SOUTH YORKSHIRE**

Archaeological Desk-based Assessment and Survey

Acknowledgements

This project was commissioned by Hunshelf Parish Council through the East Peak Industrial Heritage Support Programme and Wessex Archaeology is grateful to Barry Tylee and Tegwen Roberts (East Peak Innovation Partnership) in this regard. Wessex Archaeology would also like to thank Derek Bayliss (South Yorkshire Industrial History Society) for his contributions; the members of Hunshelf Parish Council, Stocksbridge Local History Society, Thurgoland Local History Society and the South Yorkshire Industrial History Society for their edits and comments; and all the volunteers whose hard work made this survey possible.

The report was researched and compiled by Chris Harrison and James Thomson, and illustrated by Chris Breeden. The project was managed for Wessex Archaeology by Richard O'Neill.

The East Peak Industrial Heritage Support Programme is co-funded by English Heritage and the East Peak LEADER programme (with funding from Defra and the European Union).

**WORTLEY TIN MILL, WORTLEY,
BARNSELY,
SOUTH YORKSHIRE**

Archaeological Desk-based Assessment and Survey

1 INTRODUCTION

1.1 Project Background

1.1.1 Wessex Archaeology was commissioned by Hunshelf Parish Council ('the Client') to undertake an archaeological desk-based assessment and EH Level 2 survey through the East Peak Innovation Partnership (EPIP) of Wortley Tin Mill, Wortley, South Yorkshire ('the Site'; NGR SK 29375 98894) (**Figure 1**).

1.1.2 This assessment was requested in order to define the nature, location, and relative significance of known and potential heritage assets at the Site.

1.2 The Proposal

1.2.1 Hunshelf Parish Council aims to develop a community archaeology project to investigate the Tin Mill, with the permission of the Site owners Wharncliffe Estate.

1.2.2 The work was carried out as part of the East Peak Industrial Heritage Support Programme and comprised a desk-based assessment and level 2 archaeological survey of the Site. It is intended that the results of the survey will help to guide future conservation and management plans for the Site.

1.2.3 A basic measured survey of the Site was carried out by students from Sheffield University Archaeology Department in 2002, 2003 and 2011-2012. The project worked with volunteers from Hunshelf Parish Council, Heritage Silkstone, Stocksbridge Local History Society, Thurgoland Local History Society and the South Yorkshire Industrial History Society to expand upon this initial survey to produce an interpretative plan of the Site in order to record all visible features and assess their archaeological significance and any current vulnerabilities.

1.3 Site Location and Geology

1.3.1 Wortley Tin Mill is situated close to Soughley Bridge on the River Don, 1.5km southwest of Wortley village and 1km northeast of Deepcar, in the Parish of Hunshelf, Barnsley, South Yorkshire. The Site and surrounding woodland is owned by the Wharncliffe Estate, who lease the mill dam and reservoir to a private fishing club.

1.3.2 Within the Site are the remains of former mill building(s), two rows of cottages, an associated water management system and several ancillary structures.

- 1.3.3 The geology of the Site comprises mudstone, siltstone and sandstone of the Pennine Lower Coal Measures Formation (BGS 2003, Sheet 87).

2 METHODOLOGY

2.1 Aims and Scope

- 2.1.1 The aim of this assessment is to identify and assess the significance of known and potential heritage assets within the Site and its environs.
- 2.1.2 This assessment therefore considers archaeological remains (both above and below ground), built heritage and elements of the historic landscape.
- 2.1.3 This study will assess the previous archaeological work that has been carried out within the search area.

2.2 Study Area

- 2.2.1 Recorded heritage assets within a 1km Study Area around the Site were considered in order to provide a context for the discussion and interpretation of the known and potential historic recourses surrounding the Site. (**Figure 2**).

2.3 Sources

- 2.3.1 The South Yorkshire Archaeology Service was consulted in the preparation of this assessment. A number of publicly accessible sources of primary and synthesised information were consulted. The sources consulted were:
- The South Yorkshire Sites and Monuments Record (SYSMR), comprising a database of all recorded archaeological sites, find spots, and archaeological events within the county.
 - The South Yorkshire Historic Environment Characterisation.
 - National heritage datasets including The National Heritage List for England (NHLE), Images of England, PastScape, Viewfinder, NMR Excavation Index, and Parks and Gardens UK.
 - Relevant primary and secondary sources at the SYSMR, and in Wessex Archaeology's own library. Both published and unpublished archaeological reports relating to excavations and observations in the area around the Site were studied.
 - Historic manuscripts and Ordnance Survey maps at Sheffield Archives, Sheffield Local Studies Library, Barnsley Local Studies Library and the SYSMR.
 - Private and unpublished information held by The South Yorkshire Industrial Historical Society, Hunshelf Parish Council, Heritage Silkstone, Stocksbridge Local History Society, and Thurgoland Local History Society.
- 2.3.2 A comprehensive list of documentary, archive, and cartographic sources consulted is included in the bibliography section of this report.

2.4 Survey

2.4.1 The survey was carried out in line with a brief issued by EPIP (2012) and guidelines issued by EH (2007). The work conformed to a level 2 survey and comprised a metrically accurate topographical plan and accompanying descriptive and interpretative records. More detailed survey was carried out of:

- The remains of the former mill buildings;
- The remains of the former water management system;
- The remains of two rows of cottages to the west of the mill;

2.4.2 The walkover survey was carried out using a mobile GIS platform loaded with a bespoke database for this project. Look-up tables were used where appropriate to maintain MIDAS compliance for field entry. Fields included:

- Unique Feature Number
- Physical Description
- Grid Reference(s) British National Grid
- Dimensions
- Interpretation
- Assessment of significance
- Description of vulnerabilities or threats

2.4.3 The recording of the location and extent of features was conducted using a Global Navigation Satellite System and/or a Leica TCRP1205 total station with control stations positioned within lines of sight of all features. A series of control stations were established as close as possible to the Site's perimeter using a Leica Viva GNSS utilising an RTK solution. Subsequent survey was conducted with the GNSS system or by extending a closed-loop traverse employing a Leica TCRP1205 total station with control stations positioned within lines of sight of all features identified.

2.4.4 Within the areas for detailed survey, the location and, where applicable, extent of all features identified were recorded. All identified earthworks were surveyed in a level of detail required to adequately report upon their complexity. In the case of simple earthworks this was for an illustrative scale of 1:500, for more complex features a larger scale was used. Profiles were recorded at a larger scale. All earthworks were surveyed, as a minimum, the top and bottom of slope, any visible terminus, the heights of bank and ditch and a representative profile. Hand-drawn plans were produced to complement survey data where applicable.

2.4.5 Much of the survey work was undertaken by local volunteers, including members of a number of different groups (including Hunshelf Parish Council, Heritage Silkstone, Stocksbridge Local History Society and Thurgoland Local History Society), under the supervision of suitably qualified archaeologists (**Plate 1**).

2.5 Assessment Criteria

2.5.1 Assessment of the significance of a site sets out to identify how particular parts of a place and different periods in its evolution contribute to, or detract from, identified heritage values associated with the site. This approach considers the present character of the site based on the chronological sequence of events that produced it, and allows management strategies to be developed that sustain and enhance the significance of heritage assets.

2.5.2 Significance (for heritage policy) is defined in NPPF Annex 2 as:

'the value of a heritage asset to this and future generations because of its heritage interest. That interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset's physical presence, but also from its setting.'

2.5.3 Current national guidance for the assessment of the significance of heritage assets is based on criteria provided by English Heritage in the document *Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment* (2008). Within this document significance is weighed by consideration of the potential for the asset to demonstrate the following value criteria:

- **Evidential value.** Deriving from the potential of a place to yield evidence about past human activity.
- **Historical value.** Deriving from the ways in which past people, events and aspects of life can be connected through a place to the present. It tends to be illustrative or associative.
- **Aesthetic value.** Deriving from the ways in which people draw sensory and intellectual stimulation from a place.
- **Communal value.** Deriving from the meanings of a place for the people who relate to it, or for whom it figures in their collective experience or memory. Communal values are closely bound up with historical (particularly associative) and aesthetic values, but tend to have additional and specific aspects.

2.5.4 The overall significance of heritage assets and their settings is decided in line with criteria laid out in **Table 1** below:

Significance	Factors Determining Significance
International	World Heritage Sites Assets of recognised international importance Assets that contribute to international research objectives
National	Scheduled Ancient Monuments Grade I and Grade II* Listed Buildings Grade I and Grade II* Registered Parks and Gardens Undesignated assets of the quality and importance to be designated Assets that contribute to national research agendas

Significance	Factors Determining Significance
Regional	Grade II Listed Buildings Grade II Registered Parks and Gardens Assets that contribute to regional research objectives
Local	Locally listed buildings Assets compromised by poor preservation and/or poor contextual associations Assets with importance to local interest groups Assets that contribute to local research objectives
Negligible	Assets with little or no archaeological/historical interest
Unknown	The importance of the asset has not been ascertained from available evidence

Table 1: Summary of Factors for Determining Significance of Heritage Assets

2.6 Chronology

- 2.6.1 Where mentioned in the text, the main archaeological periods are broadly defined by the following date ranges:

Modern	1900 – Present	Romano-British	AD 43 – 410
19 th Century	1800 – 1899	Iron Age	700 BC – AD 43
Post-medieval	1500 – 1799	Bronze Age	2400 – 700 BC
Medieval	AD 1066 – 1499	Neolithic	4000 – 2400 BC
Saxon	AD 410 – 1066	Mesolithic	8500 – 4000 BC
Post-Roman	AD 410 – 650	Palaeolithic	650000 – 9500 BC

2.7 Best Practice

- 2.7.1 This assessment has been carried out in accordance with the Institute for Archaeologists' *Standard and Guidance for desk based assessment* (IfA 1994, revised October 2008). The landscape survey was undertaken in accordance with English Heritage's *Understanding the Archaeology of Landscapes: A guide to good recording practice* (2007).

2.8 Assumptions and Limitations

- 2.8.1 Data used to compile this report includes of secondary information derived from a variety of sources, only some of which have been directly examined for the purposes of this Study. The assumption is made that this data, as well as that derived from other secondary sources, is reasonably accurate.
- 2.8.2 The records held by SYSMR are not a record of all surviving elements of the cultural heritage resource, but a record of the discovery of a wide range of archaeological and historical components of the cultural heritage. The information held within it is not complete and does not preclude the subsequent discovery of further elements of the historic environment that are, at present, unknown.

3 BASELINE RESOURCE

3.1 Introduction

3.1.1 The following section provides a synthesis of the archaeological and historical development of the Study Area, compiled from the sources detailed above. The aim of the synopsis is to establish the known heritage assets at the Site and Proposal Area and to provide a context for the identification and understanding of any potential heritage assets which may survive.

3.1.2 A gazetteer of the heritage assets and events referred to in the text is provided in **Appendix 1**. Sites are numbered from **1-16** with a **WA** prefix for ease of reference. An overall illustration showing sites in the gazetteer is provided in **Figure 2**.

3.2 Statutory and Local Heritage Designations

3.2.1 There are no statutorily designated heritage assets within the boundaries of the Site. Within 1km of the Site are 8 Listed Buildings, and 4 Scheduled Monuments, comprising:

- Scheduled Monument of Romano-British Settlements at Finkle Street, NHLE 1004801;
- Scheduled Monument of Iron Age and Roman Quern Workings on Wharncliffe Rocks, NHLE 1004802;
- Scheduled Monument of Top Forge, Wortley, NHLE 1018262;
- Scheduled Monument of Low Forge Bloomery, Iron Forge and Rolling Mill, NHLE 1020626;
- Grade I Listed Wortley Top Forge, NHLE 1315032;
- Grade II Listed Ivy Cottage, NHLE 1151021;
- Grade II Listed Two Cottages Adjoining and to south of Wortley Top Forge, NHLE 1151114;
- Grade II Listed Well Hill Farmhouse, NHLE 1191515;
- Grade II Listed Outbuilding on west side of Farmyard at Holly Hall, NHLE 1233963;
- Grade II Listed Top Forge Cottage, NHLE 1233963; and
- Grade II Listed Forge Bridge, NHLE 131545 and 1315033

3.3 Historic Landscape

3.3.1 The character of the landscape within the Site has been assessed by South Yorkshire Historic Environment Characterisation programme (Lines *et al* 2008). The Site lies within the *Wortley Tin Mill, Hunshelf, Barnsley* Character Area, comprising a present character of *Industrial: Water Powered Site 1774-2003* with a previous invisible character of *Enclosed Land: Piecemeal Enclosure 1066-1773*. The Site is situated within the *Industrial* Character Zone.

3.4 Archaeological and Historical Context

Prehistoric

- 3.4.1 There are no known prehistoric remains within the Site, although important evidence of prehistoric occupation has been recovered in the Study Area.
- 3.4.2 Significant Mesolithic remains were excavated in 1962 near Deepcar (**WA1**), around 800m south of the Site, comprising more than 23,000 flint artefacts, and evidence of a shelter, possibly a windbreaker, around three hearths (Jones 2000, 17). The flint artefacts included 68 microliths, 102 microburins, 37 scrapers, 8 burins and awls spread over eight sites at Pike Lowe, Mickleden and Deepcar (Radley 1963, 400). The artefacts are mostly of white flint in the Maglemosian tradition with slight variations throughout the assemblage (Radley 1963, 401). The site demonstrates that Maglemosian sites were not confined to lowland areas bordering the North Sea.
- 3.4.3 A single spot find of a Neolithic polished axe (**WA2**) was discovered at Gosling Spring during field walking for the Stocksbridge Bypass in 1986. Whilst similar finds elsewhere in the area include artefacts from Hall Wood and Greno Wood, to the east of Wharnccliffe and also from upon the Chase (Hunter Archaeological Society 1979).

Iron Age and Romano-British

- 3.4.4 There is evidence for Romano-British Settlement in the Study Area including a continuation and expansion of earlier prehistoric occupation.
- 3.4.5 There is evidence for Iron Age and Romano-British settlement, with concentrations of enclosures and fieldsystems in Canklow Wood and on the escarpment between Wharnccliffe and Grenoside (Jones 2000, 19). Of particular significance is the quern working site at Warnccliffe (**WA3-4**) which has been found to have been used from the Bronze Age with the main period of use in the Iron Age and Romano-British periods. Several querns of similar date have been found elsewhere within the Study Area (**WA5-7**).
- 3.4.6 To the north and east of the Site is a series of dispersed Romano-British settlements (**WA8**), comprising earthwork enclosures (A, B and C) with associated field systems on the eastern bank of the River Don. These settlements lie south of Finkle Street, a road of Romano-British origins. Settlements A and B comprised enclosures with evidence of structures dated from a range of ceramics including a Mortaria dated from AD 150-190, Derbyshire ware from the mid second to early third century AD, samian ware, Sandy Grey Ware and Grey Ware. Settlement C was also an enclosure, although not as well defined as Settlements A or B, containing a possible cairn and a possible sunken road. South of this group is an additional areas of earthworks (**WA9**).

Saxon and Medieval

- 3.4.7 Although no evidence dating to the Anglo-Saxon period has been identified within the Site or Study Area, both Hunshelf and Wortley appear in the Domesday Survey of 1086 (domesdaymap.co.uk). Hunshelf at the time of the survey was valued at 3 geld units (an average valuation), although no households were listed. Wortley appears twice in the survey, valued in total

at 5 geld units (above average valuation), with 6 households (3 villagers and 3 smallholders).

- 3.4.8 Place name evidence also indicates pre-medieval origins for settlement in the area (Institute for Name Studies). The name Hunshelf derives from the Old English personal name *Hun* and the word *scelf*, meaning a shelving terrain. Wortley derives from the Old English Works *wyrt* and *lēah* meaning a vegetable wood/clearing.
- 3.4.9 A group of low upstanding banks (**WA10**) in a field to the west of Finkle Street Farm are presumed to be of medieval origin, although no dating evidence has been retrieved from these features.
- 3.4.10 There is evidence of industry in the area from 1379 with four 'smythes' and a 'master' recorded at Wortley (SYTHT 2009, 7). Further suggestive evidence for a mid-13th to mid-16th century bloomery was recovered during excavations in 2009 at Low Forge (**WA11**; Scurfield 2009).

Post-medieval to Modern

- 3.4.11 In 1569 the Manor of Hunshelf was sold to the Wortley family, who held the Lordship of Wortley. By this time most of the modern settlements in the area had been established, and the development over the subsequent period expanded from them. There are few examples of this development within the Study Area recorded in the SMR, including the 17th century Gosling Moor Farm (**WA15**), the 1782 Forge Bridge (**WA16**), 17th century outbuildings beside Holly Hall (**WA17**), Well Hill Farmhouse (**WA18**), the 18th century Ivy Cottage (**WA19**) and the 1854 workhouse at Wortley (**WA20**).
- 3.4.12 In parallel with this growth a group of interconnected industrial sites developed during the post-medieval period along a 4 km stretch of the River Don stretching north from the Site within the rural landscape of Penistone, Tankersley and Silkstone parishes. The area was favourable for industrial enterprise as the raw resources for iron working were abundant in the area with the Don possessing the raw power to drive the processes. The works developed in a spread out chain along the river in order for each to pull the maximum possible energy from the 3-4m fall of the river between each site (SYTHT 2009, 5). A map from 1746 depicted the lands held with the Wortley Forges (**Figure 3**), but no similarly early plan was found for the Site.
- 3.4.13 At the northern end of the chain of industrial sites are two former wire mills, comprising the Old Wire Mill, west of Huthwaite Hall, which was built in 1624 on the site of a bloomery documented in 1567; and the New Wire Mill, or Thurgoland Wire Works, which was established c.1727 to the south of Huthwaite. Downstream of these mills was the site of a tilt mill or slitting mill built c.1624 (SYHIT 2009, 7).
- 3.4.14 Wortley Top Forge (**WA14**), situated on the flat valley floor of the Upper Don valley between Deepcar and Thurgoland, is the only substantially intact survivor of the group. The forge had possibly been used as a bloomery as early as 1600 with evidence for operations in 1638. First reference to the forge as a finery comes from a lease in 1658 when it was being used for refining pig iron. (Crossley, D. 1980, 449). Production at the forge ceased in 1908, but it was used for storage until 1912.

- 3.4.15 Downstream of Top Forge is the site of Wortley Low Forge (**WA11**) sited on a river terrace within a loop of the River Don. Wortley Low Forge includes the standing earthwork and associated buried remains of an iron forge, which operated from the mid-17th century until final closure in 1929. Accounts from 1695-1702 show that the forge worked as a finery, with extensive rebuilding adding a new water powered hammer in 1713 and puddling furnaces installed under the Cockshutts after 1787. (English Heritage file reference AA 22964/1).
- 3.4.16 The Top Forge and Low Forge were under common ownership, and were closely linked operationally. For the first half of the 18th century the Wortley Forges were part of a complex of ironworks owned by the Wortley family and operated by the Spencer partnerships from 1658 until the mid-18th century when they became an independent concern operated by the Cockshutt family.
- 3.4.17 The last mill before the Site was that of a corn mill, owned by the Lord of Wortley (**WA12**). The site now lies beside Forge Lane where possible mill goits and culverts survive.

4 WORTLEY TIN MILL

4.1 Early Industrial Activity

- 4.1.1 The origin of industry at the Wortley Tin Mill (**WA14**) is not known with any certainty. The Site lies within an area with a long tradition of iron working on the edge of the township of Hunshelf in the parish of Penistone. To the south and east of the Site lies the River Don which marks the boundary of Hunshelf with the chapelry of Wortley in the parish of Tankersley.
- 4.1.2 The earliest iron working site attested in the area is a bloomery (Wortley Bloomery) owned by the Wortley family, first documented in 1621 and likely in operation in 1600 (SA ref: Wh/M/D/503; Mott 1970, 69). This bloomery appears to have been continually in use until its last documented lease to William Wood in 1683-4 (*ibid*, 64).
- 4.1.3 In the 17th century a bloomery was a simple furnace for smelting iron ore to produce iron blooms using charcoal for fuel. Since 1 ton of iron would consume about ½ an acre of woodland, the bloomeries were typically located in forested areas and would be abandoned and built anew elsewhere if the fuel was exhausted (Jones 2000, 34). Iron blooms required hammering to expel entrained slag in order to make the iron suitable for subsequent use, and it was common for bloomeries to have a tilt-hammer for the task.
- 4.1.4 The location of Wortley Bloomery is uncertain. Mott suggests it was located within the vicinity of Wortley Tin Mill, based on the proximity of the required raw materials and the existence of bloomery slag observed in the woods below the tin mill and in the vicinity of the cottages (Mott 1970, 69). The area was, however, widely favourable for iron bloom production with known bloomeries also documented in nearby Thurgoland in 1567 (Hunter 1831, 285) and Oxspring in 1589 (Mott 1970, 64). By the production of a 1737

valuation of Hunshelf (SA ref: Wh/M/637) the Site was surveyed as lying within Holly Hall, comprising 6 enclosures tenanted by Thomas Birkenshaw. The valuation recorded field names (Ash Holme, Hob Hole, Holly Hall Rocher, Little Holme, Scofield Holme and a second Little Holme) with no reference to a bloomery or mill, suggesting that the Site was still yet to be developed by this date.

- 4.1.5 Another proposed site for the Wortley Bloomery is Wortley Low Forge, which was identified in English Heritage's scheduling in 2002 based on the same 1621 lease as referred to by Mott. This theory has been given further credibility by recent excavations in the area of the Low Forge that discovered bloomery slag in association with late 13th to mid-16th century ceramics (Scurfield 2009). Furthermore, a 1713 date stone from Low Forge bears the initials WW, which possibly refers to William Wood, the last tenant of the bloomery (Mott 1970, 69), although his presence at the forge could be coincidental.
- 4.1.6 When Wortley Bloomery was last leased in the late 17th century, it would have been coming under increasing competition from pig iron being imported into the area from works employing the much more efficient blast furnace process. The Wortley Forges are believed to have had finery forges built for the conversion of pig iron to wrought iron by the mid-17th century (SYTHT 2009, 22). One possible reason for the change was that sources of iron ore around Wortley were limited compared with the Tankersley ironstone a few miles to the east, and may have become uneconomic to work further.
- 4.1.7 Likely as a result of this pressure the Wortley Bloomery closed and is believed to have been replaced by a slitting mill documented as in operation in the Wortley area in 1695. Again, the location of this mill is not certain but is believed to have directly replaced the bloomery (Mott 1970, 63). A slitting mill comprised a machine for dividing wide iron sheet into narrow strips, rods or bars by passing the material through rollers designed to cut or shape it (Jones 2000, 341).

4.2 The Cockshutt Connection

- 4.2.1 The arrival of the Cockshutt family to the Wortley area in the 18th century was the principle factor in the development of the tin mill. John Cockshutt inherited the Wortley Forge from his uncle Matthew Wilson, who died unmarried in 1739 (Gibbs 1955, 147). The works stayed in the family for another generation, passing to John Cockshutt II in 1744, and to John Cockshutt II's brother James in 1798.
- 4.2.2 The manufacture of tin plate was originally a German process, brought to Britain in 1665 but not adopted until 1720, when a small works was set up in Pontypool in south Wales (Jones 2000, 392). It appears that the method of tin plate manufacture was imported by John Cockshutt I to Wortley from Pontypool, possibly through John Hanbury who initiated the successful Pontypool tin plate industry.
- 4.2.3 It is thought that a number of Welshmen moved to Wortley from Pontypool to work for Cockshutt. Andrews notes that a number of the gravestones in Wortley Church carry Welsh names, including ones that name the interred

as ‘gentleman of Wortley Forge’ (Andrews 1950, 45). The present survey has not been able to check, or examine these connections in more depth. This is something that any future community project might consider undertaking.

- 4.2.4 The connection between the Cockshutt and Hanbury families is not documented, but it is believed that they may have met through a mutual friendship with Thomas Wentworth, Earl of Strafford (Gibbs 1955, 148). A later connection was made by James Cockshutt who worked as a manager in the Hanbury family’s Pontypool works between 1774 and 1784 (Mott 1970, 63), remaining in Wales until the end of 1791 working for Crawshay at Cyfarthfa (Morley 2002).

4.3 Development of the Tin Mill

- 4.3.1 It is likely that in 1743 the slitting mill was replaced by the construction of a tin mill within the Site (Mott 1970, 69; Gibbs 1955, 147). The slitting mill had evidently been falling out of use over several years, as indicated in a letter from John Cockshutt to William Spencer in 1740 (SA ref: SpSt/60512) where a footnote reads:

‘I think it’s now high time we should have something on acc^d; of slitting especially as I find we are to be employ^d no more that way.’

- 4.3.2 The first clear documentary evidence for the operation of a mill from within the Site comes from the 1750 valuation of Hunshelf (SA ref: Wh/m/639), which lists John Cockshutt and Joseph Broadbent as tenants of several plots within Hunshelf, including Little Holme and Schole Field. The late tenant of this land is named as Thomas Birkinshaw. Beside these fields is noted:

On these two Closes are now erected the Tinnmill Dam and for which 40 shillings per. annum was abated in the Rent of this Farm in 1747 and added to the Rent of the Tinn mill (sic)

- 4.3.3 This reference indicates that the tin mill was already in existence and corroborates a later reference made to the mill in 1753, which indicates it had been erected for ten years (Gibbs 1950). This gives the likely date of origin for the tin mill as 1743.

- 4.3.4 It is possible that the tin mill was the same mill referred to at Wortley in an entry of William Spencer’s diary on the 5th of November in 1743 (SA ref: SpSt 60632/3). The reference appears in the header as “5 Nov. Rowling mill at Wortley leasd” repeated as a side note adjacent to possible related text reading:

‘directed Mr Broadbent and J. C. [John Cockshutt?] about ditto – agreed to meet them at Bank – to view ditto – with Mr Wortley and J.C. as to his elec^d and payment of cash’

- 4.3.5 It is not clear to what this note in Spencer’s diary refers, possibly recording a planned visit to Bank Furnace at Emley (also owned by the Spencer family) or a visit to a bank to organise payment for the mill’s lease.

- 4.3.6 And whilst no direct reference has been located to the construction of the mill in 1743, there is a suggestion that it was operating in a letter to John Cockshutt from Edward Wortley on 21st February 1743 (SA ref: Wh/M/56/11) that notes:

'I am glad your Dam & c. stand good and that you have begun to work.'

- 4.3.7 An important contemporary description of the tin mill is provided by R. R. Angerstein in his *Illustrated Travel Diary 1753-55: Industry in England and Wales from a Swedish perspective* (Berg 2001, 219). He describes the tin mill as 1 mile from the Wortley Forges and 2 miles from Thurgoland Wire Mill, comprising a rolling mill with reheating furnaces, a workshop for annealing and the removal of scale, a workshop for pickling and scouring, and another one with three pots for tinning, polishing and the removal of the thick tin on the lower edge.
- 4.3.8 Around the turn of the 19th century the mill ceased tin plating, concentrating on the production of rolled bars and plate. Shown on a plan of the Township of Wortley dating to 1796 (**Figure 4**: SA ref: Wh/M/MP/19R) the mill comprised a single rectangular building labelled 'Tin Mill'. The surrounding fields and dam of the mill are not depicted, and may indicate that the shape of the mill on the plan was intended to be illustrative rather than representative of the actual building at this date. Interestingly, the labelling of this building as Tin Mill indicates the continued use of an historic name rather than its present function, which is described in a 1793 lease renewal by John Cockshutt as a 'rolling mill heretofore used as a tin mill' (SA ref Wh. M.D.590). The varying name of the mill is further illustrated in various letters referring to the Cockshutt's possessions in 1814, which name the works as the 'Tin Mill' and the 'Rolling Mill formerly used as a tin mill' (SA ref: Wh/M/56).
- 4.3.9 An 1801 plan of the estate in Hunshelf belonging to James Archibald Stuart Wortley (**Figure 5**: SA ref: Pen/12L) illustrates the buildings at Wortley Tin Mill in more detail. By this time the works comprised a group of four buildings, with two rows of terraced cottages shown to the west and northwest. The mill dam is depicted, with the weir to the east and outfall to the southwest, and a tail goit leading out from the buildings to the Don. The numbers on the plan relate to an undated (post 1793) valuation, where the mill, dam and houses, along with surrounding grounds, are shown to have been in the possession of John Cockshutt (SA ref: Wh/M/650).
- 4.3.10 There are undated notes on the works in Fairbanks' Fieldbook 174 (SA ref. FB174), listing a Wortley Rolling Mill with 2 high breast-shot water wheels with float boards. It is likely these notes informed Fairbanks' survey of the mills and other works on the River Don of 1824 (SA ref: MB548), where the mill as described as:

*'Wortley Tin Mill now a Rolling Mill
Lord Wharnccliffe
Vincent Corbett Esq.
2 Wheels ea. — 2" 3½ wide
4 ft head
Aperture about 7 inches lifting shuttle
Dam 4 or 5 acres'*

- 4.3.11 Further details relating to a sale notice in 1824 indicates the two wheels were 17ft 8in and 16ft 6in in diameter, with the presence of two air furnaces, smiths' and carpenters' shops, eight cottages for workmen (Morley 2002).
- 4.3.12 On 28th March 1847 the Earl of Wharnccliffe's agent Vincent Corbett, who was then tenant of the Wortley forges, wrote suggesting the closure of the former Tin Mill (Morley 2002). The building by this date was evidently in disrepair, and attempts were made to find a new tenant. Although initially rejected by the Sheffield steel firm Newbould & Sons in April 1847 due to expensive essential roof repairs; the works were taken on by Messrs Andrews Burrows & Co. who repaired the building and continued its operation as a sheet rolling mill.
- 4.3.13 The Site as depicted on the first edition Ordnance Survey (OS) map of 1855 (**Figure 6**) during its occupation by Andrews Burrows and Co, shows surprisingly few changes from as depicted in 1801. The principal difference appears to be the rolling mill building in the centre of the Site, which comprised in 1855 an 'L' shaped range with a detached structure to the south as opposed to the 'F' shaped structure in 1801. The other buildings, comprising the two rows of cottages at the edge of the Tin Mill Rocher and surrounding three structures appeared to remain the same.
- 4.3.14 A postcard dating from the mid to late 19th century shows the Site from Soughley Bridge, with the cottages clearly visible (**Plate 16**). A list of Cockshutt possessions in 1814 listed the 7 dwellings' occupants as Jonathon Luck, George Eyre, Joseph Eyre, John Broadbent, John Eaton, John Woodhouse and George Leach (SA ref: Wh/M/56).
- 4.3.15 The mill was documented as still rolling in November 1879, but had been closed and become derelict by the end of the century (Morley 2002). Correspondence from the last quarter of 1887 relates how the Earl of Wharnccliffe was looking to sell off the machinery at the Tin Mill, with a suggestion that the machinery had been 'blown up' in December of that year, destroying the rolls (Williams 2003).
- 4.3.16 By the production of the 1893 OS (**Figure 7**) the Site was evidently in decline, with one of the workshops north of the rolling mill demolished and the mill dam largely silted up. Interestingly, a well is marked on the spot of the former building, possibly indicating the building had been supplied with water. This decline was evidently complete by 1905 (**Figure 8**) when the majority of works buildings are no longer depicted, leaving only the rows of cottages and the southernmost workshop. The cottages remained on the Site until the northern cottage was replaced with a smaller structure between 1936 and 1955 and both that and the southern cottage demolished between 1966 and 1976.
- 4.3.17 An account of the works made in 1950 recalls how plant within the mill had still been in situ in the early 20th century (Gibbs 1955, 146-7), presumably just prior to its demolition. The mill is described as having comprised an oblong building with water-wheels on either side arranged to run in opposite directions, so as to provide direct drive to the top and bottom rollers of the rolling mill within. Stones were fitted within the rim of the wheels to act as a

fly wheel. Platforms were situated near the stands, from which workers' could manipulate the screws to raise and lower the rolls. A single furnace was recalled. The stones within the rims of the water wheels are believed to survive at Wortley Top Forge, having first been reused at Low Forge in a balance wheel.

4.4 Manufacturing Processes

4.4.1 The following discussion presents the stages of manufacture in the production of tin plate, based on a description by John Cockshutt II in the mid to late 18th century (Gibbs 1955). Whilst Cockshutt does not mention Wortley Tin Mill, it was in his possession at this time and would likely have employed a similar if not identical technique. The parts of the process are discussed under sub headings taken from Angerstein's description of the works in the 1750s with additional details on the processes he observed.

4.4.2 It is believed that the 1801 plan showing the works is representative of its operation as a tin mill during the 18th century, although it is not fully evident which buildings housed which process.

Rolling mill and reheating furnace

4.4.3 Plate production begins with forged iron bars heated in a reverberatory furnace until scale rises. A bar is then removed and passed through the rollers, stretching it and flattening it. It is then reheated and passed twice through the rollers before being folded and beaten together. Reheated again, although not sufficiently to cause the folded sides of the sheet to adhere, it is passed several times through the rollers and whilst still red hot trimmed at either end with shears, removing the fold. This process of reheating, rolling, folding and trimming is repeated until sheets of the required dimensions are produced. For the thinnest plate – tagging tin – the sheet was folded four times forming a stack of 16 sheets. Plates were produced oversized in order to allow sufficient margin for trimming with shears when cold to create straight edges.

4.4.4 Angerstein observed what he considered to be an innovation at Wortley whereby still red-hot rolled sheets were submerged in a stone trough to remove cinder from their surfaces prior to the next stage (Berg 2001, 219). This process is not mentioned by Cockshutt.

4.4.5 Within the rolling mill Angerstein recorded that there were two separate stands of rolls with their own reheating furnaces, as well as a further cold rolling stand for flattening sheets, and a roll-turning lathe (Berg 2001, 219). One stand produced plate for tinning, where Angerstein witnessed the production of 'double sheets' measuring 16½ x 13½ inches (packed 100 to a box) and 'single sheets' 13½ x 10½ (packed 225 to a box). Its furnace was coal fired. The second stand rolled black plate (untinned sheets) of up to 28 inches by 5-10 feet. The furnace for this stand was similarly coal fired, and was larger with a length of around 5 feet.

Annealing Workshop

4.4.6 After the iron plates had been cut to size they were soaked for several hours in an ammonium chloride solution (known as a pickle). Once removed the plates were bent into a triangular shape and threaded along iron rods which

were placed within a furnace where they were fired sufficient to raise a scale. On removal the iron plates were beaten back into sheets, removing the scale, before being returned to the rolling mill to be cold rolled until smooth and even.

- 4.4.7 Angerstein does not record a building associated with this stage of the process suggesting that it may have been undertaken outside.

Pickling and Scouring Workshop

- 4.4.8 The third step of the process comprised pickling and scouring processes, preparing the sheet for tinning. The workshop in which this took place would have contained a number of wooden or stone vessels within which several plates could be placed on edge. The plates were initially placed in an acidic wheat-bran and water pickle to dissolve any scale and other impurities. After a number of days the plates were moved to a trough of clean water, scoured with rough material, placed back in water, then submerged again in the pickle. After a day the plates were removed and washed and scoured a second time this time with hot water.

- 4.4.9 Angerstein records that the pickling room at Wortley Tin Mill was built 'above the furnaces' in order to heat the acidic pickle (Berg 2001, 219).

Tinning Workshop

- 4.4.10 The tinning workshop was furnished with a series of brick built furnaces in which narrow rectangular cast iron pots were set. This process, described in more detail by Cockshutt, comprised dipping the plates into a series of pots. The first pot, known as the tinpot, contained molten tin with a thick layer of tallow and resin on its surface into which were placed 60-100 plates. The plates were shaken around in the tin and one at a time removed, brushed down, submerged, then placed on a rack. The plates were then dipped one at a time into the washing pot, which was filled with tin with a layer of tallow and fine oil on its surface. A similar process of emersion and brushing was undertaken to even out the tin. The plate was then dipped into a third pot containing only hot oil or melted tallow to allow the tin to run down the sides. The plate was then left to cool in the open air before being rubbed with bran to clean it and bring out a shine, and the bottom ¼ inch placed in molten tin and wiped off to create a clean edge.
- 4.4.11 The final step involved crating up the finished tin plates in batches prior to shipping them out from the works to the intended market.
- 4.4.12 Angerstein's description of the process roughly conforms with Cockshutt's, recording a three-fold process within which plates were first boiled then dipped consecutively into a second and third pot containing a mixture of tin, tallow, whale-oil and resin. Afterwards plates were scoured with wheat-bran and the tin on the lower edge of the plates melted off in a trough (Berg 2001, 219).

5 PREVIOUS SURVEYS

5.1 South Yorkshire Industrial History Society Survey 1985

- 5.1.1 The Society's Field Recording Group made a number of recording visits to Wortley Tin Mill between January and July 1985. They surveyed the main part of the Site between the entrance and the waterwheel head goits. A detailed report of this survey (Bayliss 2012) is presented in **Appendix 2**.

5.2 University of Sheffield Survey 2002-3

- 5.2.1 A survey of the remains of the mill and the surrounding water management system was undertaken by students and post-graduates of the University of Sheffield in 2002-2003. The survey identified elements of standing remains within the area of the mill complex. The results of the survey are incorporated into the recent survey (Section 6) and reproduced in **Figure 9**.

5.3 Additional Surveys

- 5.3.1 Further surveys were carried out in 2005 and 2011 (Bayliss *pers. comm.*) although the results were not made available to the authors at the time of writing.

6 RESULTS OF SITE SURVEY

6.1 Introduction

- 6.1.1 The survey closely resembles that undertaken by the University of Sheffield, suggesting that little change has occurred since 2003. In terms of location, the features still seem to be present, although their condition can be seen as deteriorating. The results below utilises the same identifiers as the 1985 survey to facilitate comparison of the surveyed elements. The surveys are displayed in **Figures 9-10**. Photographs of the features are provided in **Appendix 2**.

- 6.1.2 The individual elements surveyed are listed in a gazetteer in **Appendix 3**. The survey focused mainly on the Tin Mill site, to assess the presence of chronological markers, as well as to aid interpretation of the function of the features. The location of the images used in the plates and gazetteer is presented on **Figure 12**.

6.2 Results

- 6.2.1 The essential form and infrastructure of the Wortley Tin Mill site is believed to largely date to a period around 1743 when John Cockshutt constructed a complete works comprising a weir, dam, water infrastructure, and four buildings.
- 6.2.2 Whilst no evidence of the earlier bloomery and slitting mill that possibly occupied the Site was observed, the remains do indicate a series of alterations were made to the works during its operational lifetime.

The Mill

- 6.2.3 The principal focus of the works lies on the former site of the mill building located within a roughly level area bounded to the north and east by retaining walls (features **101**, **102**, **104** and **110**). Whilst no standing

elements now remain of the mill, the truncated remnants of three wheel pits are evident within the retaining walls (features **105**, **106**, **107**, **108**, **109**, and **120**).

- 6.2.4 The only remaining evidence for structures within the vicinity of the mill comprised a small mound of stones seen running roughly north-south (feature **113**) south of **109**. There is, however, no structure depicted in this area on historic maps.
- 6.2.5 The zones delineated between the retaining walls and mill structure likely formed working areas.
- 6.2.6 The area around the mill site is covered by debris and fallen stones, including two arched door lintels, each carved out of single stone, with false 'keystone' carved in the middle of one side (**Plate 2**); the other side is only rough cut.
- 6.2.7 The working area (**Plate 3**) appears to continue below the two wheel sites, again with scattered stones, including one large masonry block with four holes as a possible machine bed and a further 'cogged' masonry block (**Plate 4**) of an unknown purpose.

Wheel 1

- 6.2.8 The remains of Wheel 1, located to the east of the mill site, comprise two truncated parallel walls of large ashlar blocks (**120**) conforming to the structural requirements of a wheel house designed to support the mechanical strain and weight of a wheel. Comparison of the feature with the 1893 OS (**Figure 10**) indicates that the structure had likely adjoined a southern bay on the mill building by that date.
- 6.2.9 To its east the wheel was fed by a curving goit (**114**) (**Plate 5**) constructed from rough cut sand stone, approximately 0.3 x 0.2 x 0.1m, laid to courses with no surviving bonding. At its northern end the goit would have joined with the dam (as visible on **Figure 10**), although the dam at this point has long since silted up.
- 6.2.10 Two large stones span the width of the goit at its dam end and wheel end (**114**). Elsewhere on Site, similar stones have been observed to be associated with sluice gates, and it is likely that these may have been used to access a sluice that would have controlled the water supply to Wheel 1. South of the centre of the goit was a stone spanning its width and keyed into either wall. It was situated approximately 1.2m below the top of the wall and of unknown purpose.
- 6.2.11 The goit is located within a terrace created from two stone walls (**110** to the north and west and **115** to the south) constructed in a similar fashion to the race (**114**). It is unclear if the terrace was created by the walls being built up and filled inside, or the bank cut back and retaining walls built. In plan, wall **110** is not a true semi-circle, but is asymmetrical, pinching towards its centre. The structure of wall **110** is obscured at either end where it joins with Wheels 1 and 2 due to the partial collapse the retained bank.
- 6.2.12 The shape of the goit **114** and its associated retaining walls **110** and **115** could infer that they were designed to respect the existing or planned

structures of the mill and **116** or to establish a working area to the east of the mill.

- 6.2.13 The 1985 survey by SYIHS (**Appendix 2**) recorded the structure of Wheel 1 and the goit and retaining wall structures to be in a similar condition to that observed during this survey.

Southern Building

- 6.2.14 Structure **116** formed a rectangular building separated into two cells by an internal division. The structure is covered in rubble and demolition material. The survey revealed the possible location of two doorways in the north and south walls of the western cell, although this may be a result of differential decay of the walls. The walls are built from dressed, sandstone blocks measuring 0.4 x 0.2 x 0.2m, hewn to a greater standard than the nearby mill race **114**. Some of the rubble suggests that the structure would have had large pieces of masonry within its walling, suggesting an industrial rather than domestic origin, although these may be intrusions from Wheel 1. The building appears on the 1801 plan (**Figure 5**).
- 6.2.15 To the south of structure **116** an east-west aligned bank was identified comprising of a stone core covered in turf (feature **117**). The bank corresponds with a boundary seen on the 1855 OS map and delineates a ramp leading east towards the southern overflow. The purpose of this enclosure is unknown, although it could have formed a paddock or similar.
- 6.2.16 Whilst both the building and the ramp were observed in 1985 (**Appendix 2**), there is no record made during the earlier survey by which to gauge changes in condition.

Wheel 2

- 6.2.17 The remains of Wheel 2 are located to the north of the former mill site, comprising a retaining wall of ashlar blocks (feature **108**) with a truncated parallel wall forming a narrow rectangular east-west aligned chamber (**109**).
- 6.2.18 Water entered Wheel 2 from the dam via a forebay to the north (**Plate 6**) formed from structures **107** and **108**, and an abutting curved battered wall (**112**). Feature **112** has been built from roughly faced medium sandstone blocks (0.5 x 0.3 x 0.3m) most likely designed to reinforce the dam above Wheel 2 and possibly also acting to direct water into chamber **109**.
- 6.2.19 Chamber **109** (**Plate 7**) has two shaped stone slopes to direct the water: the first through a large low square opening in the north wall of the chamber allowing water from the dam to access the chamber (now silted up on the north side); with the second directing the water from the first slope westwards towards the shuttle and evidently there to Wheel 2. This dog-leg has resulted in wear on the southern wall of the chamber. Interestingly the arrangement of the inlets indicates that the head of water was already close to present ground level when it reached the wheel, suggesting a large part of the wheel house structure could remain below ground level.
- 6.2.20 At the western end of the chamber is a diagonal channel cut within the masonry of **108** and **109** (**Plate 8**). The stones cut by the channel were numbered with a 3 on the top course, an inverted 5 on the 3rd course down and a 6 on the 4th (**Plates 9-10**). These numbers could indicate that the

stones with the channel were pre-cut prior to being erected. Blocks displaying similar numbers were evident in the rubble where the southern wall of the structure had fallen away suggesting it had been built in a similar fashion. The channel had likely held a shuttle for moderating water flow, and broken iron plates filling the base of the channel were observed in a gap between a fallen stone.

- 6.2.21 The actual wheel pit for Wheel 2 appears to have lain within the area delineated by feature **107**, a shallow, right angled 'U' shape in plane linking **108** to **106** (**Plate 11**). The wheel would have been orientated east-west, and based on the height of the head of water within **109** the axle of the wheel, unless it was undershot, must have been close to the current ground level. There is evidence of fixtures within the fabric of **117** including joist socket (**Plate 12**) on the northern arm of the structure, and a socket for a bolted plate in the centre of the south facing wall.
- 6.2.22 The placement of the wheel near to this wall is unusual as it would appear to have been detached from the main buildings depicted on historic maps (**Figures 5-7**). It is therefore possible that this wheel pit predates the works depicted on the 1855 OS or that it was connected via an unusually long drive shaft.
- 6.2.23 The 1985 survey (**Appendix 2**) records the same features, although makes no reference of the extensive root damage now forcing apart structures **107** and **108** (**Plate 7**).

Wheel 3

- 6.2.24 The remnants of the structure associated with Wheel 3 are situated to the north of the former mill and west of Wheel 2. Water for Wheel 3 was taken from the dam from a rubble built inlet (**111**), within the same forebay as Wheel 2, via a subterranean goit running east-west before curving round 90° to Wheel 3.
- 6.2.25 At the point where the goit turns the roof steps upwards exposing an opening into it (**Plate 13**). At this point the structure comprises large ashlar blocks, similar to those at the site of Wheel 1, forming two parallel arms orientated east west (**105** and **106**), indicating that this was possibly the point of the wheel pit for Wheel 3.
- 6.2.26 A second opening to the south (**Plate 14**) appears to be at the edge of the wheel pit where the surrounding walls appeared less substantial and the top of a sloping masonry wall just visible from where water exiting Wheel 3 may have run southwards to join a subterranean tail race exiting Wheel pit 1.
- 6.2.27 South of this opening evidence of concrete bedding and filling associated with the insertion of iron or steel fixing bolts was observed within the mulch covering the Site. The intended function of these bolts was unclear.
- 6.2.28 The location of Wheel 3 would put it at the northeast corner of a northern extension of the main building complex on the 1855 and 1893 OS maps (**Figure 10**). Power from the wheel would have required gearing to transfer it from the wheel into the building. Similar with the other wheel structures within the Site, no gearing was visible likely having been robbed out or rotted away.

6.2.29 This wheel pit sits north-south at 90° to the intended outflow from the tail goits from Wheels 1 and 2. Therefore, it is unlikely that the two wheels operated at the same time, with Wheel 3 postdating Wheel 2. This is further evidenced by the structural relationship of the features with **106** appearing to abut **107**.

6.2.30 The survey of 1985 (**Appendix 2**) identified additional features not located during this survey. Further details of concrete alterations were observed, now presumably covered, comprising:

Intriguing signs of later re-use: concrete caps on walls short way below opening, each holding 2 fastening bolts with slight hollow between them, as if for axle across goit. Further piece of concrete some distance away with similar bolts holding 2 pieces of curved metal, one of them of stainless steel. Jack Hughes [elderly local member of survey team] thinks may be 2nd World War, but no idea of purpose. Between here and wheel a fallen piece of stone has concrete applied to it

6.2.31 In addition Bayliss records wrought iron work at the upper opening into the culvert comprising:

Here there is a massive lintel but quite a small opening with a roughly made stone sill, rather like that at 3rd overspill. Wrought iron rod across front of these stones, apparently oval or lentil-shaped (in cross-section), about 20 x 10 mm, vertical.

The Weir

6.2.32 Whilst outside of the survey area, the weir has been included for completion. The weir was constructed from two rows of large rectangular sandstones blocks laid diagonally across the river, directing the water into the dam. On the west bank there is a flight of 4 stone steps leading down to the weir. The 1985 survey recorded the weir in more detail, describing it as:

'Two rows of massive stones diagonally across river at point where it falls fast over beds of rock. Top row, the main weir, has rectangular stones carefully hewn and close fitting. About 1800 mm from back to front, and individual stones 550-650 mm broad. Slot cut in upper surface of stones, towards rear, across most of weir: about 500 mm from back, 60 mm wide, 40 mm deep. On W bank, flight of 4 stone steps leading down to weir. Vertical face of 4 courses of stones, about 1200 mm deep. Not carved smooth, and lower stones projecting slightly as if to break fall. Then a platform of stones [at the foot of the vertical], also rectangular but much less smooth fitting and not level on top: about 2000 mm front to back, and the stones 400-500 mm broad. Lower edge much more irregular. 2 courses of stone, the lower one projecting markedly. Fall of about 650mm to present (summer) water level'

6.2.33 Angerstein drew a footbridge/dam over the Don above the Site (not reproduced), described as comprising single upright stones with a platform laid between them (Berg 2001, 220). It has been theorised that this could potentially be the Tin Mill's weir, although the description and topography of the image do not match the present structure. Another possibility is that he was referring to a footbridge across the Don towards the junction of Forge Lane and Soughley Lane that were depicted in 1796 (**Figure 4**) as a series

of parallel stepping stones, later named a ford on the 1855 OS (**Figure 6**) and as stepping stones on the 1905 OS (**Figure 8**). The stones are still visible.

Dam

- 6.2.34 The dam (feature **123**) itself has been heavily altered over the years initially due to silting up as the mill became redundant, and more recently to accommodate fishing. The dam was recorded by Bayliss in 1985 as 'completely altered by recent earth-moving, to give roughly rectangular shape with two islands that were not there before' (**Appendix 2**).
- 6.2.35 Comparison of historic maps (**Figures 1 and 5-8**) illustrates that the present shape of the dam is narrower having been reshaped to the south and east, and compartmentalised by the creation of a land bridge and a narrow island to its east. This work in the late 20th century was necessitated by the gradual silting up of the dam, and its current use as a fishing pond is considered to have stabilised the feature.
- 6.2.36 An overflow from the dam (feature **118**) is situated to the south east of the mill complex. The observed structure is built from sandstone blocks. The original sluice has been replaced by red brick blocking and an Fe valve.

Tail Goit

- 6.2.37 The tail goit (feature **120**) is unusually wide (approximately 5m), although its width may be related to its depth as there is little height change from the wheel pits to the outflow, suggesting that the width may have been necessary to create a flow towards the river that would not back up. The curved end of the tail race, as shown on the 1855 and 1893 OS maps, may be further indicators that the tail may have been susceptible to backflow.
- 6.2.38 The location of the Wheels (1 and 2) that are orientated east-west point towards the tail goit, suggesting that a subterranean channel may connect the outflow from the wheels to the tail goit. No evidence was visible to suggest whether the outflow was once open, with subsequent buildings placed over the top.
- 6.2.39 The 1985 survey (**Appendix 2**) recorded no additional evidence for the tail goit or change in condition.

Workers' Cottages

- 6.2.40 The two areas of the workers' cottages were surveyed, although these were in a worse state than the other areas. The southern range of buildings is marked by flat building platform (feature **121**) with an area of red tile floor previously visible now covered by hardcore (Barry Tylee pers. com.). This corresponds with OS mapping of the area. The northern range of structures is marked by a T shape of collapsed stone wall (feature **122**). This shape and position is not consistent with the buildings shown on the 1855, 1893, or 1934 OS map, but instead resembles the location and shape of a structure depicted on the 1959 OS (not reproduced here).
- 6.2.41 It is thought that the last occupants of the lower range used the top to keep pigs and this later structure may represent a rebuild to create a sty.

7 CONCLUSIONS

7.1 Summary

- 7.1.1 Although the mill buildings are thought to have been demolished during the late 19th and early 20th centuries, the Site has never been redeveloped and a number of visible features of the mill complex were identified during the survey.
- 7.1.2 The majority of these features comprise elements of retaining walls and water management structures situated around the former mill site. Whilst no standing remains of the former mill remain, there is evidence for three water wheel sites comprising two east-west aligned wheels to the north and south of the mill site and a third north-south aligned wheel to the northwest. Documentary evidence points to only two wheels being operational at any given time, suggesting a phased construction and abandonment of one of the wheels during the mill's lifetime. Assessment of the remaining structure suggests that Wheels 1 and 2 were the earliest, and may have operated simultaneously. Wheel 3 appears to have been added at a later date, possibly between 1801 and 1855 (**Figure 6**) when a northern bay can be seen to have been added to the mill building.
- 7.1.3 From Angerstein's c.1750 account of the works and John Cockshutt II's description of tin plate manufacture in the mid to late 18th century it is possible to identify that a further 2-3 buildings, in addition to the rolling mill, were required for subsequent production processes. These included annealing (which may have been done outside); pickling and scouring; and tinning. Of these structures it is possible that features **101**, **102** and **104** corresponded to the southern and western wall of a building depicted on the mill on the 1801 and 1855 maps. The function of this building is not known for certain, although the depiction of a well within the site of the building on later OS maps (**Figures 7-8**) suggests it may have housed a process using water such as scouring, pickling or tinning.
- 7.1.4 In addition to the buildings housing the main works processes, it was likely that there was accommodation for a carpenter who would have manufactured the crates in which the tin plates were traded; stables and tack room for the horses used to transport goods and materials; possibly a smithy to maintain the tools and horse shoes; and housing for the workers. Whilst the site of the workers' housing is known, the location of these other subsidiary buildings is not.
- 7.1.5 The remnants of two buildings were identified outside of the mill area, comprising feature **122** a possible pig-sty structure on the site of the former workers' cottages to the west, and feature **116** an approximately 6 x 11m two room structure to the east. Feature **116** comprises the only building for which the total extent of its plan is still visible; however there are no defining features from which to interpret its function.
- 7.1.6 A description of the significance of the features identified by the survey (in line with the criteria discussed in **Section 2.5**) is summarised in **Table 2**

below. An interpretative figure identifying areas of potential is included in this report as **Figure 11**.

Significance	Features	Summary
Regional	101, 102, 104, 105, 106, 107, 108, 109, 110, 115, 116 and 119	Standing remains relating to the 18 th century Tin Plate Mill and ancillary structures. These structures have significant historical and evidential value due to their potential contribution to the understanding of the development of tin plate manufacturing and in their association with the nationally important industries of Wortley Forges.
High Local	111, 112, 114, 118, 120, and 123	Remains of the water management system, including mill pond, and goits, that provided power to the mill and preserve the early industrial character of the Site. Many of these elements have been altered to some degree.
	103, 113 and 117	Insubstantial or outlying walls within the mill complex of evidential value in understanding the operation and development of the mill.
	121 and 122	Sites of the workers' cottages on the hillside overlooking the mill site. Of evidential value in their potential to yield evidence about the living conditions, lifestyle and pastimes of those who worked at the mill.

Table 2: Summary of the Significance of Features within the Site

7.2 Statement of Condition

- 7.2.1 The Site is covered in mature trees, some of which are growing out from the structures themselves. The result is that the growth has prised open parts of the surviving structure causing decay and erosion. Features deemed to be specifically at risk of this comprise **117** and **118 (Plate 7)**. It is considered that a strategy of selective tree removal could prevent further deterioration, although repairs may be necessary to the structure itself to prevent collapse.
- 7.2.2 It is considered that all of the remaining above ground elements of the buildings are at risk of further decay from frost and rain penetrating the structure where the core fabric is exposed and where mortar has eroded. A considered strategy of conservation work repointing the structure and capping exposed cores would reduce the risk of further decay from this threat. In the case of the retaining wall structure **110**, existing areas of collapse (**Plate 15**) may need to be repaired or reinforced to prevent damage to the remaining structure.
- 7.2.3 The survey also identified a number of dry-stone revetment walls within the hillside above the former cottages (**Plate 16**). The condition of these structures is considered to be at risk from gradual decay.
- 7.2.4 Other threats include the parking of vehicles on the cottages; and damage from a vehicle hitting or removing a possible gatepost at the entrance of the Site (west end).

- 7.2.5 These threats have caused the monument to be in a **poor** state and are active. Therefore, the Site is considered to be at **high risk** of damage and the state of the Site is **declining**.

7.3 Statement of Significance

- 7.3.1 The Site is situated within a post-industrial area on the banks of the River Don. There is known evidence for prehistoric and Romano-British occupation within the surrounding landscape, with the nearby settlements in Hunshelf and Wortley likely originating from the Anglo-Saxon period. The Site was developed as an industrial site in the post-medieval period, perhaps as early as 1600. It formed the southernmost works of a group in the Penistone and Tankersley parish area known as Wortley Forges, which were significant in their early adoption and pioneering of iron working techniques. The tin mill within the Site is believed to date from 1743 and was one of the earliest such operations outside of Wales. All evidence encountered during the research undertaken for this project suggests the mill was purpose built for the production of tin plate. Its subsequent reuse as a rolling mill in the 19th century appears to have not significantly altered the works, and despite its subsequent demolition it may represent the least impacted early tin plate works in Britain.
- 7.3.2 The significance of the Site derives from its historic value as a rare example of an early tin plate manufactory enhanced by the existence of contemporary documentation detailing the processes undertaken in the works; its group value as an element of a connected group of contemporary 18th and 19th century industries within the Wortley area of which a number are statutorily designated; and its evidential value for the preservation of evidence relating to its processes and operational life due to the lack of redevelopment.
- 7.3.3 The Tin Mill site meets many of the criteria required for a site to be considered nationally significant (DCMS 2010, 18), however due to its general poor condition, it is unlikely to be eligible for designation at a high grade (English Heritage 2011, 7).
- 7.3.4 Overall the Site is considered to be of **Regional** significance.

8 FUTURE WORK

8.1 Research Questions

- 8.1.1 A number of potential research aims can be informed by further survey and investigation at the Site:

Pre Tin Mill Industry

- 8.1.2 It has been suggested by Mott that there was a 17th century bloomery within the Site, documented in leases dating from between 1600 and 1684. Evidence for this is tentatively based on observations of bloomery slag observed in the woods below the tin mill and in the vicinity of the cottages (Mott 1970, 63), and ironstone in a waste tip on Soughley Lane opposite the road to the tin mill (*ibid.*, 64). Based on the contemporary common lease by the Wood family of this bloomery and a slitting mill documented in 1695,

Mott suggests that the slitting mill replaced the bloomery and was the forerunner to the tin mill. Is there any remaining evidence for iron making within the Site?

Water Management

- 8.1.3 The presence of three wheels, operating in different configurations at different times suggested that the configuration of power altered throughout the lifespan of the works. By identifying the chronology of the power source it may be possible to explore the origin, use and abandonment of the Site: how does the power source of the mill change over time and can this identify earlier uses and structures?

The Rolling Mill

- 8.1.4 There is indefinite evidence for the final arrangement of the water wheels in the rolling mill. Historic documentation indicates that there were two wheels, which have been suggested to have provided independent drive to the upper and lower rolls without any gearing, although this needs to be tested as the chronology of the Wheels does not support this. Whilst not impossible, and there is precedent for similar arrangements elsewhere (Derek Bayliss pers. com.), there should be clear evidence within the wheel pits for one wheel to have turned in an opposite direction. Is it possible to establish from the extant structures the diameter and centre point of the wheels, and identify the direction of rotation?

Workshop Arrangement

- 8.1.5 The arrangement of processes within the Site is not known. Beyond the central rolling mill there were two buildings to the north and one to the south. It was suggested by Angerstein that pickling was undertaken above the furnaces of the rolling mill; is there any evidence for this structure to have been organised on two levels? Angerstein's description suggests the presence of three furnaces within the works; can we identify any areas of hot working? The annealing process supposedly required a sheltered area with sufficient ground space for laying out plates; is there evidence for working areas? The tinning and pickling process required a supply of fresh water; could the culvert have provided this? Packing and storage may have required a store and carpenters; is there any evidence of this?

9 REFERENCES

- Andrews, C.R., 1950. *The Storey of Wortley Ironworks*. 3rd edition. R. Milword Printers Ltd, Nottingham.
- BGS, 2003, Barnsley, Sheet 87
- Bayliss, D., *A Guide to the Industrial History of South Yorkshire*, AIA.
- Bayliss, D., 1997. *Unpublished note for Steel Valley Project*, South Yorkshire Industrial History Society.
- Bayliss, D. 2012. *South Yorkshire Industrial History Society Fieldwork Report on Wortley Tin Mill 1985*. Unpublished Report.
- Berg, 2001. R. R. Angerstein in his *Illustrated Travel Diary 1753-55: Industry in England and Wales from a Swedish perspective*.
- Crossley, D., 1980. *Wortley Top Forge*. Arch. Journal.
- Department for Culture, Media and Sport (DCMS) 2008. *Scheduled Monuments*. Available at: <http://www.english-heritage.org.uk/content/imported-docs/p-t/scheduled-monuments.pdf>
- English Heritage., 2007. *Understanding the Archaeology of Landscapes: a guide to good recording practices*. Available at <http://www.english-heritage.org.uk/publications/understanding-archaeology-of-landscapes/>
- English Heritage, 2011. *Designation Listing Selection Guide: Industrial Structures*. Available at: <http://www.english-heritage.org.uk/publications/dlsg-industrial/>
- East Peak Innovation Partnership., 2012, Specification for an Archaeological Desk Based Assessment and Earthwork Survey of the Former Rin Mill at Wortley, Hunshelf Parish. *Unpublished Specification*
- Gibbs, F.W. 1950, The Rise of the Tinplate Industry *Annals of Science* 6 pp 350-404
- Gibbs, F.W. 1955, The Rise of the Tinplate Industry. - V. Cockshutt on tinplate manufacture, in *Annals of Science* 11:2, pp. 145-153
- Hunter, J. 1831. *South Yorkshire: The History and Topography of the Deanery of Doncaster*, Volume 2.
- Hunter Archaeological Society, 1979. Correspondence.
- Jones, M., 2000. *The Making of the South Yorkshire Landscape*, Wharnccliffe Books, Barnsley.
- Lines, A. Marchant, J. and Ratcliffe, D 2008. Unpublished. South Yorkshire Historic Environment Characterisation: South Yorkshire Archaeology Service, Sheffield, English Heritage, London. Database version date 08/02/2013.
- Makepeace, G.A., 1985, *Report on the Romano-British Settlement at Whitley, Wharnccliffe. Excavated by the late L.H. Butcher* Trans. Hunter Archaeological Society Vol.13.
- Morley, C., 2002. *Forging thro' time: The story of the Wortley Iron Works*, unpublished manuscript in the Society archives.

- Mott, R.A., 1970. *The Early History of Wortley Forges*.
- Radley, J., 1970. The Mesolithic Period in north-east Yorkshire. *Yorkshire Archaeological Journal* 42, pp.314-27,
- Radley, J., 1963. *Yorkshire Archaeological Journal* 41, pp.81-97.
- Scurfield, C., 2009. *4 Low Forge, Wortley, South Yorkshire: An Archaeological Evaluation*. CS Archaeology unpublished grey literature report.
- South Yorkshire Archaeology Unit Annual Review 1989-90
- South Yorkshire Trades Historical Trust (SYTHT), 2009. *Forging Ahead: A Conservation Statement for Wortley Top Forge*.
- University of Sheffield., 2003 *Wortley 18th Century Rolling Tin Mill Survey Project*. Unpublished student report (AAP 367)
- Williams, M., 2003. *History of Wortley Forges*. Unpublished document provided by B. Tylee of Hunshelf Parish Council.

Relevant Sheffield Archive Sources Consulted

- | | |
|----------------|---|
| Fairbank FB174 | Fairbank field book dating to 1825. |
| Fairbank MB548 | List of the Mills and other Works on the River Dun above Sandbed Wheels. |
| Pen/8L | Plan of Hunshelf, not dated (does not extend to tin mill). |
| Pen/12L | A Plan of the Estate in the Township of Hunshelf belonging to the Honourable James Archibald Stuart Wortley, 1801. |
| SpSt/60512 | Documents regarding winding down of Wortley Forges after Mr Wilson's death: 1728-1740. |
| SpSt/60632-3 | Diary of William Spencer 1741-1743. |
| WC/162 | Plan of land associated with forges at Wortley, 1746 (does not extend to tin mill). |
| Wh/M/56 | 1814 lease of Wortley Forges and 1744 letter from E. Wortley. |
| Wh/M/71 | Survey by King of Mr Wortley's Estates in Hunshelve, Hoyland Swain etc. 1634 – unreadable. |
| Wh/M/637 | The Valuation of the Manor of Wortley, Pilley, Hunshelve and Hoyland Swanne taken by John Craven, April 1737. |
| Wh/M/639 | Wortley, Pilley and Hunshelf's 1750 Survey. |
| Wh/M/650 | Valuation of Pilley and Hunshelf, c. 1800. – numbers on the plan correspond directly to the 1801 Wortley Estate Plan (Pen 12L). |
| Wh/M/D/503 | 1621 lease of iron smithies in Wortley. |
| Wh/M/D/590 | 1793 lease of Wortley Forges. |
| Wh/M/MP/19R | Plan of the Township of Wortley, 1796 showing tin mill beyond end of township. |

APPENDIX 1: GAZETTEER OF KNOWN HERITAGE ASSETS

WA No.	Period	HER ref.	Name	Description	Designation	Easting	Northing
1	Mesolithic	HER: 00547/01	Deepcar Mesolithic Camp at Stocksbridge	A Mesolithic camp including a chipping floor and evidence of a number of periods of human activity.	-	429200	398120
2	Neolithic	HER: 02352/01	Neolithic Polished Stone Axe and Medieval Pottery, found near Gosling Spring, Wortley	A polished stone axe and medieval pottery found on the surface of a ploughed field near Gosling Spring	-	430090	398970
3	Iron Age / Romano-British	HER: 539/01, NHLE: 1004802	Iron Age and Roman Quern Workings on Wharncliffe Rocks	One of the main 'beehive' quern working sites of northern England. The site was first identified and surveyed by LH Butcher in 1949-1950 identifying the remains of quern workings along a 72 hectares area running for 2km along the edge of Wharncliffe Craggs. The type of querns found indicated that the site was in use as early as the Bronze Age and exploitation continued until the medieval period although the main phases of production were during the Iron Age and Romano-British periods	Scheduled Monument	429574	398007
4	Iron Age / Romano-British	HER: 04217/01	Iron Age or Romano-British Enclosures at Wortley, near Sheffield, Stocksbridge	Small enclosures recorded by Butcher 1958-60 as associated with Whitely Romano-British settlement and the Wharncliffe quern workings.	-	429600	398100
5	Romano-British	HER: 03612/01	Romano-British Quern Find, Wortley	Findspot of a Romano-British Quern found in 1951.	-	429800	398400
6	Romano-British	HER: 03613/01	Romano-British Beehive Quern Find, Wortley	Findspot of a Beehive Quern	-	429700	398400
7	Romano-British	HER: 03614/01	Unfinished Quernstone found near Gosling Spring, Wortley	Bottom 1/2 of quern unfinished.	-	429900	398700
8	Romano-British	HER: 00545/01 & 03109/01, NHLE: 1004801	Romano-British Settlement at Finkle Street (also called Gosling Rough), Wortley	A series of earthworks, thought to represent an enclosed settlement, in Wharncliffe Woods, near Gosling Moor.	Scheduled Monument	429945	398774

WA No.	Period	HER ref.	Name	Description	Designation	Easting	Northing
9	Romano-British	HER: 03222/01	Earthworks near Wharncliffe Wood, Wortley	A group of earthworks identified by L.H. Butcher and associated with WA8-9.	-	430000	398300
10	Medieval	HER: 01152/01	?Medieval Unclassified Earthworks at Finkle Street, Wortley	A group of low upstanding banks in a field to the west of Finkle Street Farm, presumably of medieval origin.	-	429200	398120
11	Medieval	HER: 03596/01, NHLE: 1020626	Low Forge, Wortley	Low Forge is nationally important for its long history and wide range of features, including both those that are upstanding and visible, as well as earlier structures thought to be buried in later deposits. Its association with Top Forge (SM 29920), together with the extensive contemporary documentation for the works, also adds to the monument's importance, as does its association with the former site office and workers housing. The survival of an early water powered hammer and a set of puddling furnaces is of particular note.	Scheduled Monument	429060	399530
15	Post-Medieval	HER: 03604/01	Gosling Moor Farm Post-Medieval Barn, Wortley	Barn in complex of farm buildings, appears to be of earlier form and construction than rest of farm, possibly dating from the 17th century.	-	430220	398690
12	Post-Medieval	HER: 03597/01	Forge Lane Corn Mill, Wortley	A water powered CORN MILL dating to the post medieval period. The site is situated adjacent to the Little Don	-	429760	399140
13	Post-Medieval	HER: 02313/01, NHLE: 1018262, 1315032, 1151114 & 1233963	Top Forge, Wortley, Hunshelf	Wortley Top Forge is a complex of great importance and demonstrates continuity in the production of iron from at least the early 18th century. The adaptation of a finery forge to secondary wrought iron working is rare and its survival unique. The buildings, machinery, and water management system will add greatly to our understanding of the iron industry in this part of the country. The physical remains, combined with the documentary evidence of leases and accounts, provides evidence of the technological developments in the industry and how these were accommodated and administered within the works. The survival of the workshops, the former office and cottages enhances the importance of the complex by providing evidence for the domestic arrangement of those who worked within it.	Scheduled Monument containing Grade I Listed Forge and three Grade II Listed cottages	429450	399850

WA No.	Period	HER ref.	Name	Description	Designation	Easting	Northing
14	Post-Medieval	HER: 04571/01	Wortley Tin Mill	Site of a former tin mill where wrought iron was rolled into plates and coated with tin, to make tinplate, from 1743 till the early 19th century. Then rolled plates for the shovel trade; closed c.1870. Possibly the oldest un-rebuilt site of a tinplate works.	-	429375	398894
16	Post-Medieval	NHLE: 1315033 & 1315045	Forge Bridge	Coursed dressed ashlar bridge of two segmental arches. Built 1782 by Thomas Ramsden.	Grade II Listed	429345	399802
17	Post-Medieval	NHLE: 1233962	Outbuilding beside Holly Hall	17th century outbuilding, derelict.	Grade II Listed	428923	398929
18	Post-Medieval	NHLE: 1191515	Well Hill Farmhouse	Late 18th century farmhouse with possible 17th century wing. Coursed squared rubble built two storey building with two-room plan and rear wing.	Grade II Listed	428918	399743
19	Modern	NHLE: 1151021	Ivy Cottage	Mid 18th century two storey house with 19th century additions	Grade II Listed	429960	399199
20	Modern	HER: 03603/01	Site of the Old Workhouse, Wortley	A structure relating to the industrial revolution: marked on 6" OS map (sheet 282) of 1854. Located near new Stocksbridge Bypass. Some of the gable windows blocked and modern breeze block extension added.	-	430310	398890

APPENDIX 2: SOUTH YORKSHIRE INDUSTRIAL HISTORY SOCIETY SURVEY

INTRODUCTION The Society's Field Recording Group made a number of recording visits to Wortley Tin Mill between January and July 1985. We surveyed the main part of the site between the entrance and the waterwheel head goits. Regrettably the member who was responsible for drawing up the work, and had the measurements, moved away from Sheffield and was unhelpful when contacted. I drew up this report in July 1985, drawing on field notes, discussions with other members of the team, and a further visit to refresh my memory and examine the weir. It was not cleared with the team. The report was in manuscript and I have only now typed it up, adding a few comments in italics.

Derek Bayliss
23 October 2012

Weir Two rows of massive stones diagonally across river at point where it falls fast over beds of rock. Top row, the main weir, has rectangular stones carefully hewn and close fitting. About 1800 mm from back to front, and individual stones 550-650 mm broad. Slot cut in upper surface of stones, towards rear, across most of weir: about 500 mm from back, 60 mm wide, 40 mm deep. On W bank, flight of 4 stone steps leading down to weir. Vertical face of 4 courses of stones, about 1200 mm deep. Not carved smooth, and lower stones projecting slightly as if to break fall. Then a platform of stones [*at the foot of the vertical*], also rectangular but much less smooth fitting and not level on top: about 2000 mm front to back, and the stones 400-500 mm broad. Lower edge much more irregular. 2 courses of stone, the lower one projecting markedly. Fall of about 650mm to present (summer) water level.

Goit leaves river about 15 metres above weir. Sluice is not here but level with weir, and combined with 2-span stone clapper footbridge [*over goit*] on path leading to weir. 2 steps down on dam side and three up on W side. Shuttle mechanism mounted on 2 massive blocks of stone clamped together by iron clamp, on N side of footbridge. Two cast iron things for holding and adjusting shuttle, one still with gear wheel. More modern valve with round handle on top, set in goit just upstream. Goit has been re-cut and is mainly earth banked but there is some stone walling on W side just N of sluice.

Dam completely altered by recent earth-moving, to give roughly rectangular shape with two islands that were not there before. [*There have been more alterations since then.*]

Top overflow All that remains after recent destruction are the badly disturbed N wall, of large blocks of stone with diagonally tooled surfaces, and a few stones at bottom of spillway.

Middle overflow Possible site marked by small depression in path. [*Not on OS plans: I'm not sure where the suggestion came from.*]

3rd overflow On dam side of path, massive stone (about 2230 mm x 630 mm) has cast iron plate mounted on it by 4 bolts. Two nuts still present, two gone, two further bolt holes in centre. Cast iron collar mounted on upstream projection of this by 4 bolts

with nuts, holds massive screw for a shuttle. Path crosses by this (most of path from weir is on a dam wall). Square arch on downstream side with another massive stone, 1850 x 290, as lintel. Sides of carefully worked stone supporting this, continuing as coursed rubble walls a few feet either side. Opening was 1200 mm wide x 1110 mm deep, and then a fall of about 550 mm to start of spillway. Opening now bricked up, and pipe comes through face below it, with cover bolted on for removal if wish to empty dam. Spillway starts 1200 mm wide and widens as it falls. Walls of coursed rubble, disappearing as it approaches river. Floor of similar stones. The coursed rubble here and on wall has been roughly tooled.

Ramp wide enough for vehicles leads down from dam here to back of Wheel 1 goit, where there are the foundations and scattered stones of a building of 2 rooms (?), one end of which abuts on outer wall of head goit embankment.

(The report assumes that there were three waterwheels at the Tin Mill. It numbers them from the east, so no.1 was at the end of the curving surface head goit; no.2 at the surviving wheelpit close to the forebay; and no.3 at the far end of the stone culvert from the forebay. Some sources refer to two wheels; Angerstein does not give the number of wheels but his description of the machinery can be read as requiring more than two. I am now doubtful about a third wheel, and think there may be some other explanation of the culvert, but I have left the text as written.)

Wheel 1 Curving goit apparently quite independent of the other 2 wheels. Can no longer see where it joins [*i.e. where it left*] dam, or whether first part was in tunnel or has been hidden by later changes. Emerges from under path through the site, where a single stone spans it and supports four stones as footway, to a curving channel in middle of a narrowing embankment. Stonework of channel is coursed rubble. At one point a large stone spans it, 1200mm below top of wall, built into the two walls, presumably to strengthen. Face of embankment towards river also coursed rubble. Both embankment walls are of similar stonework – much gone, particularly on face towards working area. [*the area between wheels 1 and 2 – work may also have been done in other areas.*]

Just before wheel site, goit is spanned by footbridge of two massive stones side by side, with tooling on upper surface. Beyond this, masonry of goit changes to massive close-fitting blocks, with signs of fastening by iron pegs and clamps. Some have been displaced. These bring us to wheel site, where stonework is now down to present ground level. In the goit here is a stone with convex (*did I mean concave?*) upper surface which presumably fed water to wheel. This stone has orange stain on surface, and ground for 2-3 metres beyond is stained orange as if by iron, a feature not seen elsewhere on site. Angled slots in side stones – and in other stones lying around – show where there was a shuttle, oddly below [*i.e. downstream of*] the convex stone. No trace of wheel fixings or tail goit arrangements.

Working area between here and Wheel 2, and towards dam. Now covered by debris and fallen stones, including two arched door lintels, each carved out of single stone, with false ‘keystone’ carved in middle on one side; other side is only rough cut. Between the two wheels is a curved embankment wall, a smooth but asymmetrical

curve, sharpest at end [*i.e. towards dam*]. From here to Wheel 2 outer stonework of embankment has gone, because of tree roots and/or robbing.

Working area continues below the two wheel sites, again with scattered stones, including one large one with four holes in (machinery bed?) and one with alternate 'teeth' and recesses along one side [*i.e. dentillated*].

Wheels 2 and 3 are fed from a single inlet of the dam [*forebay*]. Much of channel to it from main dam still visible. [*Some since destroyed by vehicles and work on dam.*] No sign of water controls here. Reported still in water in 1920s. Stonework all round; curved wall nearest to main dam, then straight wall over entrance to Wheel 2 head goit. This has massive clamped stones at top and round corner to another straight wall leading to Wheel 3 inlet. Both these walls are close to corresponding walls in working area, with only an earth or rubble core between them. Above wheel 2 the thickness is about 1350 mm, and round the corner about 1700mm. At far end of this third wall is entrance to tunnel head goit of wheel 3; then a fourth wall returning at an angle towards main dam.

Wheel 2 Water came through short tunnel in massive masonry wall, turned corner by end and wing walls and arrived almost at once at wheel site. All 3 walls massive clamped and pegged masonry. Again convex [*?*] stones (2 here) to direct water on to wheel, and shuttle grooves at a slight angle for full height of wall, meeting this stone (*i.e. the curved stone*) where its surface is almost vertical. Some stones in main wall carrying shuttle groove have carved numbers: a 3 in top course, and 5 (inverted) and 6 on 3rd and 4th courses down, particularly noticeable.

Stone footings in line with main wall, but no sign of wheel mounting or tail goit. Wheel itself pointed towards wheel 3 site, and tail goit must have been at lower level than that, so either sharp curve or tunnel.

Between wheels 2 and 3 Main wall round two right angles to give a wider working area. All of massive close-fitting stone. Apparent slot just round first corner, in courses 4 and 5 from top; might have held a beam for wheel mounting. Head goit for wheel 3 is in tunnel, some way behind the final stretch of main wall. Tunnel is rubble lined, and a line of stones on top of bank near wheel 2 roughly marks its outer side.

Wheel 3 Head goit tunnel curves through 90 degrees, and oddly there is an opening in its roof (*correction – a vertical opening just below its roof*), perhaps for inspection; the roof is stepped up (*inside*) towards it round the curve, and then it abruptly becomes smaller again, to emerge at the wheel site. (*Note: I climbed into the culvert. Risk assessment recommended before anyone tries it now.*) Here there is a massive lintel but quite a small opening with a roughly made stone sill, rather like that at 3rd overspill. Wrought iron rod across front of these stones, apparently oval or lentil-shaped (*in cross-section*), about 20 x 10 mm, vertical. Then a short channel of massive stone, but not smooth-faced and apparently not clamped together. No definite signs of (*wheel*) breast, sluice or wheel. Could almost be an overflow, but why go to all that bother? Interesting collection of irregularly shaped stones lying around, including one in segment of a circle which might be weight from wheel (cf. Andrews).

Intriguing signs of later re-use: concrete caps on walls short way below opening, each holding 2 fastening bolts with slight hollow between them, as if for axle across goit. Further piece of concrete some distance away with similar bolts holding 2 pieces of curved metal, one of them of stainless steel. Jack Hughes [*elderly local member of survey team*] thinks may be 2nd World War, but no idea of purpose. Between here and wheel a fallen piece of stone has concrete applied to it.

Tail goits Wheel 3 channel points towards steep gully straight down to river. Possible traces of masonry on sides of this.

Tail goit shown on maps (now dry) only appears beyond entrance, as if in tunnel through site [*cf. Wortley Top Forge*]; fairly steep fall to where appears, then a wide channel down to river.

Between Wheel 3 and entrance Nothing really visible except along the bank; here site seems to be cut into natural slope. Beyond Wheel 3 a wing wall parallel with goit, leading from presumed wheel site back to inspection entrance wall. (Traces of similar wing wall on other side of Wheel 3.) Corner here largely buried by tipped domestic rubbish. Slight traces of a wall at right angles to wing wall, apparently coursed rubble. Then another zigzag to give wider area below wall; purpose not clear (was the spring [*shown on 1905 and 1931 25" plans*] in the corner?) Slightly curved wall of coursed rubble, with rubble fill behind, some depth, from here to gate. Working area level again, obscured by tipping, and some of face of wall has fallen.




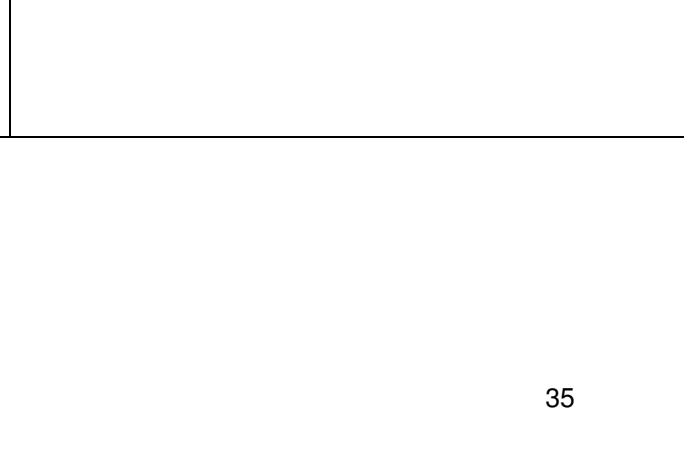
Beyond gate, an ordinary field wall. Possible gateposts lying in ground. Foundations of a later building in undergrowth between gate and river.



Higher level Other 2 buildings thought to have been on top of bank before 3rd wheel, and possibly beyond it; and further back at foot of bank up to main track. Parts of this bank almost vertical, but no visible masonry. No definite foundations, though at the 'well' corner some stonework continues across path and away from lower site.




Sites of the two sets of cottages still visible, and foundations of the larger set.




Derek Bayliss
24 July 1985




APPENDIX 3: GAZETTEER OF SURVEYED ELEMENTS




Feature No	Description	Group	Photo
101	Retaining walls between the Tail race and wheel 3 to the west of the Site. Same as 102 and forms a right angle which is abutted by 103 but possible tied into 104. The wall is constructed from rough cut sandstone and not bonded. The function of this wall is unclear.		
102	Part of retaining wall with 101. Tied into 101 and same build.		
103	North south short rubble wall constructed from random stone. 103 abuts the south end of 102.		
104	East west retaining wall, similar construction to 101, built between 102 and 105 of wheel 3. The wall separates two working zones, to the north and south.		




Feature No	Description	Group	Photo
105	Western wall of a former wheel pit 3, possibly later than wheel pit 2. Constructed from large ashlar blocks, possibly due to mechanical movement.	Wheel 3	
106	East wall of wheel pit 3 same build as 105. Creates a narrow channel with 105. 105 and 106 have an Fe bolt at their southern ends which are fixed in with concrete. The entrance into the channel between 106 and 105 at the north rises the water channel turns into it, suggesting it may have once housed a wheel. The pit has flagstones placed over suggesting it was decommissioned	Wheel 3	
107	Large Ashlar wall running east west with a central hole possibly for supporting an axle. Part of wheel pit 2 and could be the larger wheel. Wheel 3 crosses the tale race from the wheel at a right angle, suggesting it is earlier than wheel 3.	Wheel 2	


Feature No	Description	Group	Photo
108	Same as 107, but forms a dogleg that abuts 110. The west facing element has a joist hole, possibly for an ancillary structure associated with the wheel to the south of 107.	Wheel 2	
109	Sluice gate and shuttle for wheel pit 2. Has parts of the Fe gate remaining, and masons marks on the shuttle walling. Constructed from thin large Ashlar blocks	Wheel 2	
110	Semi circular roughly built wall which possibly acts as a split for goits. The wall sits the east of the main complex of structures. The area does not appear to be roofed on the OS maps.		

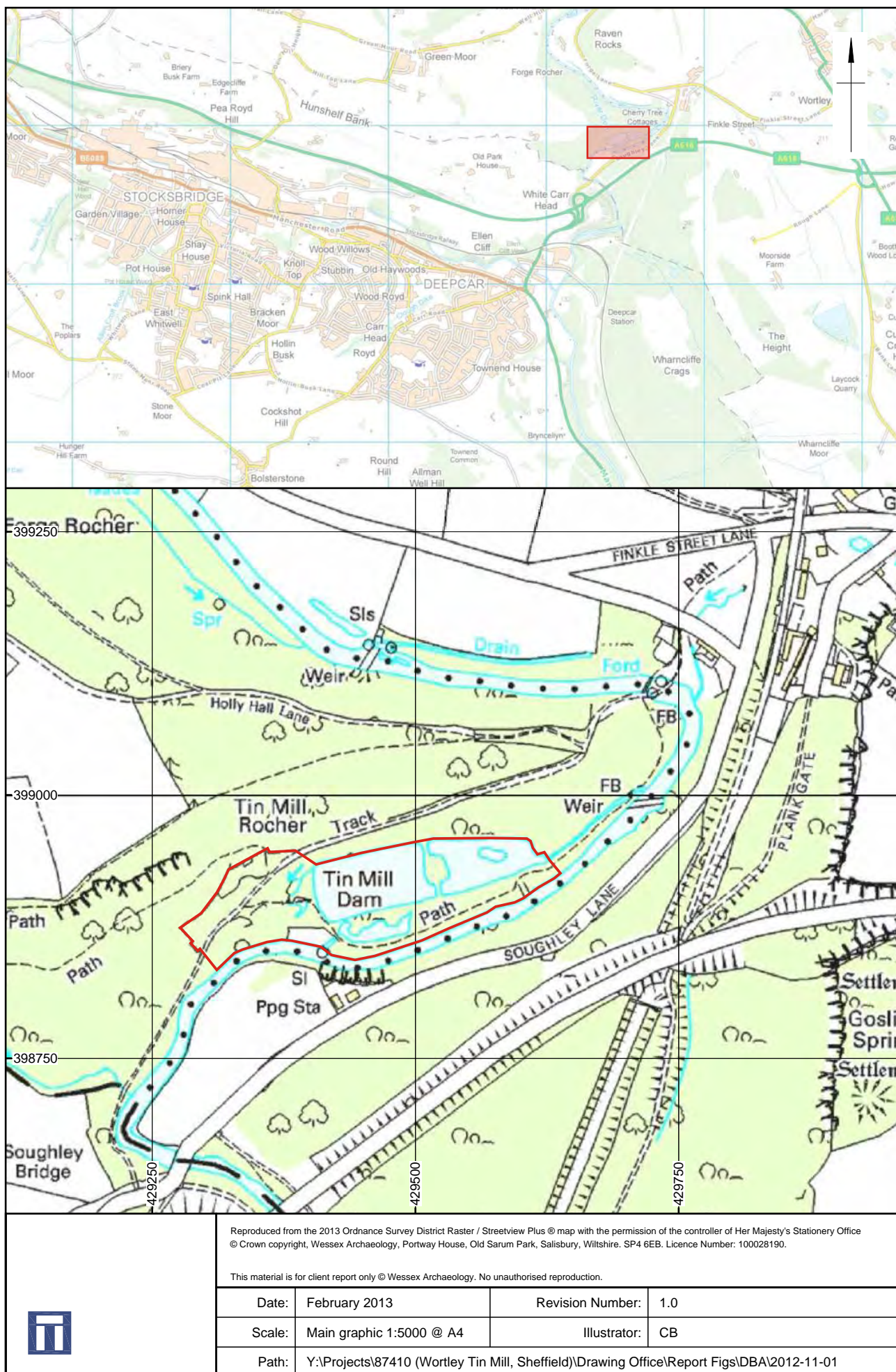
Feature No	Description	Group	Photo
111	Roughly built sandstone giot running east west to the north of wheel pit 2 and into wheel pit 3. Possibly diverted by 108. North walling		
112	Well hewn semi-circular wall abutting 108. Directs the flow of water into Wheel 2. The wall abuts 110 suggesting it is a later build or more likely a rebuild.		
113	Linear bank of stones possibly representing a former wall running north south from 109.		

Feature No	Description	Group	Photo
114	Roughly built curvi-linear tail race. Head race and wheel pit. Two separate foot bridges have been built at either end by spanning the channel with large flat stones. These may be platforms which were placed to operate a sluice.	Wheel 1	
115	Retaining wall for 114 separating it from 116. Roughly lain sandstone		
116	Rectangular structure with two cells and possible doorways to the north west, south and an internal door way to the north of the dividing wall. Rubble suggests possible industrial use due to large load bearing stones.		

Feature No	Description	Group	Photo
117	Boundary wall exiting as an east west linear bank.		
118	Outflow/bypass at south west of dam. Built from Sandstone blocks. Original sluice has been replaced by red brick blocking and an Fe valve.		
119	Remnant of substantial ashlar structure indicating location of the wheel house structure for Wheel 1. Clearance around the structure revealed a continuation of the parallel walls of the wheel pit structure extending to the west.	Wheel 1	

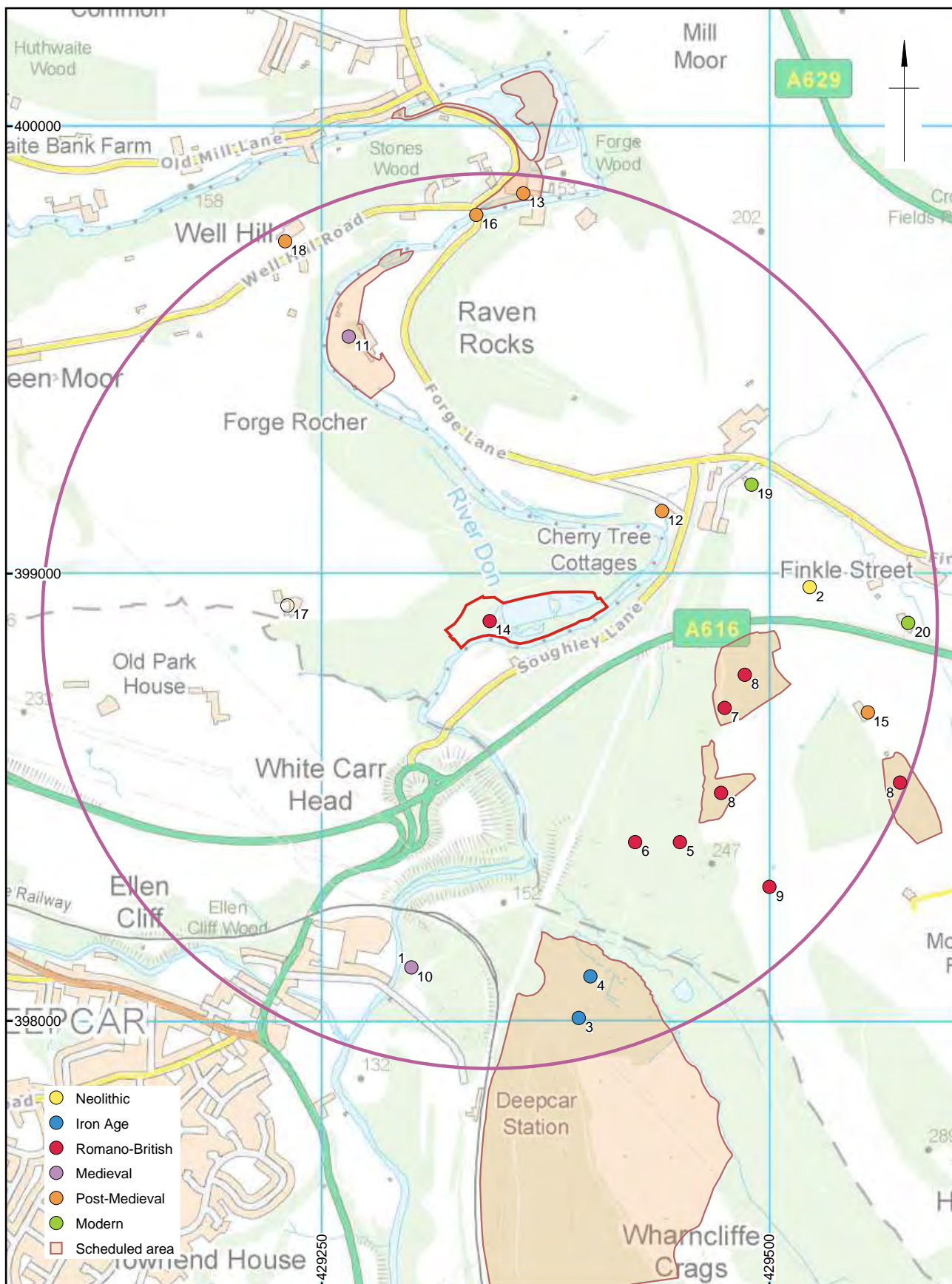
Feature No	Description	Group	Photo
120	Linear shallow ditch forming the remnant of the tail goit from the mill towards the Don. Now dry and presumably silted up. One section of masonry wall was observed on the northern bank of the goit.		
121	The site of the lower terrace of cottages is evidenced by a large level building platform. No structural remains were visible above ground.		
122	Collapsed stone structure forming a 'T' shape in plan. This building is situated in the location of the northern cottages but correlates with a smaller structure built following the demolition of the cottage between 1936 and 1955. The new structure is reputed to have been used as a pig sty.		

Feature No	Description	Group	Photo
123	<p>Mill pond, now fishing reservoir, situated to the east of the mill complex. Altered in the late 20th century but largely respects the northern boundary of the original mill pond. In conversion to fishing the pond was divided by a land bridge, with a second detached island situated towards the centre of the eastern half of the pond.</p> <p>[The image for this asset is taken from the eastern end of the pond – looking west].</p>		



Site location

Figure 1



Reproduced from the 2013 Ordnance Survey District Raster © map with the permission of the controller of Her Majesty's Stationery Office
 © Crown copyright, Wessex Archaeology, Portway House, Old Sarum Park, Salisbury, Wiltshire. SP4 6EB. Licence Number: 100028190.

This material is for client report only © Wessex Archaeology. No unauthorised reproduction.

Date:	February 2013	Revision Number:	1.0
Scale:	1:12,500 @ A4	Illustrator:	CB
Path:	Y:\Projects\87410 (Wortley Tin Mill, Sheffield)\Drawing Office\Report Figs\DBA\2012-11-01		





Reproduced with permission of Sheffield Archives
Sheffield Archives ref: WC/162

This material is for client report only © Wessex Archaeology. No unauthorised reproduction.

Date:	February 2013	Revision Number:	1.0
Scale:	n/a	Illustrator:	CB
Path:	Y:\Projects\87410 (Wortley Tin Mill, Sheffield)\Drawing Office\Report Figs\DBA\2012-11-01		

1746 Map of the land belonging to Wortley Forges

Figure 3



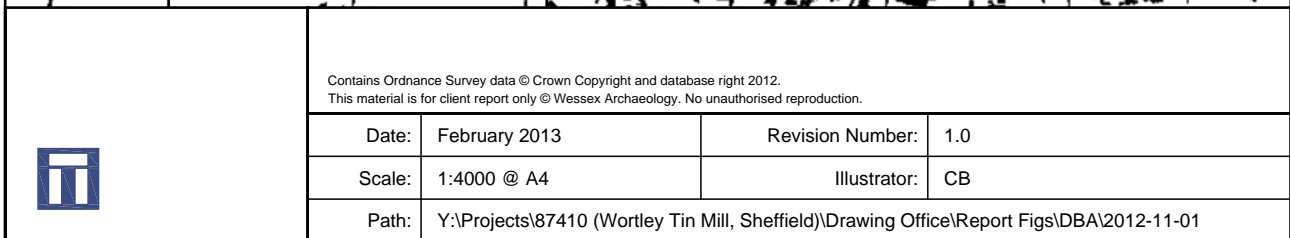
1796 Plan of the Township of Wortley

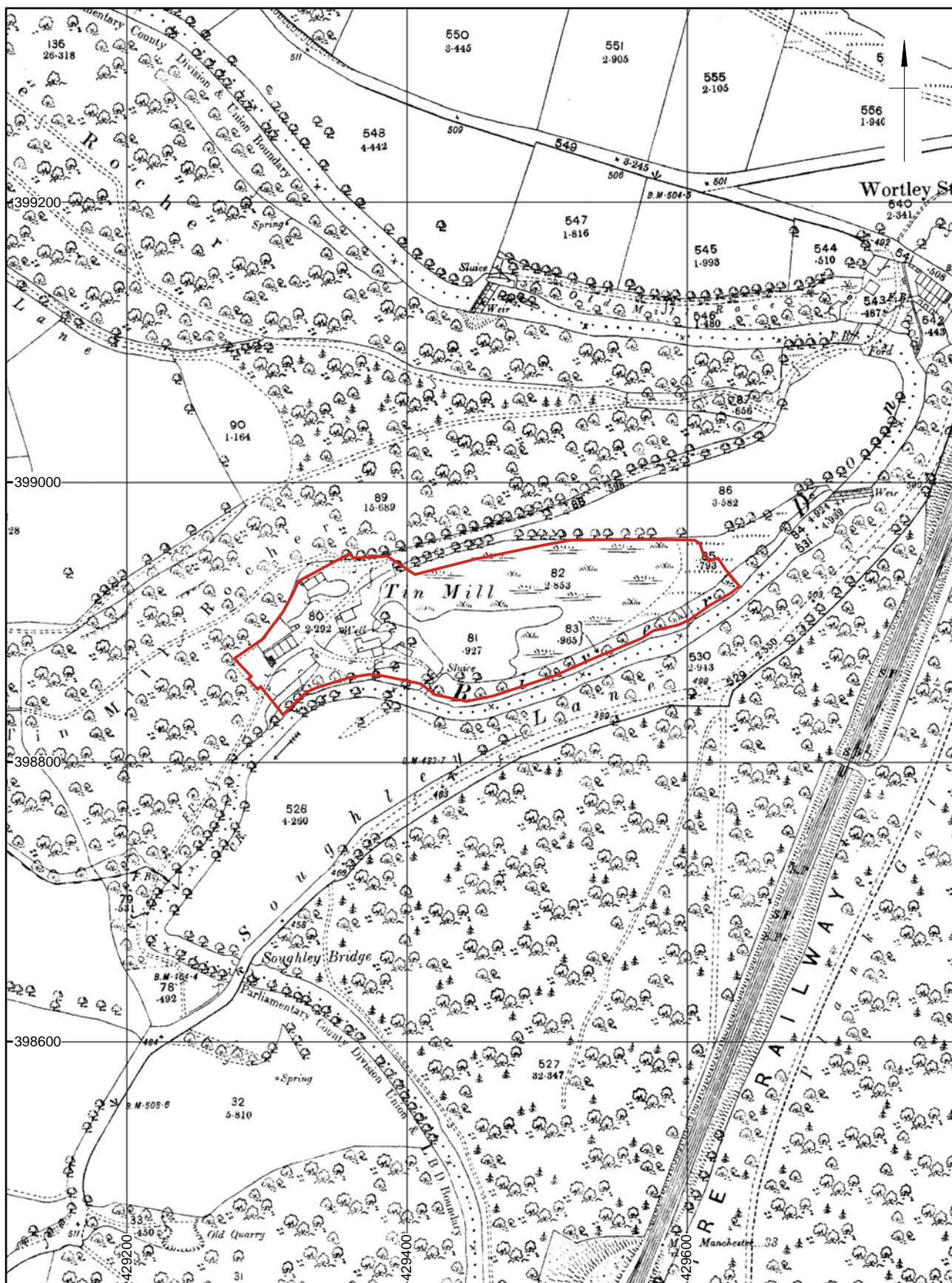
Figure 4



1801 Plan of the Wortley Estate in the Township of Hunshelf

Figure 5

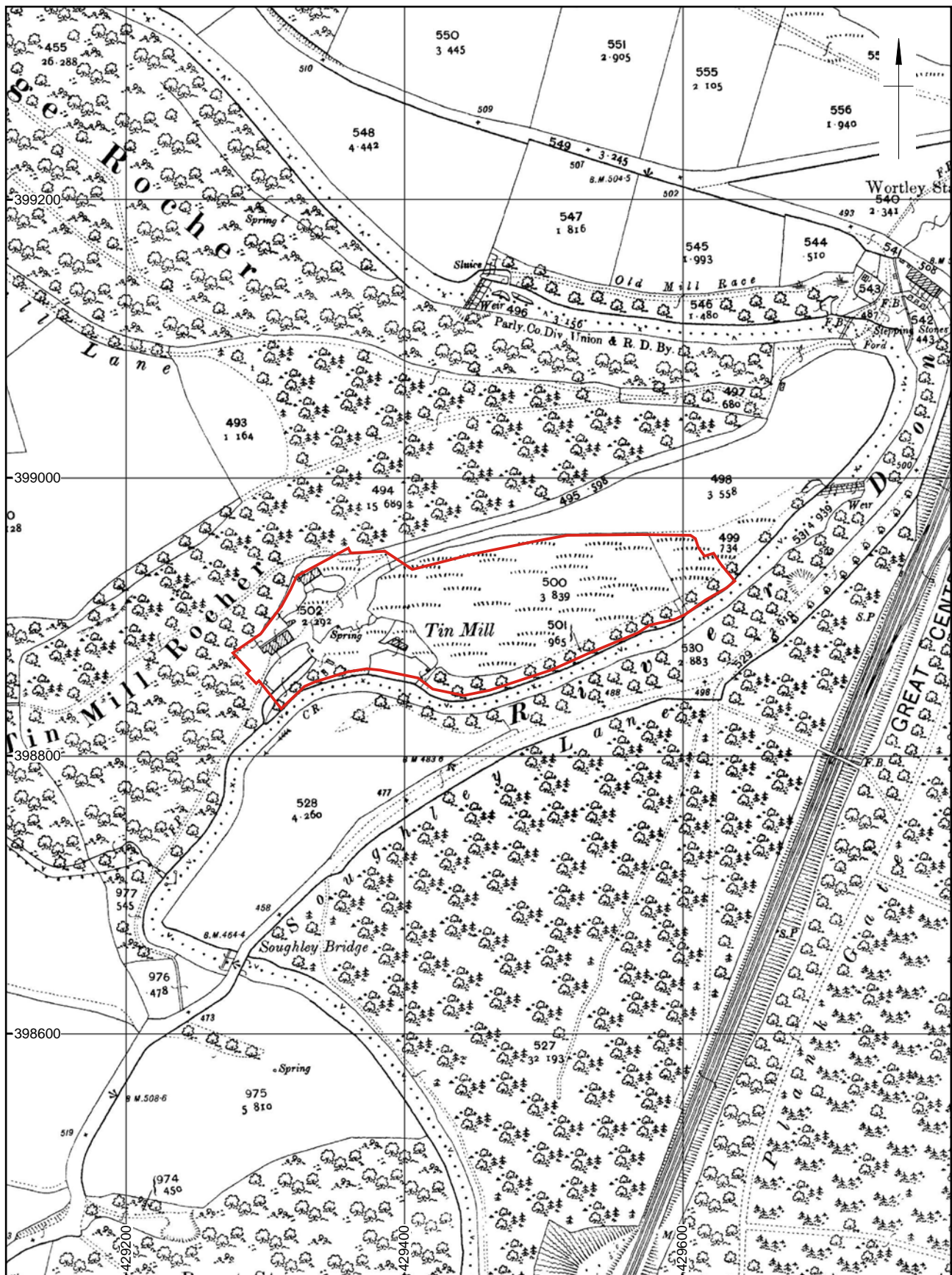




Contains Ordnance Survey data © Crown Copyright and database right 2012.
This material is for client report only © Wessex Archaeology. No unauthorised reproduction.



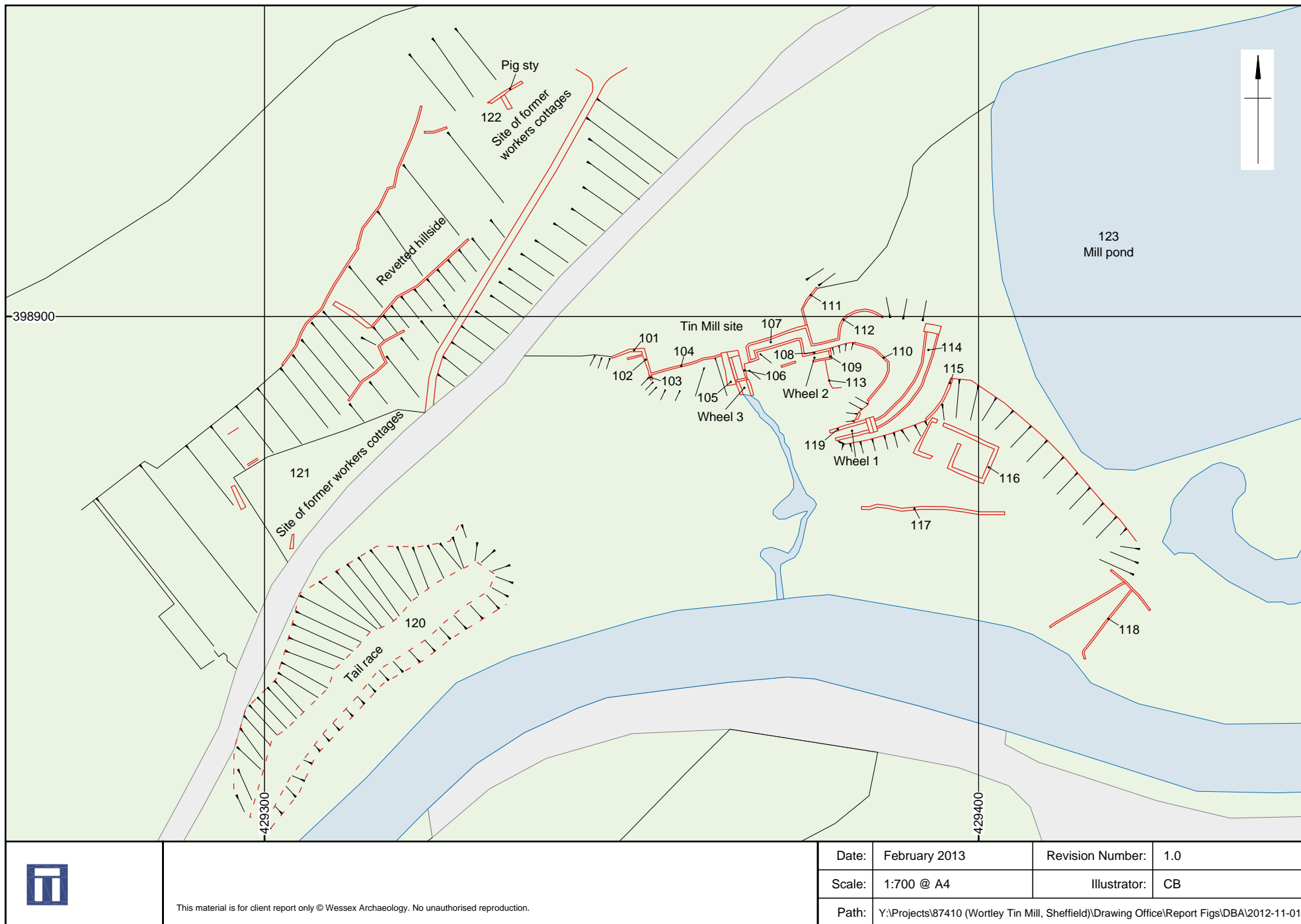
Date:	February 2013	Revision Number:	1.0
Scale:	1:4000 @ A4	Illustrator:	CB
Path:	Y:\Projects\87410 (Wortley Tin Mill, Sheffield)\Drawing Office\Report Figs\DBA\2012-11-01		

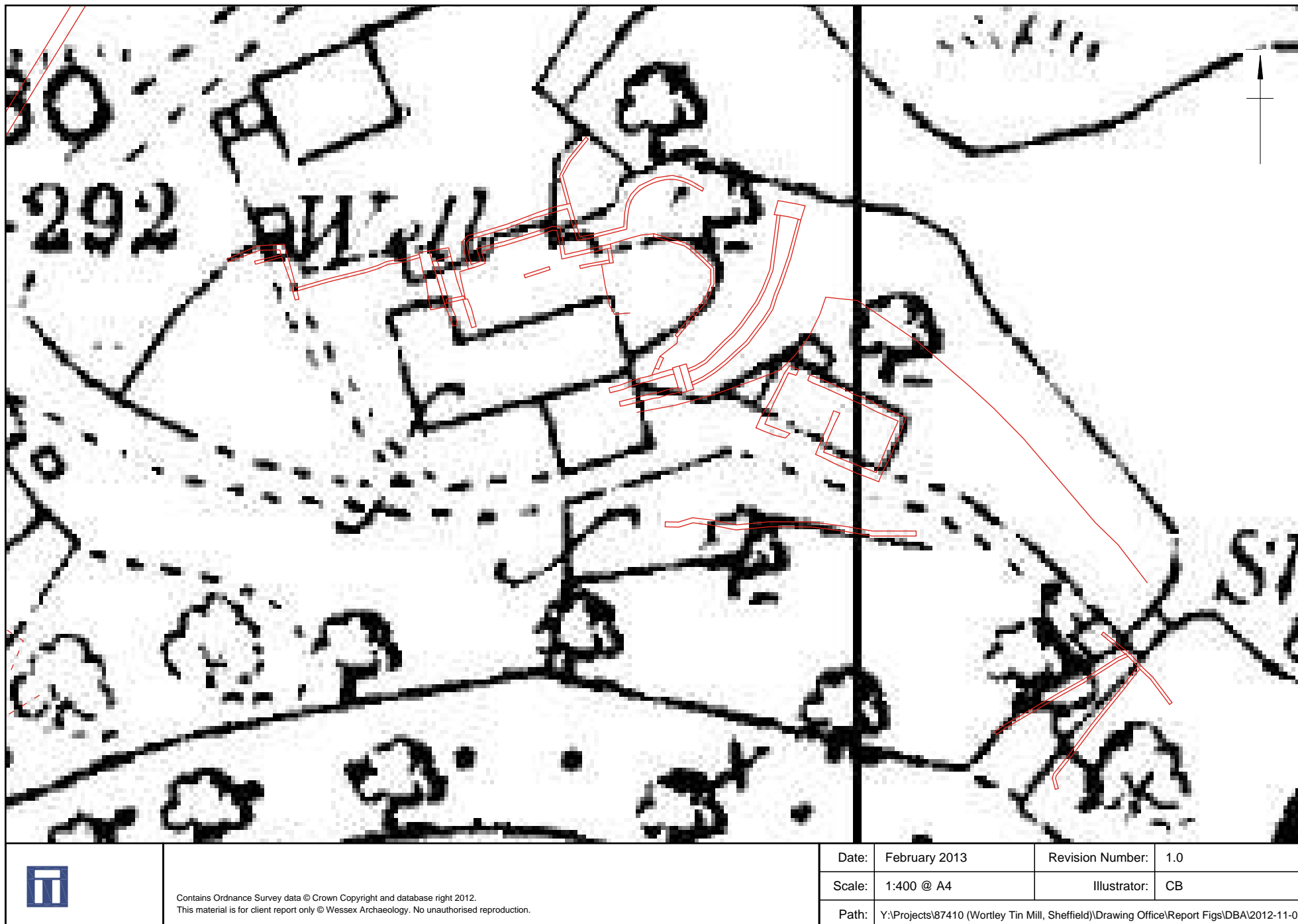


Contains Ordnance Survey data © Crown Copyright and database right 2012.
This material is for client report only © Wessex Archaeology. No unauthorised reproduction.



Date:	February 2013	Revision Number:	1.0
Scale:	1:4000 @ A4	Illustrator:	CB
Path:	Y:\Projects\87410 (Wortley Tin Mill, Sheffield)\Drawing Office\Report Figs\DBA\2012-11-01		





Detail of Tin Mill survey overlain onto 1893 OS map

Figure 10

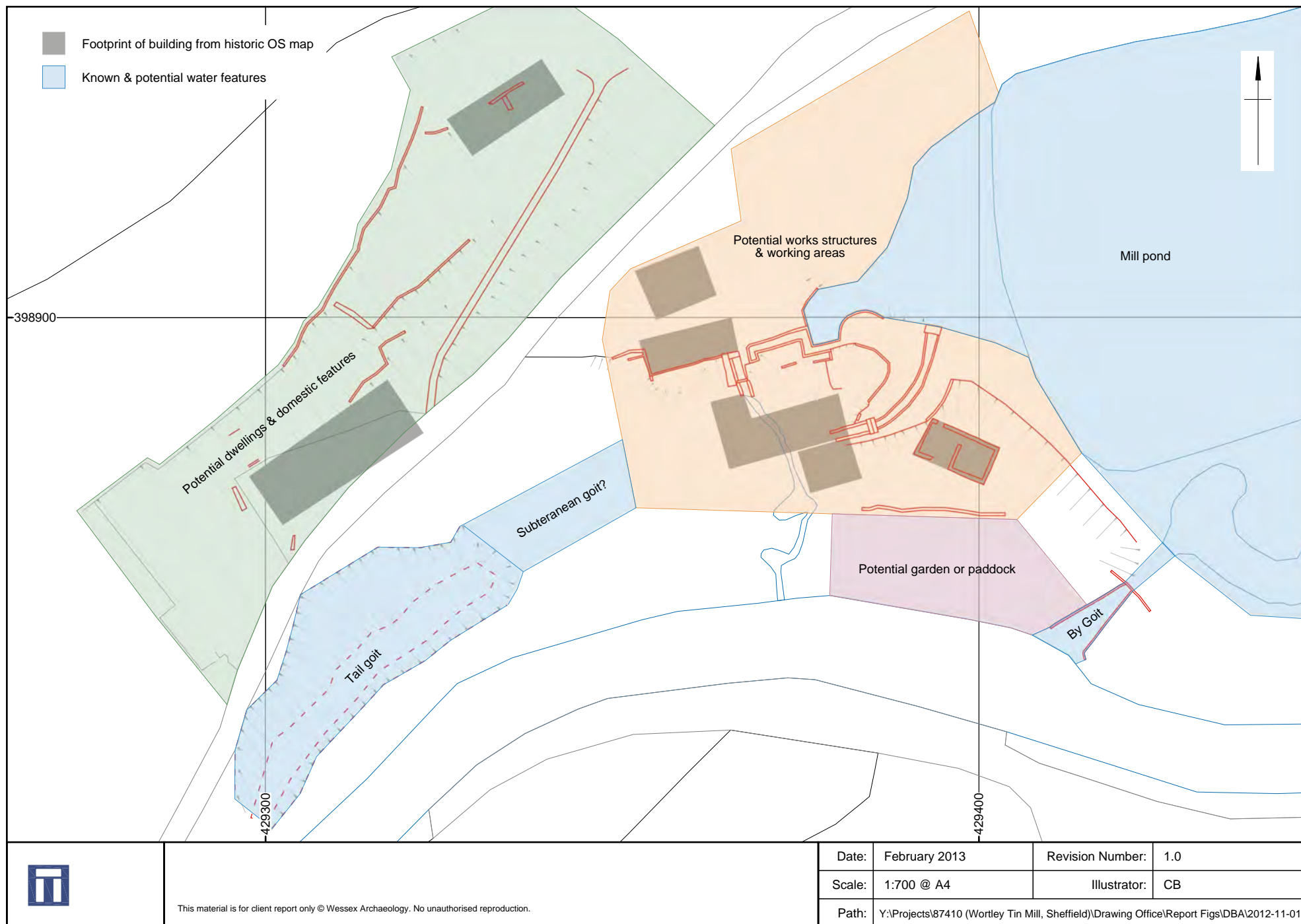


Figure showing areas of potential

Figure 11

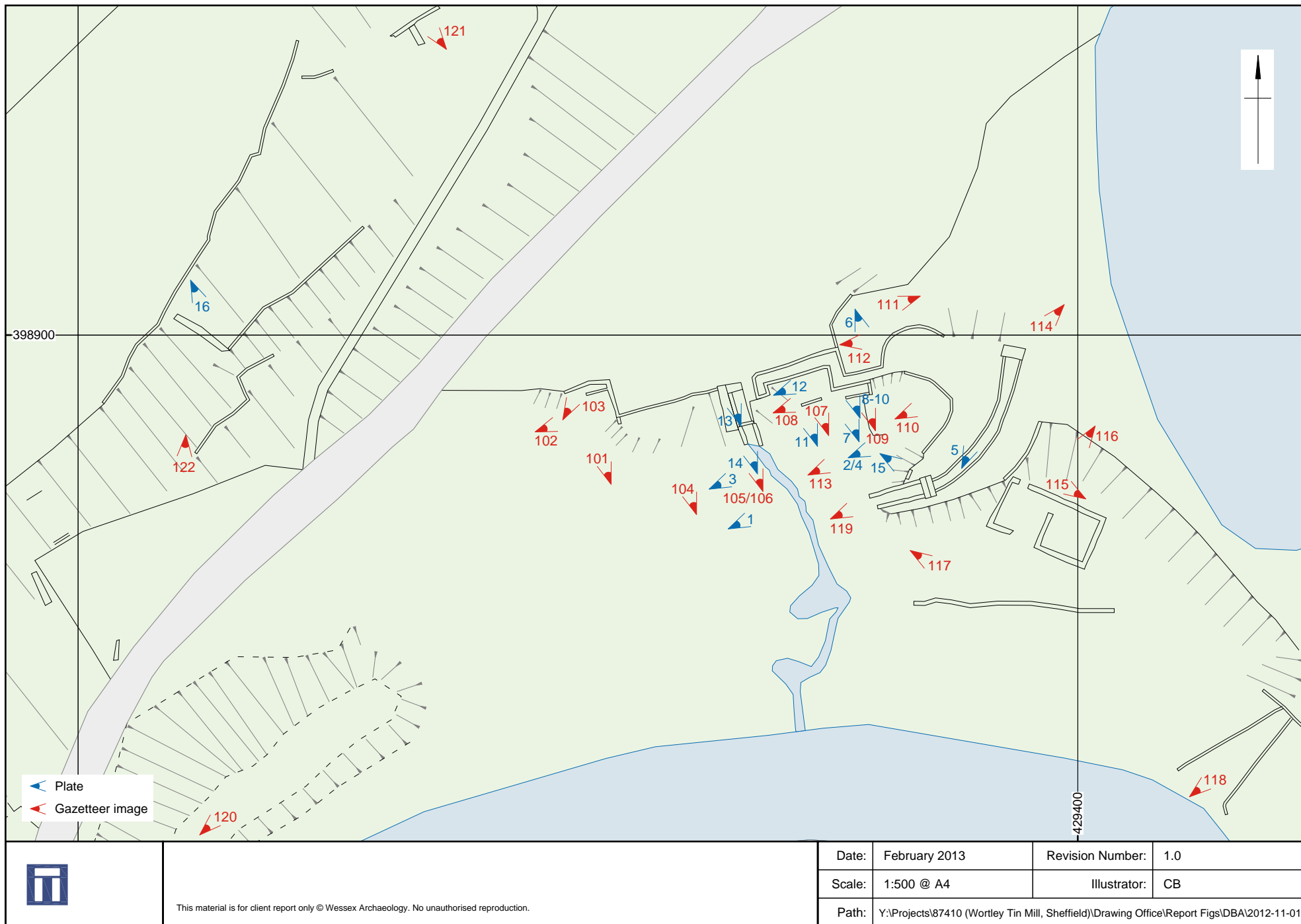


Image location plan

Figure 12



Plate 1: Volunteers working on clearing the mill site



Plate 2: Main working area: arched door lintel, with false 'keystone'


	This material is for client report only © Wessex Archaeology. No unauthorised reproduction.		
	Date:	February 2013	Revision Number: 1.0
	Scale:	N/A	Illustrator: CB
	Path:	S:\PROJECTS\87410 (Wortley Tin Mill, Sheffield)\Reports\Plates	



Plate 3: Main working area between Wheels 1 and 2



Plate 4: Main working area: 'cogged' stone


	This material is for client report only © Wessex Archaeology. No unauthorised reproduction.		
	Date:	February 2013	Revision Number: 1.0
	Scale:	N/A	Illustrator: CB
	Path:	S:\PROJECTS\87410 (Wortley Tin Mill, Sheffield)\Reports\Plates	



Plate 5: Curved head goit for Wheel 1 (**114**)



Plate 6: North elevation of **108** within forebay


	This material is for client report only © Wessex Archaeology. No unauthorised reproduction.		
	Date:	February 2013	Revision Number: 1.0
	Scale:	N/A	Illustrator: CB
	Path:	S:\PROJECTS\87410 (Wortley Tin Mill, Sheffield)\Reports\Plates	



Plate 7: South elevation of **108**, showing inlet, channel for shuttle and damage caused by vegetation



Plate 8: Detail of channel and numbered stones in **108**


	This material is for client report only © Wessex Archaeology. No unauthorised reproduction.		
	Date:	February 2013	Revision Number: 1.0
	Scale:	N/A	Illustrator: CB
	Path:	S:\PROJECTS\87410 (Wortley Tin Mill, Sheffield)\Reports\Plates	



Plate 9: Masonry marks, a '3'



Plate 10: Masonry marks, a '5' (inverted) and '6'


	This material is for client report only © Wessex Archaeology. No unauthorised reproduction.		
	Date:	February 2013	Revision Number: 1.0
	Scale:	N/A	Illustrator: CB
	Path:	S:\PROJECTS\87410 (Wortley Tin Mill, Sheffield)\Reports\Plates	



Plate 11: South facing elevation of **107**, defining the presumed location of Wheel 2



Plate 12: Possible beam slot in west facing elevation of **107**


	This material is for client report only © Wessex Archaeology. No unauthorised reproduction.		
	Date:	February 2013	Revision Number: 1.0
	Scale:	N/A	Illustrator: CB
	Path:	S:\PROJECTS\87410 (Wortley Tin Mill, Sheffield)\Reports\Plates	



Plate 13: Detail of void between **105** and **106**, showing stepped roof of goit between the dam and Wheel 3



Plate 14: Detail of **105** and **106** delineating presumed location of Wheel 3


	This material is for client report only © Wessex Archaeology. No unauthorised reproduction.		
	Date:	February 2013	Revision Number: 1.0
	Scale:	N/A	Illustrator: CB
	Path:	S:\PROJECTS\87410 (Wortley Tin Mill, Sheffield)\Reports\Plates	



Plate 15: Example of collapse of retaining wall 110



Plate 16: Example of revetment walls on hillside above the mill



	This material is for client report only © Wessex Archaeology. No unauthorised reproduction.		
	Date:	February 2013	Revision Number: 1.0
	Scale:	N/A	Illustrator: CB
	Path:	S:\PROJECTS\87410 (Wortley Tin Mill, Sheffield)\Reports\Plates	



Plate 17: Workers cottages (Courtesy of Hunshelf Parish Council)



Plate 18: 19th century postcard from Soughley Bridge (Courtesy of Hunshelf Parish Council)

	This material is for client report only © Wessex Archaeology. No unauthorised reproduction.		
	Date:	February 2013	Revision Number: 1.0
	Scale:	N/A	Illustrator: CB
	Path:	S:\PROJECTS\87410 (Wortley Tin Mill, Sheffield)\Reports\Plates	



salisbury rochester sheffield edinburgh



Wessex Archaeology Ltd registered office Portway House, Old Sarum Park, Salisbury, Wiltshire SP4 6EB
Tel: 01722 326867 Fax: 01722 337562 info@wessexarch.co.uk www.wessexarch.co.uk



Wessex Archaeology Ltd is a company limited by guarantee registered in England, company number 1712772. It is also a Charity registered in England and Wales, number 287786; and in Scotland, Scottish Charity number SC042630. Our registered office is at Portway House, Old Sarum Park, Salisbury, Wiltshire SP4 6EB.