

**AN ARCHAEOLOGICAL EXCAVATION AT
SIR CHARLES PARSONS SCHOOL,
WESTBOURNE AVENUE, WALKER,
NEWCASTLE-UPON-TYNE, TYNE AND WEAR**

ASSESSMENT REPORT

JULY 2012

PRE-CONSTRUCT ARCHAEOLOGY

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ASSESSMENT REPORT

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**An Archaeological Excavation at Sir Charles Parsons School,
Westbourne Avenue, Walker, Newcastle-upon-Tyne, Tyne and Wear**

Assessment Report

Central National Grid Reference: NZ 2900 6510

Site Code: SCP 11

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PART A: PROJECT SUMMARY

1. NON-TECHNICAL SUMMARY

- 1.1 An archaeological excavation was undertaken November-December 2011 by Pre-Construct Archaeology Limited at Sir Charles Parsons School, Walker, Newcastle. The work was undertaken during re-development of the school as part of Phase 2 of the Newcastle Building Schools for the Future project, commissioned by the Principal Contractor, Sir Robert McAlpine Limited. The original school site was centred at National Grid Reference NZ 2900 6510.
- 1.2 At the time of the archaeological excavation, the former buildings of Sir Charles Parsons School were in the process of being demolished, with new build in place immediately to the east, adjacent to the new Walker Technology College. Some of the archaeological excavation area lay within the footprint of the former buildings.
- 1.3 A phased programme of archaeological work was undertaken in association with the re-development scheme. The archaeological potential of the site was initially established by a desk-based assessment in 2008. Historic mapping indicated that a colliery waggonway, of likely 18th-century origin, crossed the site on a NW-SE alignment. This ran from Gosforth Pit, passing Delight Pit and crossing the site of Sir Charles Parsons School, before continuing southwards towards the River Tyne. Gosforth Pit and Delight Pit were outlying workings of Walker Colliery, which was worked from the mid 18th century. Mapping showed that, within the south-easternmost portion of the school site, the waggonway ran along a substantial embankment where it crossed the dene of a tributary of a watercourse, Stott's Burn.
- 1.4 An archaeological trial trenching evaluation, undertaken in 2009 while the original school was in use, investigated the route of the waggonway in the south-eastern portion of the site. The work recorded a substantial clay trackbed embankment in one trench, although no track timbers survived. The embankment was overlain by deposits associated with the development of the route, probably during the late 18th or early 19th century. Part of a substantial brick structure of early 20th-century origin was recorded, probably the south-western portion of the 'Walker Refuse Destructor' identified on early 20th-century maps.
- 1.5 The archaeological remains recorded in the evaluation were of sufficient importance to require an additional phase of archaeological excavation, following demolition of the original school buildings. Therefore, three areas (Areas 1, 2 and 3) were investigated along the route of the waggonway. Area 1 was located immediately to the south-east of the former school buildings on a former car park; broadly rectangular in shape, it covered c. 136m². To the north-west, Area 2 was located within the south-eastern portion of the footprint of the original school building; rectangular in shape, it covered c. 28m², in two parts. Area 3, located further to the north-west, was situated within an area of former yard; trapezoidal in shape, it covered c. 27m², with work here undertaken during the demolition of the school building.
- 1.6 The archaeological remains encountered during the excavation represent six main phases of activity. Phase 1 represents the natural clay sub-stratum, encountered as the basal deposit within all areas investigated. Across the site, the material sloped downwards from north-west to south-east, reflecting the natural topography of area to the north of the dene of the Stott's Burn tributary.

- 1.7 Phase 2 represents the archaeological remains of the late post-medieval colliery waggonway. The NW-SE aligned trackbed embankment of the waggonway exposed in Areas 1 and 2 comprised a substantial clay embankment, recorded for a maximum distance of 27.60m by up to 7.60m wide and up to at least 1.11m high; it was at its most substantial to the south-east, in Area 1, on the approach to the dene, but to the north-west, in Area 3, had been completely horizontally truncated by modern landscaping. Although no timbers of the waggonway track survived, the impressions of sleepers and rails were recorded, as well as postholes representing fixings, across the upper portion of the embankment in Area 3. A small assemblage of finds recovered from the remains attributed to this phase of activity was of broadly 18th- to 19th-century date.
- 1.8 Phase 3 represents archaeological remains associated with the development of the waggonway, probably during the late 18th or early 19th century. Material dumped on the embankment potentially represents development of the route at a time of trackway upgrade to stone sleepers and iron rails. Trackside ditches were recorded running along both sides of the embankment in all excavation areas. Re-cutting probably represents cleaning out or re-establishment of ditches to maintain drainage efficiency. Timber posts and stakes, as well postholes and stakeholes, represent structures associated with the ditches, such as revetting of ditch sides to increase drainage efficiency, a simple bridge across the features and a fence line. Material recovered from these features was broadly dateable to the 18th to 19th century.
- 1.9 Phase 4 represents probable mid 19th to early 20th-century activity post-dating the abandonment of the waggonway. Successive colliery waste deposits were recorded and a NW-SE aligned ditch which truncated these deposits was probably a drainage ditch in use after the abandonment of the waggonway, the route of which was probably still utilised as a road to the Tyne. Phase 5 represents early 20th-century activity associated with the 'Walker Refuse Destructor'. Three substantial features recorded in Area 1 probably represent the construction cut for this building or an associated structure. Modern levelling deposits, services and current surfaces were assigned to Phase 6.
- 1.10 This Assessment Report is divided into three parts. Part A, the Project Summary, begins with an introduction to the site, describing its location, geology and topography, as well summarising the planning and archaeological background to the project. The aims and objectives of the work are then discussed, followed by full descriptions of the archaeological methodologies employed during both the fieldwork and the subsequent post-excavation work. This part concludes with an illustrated phased summary description of the archaeological remains.
- 1.11 Part B, the Data Assessment, quantifies the written, graphic and photographic elements of the Site Archive and contains specialist assessments of all categories of artefactual and biological evidence, with recommendations for any further work in each case. This part then has a summary discussion of the findings, before summarising the potential for further analysis of all elements of the collected project data.
- 1.12 Part C of the report contains acknowledgements and references. There are three appendices to the report, the third being a selection of photographs from the fieldwork.

2. INTRODUCTION

2.1 General Background

- 2.1.1 This report details the methodology and results of an archaeological excavation undertaken by Pre-Construct Archaeology Limited (PCA) November-December 2011 at Sir Charles Parsons School, Walker, Newcastle. The school has been re-developed as part of Phase 2 of the Newcastle Building Schools for the Future (BSF) project and the work was commissioned by the Principal Contractor, Sir Robert McAlpine Limited (SRM).
- 2.1.2 Ahead of re-development, the school site comprised a trapezoidal shaped parcel of land covering an area of c. 1.35 hectares, centred at National Grid Reference NZ 2900 6510 (Figure 1). Re-development has entailed extensive new build to the east of the former school buildings, which were demolished, and new access created from Waverdale Avenue, so that the new school lies adjacent to the new Walker Technology College.
- 2.1.3 The archaeological potential of the school site was initially established by a desk-based assessment (DBA) undertaken by PCA in 2008.¹ Map evidence indicated that the site was crossed by the route of a waggonway, associated with outlying workings of Walker Colliery and probably of 18th-century origin. An archaeological evaluation carried out by PCA in 2009, while the original school was in use, recorded the NW-SE aligned trackbed embankment of the waggonway as it approached the dene of a tributary of a watercourse, Stott's Burn.²
- 2.1.4 The archaeological remains of the waggonway at the school site represent undesignated heritage assets of local or regional significance in terms of industrial archaeology. Further exposure and recording by archaeological excavation was required as a planning condition. The excavation was carried out according to a Specification prepared by the Tyne and Wear Archaeology Officer of the Tyne and Wear Specialist Conservation Team.³ Three areas (Area 1, 2 and 3) were investigated during and in association with demolition of the former school buildings. Area 1 was located immediately to the south-east of the footprint of the buildings and Areas 2 and 3 were located within the south-eastern extent of the footprint buildings and within a yard area within the complex, respectively.
- 2.1.5 The archaeological project herein described was designed according to the guidelines set out in *Management of Research Projects in the Historic Environment* (MoRPHE).⁴ In line with MoRPHE guidelines, this Assessment Report sets out a formal review of the data collected during the fieldwork.
- 2.1.6 At the time of writing, the Site Archive, comprising written, drawn, and photographic records and all artefactual recovered during the investigations, is housed at the Northern Office of PCA, Unit N19a Tursdale Business Park, Durham, DH6 5PG. When complete, the Site Archive will be deposited with Tyne and Wear Museums and Archives at Arbeia, South Shields, Tyne and Wear under the site code SCP 11.

¹ PCA 2008.

² PCA 2009.

³ Tyne and Wear Specialist Conservation Team 2009.

⁴ English Heritage 2006.

- 2.1.7 The Online Access to the Index of Archaeological Investigations (OASIS) reference number for the project is: preconst1-130646.

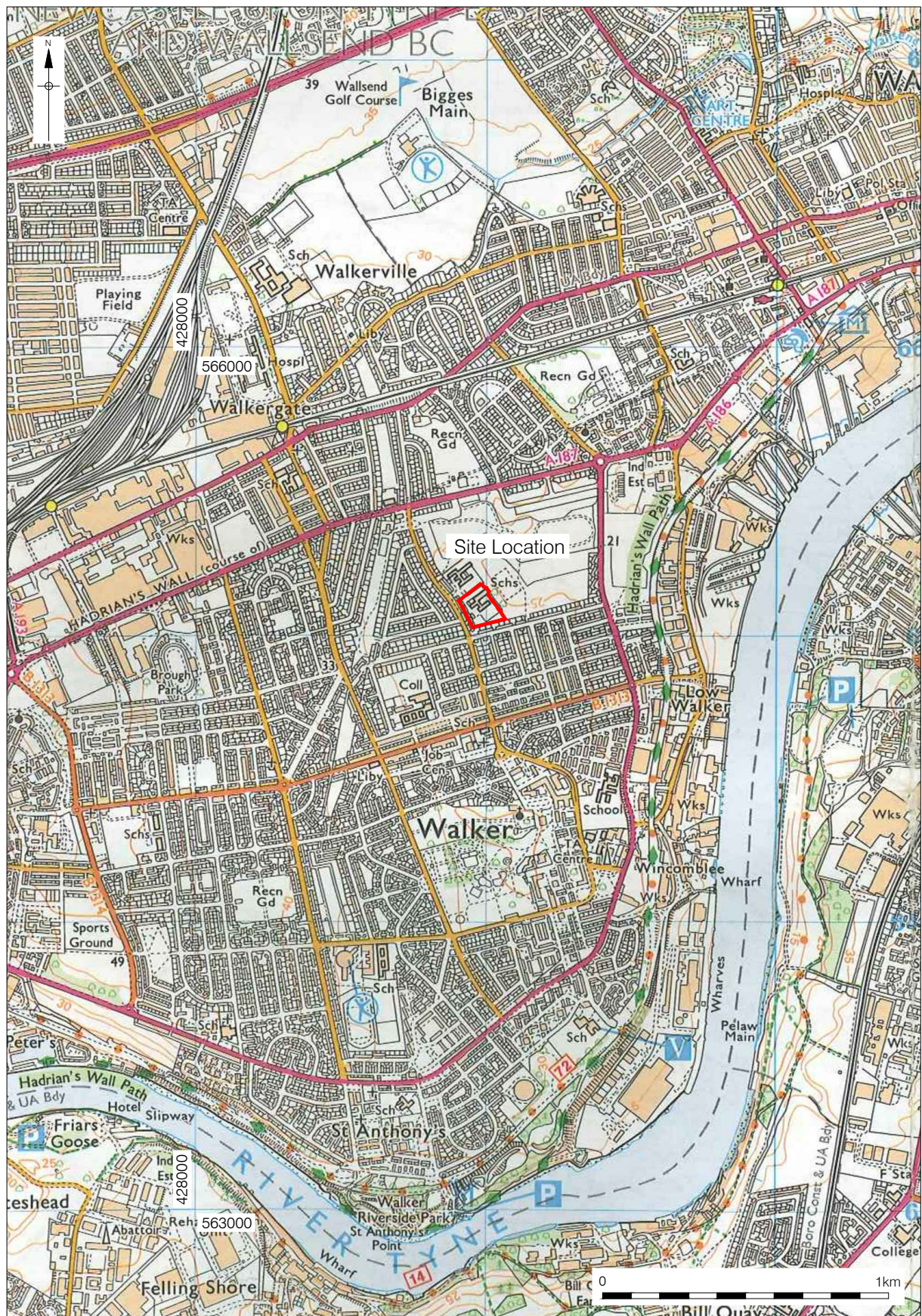
2.2 Site Location and Description

- 2.2.1 Walker is an eastern suburb of Newcastle, c. 3km from the city centre, occupying an elevated plateau overlooking a sharp bend in the Tyne (Figure 1). With the exception of early coal mining activity, the area was largely agricultural until the mid 19th century, when the riverside area developed rapidly at the heart of the Tyneside shipbuilding industry. From the mid 18th century onwards, Walker Colliery, the core elements of which lay c. 500m south of the Sir Charles Parsons School site, was very much the focus of the industrial township.
- 2.2.2 Since the 1930s, Walker has become subsumed into the urban sprawl of Newcastle, and now forms a core element of the densely populated east end of the city. Within the suburb, off Westbourne Avenue, was the original Sir Charles Parsons School site, quadrilateral in shape and c. 1.35 hectares in size, centred at NZ 2900 6510 (Figures 1 and 2). The original school site was bounded to the south and west by housing fronting onto Ennerdale Road and Westbourne Avenue, respectively, while to the north-west lay St. Albans Roman Catholic Primary School, with a large area of open ground, the 'Waverdale Open Space', to the east.
- 2.2.3 Until 2011, the site was occupied by the buildings and associated grounds of Sir Charles Parsons School. The buildings were demolished in the autumn of 2011 as part of the re-development scheme, with the archaeological work following on directly from the demolition work on what was, therefore, effectively an active demolition site. A palisade-type steel security fence delineated the site boundary to the north, west and south, while to the east it was delineated from the new build site by timber hoarding. As a result of the re-development scheme, the new Sir Charles Parsons School lies immediately to the east of the original site boundary on what was previously the western edge of the Waverdale Open Space, the majority of which is now occupied by the new Walker Technology College.

2.3 Geology and Topography

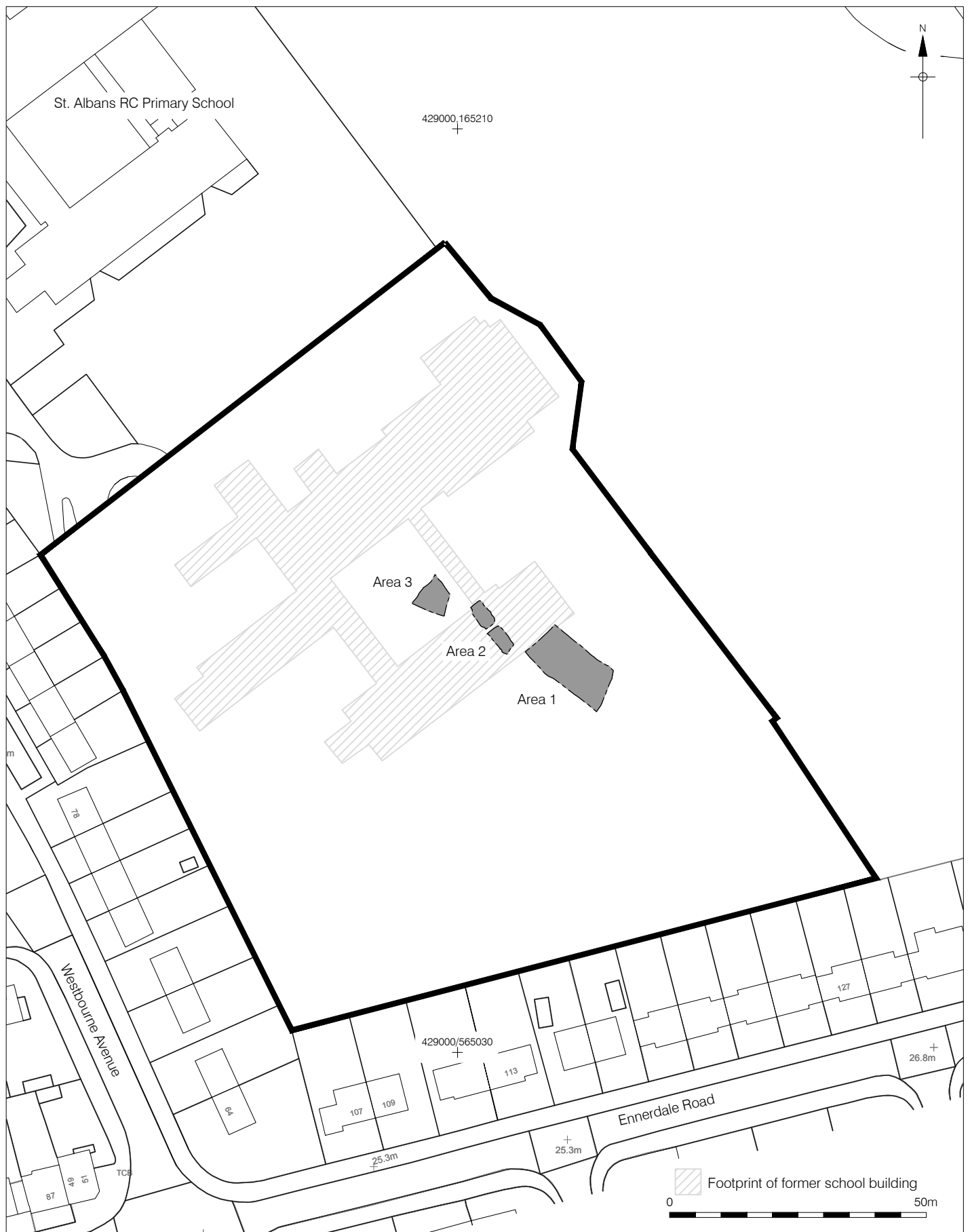
- 2.3.1 The solid geology of the part of Tyneside in which the site lies is formed by the Westphalian Coal Measures of the Upper Carboniferous. In general the rocks comprise a succession of shales and sandstones riddled with numerous coal seams. Towards Wallsend, the solid geology is specifically formed by sandstone beds high in the Middle Coal Measures.⁵ In this area, the underlying rocks are overlain by an often relatively thin mantle of glacial debris, mainly Glacial Till, generally known as 'Boulder Clay', deposited by ice sheets that covered the area during the last glacial period.
- 2.3.2 The area of the original Sir Charles Parsons School site lies at c. 26m AOD, with localised variation on the site itself, as described below. In the wider area, ground level falls away to the south and east towards the main geographical feature in the vicinity, the River Tyne. The varying course of the river means that it bounds the Walker area to the south and east, flowing in a roughly north-south direction c. 1km to the east of the site before turning eastwards at Wallsend.

⁵ Johnson 1997.



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Figure 1
 Site location
 1:20,000 at A4



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Figure 2
 Excavation areas location
 1:1,000 at A4

- 2.3.3 As mentioned above, the new build of Sir Charles Parsons School lies on what was previously the western margin of the Waverdale Open Space. This area was subject to substantial tipping of domestic and industrial waste after the Second World War and up to the 1970s. This activity infilled the denes⁶ of several converging streams, one of which is depicted on 18th- to 19th-century mapping crossing the south-eastern portion of the original Sir Charles Parsons School site and continuing to the north-east across the Waverdale Open Space. In addition, there is strong evidence for some earlier infilling of this dene - in the later post-medieval period - in association with construction of a colliery waggonway. This ran south-eastwards from Gosforth Pit and crossed the original Sir Charles Parsons School site on a NW-SE alignment, running towards the main workings of Walker Colliery and riverside staiths. The waggonway is depicted on mid 19th-century maps running along a substantial embankment as it crossed the dene in the south-eastern portion of the original school site. The streams in the vicinity of the site are generally tributaries of a watercourse known as Stott's Burn, which converged to the east, beyond Waverdale Avenue, before discharging into the Tyne.
- 2.3.4 The original school site was relatively flat, with a slight fall in ground level from north to south. Its highest part was the developed north-western corner, at c. 27.20m OD, while along the southern margin ground level lay at c. 25-26.0m OD. Previous geotechnical investigations established the presence of a sinuous corridor of sub-surface 'made ground' crossing the south-eastern portion of the original school site, continuing to the north-east onto the Waverdale Open Space; this represents the aforementioned infilled dene demonstrating that the natural topography of this area has been much altered. Modern refuse tipping on the Waverdale Open Space resulted in the main dene of Stott's Burn being infilled with a thickness of at least c. 9m of material.

2.4 Planning Background

- 2.4.1 At the time of the archaeological excavation herein described, UK Government guidance on archaeology and heritage conservation was set out in *Planning Policy Statement 5: Planning for the Historic Environment* (PPS5).⁷ At a local level, the Local Planning Authority (LPA), Newcastle City Council (NCC), has various policies in its Unitary Development Plan (UDP)⁸, concerning archaeology and cultural heritage. Policies of particular relevance are:

POLICY C04. DEVELOPMENT THAT WOULD HARM SITES OR AREAS OF ARCHAEOLOGICAL INTEREST AND THEIR SETTINGS WILL NOT BE ALLOWED.

POLICY C04.2. WHERE A PROPOSAL MAY AFFECT A SITE OR AREA OF ARCHAEOLOGICAL INTEREST, THE DEVELOPER WILL BE REQUIRED TO SUBMIT AN APPROPRIATE ASSESSMENT OF ITS POTENTIAL IMPACT UPON THE ARCHAEOLOGICAL REMAINS AND WHERE NECESSARY UNDERTAKE AN ARCHAEOLOGICAL EVALUATION.

⁶ 'Dene' is a familiar term throughout Northumberland and Durham meaning a typically steep-sided, wooded valley through which a burn (stream) runs.

⁷ Department for Communities and Local Government 2010. PPS5 replaced the 1990 *Planning Policy Guidance 16: 'Archaeology and Planning'* (PPG16) and was itself replaced, in March 2012, by the *National Planning Policy Framework*.

⁸ Available at the *Planning Portal* website.

POLICY C04.3. WHERE ASSESSMENT AND EVALUATION HAVE ESTABLISHED THAT PROPOSED DEVELOPMENT WILL ADVERSELY AFFECT A SITE OR AREA OF ARCHAEOLOGICAL INTEREST, DEVELOPERS WILL BE REQUIRED TO PRESERVE ARCHAEOLOGICAL REMAINS IN SITU UNLESS THIS IS CLEARLY INAPPROPRIATE OR THE DESTRUCTION OF THE REMAINS IS DEMONSTRABLY UNAVOIDABLE, IN WHICH CASE A PROGRAMME OF ARCHAEOLOGICAL WORKS SHALL BE SUBMITTED TO AND AGREED WITH THE COUNCIL BEFORE THE START OF DEVELOPMENT.

POLICY C04.4. WHERE PROPOSED DEVELOPMENT WOULD INVOLVE LARGE SCALE GROUND DISTURBANCE IN CURRENTLY UNDEVELOPED AREAS DEVELOPERS WILL BE REQUIRED TO SUBMIT A PRELIMINARY ARCHAEOLOGICAL ASSESSMENT TO IDENTIFY ANY SITES OR POTENTIAL AREAS OF ARCHAEOLOGICAL INTEREST.

2.4.2 Re-development of Sir Charles Parsons School is an element of Phase 2 of the Newcastle BSF project, implemented by Aura Newcastle, a partnership between Newcastle City Council (NCC), SRM, Parsons Brinckerhoff and Robertson Capital Projects. SRM is Principal Contractor. The scheme includes new build to the east of the original school buildings, with associated access routes, car parks, play areas and landscaped areas. The archaeological excavation was undertaken as a condition of planning consent for the scheme, at the request of the Tyne and Wear Archaeology Officer, following the results of the 2009 archaeological evaluation. The Archaeology Officer is part of the Tyne and Wear Specialist Conservation Team of NCC, the body which undertakes archaeological development control throughout Tyne and Wear. The aforementioned Specification for the excavation was compiled by the Archaeology Officer, detailing the required work. In sum, the excavation described in this report was required, as part of the planning process, to provide a record of significant archaeological remains associated with the colliery waggonway.

2.4.3 A programme of archaeological work has been conducted by PCA as part of the re-development of Sir Charles Parsons School. The initial elements of work were undertaken in line Policy C04.2 of the UDP and when PPG16 formed UK Government guidance on archaeological remains. In 2008, the aforementioned DBA was prepared and this highlighted the potential of the site for archaeological sub-surface remains associated with the post-medieval industrial era. Of particular interest was the route of a colliery waggonway running between Gosforth Pit and the main workings of Walker Colliery. The subsequent trial trenching evaluation undertaken by PCA in 2009 exposed archaeological remains of the trackbed embankment of the waggonway. These remains were considered to be of sufficient importance for the Archaeology Officer to require further exposure and recording by archaeological excavation, in line with Policy C04.3 of the UDP and PPG16.

2.5 Archaeological and Historical Background

The archaeological DBA undertaken in 2008 has been used as the basis of the following summary, which should be consulted for full details, including Tyne and Wear Historic Environment Record (HER) numbers. The research and writing of those responsible for the DBA is gratefully acknowledged. The 'wider study area' referred to below was an area of 1km radius from the centre of the original school site.

2.5.1 Prehistoric and Palaeoenvironmental

2.5.1.1 There are no HER entries for the various prehistoric eras on the school site. A watercourse depicted at the site on the earliest detailed mapping is a natural stream (burn), one element of a network of such features that converged to form Stott's Burn. Prior to industrial era and modern landscaping, these features would have occupied possibly steep-sided denes, which, if present during prehistory, are likely to have been a focus for various human activities.

2.5.1.2 There is some known prehistoric activity within the wider area. Earthworks known as ‘Stott’s House Mounds’ located to the north-east of the site were published in 1732 by the antiquarian John Horsley and described as burial mounds or ‘tumuli’. In 1964 one of these was excavated by George Jobey. Although no function was recorded for the mound, evidence of probable prehistoric plough marks were recorded across the former ground surface below the mound. Similar plough marks have been recorded underlying the Roman Fort (*Segedunum*) at Wallsend. This evidence broadly suggests the wider area was utilized for cultivation during prehistory.

2.5.1.3 The precise period of origin of the former watercourse at the site is unknown, although it is likely to be of considerable age.

2.5.2 Roman

2.5.2.1 By far the most notable archaeological feature in the vicinity is Hadrian’s Wall, which runs SW-NE across the northern portion of the wider study area, c. 400m beyond the site. The Wall, constructed on the orders of the Roman Emperor Hadrian from AD 122, marked the northern frontier of the Roman Empire. As originally planned it ran from *Pons Aelius* in Newcastle, but at some stage it was decided to build an extension from the original terminus at the Tyne Bridge a further 3½ miles (5.6km) further east to a new fort at Wallsend, known as *Segedunum*. A broad earthwork known as the Vallum, comprising a wide ditch with two flanking banks, was constructed to the south of the Wall. This earthwork was not constructed along the stretch of Wall from *Pons Aelius* to *Segedunum*, presumably as the River Tyne was considered to serve the purpose of the Vallum in this area.⁹

2.5.2.2 Like all the *vici* identified at forts along the Wall, the civilian settlement at Wallsend was positioned to the south of the Wall, within the area directly protected by the fort, Wall and Vallum. While the full extent of the *vicus* has not been established at Wallsend, it is probable that the school site lies c. 0.5km to the south-west of its limits.

2.5.3 Anglo-Saxon

2.5.3.1 No Anglo-Saxon activity is known within the wider study area. Neither is there any documentary evidence to suggest settlement or exploitation of the land in the vicinity of the site during this era.

2.5.4 Medieval

2.5.4.1 There is just one known medieval site within the wider study area, this being the village of Walker, the core of which lay c. 0.5km to the north-west of the school site. The location of the village is derived from mid 18th-century mapping, which shows ‘Walker’ adjacent to Hadrian’s Wall, with a triangular ‘Town Green’ to the south. By the mid 19th century, maps depicted a small settlement there as ‘Old Walker’.

2.5.4.2 Evidence of medieval settlement within the Walker area is largely absent from the archaeological record. However, traces of ridge and furrow ploughing recorded within the Walker area are of probable medieval origin. While the school site itself was almost certainly not settled during the medieval period, the land may have been utilised for agriculture.

⁹ Breeze and Dobson 2000, 60.

2.5.5 *Post-medieval and Early Modern*

- 2.5.5.1 The core elements of Walker Colliery lay c. 0.5km to the south of the school site. An outlying working, Fair Pit, may actually have been the earliest to be won - in 1753 - by William Brown of Throckley.¹⁰ West Engine Pit was sunk in 1766, Ann Pit shortly afterwards, and, in 1770, East Engine Pit. A waggonway that ran south-eastwards from another outlying working, Gosforth Pit, crossed the school site on a NW-SE alignment, and then continued towards the core workings, such as Ann Pit and B Pit, in 'Low Walker' and then onto the riverside staithes. Gosforth Pit was located to the north of but close to the line of Hadrian's Wall, c. 0.5km to the north-west of the site. Documentary evidence indicates that Gosforth Pit, and therefore also probably the waggonway which crossed the site, dates from the 1780s. The date of Gosforth Pit is known from a '*Description of the sinking of Gosforth Pit [Walker], by Ralph Elliot, 14 April 1780-13 January 1782*' listed in a colliery report and account book.
- 2.5.5.2 Waggonways were a crucial element of the post-medieval and early industrial era colliery infrastructure across the North-East of England. As the coal trade expanded greatly in the region in the later part of the 17th century, there was a significant increase in the number of waggonways in south Northumberland and on Tyneside and Wearside. By 1670, flanged wheels had been added to help guide the waggons, with the addition of protective metal strips to the rails by 1716. The widespread use of waggonways throughout the coalfields of the region in the 18th century was linked directly to the need to move coal quickly and efficiently for export, especially to London. Across the region, the heyday of these forerunners of the railways proper was arguably between the mid 18th century and the first decade of the 19th century. They were largely replaced as a result of the rapid increase in mechanisation in the early to mid 19th century. Archaeological remains of all waggonways pre-dating the use of iron rails in Tyne and Wear are of high significance.
- 2.5.5.3 Colliery waggonways had their origin in the simple horse and cart, with wooden rails initially being laid down in the early 17th century to facilitate the movement of wheeled vehicles in overground colliery transport systems. The early systems were usually designed so that full waggons would travel under their own weight, on a gradual downhill incline, with horses pulling the empty vehicles uphill to the coal workings for reloading. By 1797 the self-acting inclined plane was in operation at Benwell in Newcastle, this using the principle that the weight of a loaded waggon going downhill could be utilised to pull an empty waggon back uphill. Early rails were typically of oak, ash or birch, usually approximately 4 inches square, with sleepers between, with a variety of gauges in use.

¹⁰ Turnbull 2009, 105.

- 2.5.5.4 Early lines were single track, with a buffer zone on either side where lines passed through private property. Double-tracked lines were certainly in existence in the 18th century, although many remained single track, facilitating vehicular movement with a series of sidings and passing places. The waggons were also initially made entirely of wood, with a brake to regulate the downhill descent, while from the mid 18th century wooden axles were replaced by iron ones and cast-iron wheels were eventually introduced. Upgrade of the rails was inevitable, with 1794 often quoted as being the date of the first recorded use of two-foot long malleable iron rails, at Walbottle Colliery in Newcastle. A survey of 1810 noted that although 'traditional' wooden waggonways remained in extensive use in the Tyneside area, replacement of wooden rails with metal ones was taking place on most routes.
- 2.5.5.5 To date there remains just a handful of examples of detailed archaeological investigation of early colliery waggonways in Tyne and Wear. Two pieces of work, both of which examined likely late 18th-century features in the vicinity of Houghton-le-Spring, near Sunderland, have led to published papers, underlining the significance of these structures within the context of later post-medieval and early modern industrial archaeology. The first reported on an excavation at Lambton D Pit, near Fence Houses, in 1995, which uncovered the substantial and well preserved remains of a timber waggonway, dating from c. 1780-90.¹¹ The second reported the findings of an excavation in 2002 at Rainton Bridge South, which revealed a waggonway that could predate the example at Lambton D Pit.¹²
- 2.5.5.6 These previous archaeological projects have largely confirmed theories regarding general construction of late 18th-century waggonways, in that initial groundworks involved laying down linear banks of ballast, often small-coal and ash, upon which wooden sleepers were placed and to provide gradients, as required. Wooden rails were then laid and pegged into place, before a further layer of fine ballast was deposited on and around the sleepers as protection. Further ballast could be added to raise or effectively conceal the rails, with provision sometimes made for a path and, more usually, drainage gutters/ditches either side.
- 2.5.5.7 In sum, cartographic evidence shows that by the mid 19th century, probably earlier, the waggonway at the school site ran south-eastwards from Gosforth Pit of Walker Colliery, which dates from the early 1780s, passing Delight Pit, which lay immediately to the north-west of the site, and into Low Walker. In the south-eastern portion of the site, a substantial embankment, probably formed from colliery waste, carried the route across the dene of a burn, with the watercourse itself probably being culverted below the feature. By the early 20th century, the embankment remained in place, standing more than 1m higher than existing ground levels at the point at which it crossed the original (underlying) route of the burn.

2.5.6 Modern

- 2.5.6.1 The 1908 and 1912 Ordnance Survey maps show that a substantial rectangular building, 'Walker Refuse Destructor,' extended into the south-eastern portion of the original school site. The south-western end of this building evidently abutted the eastern side of the former colliery waggonway embankment, with an associated chimney to the north-west. Another building, 'Walker Electric Sub-Station', lay further to the north, just beyond the existing eastern boundary of the site.

¹¹ Ayris *et al.* 1998.

¹² Glover 2005.

3. PROJECT AIMS AND RESEARCH OBJECTIVES

3.1 Project Aims

3.1.1 Re-development of Sir Charles Parsons School had the potential to disturb or destroy significant undesignated heritage assets, in the form of sub-surface archaeological remains of the later post-medieval industrial era. Specifically under threat were the known remains of a probable mid to late 18th-century overground colliery waggonway which crossed the site on a NW-SE alignment. Therefore, the overarching aim of the project was to achieve preservation by record of the archaeological remains of the waggonway in the south-eastern portion of the original school site.

3.1.2 The specific aims of the project were:

- to record the form, composition, profile and alignment of the waggonway trackbed embankment;
- to establish the survival of any timber track elements and record their form and construction methods;
- to record the form, composition and profile of trackside ditches.

3.1.3 Additional aims of the project were:

- to compile a Site Archive consisting of all site and project documentary and photographic records, as well as all artefactual and palaeoenvironmental material recovered;
- to compile a report that contains an assessment of the nature and significance of all data categories, stratigraphic, artefactual and palaeoenvironmental data.

3.2 Research Objectives

3.2.1 There remain relatively few examples of detailed investigation of post-medieval industrial era waggonways in the North-East. However, in recent years, the efforts of the Tyne and Wear Specialist Conservation Team in securing planning conditions to record archaeological remains for developments which threaten sites where such features survive, have resulted in a significant increase in knowledge. As mentioned above, two sites in Tyne and Wear have been published to date, both in the vicinity of Houghton-le-Spring, these being Lambton D Pit and Rainton Bridge South. Further investigations and continued wider dissemination of findings, particularly through academic publication of results, will undoubtedly contribute to the knowledge base.

3.2.2 The Sir Charles Parsons School project had potential to make a significant contribution to archaeological knowledge of the later post-medieval industrial era. *Shared Visions: The North-East Regional Research Framework for the Historic Environment* (NERRF),¹³ highlights the importance of research as a vital element of development-led archaeological work.

¹³ Petts and Gerrard 2006.

- 3.2.3 Within the NERRF research agenda for the post-medieval (PM) period, the following key priorities are of direct relevance to the project:

PM1. Early coal industry and coal use:

To ensure improved targeting of archaeological evaluation, there should be a survey of documentary evidence and cartographical evidence for early mining in order to identify precise locations.

Development controlled commissioned fieldwork should also be aware of the potential for the buried remains of colliery buildings on later sites.

Sub-surface mine workings may survive. These may be revealed by modern deep ground disturbances in advance of other surface developments. It is essential that appropriate archaeological monitoring processes be put in place to record such remains.

PM2. Early railways:

Ongoing research needs to recognise the role of the North East in the development of the early railways, with several key areas of investigation having been identified.

Investigations should focus on the early waggonways and pre-locomotive hauled lines, whilst also recognising the potential archaeological importance of terminals, and specifically the development of coal staithes. Existing landscape features along the course of known early waggonways require survey, which if possible, should include railway formations, track beds and gradients.

The routes of early railways should be plotted on the HERs of the region, through archival research on early documentary and cartographic sources.

- 3.2.4 With regard to the first paragraph taken from NERRF PM1, the Sir Charles Parsons School project has provided a particularly good example of the importance of a phased approach to a programme of archaeological work undertaken in association with a development proposal/scheme. For this site, the initial documentary and cartographic research, undertaken as part of the archaeological DBA ahead of the planning decision, greatly informed the design of the subsequent archaeological evaluation exercise, with the result that one of the two evaluation trenches investigated accurately located the waggonway.
- 3.2.5 In line with the second paragraph taken from NERRF PM2, the specific focus of the excavation herein described was the waggonway route on its approach to an existing landscape feature – the dene of the tributary of Stott's Burns – with detailed investigation of rail formations, track beds and gradients a specific focus of the work.
- 3.2.6 In line with the final paragraph from NERRF PM2, the Tyne and Wear HER has now undertaken an HER enhancement project to plot the routes of early (pre-Ordnance Survey mapping) colliery waggonways north of the Tyne through archival research on early documentary and cartographic sources. This important work will greatly enhance knowledge of later post-medieval industrial era waggonway routes north of the Tyne and improvements of this type to the knowledge base can only serve to more fully inform decisions regarding archaeological mitigation strategies for future developments.

4. METHODOLOGIES

4.1 Fieldwork

- 4.1.1 The excavation fieldwork was undertaken between 4 November and 5 December 2011. All fieldwork was undertaken in accordance with the relevant standard and guidance document of the Institute for Archaeologists (IfA).¹⁴ PCA is an IfA-Registered Organisation. The Specification for the work set out the research aims and objectives of the work and described the techniques and approaches to be employed to achieve those aims and objectives. The Specification should be consulted for full details of methodologies employed regarding archaeological excavation, recording and sampling.
- 4.1.2 The Specification required the examination of an area along the line of the waggonway measuring 20m x 6m (120m²) at base, with a contingency requiring a further 10m x 6m (60m²) if significant remains were found. In practice, excavation was undertaken in three separate areas (Areas 1, 2 and 3) along its line (Figure 2), with the three areas having a combined size of 190.80m². The south-easternmost (Area 1) was located immediately south-east of the former school buildings on an area of former car park. Sub-rectangular in shape, it measured c. 18.30m NW-SE by c. 8.50m NE-SW (covering c. 136m²) at ground level. Area 2 was located within the south-eastern extent of the footprint of the former buildings. Rectangular in shape, it measured c. 11m NW-SE - with an interruption - by up to 3m NE-SW (covering a total of c. 28m²). The north-westernmost area, Area 3, was trapezoidal in shape, measuring c. 6.65m NW-SE by c. 7m NE-SW (c. 27m²). This area was the first to be investigated, as archaeological remains of importance were exposed by the demolition contractor during removal of a yard area within the former complex of buildings. Limited hand cleaning was undertaken in this area, according to the prevalent circumstances, but the remains were fully recorded and sample excavated and sufficient time was allowed in the demolition programme to allow this to take place. Areas 1 and 2 - the main elements of the excavation phase of work - were investigated further into the demolition programme, as intended.
- 4.1.3 In Areas 1 and 2, modern surfaces and all overburden was removed by a c. 13-tonne 360° excavator, using a wide toothless bucket, down to the first archaeologically sensitive deposits, or the natural sub-stratum, or to the maximum safe depth of excavation. Two slots were excavated by the machine within the north-western and south-eastern portions of Area 1, these positioned to establish the profiles of the trackbed embankment. All work was undertaken under direct archaeological supervision.
- 4.1.4 Excavations Areas 1 and 2 were cleaned using appropriate hand tools, with deposits and features subsequently excavated and recorded using a single context recording system utilising *pro forma* context sheets. Plans were drawn at 1:20 and sections at 1:10.

¹⁴ IfA 2008a.

- 4.1.5 A photographic record of the investigations was compiled using SLR cameras loaded with 35mm monochrome print and colour slide film, illustrating in both detail and general context the principal features and finds discovered. All record photographs included a legible graduated metric scale. The photographic record also included 'working shots' to illustrate more generally the nature of the archaeological operation mounted. Digital photography was used to supplement the film record.
- 4.1.6 The excavation areas were located relative to the Ordnance Survey grid using GPS instrumentation. A Temporary Bench Mark (TBM) - value 26.38m OD - was established on the site using GPS instrumentation and checked against Ordnance Survey height data. The heights of all principal strata and features were calculated relative to Ordnance Datum and indicated on the appropriate plans and sections.

4.2 Post-excavation

- 4.2.1 The stratigraphic data generated by the project is represented by the written, drawn and photographic records. A total of 171 archaeological contexts were defined (Appendix B). The contents of the paper and photographic elements of the site archive are quantified in Section 6. Post-excavation work involved checking and collating site records, grouping contexts and phasing the stratigraphic data (Appendix A). A written summary of the archaeological sequence was then compiled, as described below in Section 5.
- 4.2.2 The recovered artefactual material comprised a small assemblage of pottery, clay tobacco pipe, brick, other building material and glass. For each category of material an assessment report has been produced including a basic quantification and a statement of potential for further analysis. The results are given in Sections 7-10. No other categories of inorganic artefactual material were represented.
- 4.2.3 The palaeoenvironmental sampling strategy of the project was to recover bulk samples where appropriate, from well-dated (where possible), stratified deposits covering the main periods or phases of occupation and the range of feature types represented, with specific reference to the objectives of the excavation. To this end, no appropriate deposits were encountered and therefore no bulk samples were recovered. No other biological material was recovered.
- 4.2.4 None of the material recovered during the excavation required specialist stabilisation or an assessment of its potential for conservation research.
- 4.2.5 The complete Site Archive, including all material generated electronically during post-excavation, and the artefactual material will be packaged for long term curation. In preparing the Site Archive for deposition, all relevant standards and guidelines documents referenced in the Archaeological Archives Forum guidelines document¹⁵ will be adhered to, in particular a well-established United Kingdom Institute for Conservation (UKIC) document¹⁶ and a more recent IfA publication.¹⁷ The depositional requirements of the body to which the Site Archive will be ultimately transferred will be met in full. At the time of writing this will be the Tyne and Wear Museums and Archives, Arbeia, South Shields.

¹⁵ Brown 2007.

¹⁶ Walker, UKIC 1990.

¹⁷ IfA 2008b.

5. RESULTS: THE ARCHAEOLOGICAL SEQUENCE

During the excavation, separate stratigraphic entities were assigned unique and individual 'context' numbers, which are indicated in the following text as, for example [123]. The archaeological sequence is described by placing stratigraphic sequences within broad phases, assigned on a site-wide basis in this case. An attempt has been made to add interpretation to the data, and correlate these phases with recognised historical and geological periods.

5.1 Phase 1: Natural Sub-stratum

- 5.1.1 Phase 1, which represents natural geological material, was exposed as the basal deposit within all excavation areas (Figures 3, 5 & 7 and Figure 4, Sections 4, 7 & 11). The deposits comprised stiff, variously coloured clays, representing the glacial 'Boulder Clay' that is known to overlie the solid geology within the area of the site.
- 5.1.2 In Area 1, the natural sub-stratum was recorded within two slots excavated across the waggonway embankment (Figure 3). In the north-western slot, the sub-stratum comprised stiff, light brownish grey clay, [78], giving way to an overlying stiff, mid yellow clay, [77] (Section 11, Figure 4). Recorded at a maximum height of 25.85m OD, these natural deposits had an overall maximum recorded thickness of 0.90m. The natural sub-stratum recorded in the south-eastern slot comprised stiff, mid pinkish brown clay, [68], recorded at maximum and minimum heights of 24.76m OD and 24.18m OD, respectively (Section 4, Figure 4).
- 5.1.3 In Area 2, the natural sub-stratum comprised stiff, mid brownish yellow clay, [10], recorded at a maximum height of 26.24m OD (Figure 5).
- 5.1.4 In Area 3, the natural sub-stratum, [180], comprised stiff, mid yellow clay, recorded at a maximum height of 26.27m OD (Figure 7).
- 5.1.5 The natural topography of the area in which the excavation areas were located is broadly reflected by the fall in the recorded height of the natural sub-stratum from north-west to south-east across the three areas - from 26.27m OD in Area 3 to 24.18m OD in the south-east of Area 1. Historic map evidence depicts the dene of the Stott's Burn tributary in the south-eastern portion of the site, to the south of the excavation areas, and the fall in natural ground levels reflects the presence of this feature, which was finally infilled in the modern era by refuse tipping.

5.2 Phase 2: The Earliest Waggonway (Late 18th Century)

Waggonway Embankment

- 5.2.1 Phase 2 represents features and deposits associated with the probable 18th-century colliery waggonway that ran south-eastwards from Gosforth Pit of Walker Colliery through the site, crossing the dene of the Stott's Burn tributary, continuing towards 'Low Walker' and the riverside staiths. The earliest recorded element of the waggonway comprised a substantial NW-SE aligned clay trackbed embankment recorded for a maximum distance of 27.60m and measuring at least c. 3m wide across its top, with a maximum recorded basal width of 7.60m. The maximum recorded thickness of the embankment was 1.34m, this recorded at its south-eastern extent, towards the dene.

- 5.2.2 The embankment was formed by two substantial clay deposits, recorded as deposits [50] and [49], in Area 1 (Plate 1) and in Area 2 as a single deposit, [9] (Figure 4, Sections 4, 7, 11, 13 & 14). Directly overlying the natural sub-stratum, [68], the initial embankment deposit, [50], comprised firm, mid brownish grey clay. This was only recorded within the south-eastern slot in Area 1 and was exposed for a distance of c. 4m NW-SE with a maximum basal width of c. 4m NE-SW (Plate 2). It was up to 1.11m thick, deposited as a distinct mound, and was recorded at a maximum height of 25.29m OD (Section 4, Figure 4). A small assemblage of finds recovered from this deposit included pottery, ceramic building material and glass, only broadly dateable to the 18th to 19th century (see Sections 7-10). Clay tobacco pipe stems recovered from the deposit comprised one of 17th- to early 18th-century date and two of later, probably 18th- to 19th-century, date.
- 5.2.3 In Area 1, the upper embankment deposit, [49], was recorded for a distance of 14.80m NW-SE and its maximum exposed basal width was 7.60m (Plates 2 and 6; Figure 3). At the north-western extent of Area 1, it was up to 0.46m thick, recorded at a maximum height of 26.16m OD (Section 11, Figure 4). To the south-east, it was up to 0.89m thick, recorded at a maximum height of 25.46m OD (Section 4, Figure 4). Immediately to the south-east of Area 1 the upper embankment deposit was exposed in Trench 1 during the earlier archaeological evaluation at a maximum height of 25.13m OD, demonstrating the continuing downward gradient to the south-east, towards the dene. A small assemblage of finds recovered from the upper embankment deposit included pottery, clay tobacco pipes, ceramic building material and window glass. The assemblage is broadly dateable to the 18th to 19th century with exception of the group of clay tobacco pipe fragments, all of which date to the 17th to 18th century (see Section 8). A Tyneside type D stem stamp was identified on one fragment as Thomas Parke, a late 17th-century Gateshead maker (c. 1667-1687).
- 5.2.4 In Area 2, the upper embankment deposit, [9], directly overlay the natural sub-stratum, [10] (Figure 5). The embankment material comprised firm, mid bluish grey clay recorded over a distance of 8.10m NW-SE by up to 1.96m wide and was up to 0.17m thick, recorded at a maximum height of 26.26m OD. A small assemblage of pottery sherds, not closely dateable, and a clay tobacco pipe stem of 17th- to 18th-century date were recovered from this deposit.
- 5.2.5 No deposits associated with the trackbed embankment were recorded within the north-westernmost excavation area (Area 3), and it appeared that modern landscaping/levelling activity had completely removed them. In fact, evidence was recorded across Areas 2 and 3, and the north-western part of Area 1, for extensive modern landscaping/levelling activity.

Waggonway Track

- 5.2.6 The earliest waggonway track that would have run along the embankment would have been constructed using timber rails and sleepers. Although no track timbers survived *in situ*, timber impressions and postholes recorded within the upper part of the clay embankment, [49], likely represent the remains of the 18th- or early 19th-century waggonway track.

- 5.2.7 Four irregular, but roughly linear, NE-SW aligned features, [154], were recorded in the north-eastern portion of Area 1 (Figure 3; Plate 3). These measured up to 1.17m NE-SW by up to 0.28m wide and were up to 0.14m deep. All four had a single crushed coal and ash fill, [153], from which no dateable artefactual material was recovered. These features are interpreted as impressions of timber sleepers associated with the earliest waggonway track. The composition of the fills indicates that the timbers were removed, rather than being left to rot *in situ*.
- 5.2.8 Features interpreted as the impressions of timber rails associated with the earliest waggonway track were also recorded in Area 1. Four linear NW-SE aligned impressions, [85], [150], [157] and [156], were recorded running along the north-eastern side of the upper portion of the clay embankment, [49] (Figure 3). The south-easternmost impression, [85], measured at least 0.48m NW-SE by 0.20m wide and was 30mm deep. Timber impressions [150] (Plate 4), [157] and [156], recorded further to the north-west in Area 1, measured up to 1.70m NW-SE by up to 0.35m wide and varied in depth from 90mm to 0.25m deep (Sections 16 and 17, Figure 4). Impression [156] was recorded at a maximum height of 25.97m OD, while impression [85] was recorded at a maximum height of 25.47m OD, demonstrating the downward gradient of the track from north-west to south-east. Timber impressions [85], [156] and [157] each had a single fill, [84], [155] and [163], respectively, comprising crushed coal and ash from which no dateable artefactual material was recovered. Timber impression [150] contained two fills; the primary fill, [152], comprised silty clay and the upper fill, [149], comprised crushed coal and ash which produced a single fragment of clay tobacco pipe stem of broad 19th-century date. All four features are interpreted as the impressions of rails forming the north-eastern side of the waggonway track.
- 5.2.9 Five features interpreted as postholes, [80], [127], [151], [158] and [167], were recorded in the upper embankment deposit, [49], within the north-western part of Area 1 (Figure 3). Two sub-rectangular postholes, [151] and [158], were recorded within the bases of two of the rail impressions, [150] and [156], respectively. Posthole [151] measured 0.33m NW-SE by 0.26m NE-SW and was 0.38m deep, while posthole [158] measured 0.34m NE-SW by 0.18m NW-SE and was 90mm deep. Given their locations, both postholes probably represent fixings for the waggonway track. Rectangular posthole [127] measured 0.35m NW-SE by 0.21m NE-SW and was 70mm deep (Section 15, Figure 4), while circular posthole [167] measured c. 0.31m diameter and was 0.17m deep (Section 18, Figure 4). Both of these postholes could represent fixings associated with the south-western portion of the waggonway track. Located at the north-western extent of Area 1, a discrete feature, [80], was recorded truncating the upper embankment deposit, [49], measuring 0.50m NE-SW by at least 0.16m NW-SE and 0.15m deep. Heavily truncated, the function of the feature is uncertain, although given its location, it may represent a further fixing. These postholes generally had a single fill, deposits [79], [126], [164], [162] and [166], respectively, that generally comprised crushed coal and ash, with the exception of posthole [167], which also had an upper silty clay fill, [165].

5.3 Phase 3: Waggonway Development (Late 18th to Early 19th Century)

Area 1

- 5.3.1 Phase 3 represents activity at the site relating to the development of the waggonway, probably during the late 18th to early 19th century. Within the south-eastern half of Area 1, the Phase 2 embankment, and timber rail impression [85], were overlain by a substantial crushed coal and ash deposit, [32] (Sections 3, 4, 7, and 13, Figure 4). This material had the effect of raising the height of and increasing the overall width of the embankment. It was recorded for a distance of at least 8.96m NW-SE and its maximum basal width was 4.28m NE-SW, while the top of the new embankment was at least 3.70m wide. The deposit was up to c. 0.65m thick along its south-western edge and at least 0.21m thick where the track would have been located, surviving to a maximum height of 25.72m OD. The full extent of the embankment to the north-east could not be established due to substantial modern truncation. Similar material recorded overlying the embankment in evaluation Trench 1 was interpreted as late 18th- or early 19th-century development of the waggonway embankment; deposit [32] is similarly interpreted. Directly overlying the south-western portion of embankment deposit [32] was a similar crushed coal and ash deposit, [118] (Sections 3 and 4, Figure 4). With maximum recorded dimensions of 1.13m NE-SW by 1m NW-SE and up to 0.20m thick, its maximum recorded height was 25.45m OD; this likely represents further development of the embankment.
- 5.3.2 Five intercutting approximately NW-SE aligned linear features, [31], [75], [88], [130] and [138], were recorded along the south-western edge of the Phase 3 embankment within Area 1 (Figures 3 and Sections 7, 11, 13 and 14, Figure 4). These are interpreted as successive trackside ditches/gullies associated with the proposed late 18th- or early 19th-century development of the waggonway. Such features were likely required in the first instance to delineate the wayleave corridor of the waggonway, as well as preventing animals from straying onto the track and providing drainage for the track. In stratigraphic terms, the earliest of the features recorded were ditches [75] and [138].
- 5.3.3 Ditch [138] was recorded within the central slot across the embankment within Area 1 for a distance of 1.18m NW-SE; its upper portion was heavily truncated by ditch re-cut [31] (Plate 5, Figure 3 and Sections 13 and 14, Figure 4). Ditch [138] survived for a maximum width of 0.60m and was up to 0.40m deep. Its single fill, [137], comprised clayey silt with patches of ash. A small assemblage of finds recovered from this fill included a three pottery sherds broadly dateable to the 18th to 19th century.
- 5.3.4 Two small postholes, [146], and [144] were recorded along the edge of ditch [138] (Figure 3). Posthole [146] measured 0.12m by 0.10m and was 0.26m deep, while posthole [144] contained an upright timber, [143], presumably the base of a post, measuring 90mm by 0.10m and with just 90mm of its length surviving. The features may represent part of retaining structure associated with ditch [138].
- 5.3.5 Trackside ditch [75] truncated the south-western side of embankment deposit [49] in Area 1. Traced for a distance of 8.10m NW-SE (Plate 6, Figure 3 and Section 11, Figure 4), it had steeply sloping sides, a narrow flat base and measured up to 1.54m wide by 0.68m deep. Its fills, [71], [72], [73], [74] and [86], comprised various compositions of clay, silt, ash and coal.

- 5.3.6 Beyond the north-westernmost slot in Area 1, the upper part of ditch [75] was truncated along its north-eastern edge by a narrow re-cut, [88], recorded for a maximum distance of c. 0.50m NW-SE. This was 0.34m wide and 0.17m deep and contained a single silty coal ash fill, [87].
- 5.3.7 Ditches [75] and [138] were truncated by a ditch, [31], with an irregular broadly U-shaped profile, recorded for a maximum distance of c. 14.86m NW-SE and up to 2.48m wide and 0.69m deep (Figure 3 and Sections 7, 13 and 14, Figure 4). Its fills, [136], [117] and [52], comprised various compositions of clay, crushed coal and ash. Within the upper fill, [52], a square impression, [172], was recorded in section measuring 0.16m by 0.14m (Section 13, Figure 4). This probably represents a discarded timber from the waggonway track. A small assemblage of finds broadly dateable to the 18th-19th century was recovered from its upper fills, [117] and [52], including brick, pottery and a fragment of clay tobacco pipe.
- 5.3.8 Two postholes, [141] and [148], were recorded truncating upper embankment deposit [49], within the base of ditch [31]. Posthole [141], recorded on the south-western edge of the ditch, measured at least 0.54m NE-SW by 0.40m NW-SE and was 0.23m deep. Posthole [148], recorded on the north-eastern edge of the ditch, measured c. 0.20m diameter and was 0.12m deep. Their function is uncertain, but they could conceivably represent part of a timber structure forming an access across the trackside ditch.
- 5.3.9 The upper fill, [52], of ditch [31] had been truncated by a re-cut, [130], recorded for a distance of 5.64m, with maximum recorded dimensions of 0.72m wide and 0.30m deep (Figure 3 and Sections 13 and 14, Figure 4). This version had a narrow base, but as the full width was not exposed, having been truncated to the north-west by modern landscaping/levelling activity and overlain by Phase 4 deposits to the south-east, its full profile was not recorded. Its fills, [129] and [128], comprised clay and ash.
- 5.3.10 In the north-western extent of Area 1, a NW-SE aligned ditch, [90], was recorded running parallel to and truncating the north-eastern edge of Phase 2 embankment deposit [49] (Figure 3 and Section 12, Figure 4). This was recorded for a maximum distance of 2.50m, truncated to the south-east by a Phase 5 feature, [116], and was 2.35m wide and at least 0.75m deep. Its fills, [123], [125] and [124], generally comprised crushed coal and ash. This ditch is interpreted as a trackside ditch on the north-eastern side of the embankment and associated with the proposed probable 19th-century development of the waggonway.

Area 2

- 5.3.11 Features associated with the proposed 19th-century development of the waggonway were also recorded in Area 2, including two NW-SE aligned parallel ditches, [8] and [40], and later re-cuts, [5] and [36], representing wayleave corridor delineation/drainage features on the south-western side of the embankment (Figure 5). Only the very base of the north-easternmost ditch, [8], which cut into the natural sub-stratum, [10], survived truncation by re-cut [5] (Plates 8, 9 and 10, Sections 5, 6, 21 and 22, Figure 6). This was recorded for a maximum distance of 8.10m NW-SE and its surviving profile had steeply sloping sides and a flat base and was up to 0.62m wide and at least 0.21m deep. Its fills, [7] and [6], comprised silty clay and clayey silt, respectively. A single sherd of pottery of 17th- or early 18th-century date recovered from its primary fill may have been residual in context.

- 5.3.12 Ditch re-cut [5], which truncated the upper portion of ditch [8] along its full length, was recorded for a maximum distance of 8.10m NW-SE (Plates 8, 9 and 10 and Figure 5). This had steeply sloping sides and a flat base and was up to 1.60m wide and 0.37m deep (Sections 5, 6, 21 and 22, Figure 6). This ditch ran on a similar alignment to that of Area 1 ditch [75] and is tentatively interpreted as the north-western continuation of this feature. Two sub-rectangular postholes, [63] and [67], were recorded on the north-eastern edge of ditch [5] (Figure 5). Posthole [62] measured 0.20m NW-SE by 0.15m NE-SW and was 0.26m deep and posthole [67] measured 0.16m NE-SW by 0.13m NW-SE and was 0.38m deep. Both likely represent part of a fence line running along the north-eastern edge of ditch [5].
- 5.3.13 Seven upright timber stakes, [4], [15], [16], [53], [54], [55] and [57], and a stakehole, [65], were recorded within the base of ditch [5], broadly forming two rows (Plates 8 and 9 and Figure 5). Stake [16] and the stakehole [65] represented the only elements along the north-eastern row. The timbers varied in size from 40mm x 40mm x 220mm up to 100mm x 100mm x 820mm. Stakehole [65] was square in plan measuring 50mm by 50mm and 0.13m deep. The upper portions of the timber were generally in a poor state of preservation with moderate to good preservation where these occurred within natural Boulder Clay. They were generally box cut and tapered to a point, indicating that they had been driven into the ground. Immediately adjacent to stake [55] were two timber wedges, [56], each measuring c. 80mm x 40mm x 150mm, these presumably installed to support the stake (Plate 9). Overall, the function of these stakes remains unclear, but they may represent the surviving elements of a simple timber revetment within ditch re-cut [5].
- 5.3.14 The primary fill, [3], of ditch [5], which also overlay the stakes, comprised crushed coal, from which four sherds of 18th- to 19th-century pottery was recovered. Its upper fills, [2] and [1], comprised various compositions of clay and silt. A small assemblage of finds dated broadly to the 18th/19th century were recovered from its fills, including pottery, brick, a fragment of bottle glass and a fragment of clay tobacco pipe.
- 5.3.15 Located c. 1.50m south-west of ditches [8] and [5] was a similarly NW-SE aligned ditch, [40], recorded for a distance of 3.66m (Figure 5). This had vertical sides and a flat base and was up to 0.80m wide and 0.50m deep (Plate 11 and Sections 1 and 2, Figure 6). Its fills, [38] and [37], comprised clay and clayey silt respectively. A single timber, [39], was recorded at the base of the ditch, within the primary fill, [38]. This timber was a disturbed stake, within the ditch backfill. This ditch was recorded on a similar alignment to that of ditch [31] in Area 1. However, the profiles of the ditches were markedly different and, therefore, it is proposed that they probably do not represent elements of the same feature.
- 5.3.16 A NW-SE aligned ditch re-cut, [36], truncated the north-eastern edge of ditch [40] along its full extent, recorded for a maximum distance of 3.66m. This was of very similar profile to ditch [40], though considerably narrower, up to 0.33m wide and 0.50m deep (Sections 1 and 2, Figure 6). Its primary fill, [35], comprised ash and its upper fills, [33] and [34], comprised clayey ash and clayey silt, respectively.

- 5.3.17 Seven postholes, [12], [14], [42], [44], [46], [59] and [61], were recorded cutting into either the natural sub-stratum, [10], or the Phase 2 upper embankment deposit, [9], within the south-eastern portion of Area 2. Most of these broadly formed two NNE-SSW aligned rows. The easternmost row comprised square posthole [59] and circular postholes [44], [42] and [61]. These varied in size from a maximum of c. 0.25m in diameter to a minimum of c. 0.17m in diameter, with maximum and minimum depths of between 0.42m and 60mm, respectively. They had tapered bases indicating that the original timbers had been driven into the ground. Posthole [46] was situated to the east of this alignment. The westernmost row was formed by two far more substantial sub-rectangular postholes, [12] and [14]. Posthole [12] measured 0.44m by 0.40m and was up to 0.11m deep, while posthole [14] measured 0.46m by 0.25m and was up to 0.12m deep. The fills of these features comprised various compositions of clay, silt and ash. A tentative interpretation for this group of postholes is that they represent part of a NNE-SSW aligned timber structure that formed an access route across the trackside ditches.

Area 3

- 5.3.18 Two parallel NW-SE aligned features, [175] and [179], and a re-cut, [177], interpreted as trackside ditches were recorded in Area 3 (Plate 12 and Figure 7). The south-easternmost ditch, [175], cut into natural sub-stratum [180], and was recorded for a maximum distance of 5.85m NW-SE. It had near vertical sides and a flat base and measured 0.56m wide and 0.30m deep (Plates 13 and 14 and Section 19, Figure 8). Its fills, [173] and [174], generally comprised crushed coal, with patches of clay throughout. This ditch represents a wayleave corridor delineation/drainage feature running along the south-western side of the waggonway, though no traces of an embankment survived within this area. Within Area 2, ditch re-cut [5] was recorded on a similar alignment and contained similar backfills, and therefore can be reasonably said to represent the same ditch (Figure 9).
- 5.3.19 Located c. 3.30m to the north-east was a ditch, [179], running on the same alignment. Its base was recorded within a slot excavated through ditch re-cut [177] (Figure 7 and Section 20, Figure 8). Ditch [179], which cut into the natural sub-stratum, was recorded for a maximum distance of 0.55m NW-SE. The surviving portion had a broad U-shaped profile and measured 0.53m wide and 0.14m deep. Its single fill, [178], was a mottled deposit of crushed coal and clay. This ditch probably represents a trackside feature located along the north-eastern edge of the waggonway embankment.
- 5.3.20 Ditch re-cut [177] truncated the upper portion of ditch [179] along its full extent and was recorded for a maximum distance of 2.50m (Figure 7 and Section 20, Figure 8). It had steeply sloping sides, a wide flat base and measured 0.92m wide and 0.17m deep. Its single fill, [176], comprised crushed coal. A more substantial ditch, [90], also located on the north-eastern side of the embankment was recorded within the north-western extent of Area 1. Although this is unlikely to represent a continuation of ditch [177], it represents an element of the sequence of features along the north-eastern side of the waggonway embankment.

5.4 Phase 4: Post-Waggonway Activity (Later 19th or Early 20th Century)

- 5.4.1 Phase 3 waggonway embankment deposits and associated trackside features in Area 1 were overlain by successive colliery waste deposits, [23], [24], [25], [28], [29] and [30], representing 19th- to early 20th-century levelling activity, seemingly post-dating the use of the waggonway (Figure 4, Sections 3 and 4, Figure 4). These deposits were recorded within the south-eastern half of Area 1 for a maximum distance of 9.20m NW-SE by 5.13m NE-SW and had a maximum combined thickness of 1.12m. The uppermost deposit was recorded at a maximum height of 25.94m OD, in section to the south-east. Phase 3 embankment deposit [118] was directly overlain by the earliest of the dump deposits, [30]. Comprising clay, this was recorded only within the south-eastern part of Area 1. It was overlain by a crushed brick deposit, [29], recorded in section directly overlying Phase 3 trackside ditch [31] (Section 4, Figure 4). This was overlain in turn by colliery waste deposits, [28], [25], [24] and [23], generally comprising crushed coal and ash with the exception of clay and crushed coal deposit [24]. These deposits probably represent 19th- or early 20th-century infilling of the dene to the south of the excavation area.
- 5.4.2 Levelling deposit [25] was truncated by a NW-SE aligned ditch, [27], recorded for a maximum distance of 6m (Figure 3 and Sections 3 and 4, Figure 4). This had steeply sloping sides and a flat base and measured 0.70m wide and 0.47m deep. Its single fill, [26], comprised fragments of slate and crushed coal. This feature is likely to represent either a drainage feature or land boundary instated after the abandonment of the waggonway.
- 5.4.3 A short length of a WNW-ESE aligned gully, [120], which truncated embankment deposit [32], was recorded at the south-eastern extent of Area 1 for a maximum distance of 1.95m (Figure 3 and Sections 3 and 4, Figure 4). This had a U-shaped profile and measured up to 0.74m wide and 0.23m deep. Its single fill, [119], comprised crushed coal. The feature ran along the top of the embankment, on a slightly different alignment to the sequence of Phase 3 ditches recorded along the south-western side of the embankment. Its alignment and location suggests that this gully - possibly a drainage feature - was also in use following abandonment of the waggonway.
- 5.4.4 The 1908 1:500 scale Ordnance Survey map includes spot heights on the surface of what by that date appears to be a road, rather than a waggonway, running through the original school site along the line of the former waggonway embankment and skirting the 'Walker Refuse Destructor' building, discussed in greater detail in the following section. The excavation evidence indicates that this road was created by dumping colliery waste. The spot heights shown on the 1908 map are c. 27.25m OD on the road embankment as it crosses the line of the converted burn, at the south-eastern corner of the building, and c. 27.67m OD, this to the north-west on the road embankment, at its junction with another road serving the north-eastern end of the building. The first height (c. 27.25m OD) lies in the approximate vicinity of the south-eastern end of excavation Area 1, where the maximum height recorded on a Phase 4 dump deposit was c. 25.94 OD, while the second (c. 27.67m OD) lies in the approximate vicinity of excavation Area 3, where no Phase 4 deposits were recorded and archaeological levels were severely truncated. These findings give a good indication of the extent of landscaping/levelling activity undertaken across the site in the modern era.

5.5 Phase 5: 'Walker Refuse Destructor' (Early 20th Century)

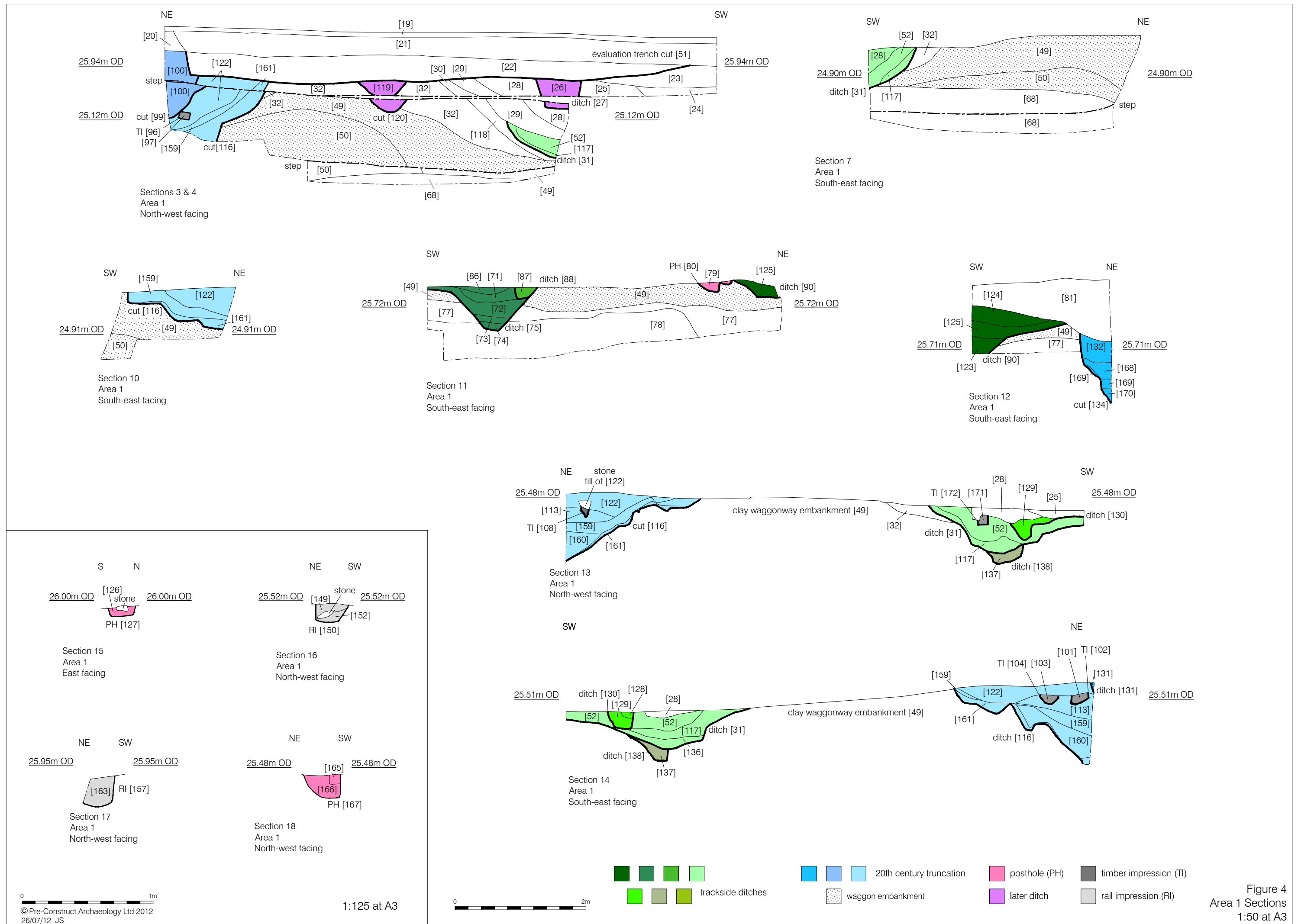
- 5.5.1 Phase 5 represents early 20th-century activity recorded along the north-eastern edge of Area 1, associated with the aforementioned 'Walker Refuse Destructor'. This substantial rectangular structure is depicted on the 1908 and 1912 Ordnance Survey maps along with an associated chimney to the north-west. The south-western end of the building is shown on the 1908 map as truncating the north-eastern side of the adjacent road/waggonway embankment. What was probably this structure and its construction cut were recorded during the evaluation phase of work truncating the waggonway embankment and that work suggested that the building was probably located immediately to the east of Area 1.
- 5.5.2 Three substantial cut features, [116], [134] and [99], were recorded along the north-eastern side of Area 1. The earliest, feature [116], was recorded for a maximum distance of 13.34m NW-SE by at least 2.50m NE-SW and was at least 1.26m deep (Figure 3 and Sections 3, 4, 10, 13 and 14, Figure 4). Its five fills, [161], [160], [159], [113] and [122], generally comprised various quantities of crushed coal and ash, with the exception of a clay fill, [160]. A small assemblage of finds was recovered from these deposits, including two fragments of brick of possibly 19th-century date and two sherds of pottery only broadly dateable to the 18th-20th century. Five broadly rectangular shaped impressions, [102], [104], [106], [108] and [109], were recorded in the central slot within fill [113], and a further impression, [96], was recorded in the south-eastern slot, within fill [122]. These were generally formed by crushed coal and ash with the exception of impression [109], recorded as a void. All these impressions are considered likely to represent timbers that have degraded *in situ* within a backfill. Feature [116] is interpreted as probably representing a construction cut for a structure associated with the 'Walker Refuse Destructor' and it may represent a continuation of a construction cut recorded during the earlier evaluation. Two narrow NE-SW aligned linear impressions, [111], were recorded along the upper edge of construction cut [116], measuring up to 0.96m long by 0.14m wide and up to 0.10m deep. These likely represent impressions left by a toothed bucket on a mechanical excavator or possibly impressions created by dragged stones during construction.
- 5.5.3 A substantial irregular shaped feature, [134], which truncated the upper fills of construction cut [116], was recorded for a maximum distance of 8.20m NW-SE by 1.46m wide and was at least 1.06m deep (Figure 3 and Section 12, Figure 4). Its fills, [170], [169]=[133], [168], [132] and [131], generally comprised clay with the exception of ash deposit [169]=[133]. A small assemblage of finds was recovered from these deposits including pottery, clay tobacco pipe and brick, this material broadly dating to the 18th-20th century.
- 5.5.4 Located in the south-eastern corner of Area 1, truncating the upper fills of construction cut [116], was another substantial feature, [99], recorded for a maximum distance of 3.15m NW-SE by 1m NE-SW and at least 1.03m deep (Figure 3 and Sections 3 and 4, Figure 4). Its single fill, [100], comprised crushed coal and ash. Although no dateable material was recovered from this feature, it is likely to represent early 20th century activity associated with the construction of the 'Walker Refuse Destructor'.

5.6 Phase 6: Modern

- 5.6.1 Phase 6 represents activity of 20th-century date, probably associated with ground landscaping/levelling and services associated with the former building of Sir Charles Parsons School.
- 5.6.2 A NE-SW aligned drain, [94], containing a ceramic pipe, was recorded extending across the north-western extent of Area 1, measuring at least 8.15m long by 0.86m wide and at least 0.63m deep (Figure 3).
- 5.6.3 A levelling deposit, [81], up to 0.94m thick was recorded within the north-western extent of Area 1 and extending across Areas 2 and 3 (Section 12, Figure 4) . This deposit comprised silty clay with frequent brick and stone throughout. This in turn was overlain by a further levelling deposit, [20], extending across the whole of Area 1 and up to 0.32m thick. This comprised crushed brick to the south-east and crushed yellow dolomite to the north-west and formed the sub base for the current tarmac surface, [19].
- 5.6.4 At the south-east extent of Area 1, a cut, [51], representing evaluation Trench 1 was recorded for a distance of 8.30m NE-SW and 0.75m deep. It was backfilled by crushed brick and crushed coal, [22], up to 0.47m thick, then by a 0.37m thick crushed yellow dolomite, [21], the sub-base for the tarmac surface [19], this having been reinstated at this location at the conclusion of the evaluation.
- 5.6.5 Seven irregular features, group number [70], were recorded within the north-eastern extent of Area 2, measuring up to 0.80m NE-SW by 0.30m NW-SE and up to 80mm deep. Their fills, [69], comprised ash with frequent quantities of fragmented brick and. These features are thought likely to represent the impressions of the feet of a mechanical excavator associated with 20th-century landscaping/levelling activity.



Figure 3
Area 1 plan
1:75 at A3



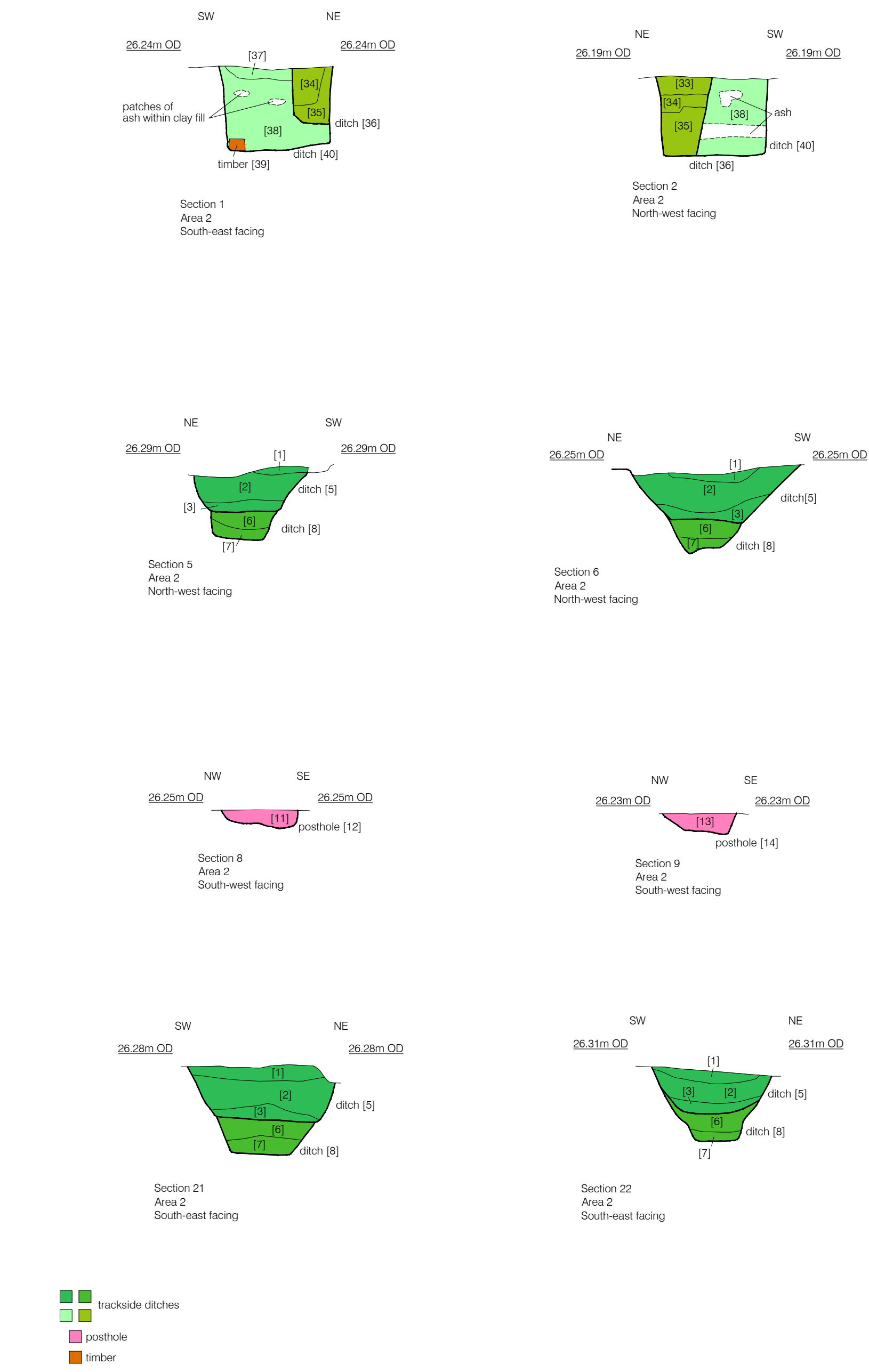
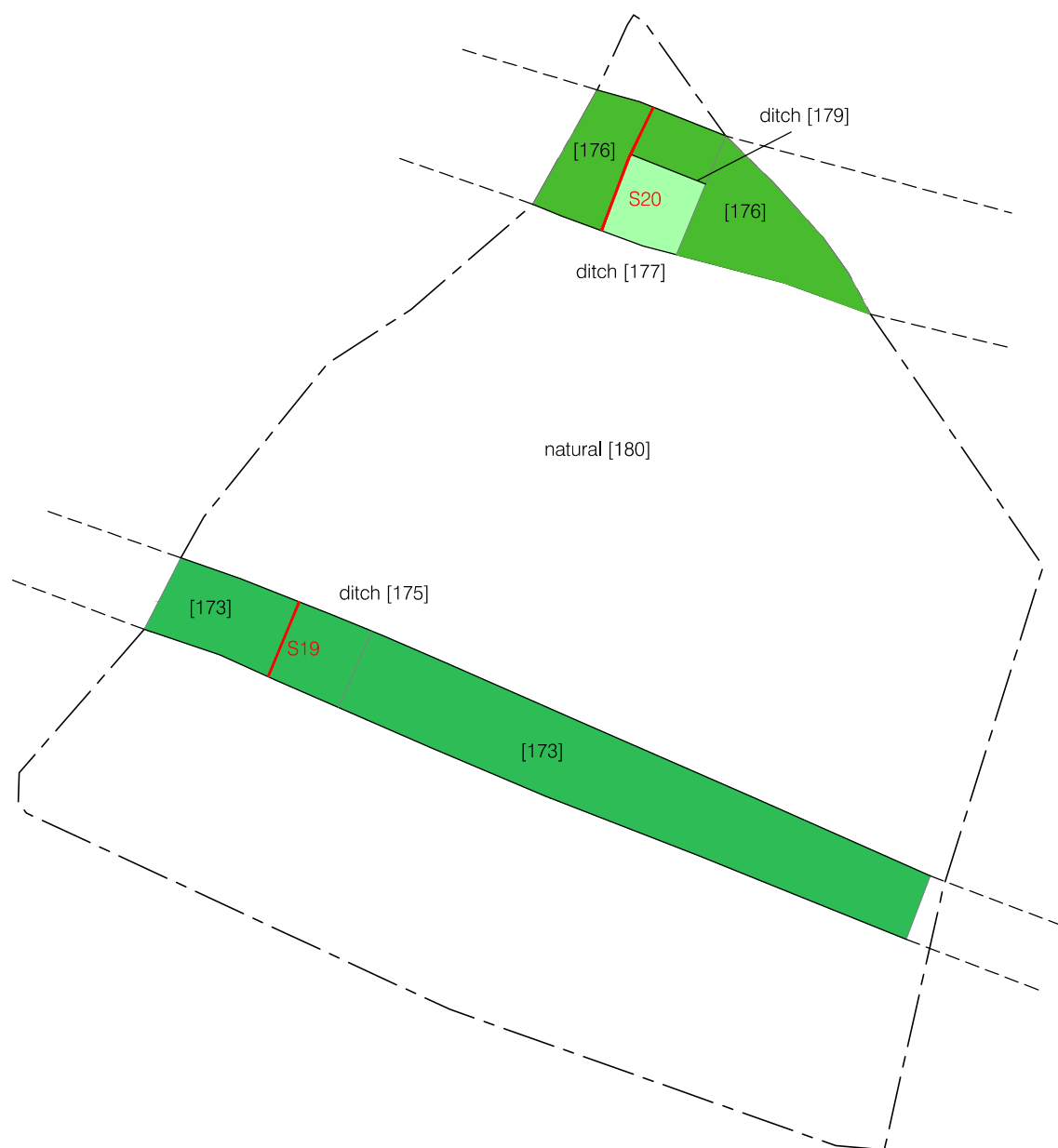


Figure 6
Area 2 sections
1:25 at A3

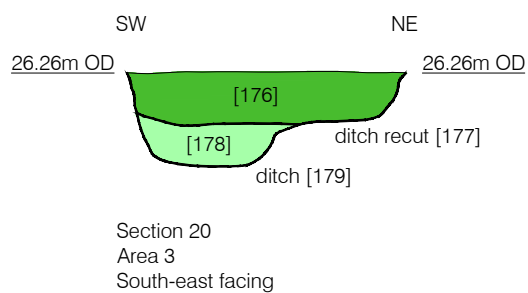
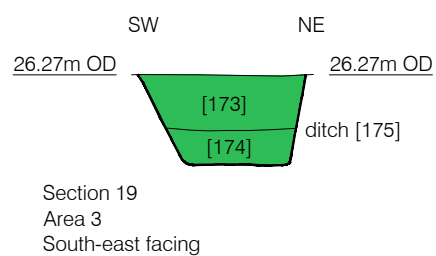


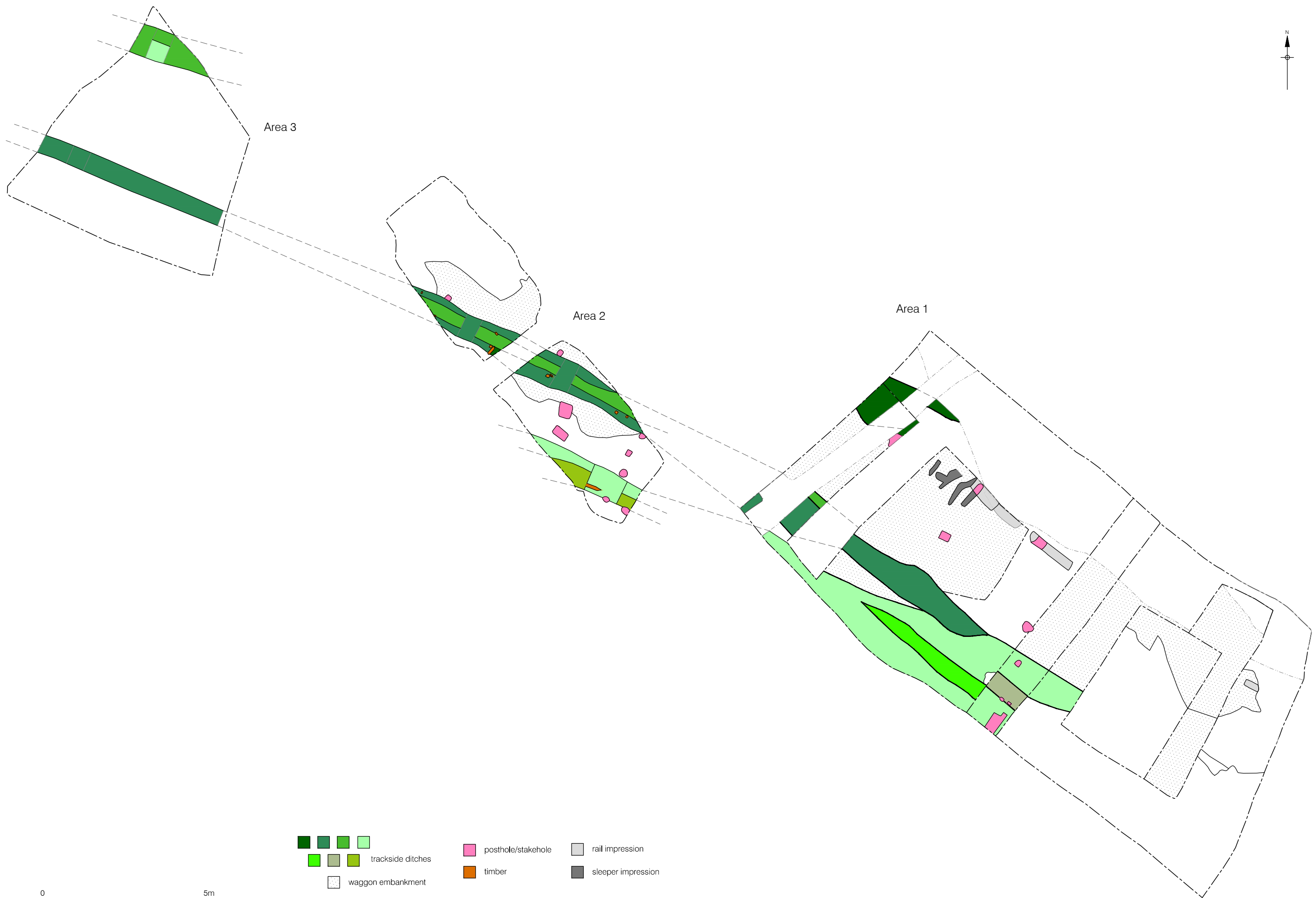
■ ■ ■ trackside ditches

0 2m

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Figure 7
Area 3 plan
1:50 at A4





0 5m
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Figure 9
 Overall plan of waggonway elements in Areas 1, 2 & 3
 1:100 at A3

PART B: DATA ASSESSMENT

6. STRATIGRAPHIC DATA

6.1 Paper Records

6.1.1 The paper element of the Site Archive is as follows:

<i>Item</i>	<i>No.</i>	<i>Sheets</i>
Context Register	1	5
Context sheets	171	171
Section Register	1	1
Section drawings	22	30
Plan Register	1	1
Plans	12	30

Table 6.1. Contents of the paper archive

6.2 Photographic Records

6.2.1 The photographic element of the Site Archive is as follows:

<i>Item</i>	<i>No.</i>	<i>Sheets</i>
Digital Photograph Register	1	4
Digital photographs	124	N/A
Colour Slide Register	2	4
Colour slides	72	4
Monochrome Photograph Register	2	4
Monochrome photographs	73	10
Monochrome negatives	73	4

Table 6.2. Contents of the photographic archive

6.3 Site Archive

6.3.1 The complete Site Archive, including the paper and photographic records, is currently housed at the Northern Office of PCA.

6.3.2 The Site Archive will eventually be deposited with Tyne and Wear Museums and Archives, Arbeia, South Shields, for permanent storage and the detailed requirements of the repository will be met prior to deposition.

7. POTTERY (*Jenny Vaughan*)

7.1 Introduction

- 7.1.1 A small assemblage of 40 sherds of pottery weighing 543g was recovered from the site. The group is not closely dateable, being broadly 18th to 20th century.

7.2 Methodology

- 7.2.1 The assemblage was catalogued by type using MS Access, recording counts and weights per context and noting form sherds where present. The full catalogue and key to fabrics are set out below in Tables 7.2 and 7.3.

7.3 Range and Variety

- 7.3.1 The assemblage is summarised in Table 7.1 below.

Type	No. of sherds	Weight (g)
Possible Staffordshire slipware	1	5
Red earthenware	18	168
White glazed refined earthenware	5	102
Utilitarian stoneware	1	39
China	11	217
Unidentifiable	4	12

Table 7.1. Quantification of ceramic assemblage by type

- 7.3.2 One of the red earthenware sherds was perhaps of 17th- or early 18th-century date. Only two fragments were of the slip-coated kitchenwares typical of later redware assemblages. The few refined whiteware fragments were undecorated, apart from one with a gold band. One of the china vessels present also had gold bands. There were seven sherds of some type of closed china vessel, but the top was missing so it could not be identified. The interior was unglazed suggesting it might be an ornament.

7.4 Discussion

- 7.4.1 This assemblage is very small and, apart from the group of china sherds from context [133], fairly well fragmented. Some of the redware may indicate an 18th-century element but there is too little to be sure. None of the material has any particular interest.
- 7.4.2 The assemblage has no further potential for study.

Context	Type	Fabric group no.	No. of sherds	Weight (g)	Comments
2	gre	32	3	7	Internal slip coat, simple rim
3	blgre	32	4	67	Gl x2. Includes chipped rim sherd
7	red	27	1	3	Possibly early redware
9	Staffs?	29	1	5	Off white fabric with discoloured glaze, brown feathered slip.
9	ungre	50	3	9	Small fragments
49	gre	32	2	40	One is just a chip
49	lgresl	32	1	8	With brown mottling
49	gre	32	1	1	With white slip band, gl x2.
49	ungre	32	1	5	Flake
49	redew	50	1	3	Very worn fragment, undateable. Very possibly a frag of samian
50	gre	32	3	5	Simple rim with white slip line
52	gre	32	1	2	Gl x2
112/122	refww	33	1	14	Small handle attachment ?cup
112/122	util st	35	1	39	Rim of ribbed jam jar.
133/169	refww	33	1	3	Rim of hollow vessel with gold band.
133/169	refww	33	1	51	Rim of bowl
133/169	china	36	7	100	Base to shoulder, possibly of closed ornament as interior is unglazed. Painted dec in green, pink, orange, red and gold.
133/169	china	36	3	99	Profile of plate
133/169	china	36	1	18	Profile of plate with gold painted lines
137	lgresl	32	1	30	Rim with brown mottling
137	refww	33	2	34	Joining sherds of base

Table 7.2. Pottery catalogue

Fabric no.	Type	Abbreviations used
27	17th/early 18th c. red earthenware	..sl (with slip trailing), imp (imported)
29	Staffordshire type wares	Staffs
32	Later red earthenwares - 18th/19th c.	lgre (later glazed red earthenware), ..sl (with slip coat), blgre (black ..), ungre (unglazed), gre (may be 18th c. type)
33	Refined whitewares - late 18th/19th c.	refww
35	Utilitarian stoneware - 19th/20th c.	util st
36	China	China
50	Unidentified	

Table 7.3. Key for pottery catalogue

Other abbreviations used are:
dec - decoration
frag/frags – fragment/fragments
gl x2 - glazed inside and out
ves - vessel

8. CLAY TOBACCO PIPE (*Jenny Vaughan*)

8.1 Introduction

- 8.1.1 A small group of 16 fragments of clay tobacco pipe was recovered. Apart from two very small bowl fragments, the items were all stem fragments.

8.2 Methodology

- 8.2.1 The assemblage was recorded in a simple MS Access table, see Table 8.1 below.

8.3 Range and Variety

- 8.3.1 The stem with stamp is very chipped but the mark is readable as Thomas Parke, a late 17th-century Gateshead maker (c. 1667-1687). The other stems with a bore of 6/64" could also be of this date, or early 18th century. The rest of the group is probably later and the items are of no particular interest.

8.4 Discussion and Potential

- 8.4.1 There are very few complete or marked items in this small group and it has no potential for further work.

Context	Object	Count	Bore	Detail
2	Stem	1	6	
9	Stem	1	6	
49	Stem	1	6	Tyneside type D stem stamp
49	Stem	4	6	
49	Bowl	2	N/A	Small fragments
50	Stem	1	6	With spur
50	Stem	2	5	
52	Stem	1	5	
133/169	Stem	1	5	
149	Stem	1	5	
168	Stem	1	5	With spur

Table 8.1. Clay tobacco pipe catalogue

9. BRICK AND OTHER BUILDING MATERIAL *(Jenny Vaughan)*

9.1 Introduction

- 9.1.1 Seventeen fragments of brick were recovered, none were complete, only four had two measurable dimensions and a further six had a measurable thickness. Eighteen fragments of other building material were also recovered.

9.2 Methodology

- 9.2.1 All fragments were examined, described, and their dimensions recorded.
- 9.2.2 The smaller fragments were considered too fragmentary for meaningful analysis beyond basic identification and quantification.
- 9.2.3 The recorded data was entered into a simple database table, see Tables 9.1 and 9.2, below.

9.3 Discussion

- 9.3.1 Apart from two brick fragments from context [168], all were from hand-moulded bricks with wiped surfaces and sanded bottoms. Shallow scooped 'frogs' were visible on some fragments. These are broadly first half of the 19th century in date. The two fragments from context [168] are late 19th/early 20th century, machine pressed and wire cut.
- 9.3.2 The absence of mortar on most of the fragments may suggest that these are brick manufacturing waste rather than demolition material. There is a marked absence of firebrick which may also infer an early, rather than a later, 19th-century date for the contexts.
- 9.3.3 There were two pieces of pantile and eight small unidentifiable fragments from context [50] and two pieces of pantile (one a small chip) from context [149]. Other unidentifiable small fragments, possibly of tile or brick, came from context [49] (four) and context [159] (two).

9.4 Potential

- 9.4.1 No further work is recommended on the brick and other building material.

Context	Width (mm)	Thickness (mm)	Comments
2			Small fragment, dark red. Probably hand moulded
2	112	62	Half brick. Dark red-brown margins, reduced core. Hand moulded. No mortar
2	103	65	Half brick. Dark red/brown/black i.e. burnt. Hand moulded. No mortar, some iron accretion
2		59	Corner, dark red purple, burned. Hand moulded
49			Fragment. Dark red-brown margins, reduced core. Traces of scooped 'frog'. Hand moulded
49		50	Fragment. Dark red-brown margins, reduced core. Traces of scooped 'frog'. Hand moulded
52		62	Fragment (1/4) Dark red-brown margins, reduced core. Hand moulded. Remains of scooped 'frog'. No mortar
52			Fragment. Dark red margins and core, hand moulded. Some mortar
52			Fragment. Mid red margins, dark red-brown core, hand moulded. No mortar
112	110	57	Half brick. Mid red with pale streaks and blobs in core. Upper face spotted and gritty. Hand moulded
117		61	Fragment, mid red. Remains of shallow frog. No mortar
117		56	Fragment. Dark red-brown, reduced core. Hand moulded
112/122			Fragment. Light red with some pale yellow inclusions.
137			Fragment. Burnt purple/red/brown with some slaggy deposit. Probably hand moulded
159			Fragment. Dark red-brown ?partly burnt. Probably hand moulded
168		67	Fragment, mid red with reduced streaks in core. Sides abraded.
168	113	75	Half brick. Mid red, core has reduced streaks. Wire cut and machine pressed. No frog, no mortar

Table 9.1. Brick catalogue

Context	Count	comments
49	4	?brick/tile unidentifiable fragments
50	2	Pantile fragments
50	8	Small unidentifiable fragments
149	2	Pantile fragments (one a small chip)
159	2	?brick/tile unidentifiable fragments

Table 9.2. Other building material catalogue

10. GLASS (*Jenny Vaughan*)

10.1 Introduction

10.1.1 Six fragments of glass were recovered. Two were of window glass, the others from vessels of some type.

10.1.2 Thin glass was still being used up to the middle of the 19th century so these two pieces are not closely dateable. The vessels are probably 19th or, in the case of the white glass jar, early 20th century.

10.2 Potential

10.2.1 This small assemblage has no potential for further work.

Context	Type	No. of frags.	Comments
2	Bottle	1	Bottle base with large kick up, dark green
49	Window	1	Green, 1.5mm thick
50	Window	1	Small fragment, 1mm thick
50	Bottle	1	Mid green bottle glass with some patina
133/169	Vessel	1	White glass profile of ?jar to shoulder
133/169	Vessel	1	White glass with patina

Table 10.1. Glass catalogue

11. SUMMARY DISCUSSION OF THE ARCHAEOLOGICAL FINDINGS

11.1 Phase 1: Natural Geology

- 11.1.1 Natural Boulder Clay encountered within all areas investigated represents glacial material overlying the solid geology within the wider area of the site, deposited by ice sheets during the last glacial period.
- 11.1.2 The natural sub-stratum was encountered at a maximum height of 26.27m OD, this in Area 3 to the north-west, sloping down gradually to the south-east, with its upper interface recorded at a minimum height of 24.18m OD in the south-eastern corner of Area 1. A dene depicted on historic maps occupied the south-eastern portion of the original school site and this was initially partly infilled to carry the late 18th century colliery waggonway across it. It was subsequently infilled completely in the 20th century by material derived from the 'Walker Refuse Destructor' and then more extensively by modern refuse tipping. The downward gradient of the natural sub-stratum to the south-east as recorded in the excavation areas reflects the natural topography of the area, prior to modern era infilling of the dene and more extensive ground raising.

11.2 Phase 2: Late 18th-Century Waggonway

- 11.2.1 A substantial length of the NW-SE aligned colliery waggonway was recorded in the excavation areas. The waggonway is first depicted on an estate plan of 1840 running south-eastwards from Gosforth Pit, passing Delight Pit and crossing the school site, where it is shown as running along a substantial embankment as it crosses the dene of the Stott's Burn tributary. It is possible that this waggonway was established at the time of sinking of Delight Pit, to the north-west of the site. The origin of Delight Pit is uncertain, with documentary evidence indicating at least an early 19th-century origin. However it is known from documentary evidence that the earliest workings of Walker Colliery were in the mid to late 18th century, and it is entirely possible that Delight Pit and the waggonway at the site were also established in this period.
- 11.2.2 The embankment recorded by the excavation was formed by two substantial clay deposits - re-deposited natural material – and its maximum recorded thickness was 1.34m high, with a maximum basal width of 7.60m and an upper width of at least 3m. The clay material would have provided a solid foundation, as well as the required track gradient; similar construction methods have been recorded for similarly dated waggonway embankments at other locations in the region such as Harraton Outside, near Washington¹⁸ and Killingworth.¹⁹ A small assemblage of pottery, glass and tobacco pipe recovered from the embankment deposits at this site was only broadly dateable to the 18th or 19th century, which broadly corresponds with the historic map evidence.

¹⁸ PCA 2010.

¹⁹ T&WM 2005.

- 11.2.3 The earliest waggonway track at this site would have been constructed using regularly spaced, but irregularly-shaped, sleepers of untrimmed branches, onto which flat wooden rails would have been fixed. The aforementioned work at Lambton D Pit, Rainton Bridge South and Harraton Outside has demonstrated that this was evidently the standard method for the construction in timber of early colliery waggonway tracks in the North-East coalfields.
- 11.2.4 The very earliest waggonways in the North-East region tended to be single tracks with passing loops, and there is no certain evidence for double tracks, main ways to take loaded wagons and bye ways to return empty wagons to the pit head, until the 1720s.²⁰ Some waggonways had their bye ways at some distance from the main way, with the main way track having the most direct alignment and regular gradient, particularly when the bye way was a later addition to a single track. Many waggonways remained as single track, especially if they did not carry heavy traffic. The known range of gauges used on waggonways within the North-East coalfields is 1.22 (4ft) to 1.52m (5ft)²¹ and it is likely that the gauge for the waggonway recorded at this site would have fallen within this range. The width of the embankment recorded during the investigations demonstrates that the waggonway would have been a single track. This may have been due to the topography of the area and particularly the presence of the dene to the south-east; the considerable effort required to construct the substantial embankment over the dene would have been a significant factor in the decision to build a single-track waggonway.
- 11.2.5 The excavation recorded remnants of the waggonway track across the upper part of the clay embankment only in Area 1. The timbers themselves did not survive and track components were only identified as impressions in the clay embankment of Area 1; four timber sleepers and three rails in the north-eastern portion, along with part of a rail impression to the south-east. The absence of timbers within these features suggests that they were removed, presumably during later re-development of the waggonway. Evidence for removal of timber elements from disused waggonway tracks is typical for the region, and was noted, for example, at both Lambton D Pit and Rainton Bridge South.
- 11.2.6 Although heavily truncated by later activity, the sleeper impressions survived up to 1.17m (3ft 10in) long and up to 0.28m (11in) wide. Their irregular shape indicates they were made from roughly-trimmed branches. Examples of well-preserved sleepers were recorded at Lambton D Pit, these being roughly-trimmed oak branches, measuring up to 1.90m (6ft 2in) in length, often with only the ends sawn and a flat surface cut on the upper end to house the rail. It is likely that the sleepers recorded at this site were of similar construction and size. The distance between the central points of the sleeper impressions varied between 0.45m and 0.50m (1ft 5in and 1ft 7in). Documentary evidence from 1765 describing waggonway construction,²² along with previous archaeological work in the region, have shown that, for main ways, sleepers were generally spaced between 0.30m (1ft) and 0.45m (1ft 6in) and occasionally 0.61m (2ft). Although the evidence of the sleeper group at this site is limited, it would seem to fall within this range.

²⁰ Lewis 1970, 144.

²¹ Jars 1765, in Lewis 1970.

²² *ibid.*

- 11.2.7 Rail impressions up to 1.70m in length were recorded only on the north-east side of the track, therefore, the gauge for the waggonway was impossible to determine precisely. However, the recorded evidence indicates that it would have fallen within the range of gauges used on North-East waggonways, namely 1.22m (4ft) to 1.52m (5ft). As with the sleepers, no timber remains survived to determine the type of wood used for rails. Oak was the preferred wood for the rails on early single tracks due to its strength, and it was common for main ways to be built with oak rails and bye way rails with fir or ash.²³
- 11.2.8 Two postholes were recorded within the bases of rail impressions, one of which was located where a sleeper and rail impression intersected; given their locations, these postholes are likely to have housed track fixings. A further two postholes on the embankment in Area 1 also possibly represent fixings associated with the south-western side of the track.

11.3 Phase 3: Late 18th- to 19th-Century Waggonway Development

- 11.3.1 Phase 3 activity represents the development of the waggonway during the late 18th or early 19th century. This comprised substantial dumps of colliery waste to raise, widen and possibly consolidate the embankment, possibly at a time of trackway upgrade to stone sleepers and iron rails, along with associated drainage features and evidence for associated timber structures. By the time of the 1858 Ordnance Survey map, the waggonway at the site has been abandoned and is annotated 'Old Waggonway', therefore it is assumed that all Phase 3 deposits and features must pre-date this.
- 11.3.2 The material used to enlarge the embankment in Phase 3 comprised colliery waste, crushed coal and ash, up to 0.65m thick. This material probably also formed the ballast that would have been packed around the sleepers and rails of the track. These deposits would have originally been far more extensive, continuing along the length of the waggonway, however due to modern era landscaping/levelling activity, the deposits only survived in the south-easternmost excavation area.
- 11.3.3 A series of ditches was recorded along both sides of the exposed length of the waggonway embankment. These measured up to 2.25m wide and up to 0.75m deep, surviving to shallower depths towards the north-west, within the areas that had seen greater modern horizontal truncation. These features represent trackside ditches to delineate the wayleave corridor of the waggonway, to prevent animals from straying onto the track and, importantly, to provide track drainage. Re-cutting of the ditches was recorded along the extent of the waggonway, with the NW-SE alignment roughly maintained, and represents the cleaning out of silted up or infilled ditches to maintain drainage efficiency. The work at Rainton Bridge South recorded a similar arrangement of trackside ditches and, at that site, subsequent re-cutting was also interpreted as activity relating to the maintenance of drainage efficiency. The bulk of the artefactual assemblage recovered from the fills of the ditches at this site broadly dates to the 18th or 19th century, with the exception of a single sherd of 17th- or 18th-century pottery recovered from a ditch in Area 2, suggesting that this feature could potentially be contemporary with the Phase 2 waggonway.

²³ Jars 1765, in Lewis 1970.

- 11.3.4 Two rows of timber stakes were recorded within the base of a trackside ditch in Area 2. These were generally square or rectangular timbers, tapered to a point, having been rammed into the ground. One post had been reinforced with two timber wedges. These structural remains possibly represent part of a retaining structure or revetment, constructed to aid drainage and reduce silting in the ditch. They may have formed supports for planks although no traces of any planking survived. Postholes were also recorded in the bases of trackside ditches within a slot excavated on the south-western side of the embankment in Area 1. Their function is uncertain, but they may also represent part of a revetment.
- 11.3.5 Two postholes recorded in Area 2 along the north-eastern edge of one of the trackside ditches are tentatively interpreted as forming part of a fence line. Excavations at Rainton Bridge South recorded rows of stakeholes interpreted as fencelines alongside the trackside ditches. At that site, apart from delineation of the wayleave corridor, their function may also have been to prevent livestock from straying onto the track. Two roughly NE-SW aligned rows of postholes recorded in Area 2 at this site possibly represent part of a timber structure allowing access across the drainage ditches to the trackway.

11.4 Phase 4: Post-Waggonway Activity (19th or Early 20th Century)

- 11.4.1 Phase 4 was characterised by substantial dump deposits of predominantly colliery waste material, comprising crushed coal and ash, relating to the infilling of the dene during the 19th or early 20th century. Two ditches were recorded truncating these dump deposits at the south-eastern extent of Area 1, running along the top of the embankment. These were likely in use during the later 19th century or early 20th century, long after the abandonment of the waggonway. It is likely however that the disused waggonway route remained in use as a road to 'Low Walker' and drainage would therefore have been maintained.

11.5 Phase 5: Early 20th Century 'Walker Refuse Destructor'

- 11.5.1 Three substantial features recorded along the north-eastern edge of Area 1 are likely to represent construction of the 'Walker Refuse Destructor'. This is depicted on the 1908 and 1912 Ordnance Survey maps as a substantial rectangular structure located immediately to the north-east of Area 1.

12. SUMMARY OF POTENTIAL FOR FURTHER ANALYSIS

- 12.1 The archaeological excavation at the original Sir Charles Parsons School site recorded the archaeological remains of a colliery waggonway of probable late 18th-century origin. The route ran south-eastwards from Gosforth Pit, passing Delight Pit and crossing the school site on a NW-SE alignment, running towards the core workings of Walker Colliery. The remains were particularly well-preserved towards the south-eastern extent of the site where the waggonway ran 'downhill' on the approach to the dene of a tributary of Stott's Burn. The archaeological evidence confirms the historic map evidence by demonstrating that the dene was partly infilled by the construction of a substantial clay embankment to carry the waggonway across it, with the watercourse presumably culverted below this. Although no timbers of the waggonway track survived *in situ*, the impressions of track timbers were recorded in one excavation area on the upper strata of the embankment. The archaeological remains of this waggonway are considered to be significant heritage assets, to the extent that the findings of the work require further analysis and publication of a final report in an appropriate academic outlet, to form a permanent record of those assets.
- 12.2 Archaeological remains associated with the development of the waggonway, probably in the late 18th or early 19th century, were also recorded. Deposits associated with consolidation and enlargement of the embankment were recorded, along with trackside ditches along both sides. Timber stakes within the ditches could represent part a retaining structure to facilitate drainage, while there was also evidence for a timber structure to provide access across the ditches to the waggonway track. Artefacts recovered from deposits associated with this phase of development were broadly of 19th-century date. The archaeological remains representing a further element in the developmental sequence of the waggonway are also considered to be significant heritage assets, with the evidence requiring incorporation into the proposed publication.
- 12.3 Archaeological remains of the later usage of the waggonway route as a road in the later 19th and into the 20th century, when it ran alongside the 'Walker Refuse Destructor,' are of lesser significance. However, a summary of the later elements of the stratigraphic sequence recorded by the work should complete the description of the archaeological remains recorded at the site in the proposed publication.
- 12.4 The artefactual assemblages recovered during the excavation were generally small and not closely dateable. The ceramic material recovered predominantly comprised domestic wares and has limited value, principally to provide broad confirmation of the period of usage of the site. Specialist assessment has concluded that no further analytical work is warranted on the artefactual assemblages. However, while the limited significance of the material means that no further work is necessary, a summary of material which provides dating evidence for the stratigraphic data and mention of any other items of note should be included within the proposed publication.

12.5 To sum up, despite the excavation of sections of a number of later post-medieval industrial era colliery waggonways in Tyne and Wear in the last 20 years, detailed archaeological examination of these features remains relatively uncommon given the proliferation of waggonway routes during their mid 18th- to early 19th-century heyday. The picture that is emerging is that, although many aspects of track construction and design were evidently fairly standard, local topographical factors and other considerations necessitated specific variations, particularly in terms of the requirement for, as well as the construction and design of, an embankment to carry the track. This site has provided an example of part of a waggonway route being influenced by the presence of a substantial topographical feature; the dene spanned at this location possibly represents the largest feature that a waggonway could be carried across by means of manual earth-moving to create an embankment at this time. With a reasonably-sized and growing body of data now available for later post-medieval industrial era colliery waggonways in the region, there emerges greater potential for comparison between sites of technological aspects of embankment and track design, construction and development. Work of this nature will form a key component of the analysis element of the further work proposed for this project leading to publication.

PART C: ACKNOWLEDGEMENTS AND REFERENCES

13. ACKNOWLEDGEMENTS AND CREDITS

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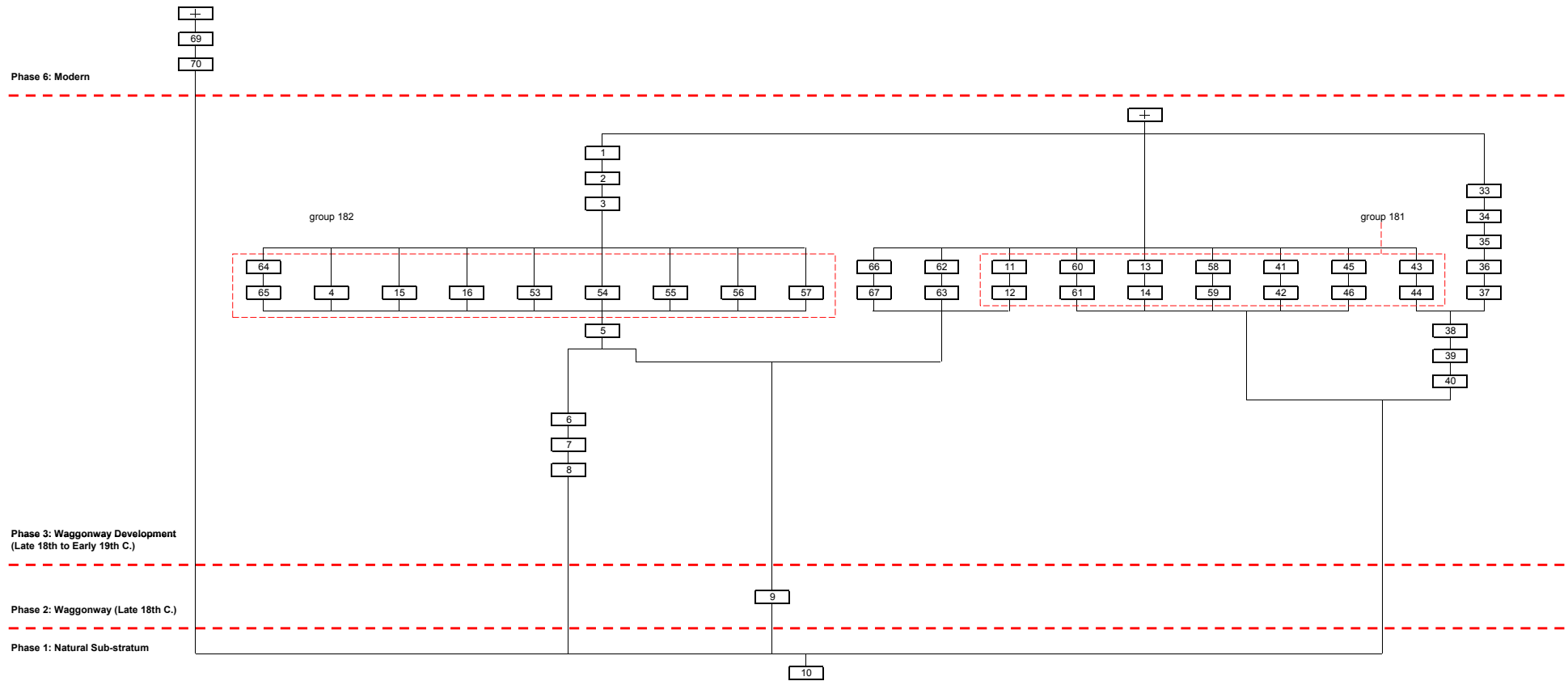
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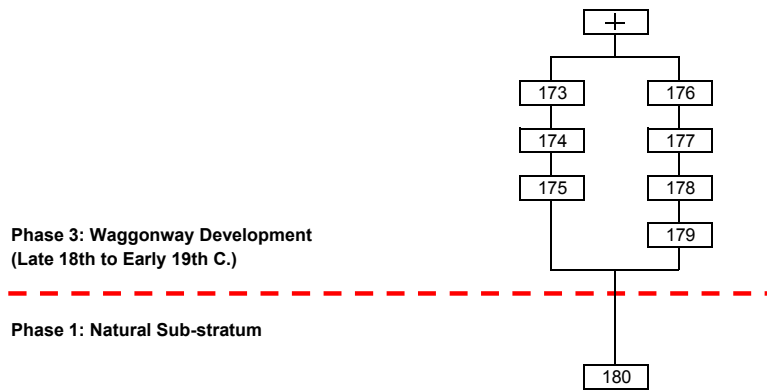
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APPENDIX A
STRATIGRAPHIC MATRICES

Area 2



Area 3



APPENDIX B
CONTEXT INDEX

SCP 11: CONTEXT INDEX

Context	Area	Phase	Type 1	Type 2	Interpretation
1	2	3	Deposit	Fill	Fill of ditch re-cut [5]
2	2	3	Deposit	Fill	Fill of ditch re-cut [5]
3	2	3	Deposit	Fill	Fill of ditch re-cut [5]
4	2	3	Timber	Stake	Stake
5	2	3	Cut	Linear	Re-cut of ditch [8]; filled by [1], [2], [3] & [4]
6	2	3	Deposit	Fill	Fill of ditch [8]
7	2	3	Deposit	Fill	Fill of ditch [8]
8	2	3	Cut	Linear	Ditch; filled by [6] & [7]
9	2	2	Deposit	Layer	Waggonway embankment
10	2	1	Deposit	Layer	Natural sub-stratum
11	2	3	Deposit	Fill	Fill of posthole [12], Group [181]
12	2	3	Cut	Discrete	Posthole; filled by [11], Group [181]
13	2	3	Deposit	Fill	Fill of posthole [14], Group [181]
14	2	3	Cut	Discrete	Posthole; filled by [13], Group [181]
15	2	3	Timber	Stake	Stake, Group [182]
16	2	3	Timber	Stake	Stake, Group [182]
17	Void				
18	Void				
19	1	6	Deposit	Layer	Tarmac surface
20	1	6	Deposit	Layer	Levelling layer
21	1	6	Deposit	Layer	Fill of modern intusion (evaluation trench) [51]
22	1	6	Deposit	Layer	Fill of modern intusion (evaluation trench) [51]
23	1	4	Deposit	Layer	Levelling layer
24	1	4	Deposit	Layer	Levelling layer
25	1	4	Deposit	Layer	Levelling layer; same as [139]
26	1	4	Deposit	Fill	Fill of ditch [27]
27	1	4	Cut	Linear	Ditch; filled by [26]
28	1	4	Deposit	Layer	Levelling layer; same as [135]
29	1	4	Deposit	Layer	Levelling layer
30	1	4	Deposit	Layer	Levelling layer
31	1	3	Cut	Linear	Ditch; filled by [52], [117] & [136]
32	1	3	Deposit	Layer	Ballast layer
33	2	3	Deposit	Fill	Fill of ditch re-cut [36]
34	2	3	Deposit	Fill	Fill of ditch re-cut [36]
35	2	3	Deposit	Fill	Fill of ditch re-cut [36]
36	2	3	Cut	Linear	Ditch re-cut; filled by [33]-[35]
37	2	3	Deposit	Fill	Fill of ditch [40]
38	2	3	Deposit	Fill	Fill of ditch [40]
39	2	3	Timber	Stake	Stake within ditch [40]
40	2	3	Cut	Linear	Ditch; filled by [37]-[39]
41	2	3	Deposit	Fill	Fill of stakehole [42], Group [181]
42	2	3	Cut	Discrete	Stakehole filled by [41], Group [181]
43	2	3	Deposit	Fill	Fill of stakehole [44], Group [181]
44	2	3	Cut	Discrete	Stakehole filled by [43], Group [181]
45	2	3	Deposit	Fill	Fill of posthole [46], Group [181]
46	2	3	Cut	Discrete	Posthole filled by [45], Group [181]
47	1	5	Deposit	Fill	Fill of ditch [116]
48	Void				
49	1	2	Deposit	Layer	Waggonway embankment; same as [76]
50	1	2	Deposit	Layer	Waggonway embankment
51	1	6	Cut	Linear	Evaluation trench filled by [21]-[22]
52	1	3	Deposit	Fill	Fill of ditch [31]
53	2	3	Timber	Stake	Stake, Group [182]
54	2	3	Timber	Stake	Stake, Group [182]
55	2	3	Timber	Stake	Stake, Group [182]
56	2	3	Timber	Stake	Stake, Group [182]
57	2	3	Timber	Stake	Stake, Group [182]
58	2	3	Deposit	Fill	Fill of posthole [59], group [181]
59	2	3	Cut	Discrete	Posthole; filled by [58], group [181]

SCP 11: CONTEXT INDEX

Context	Area	Phase	Type 1	Type 2	Interpretation
60	2	3	Deposit	Fill	Fill of posthole [61], Group [181]
61	2	3	Cut	Discrete	Posthole; filled by [60], Group [181]
62	2	3	Deposit	Fill	Fill of stakehole [63]
63	2	3	Cut	Discrete	Stakehole; filled by [62]
64	2	3	Deposit	Fill	Fill of stakehole [65]
65	2	3	Cut	Discrete	Stakehole; filled by [64]
66	2	3	Deposit	Fill	Fill of stakehole [67]
67	2	3	Cut	Discrete	Stakehole; filled by [66]
68	1	2	Deposit	Layer	Natural boulder clay
69	2	3	Deposit	Fill	Fill of intrusions Group [70]
70	2	6	Cut	Discrete	Group of intrusions; filled by [69]
71	1	3	Deposit	Fill	Fill of ditch [75]
72	1	3	Deposit	Fill	Fill of ditch [75]
73	1	3	Deposit	Fill	Fill of ditch [75]
74	1	3	Deposit	Fill	Fill of ditch [75]
75	1	3	Cut	Linear	Ditch; filled by [71]-[74] & [86]
76	1	2	Deposit	Layer	Waggonway embankment; same as [49]
77	1	2	Deposit	Layer	Natural sub-stratum
78	1	2	Deposit	Layer	Natural sub-stratum
79	1	2	Deposit	Fill	Fill of posthole [80]
80	1	2	Cut	Discrete	Posthole; filled by [79]
81	1	6	Deposit	Layer	Levelling layer
82	Void				
83	Void				
84	1	2	Deposit	Fill	Fill of rail impression [85]
85	1	2	Cut	Discrete	Possible rail impression; filled by [84]
86	1	3	Deposit	Fill	Fill of ditch [75]
87	1	3	Deposit	Fill	Fill of ditch re-cut [88]
88	1	3	Cut	Linear	Re-cut of ditch [75]; filled by [87]
89	Void				
90	1	3	Cut	Linear	Ditch; filled by [124], [125] & [123]
91	Void				
92	1	6	Deposit	Fill	Backfill of drain cut [94]
93	1	6	Deposit	service	Ceramic drain, within drain cut [94]
94	1	6	Cut	Linear	Drain cut; filled by [92] & [93]
95	1	5	Deposit	Fill	Fill of ditch [116]; same as [122]
96	1	5	Cut	Discrete	Sleeper impression within ditch [116]; filled by [97]
97	1	5	Deposit	Fill	Fill of sleeper impression [96]
98	1	5	Deposit	Fill	Fill of ditch [116]; same as [122]
99	1	5	Cut	Linear	Ditch; filled by [100]
100	1	5	Deposit	Fill	Fill of ditch [99]
101	1	5	Deposit	Fill	Fill of sleeper impression [102]
102	1	5	Cut	Discrete	Sleeper impression; filled by [101]
103	1	5	Deposit	Fill	Fill of sleeper impression [104]
104	1	5	Cut	Discrete	Sleeper impression; filled by [103]
105	1	5	Deposit	Fill	Fill of sleeper impression [106]
106	1	5	Cut	Discrete	Sleeper impression; filled by [105]
107	1	5	Deposit	Fill	Fill of sleeper impression [108]
108	1	5	Cut	Discrete	Sleeper impression; filled by [107]
109	1	5	Cut	Discrete	Timber impression as a void - no fill
110	1	5	Deposit	Fill	Fill of impressions [111]
111	1	5	Cut	Discrete	Group of linear impressions; filled by [110]
112	Void				
113	1	5	Deposit	Fill	Fill of ditch [116]
114	Void				
115	Void				
116	1	5	Cut	Linear	Ditch filled by [113], [95] = [98] = [122], [47] = [159], [91] = [161] & [161]
117	1	3	Deposit	Fill	Fill of ditch [31]

SCP 11: CONTEXT INDEX

Context	Area	Phase	Type 1	Type 2	Interpretation
118	1	3	Deposit	Layer	Levelling layer
119	1	4	Deposit	Fill	Fill of gully [120]
120	1	4	Cut	Linear	Gully; filled by [119]
121	Void				
122	1	5	Deposit	Fill	Fill of ditch [116]
123	1	3	Deposit	Fill	Fill of ditch [90]
124	1	3	Deposit	Fill	Fill of ditch [90]
125	1	3	Deposit	Fill	Fill of ditch [90]
126	1	2	Deposit	Fill	Fill of posthole [127]
127	1	2	Cut	Discrete	Posthole; filled by [126]
128	1	3	Deposit	Fill	Fill of gully [130]
129	1	3	Deposit	Fill	Fill of gully [130]
130	1	3	Cut	Linear	Gully; filled by [128] & [129]
131	1	5	Deposit	Fill	Fill of ditch [134]
132	1	5	Deposit	Fill	Fill of ditch [134]
133	1	5	Deposit	Fill	Fill of ditch [134]; same as [169]
134	1	5	Cut	Linear	Ditch; filled by [131]-[133] & [168]-[170]
135	1	4	Deposit	Layer	Levelling layer; same as [28]
136	1	3	Deposit	Fill	Fill of ditch [31]
137	1	3	Deposit	Fill	Fill of ditch [138]
138	1	3	Cut	Linear	Ditch; filled by [137]
139	1	4	Deposit	Layer	Levelling layer; same as [25]
140	1	3	Deposit	Fill	Fill of posthole [141]
141	1	3	Cut	Discrete	Posthole; filled by [140]
142	1	3	Deposit	Fill	Fill of stakehole [144]
143	1	3	Timber	Stake	Stake
144	1	3	Cut	Discrete	Stakehole; filled by [142] & [143]
145	1	3	Deposit	Fill	Fill of posthole [146]
146	1	3	Cut	Discrete	Posthole; filled by [145]
147	1	3	Deposit	Fill	Fill of posthole [148]
148	1	3	Cut	Discrete	Posthole; filled by [147]
149	1	2	Deposit	Fill	Fill of rail impression [150]
150	1	2	Cut	Linear	Rail impression; filled by [149] & [152]
151	1	2	Cut	Discrete	Posthole; filled by [164]
152	1	2	Deposit	Fill	Fill of rail impression [150]
153	1	2	Deposit	Fill	Fill of sleeper impressions [154]
154	1	2	Cut	Discrete	Group of sleeper impressions; filled by [153]
155	1	2	Deposit	Fill	Fill of rail impression [156]
156	1	2	Cut	Linear	Rail impression; filled by [155]
157	1	2	Cut	Linear	Rail impression; filled by [163]
158	1	2	Cut	Discrete	Posthole; filled by [162]
159	1	5	Deposit	Fill	Fill of ditch [116]
160	1	5	Deposit	Fill	Fill of ditch [116]
161	1	5	Deposit	Fill	Fill of ditch [116]
162	1	2	Deposit	Fill	Fill of posthole [158]
163	1	2	Deposit	Fill	Fill of rail impression [157]
164	1	2	Deposit	Fill	Fill of posthole [151]
165	1	2	Deposit	Fill	Fill of posthole [167]
166	1	2	Deposit	Fill	Fill of posthole [167]
167	1	2	Cut	Discrete	Posthole; filled by [165] & [166]
168	1	5	Deposit	Fill	Fill of ditch [134]
169	1	5	Deposit	Fill	Fill of ditch [134]; same as [133]
170	1	5	Deposit	Fill	Fill of ditch [134]
171	1	3	Deposit	Fill	Fill of posthole [172]
172	1	3	Cut	Discrete	Posthole; filled by [171]
173	3	3	Deposit	Fill	Fill of ditch [175]
174	3	3	Deposit	Fill	Fill of ditch [175]
175	3	3	Cut	Linear	Ditch; filled by [173] & [174]
176	3	3	Deposit	Fill	Fill of ditch [177]

SCP 11: CONTEXT INDEX

Context	Area	Phase	Type 1	Type 2	Interpretation
177	3	3	Cut	Linear	Re-cut of ditch [179]; filled by [176]
178	3	3	Deposit	Fill	Fill of ditch [179]
179	3	3	Cut	Linear	Ditch; filled by [178]
180	3	1	Deposit	Layer	Natural sub-stratum
181	2	3	Group no.		Group no. for seven postholes and stakeholes [12], [14], [42], [44], [46], [59], [61]
182	2	3	Group no.		Group no. for eight timber posts, stakes and wedges [4], [15], [16], [53], [54], [55], [56], [57], [65]

APPENDIX C
PLATES



Plate 1: Area 1, overview, looking east (*scale 2m*)



Plate 2: Area 1, waggonway embankment, north-west facing section (*scale 1m & 2m*)



Plate 3: Area 1, waggonway track, looking south-east (*scale 1m*)



Plate 4: Area 1, rail impression [150], looking north-west (*scale 1m*)



Plate 5: Area 1, north-west facing section of ditch [138] and re-cuts [31] and [130] (*scale 1m*)



Plate 6: Area 1, south-east facing section across clay embankment [49] and trackside ditch [75], looking north (*scale 1m & 2m*)



Plate 7: Area 1, north-west facing section across construction cut [116] (*scale 1m*)



Plate 8: Area 2, ditch [8] and re-cut [5], showing stakes [4], [15] and [16], looking south-east (*scale 1m*)



Plate 9: Area 2, ditch [8] and re-cut [5], showing stake [55] and wedges [56], looking south-east (*scale 1m*)



Plate 10: Area 2 ditch [8] and re-cut [5], looking south-east (*scale 1m*)



Plate 11: Area 2, ditch [40] and re-cut [36], north-west facing section (*scale 1m*)



Plate 12: Area 3, overview, looking north-west (*scale 1m*)



Plate 13: Area 3, ditch [175], looking north-west (*scale 1m*)



Plate 14: Area 3, ditch [179] and re-cut [177], looking north-west (*scale 1m*)

APPENDIX D
SPECIFICATION

TYNE AND WEAR SPECIALIST CONSERVATION TEAM

SPECIFICATION FOR SECOND PHASE EXCAVATION TO RECORD AN 18TH CENTURY COLLIERY WAGGONWAY AT SIR CHARLES PARSONS SCHOOL, WESTBOURNE AVENUE, WALKER, NEWCASTLE UPON TYNE

Introduction

Planning permission has been granted for a 1-2 storey secondary special school with associated 80 space car park and 20 space mini-bus drop off area, hard and soft play areas, landscape planting and boundary fencing and an access road from Waverdale Avenue.

An archaeological desk based assessment has been produced (Pre-Construct Archaeology Ltd, 2008).

The report concludes that an 18th century colliery waggonway ran through the site. This ran south-eastwards from Gosforth Pit of Walker Colliery to Low Walker. The route may have been constructed at the same time as the sinking of Delight Pit which lay in the area now occupied by St. Alban's Primary School. The waggonway is shown on Thomas Oliver's estate plan of 1840, carried on an embankment over the tributary of the Stott's Burn. On the Ordnance Survey first edition map of 1850, the waggonway is described as 'old' suggesting that it was out of use.

In April 2009, Pre-Construct Archaeology Ltd excavated two evaluation trenches across the line of the waggonway.

Trench one was excavated within the tarmac car park south-east of the school. It was located to pick up the waggonway at the point where it crossed the infilled dene of the tributary of the Stott's Burn. The embanked trackbed of the waggonway was recorded at a depth of 1.25m below existing ground level. The clay embankment was 3m wide and 0.70m high. No timbers survived in-situ, but a posthole probably represents a fixing associated with the waggonway. Probably when the timbers were replaced with stone sleepers and iron rails in the late 18th or early 19th century, a dump of ash and crushed coal widened the embankment to over 4m.

A brick structure, probably the Walker Refuse Destructor shown on early 20th century maps was recorded in the north-eastern end of the trench. This had cut through the earlier deposits.

Trench 2 was excavated in a grassed area on the line of the waggonway as shown on Ordnance Survey first edition. However no evidence of the waggonway was found. A succession of dumps of colliery waste, representing ground levelling in the 20th century was found. Projection of the line of the embankment found in the trench one, suggested that the waggonway lay north-east of trench 2, beyond the edge of the school grounds.

The appointed archaeologist must familiarise themselves with the results of previous archaeological work on the site before starting work.

The construction of the new special school could impact on the remains of the waggonway.

In accordance with PPG16 and UDP Policy C4.3

C4.3 WHERE ASSESSMENT AND EVALUATION HAVE ESTABLISHED THAT PROPOSED DEVELOPMENT WILL ADVERSELY AFFECT A SITE OR AREA OF ARCHAEOLOGICAL INTEREST, DEVELOPERS WILL BE REQUIRED TO PRESERVE ARCHAEOLOGICAL REMAINS IN SITU UNLESS THIS IS CLEARLY INAPPROPRIATE OR THE DESTRUCTION OF THE REMAINS IS DEMONSTRABLY UNAVOIDABLE, IN WHICH CASE A PROGRAMME OF ARCHAEOLOGICAL WORKS SHALL BE SUBMITTED TO AND AGREED WITH THE COUNCIL BEFORE THE START OF DEVELOPMENT.

a programme of archaeological excavation is required, to record a larger extent of the waggonway embankment and to see if timber rails and sleepers survive or evidence of trackside ditches or palisades (read discussion on waggonway development in previous reports).

Research Aims and Objectives

The evaluation report should make reference to Regional and Thematic Research Frameworks.

The North-East Regional Research Framework for the Historic Environment (2006) notes the importance of research as a vital element of development-led archaeological work. It sets out key research priorities for all periods of the past allowing commercial contractors to demonstrate how their fieldwork relates to wider regional and national priorities for the study of archaeology and the historic environment. The aim of NERRF is to ensure that all fieldwork is carried out in a secure research context and that commercial contractors ensure that their investigations ask the right questions. The relevant key research themes for this evaluation are PM1 and PM2.

See <http://www.algao.org.uk/Association/England/Regions/ResFwks.htm>

Ideally and where possible the evaluation should cross-reference its aims and objectives to national priorities, defined in SHAPE (Strategic Frameworks for Historic Environment Activities and Programmes in English Heritage), and the English Heritage Research Agenda 2005-2010.

Where appropriate note any similar nationwide projects using ADS, internet search engines, ALSF website, HEEP website, OASIS, NMR excavation index.

All staff on site must understand the project aims and methodologies.

Methods statement

An archaeological excavation is needed to inform the Planning Authority of the character, nature, date, depth, degree of survival of archaeological deposits on this site. The excavation must be carried out by a suitably qualified and experienced archaeological organisation. The work will record and environmentally sample any archaeological deposits of importance found on the plot. The purpose of this brief is to obtain tenders for this work. The report must be the definitive record for deposition in the Tyne and Wear HER.

All staff employed by the Archaeological Contractor shall be professional field archaeologists with appropriate skills and experience to undertake work to the highest professional standards.

The work will be undertaken according to English Heritage Guidelines - Managing Archaeological Projects 2nd Edition ('MAP2') 1991 (www.english-heritage.org.uk/guidance/map2/index.htm) and Management of Research Projects in the Historic Environment (MoRPHE) – The MoRPHE Project Managers' Guide, Project Planning Notes and Technical Guides 2006 (www.english-heritage.org.uk/publications).

The work will be undertaken according to MoRPHE Project Planning Notes 2006 - PPN3 – Archaeological Excavation and PPN6 – Development of Procedural standards and guidelines for the historic environment.

All work must be carried out in compliance with the codes of practice of the Institute of Field Archaeologists and must follow the IFA Standard and Guidance for Archaeological Field Evaluations, Excavation or Watching Briefs as appropriate. www.archaeologists.net

Notification

The County Archaeologist needs to know when archaeological fieldwork is taking place in Tyne and Wear so that he can inform the local planning authority and can visit the site to monitor the work in progress. The Archaeological Contractor must therefore inform the County Archaeologist of the start and end dates of the Evaluation. He must also keep the County Archaeologist informed as to progress on the site. The CA must be informed of the degree of archaeological survival and of any significant finds. The Client will give the County Archaeologist reasonable access to the development to undertake monitoring.

PROJECT INITIATION

PROJECT DESIGN

Because this is a detailed specification, the County Archaeologist does not require a Project Design from the appointed archaeologist. However a health and safety statement and risk assessment, identifying potential risks in a risk log (see template in appendix 2 of The MoRPHE Project Manager's Guide) and specifying suitable countermeasures and contingencies, is required to be submitted to the commissioning client.

The Management of Research Projects in the Historic Environment (MoRPHE) – The MoRPHE Project Managers' Guide 2006 contains general guidance on Risk management (section 2.3.2, Appendix 2).

Risk assessments must be produced in line with legislative requirements (for example the Health and Safety at Work Act 1974, the Management of Health and Safety at Work Regulations 1999, the Control of Substances Hazardous to Health (COSHH) Regulations 2002 and the Personal Protective Equipment at Work Regulations 2002) and best practice e.g. as set out in the SCAUM (Standing Conference on Archaeological Unit Managers) Health and Safety Manual <http://www.scaum.org/uk>

Detailed information on hazards and how to carry out a risk assessment can be obtained from the Health and Safety Executive (www.hse.gov.uk) and the local authority health and safety department. Specific guidance for land contamination and archaeology can be obtained from the Institute for Archaeologists (www.archaeologists.net), the Construction Industry Research and Information Association (www.contaminated-land.org) and the Association of Geotechnical and Geoenvironmental Specialists (www.ags.org.uk).

See also Environment Agency, 2005 "Guidance on Assessing the Risk Posed by Land Contamination and its Remediation on Archaeological Resource Management".

The Archaeological Contractor must be able to provide written proof that the necessary levels of Insurance Cover are in place.

The Archaeological Contractor must detail measures taken to ensure the safe conduct of excavations, and must consult with the client's structural engineers concerning working in close proximity to the foundations of the surrounding buildings. The Client may wish to see copies of the Archaeological Contractor's Health and Safety Policies.

The Archaeological Contractor must maintain a Site Diary for the benefit of the Client, detailing the nature of work undertaken on a day by day basis, with full details of Site Staff present, duration of time on site, etc. and contact with third parties.

PROJECT EXECUTION

1) Archaeological evaluation

The archaeological excavation will probably be best undertaken after the demolition of the existing Sir Charles Parsons School building. The building will be demolished to ground level. The ground slab can be removed but any foundations below this must be left insitu until after the archaeological work has been completed, as grubbing up the foundations may damage the archaeological remains.

The appointed archaeologist will decide where best to locate the excavation area by laying a plan of the proposed development over the projecting course of the waggonway. The location will be approved by the County Archaeologist before work commences.

The dimensions of the excavation area are 6m x 20m in plan **at base**.

There will be an contingency for the excavation of an additional area 6m x 10m which can be used if significant remains are found.

The excavation area should avoid services.

The excavation area sides can be widened and stepped to reach depths over 1.2m.

The excavation area must stay a safe distance away from pylons and overhead power lines.

The commissioning client will advise of any ecological or biodiversity issues which need to be taken into consideration.

The commissioning client will advise of any protected trees which must be avoided by the evaluation. Damage to trees covered by a Tree Protection Order carries a substantial fine.

The excavation area position should be accurately surveyed prior to excavation and tied in to the national grid.

The excavation area should be excavated to the depth of natural subsoil.

Tasks

Hand excavation, recording and environmental sampling (as stipulated below) of deposits down to the depth specified above.

Any modern overburden or levelling material can be machined-off using a wide toothless ditching bucket under strict archaeological supervision.

Dumps of levelling material as seen in the evaluation trenches can be machined-off, but these layers must be recorded in section and context sheets completed for them.

Only features associated with the waggonway, such as the waggonway embankment (or other significant archaeological remains) need to be hand cleaned and excavated by hand.

All faces of the trench that require examination or recording will be cleaned.

Excavation is to be carried out with a view to avoid damage to any archaeological features which appear to be worthy of preservation in-situ.

Excavation is to be carried out by single context planning and recorded on *pro forma* context sheets. Features over 0.5 m in diameter can be half sectioned.

Environmental sampling (and where relevant scientific dating) are compulsory parts of the evaluation exercise. All tenders will give a price for the assessment, full analysis, report production and publication per environmental and scientific dating sample as a contingency.

Samples will be taken of bricks from any brick-built structures. The dimensions of the bricks and the type of bonding must be recorded.

Scientific investigations should be undertaken in a manner consistent with "The Management of Archaeological Projects", English Heritage 1991 and with "Archaeological Science at PPG16 Interventions: Best Practice for Curators and Commissioning Archaeologists", English Heritage, 2003. Advice on the sampling strategy for environmental samples and samples for scientific dating etc. must be sought from Jacqui Huntley, English Heritage Regional Advisor for Archaeological Science (jacqui.huntley@english-heritage.org.uk or 07713 400387) **before** the evaluation begins. See Appendix 1 for more information.

See Appendix 2 for guidance on procedures relating to human remains.

See Appendix 4 for guidance on Treasure Act procedures.

The spoil can be kept close-by and rapidly backfilled into the trenches at the conclusion of this work.

Recording

A full written, drawn (accurate scale plans, elevations and section drawings) and photographic record (of all contexts in black and white print and colour transparency with clearly visible graduated metric scale) will be made.

The finished report must include a plan and section of each trench (even where no archaeological remains are recorded) plus plans and sections through excavated archaeological features.

The plans will include at least two site grid points and will show section line end points.

The plans will depict building material (i.e. brick and stone) where a complex of structures has been found.

Where there is a complex of interlocking multi-phased structures, a phasing plan will also be included.

There will be elevation drawings of any standing structures such as walls.

Pro-forma context sheets will be used.

All deposits and the base of the trench will be levelled. Levels will be expressed as metres above Ordnance Datum.

Stratigraphy shall be recorded even when no archaeological features have been recognised.

A 'Harris' matrix will be compiled where stratified deposits are recorded.

2) Post-excavation and report production

Finds Processing and Storage

The Archaeological Contractor will process and catalogue the finds in accordance with Museum and Galleries Commissions Guidelines (1992) and the UKIC Conservation Guidelines, and arrange for the long term disposal of the objects on behalf of the Client. A catalogue of finds and a record of discard policies, will be lodged with the finds for ease of curation.

Finds shall be recorded and processed in accordance with the IFA Guidelines for Finds Work

Finds will be assessed by an experienced finds specialist.

Human and animal bone assemblages should be assessed by a recognised specialist (see Appendices 2 and 3 for more information).

Industrial slag and metal working debris will be assessed by a specialist.

Assessment should include x-radiography of all iron objects (after initial screening to exclude recent debris) and a selection of non-ferrous artefacts (including all coins). Refer to "Guidelines on the x-radiography of archaeological metalwork, English Heritage, 2006.

Brick dimensions will be measured and a note made of the bonding material.

If necessary, pottery sherds and bricks should be recommended for Thermoluminescence dating.

Finds processing, storage and conservation methods must be broadly in line with current practice, as exemplified by the IFA "Standard and guidance for the collection, documentation, conservation and research of archaeological materials", 2001. Finds should be appropriately packaged and stored under optimum conditions, as detailed in the RESCUE/UKIC publication "First Aid

for Finds” (Watkinson and Neal 1998). Proposals for ultimate storage of finds should follow the UKIC publication “Guidelines for the Preparation of Excavation Archives for Long-term Storage” (Walker 1990). Details of methodologies may be requested from the Archaeological Contractor.

Other useful guidance – “A Strategy for the Care and Investigation of Finds”, English Heritage, 2003, “Finds and Conservation Training Package”, English Heritage, 2003.

All objects must be stored in appropriate materials and conditions to ensure minimal deterioration. Advice can be sought from Jacqui Huntley of English Heritage (0191 3341137 or 07713 400387) where necessary.

PRODUCTS

The report

1. The Archaeological Contractor must produce an interim report of 200 words minimum, **two weeks after the completion of the field-work**, for the Client and the Planning Authority, with a copy for information to the County Archaeologist. This will contain the recommendations for any further work needed on site.
2. The production of Site Archives and Finds Analysis will be undertaken according to English Heritage Guidelines - Managing Archaeological Projects 2nd Edition ('MAP2') 1991 and Management of Research Projects in the Historic Environment (MoRPHE) 2006.
3. A full archive report or post-excavation assessment, with the following features should be produced **within six months of the completion of the field-work**. All drawn work should be to publication standard. The report must include:
 - * Location plans of trenches and grid reference of site
 - * Site narrative – interpretative, structural and stratigraphic history of the site
 - * Plans showing major features and deposit spreads, by phase, and section locations
 - * Sections of the two main trench axes and through excavated features with levels
 - * Elevation drawings of any walls etc. revealed during the excavation
 - * Artefact reports – full text, descriptions and illustrations of finds
 - * Tables and matrices summarising feature and artefact sequences.
 - * Archive descriptions of contexts, grouped by phase (not for publication)
 - * Deposit sequence summary (for publication/deposition)
 - * Colour photographs of trenches and of archaeological features and finds
 - * Laboratory reports and summaries of dating and environmental data, with collection methodology.
 - * A consideration of the results of the field-work within the wider research context (ref. NERRF).
 - * Recommendations for further work on site, or further analysis of finds or environmental samples
 - * Copy of this specification
4. Three bound and collated copies of the report need to be submitted:
 - one for the commissioning client
 - one for the planning authority (Newcastle City Council) – this must be formally submitted by the developer to the planning department with the appropriate fee.

- one for deposition in the County HER at the address below. A digital copy of the report on CD is also required by the HER in a plastic case. Please do not attach this to the report. **The CD will also include a GIS shapefile or a dwg file showing the location of the excavation area and the waggonway. This to allow accurate depiction in the HER GIS system.**

The report and CD for the HER must be sent by the archaeological consultant or their client directly to the address below. If the report is sent via the planning department, every page of the report will be stamped with the planning application number which ruins the illustrations. The HER is also often sent a photocopy instead of a bound colour original which is unacceptable.

Publication

If significant archaeological features are found during the evaluation, the results may also warrant publication in a suitable archaeological journal. The tender should therefore include an estimated figure for the production of a short report of, for example 20 pages, in a journal such as *Archaeologia Aeliana*, the *Arbeia Journal*, *Industrial Archaeology Review* or *Durham Archaeological Journal*. This is merely to give the commissioning client an indication of potential costs.

Before preparing a paper for publication, the archaeological contractor must discuss the scope, length and suitable journal with the County Archaeologist.

Archive Preparation and Dissemination

The archive should be a record of every aspect of an archaeological project – the aims and methods, information and objects collected, results of analysis, research, interpretation and publication. It must be as complete as possible, including all relevant documents, records, data and objects {Brown, 2007, 1}.

The site archive (records and materials recovered) should be prepared in accordance with *Managing Archaeological Projects*, Second Edition, 5.4 and appendix 3 (HBMCo 1991), MoRPHE Project Planning Notes 2006 PPN3 – Archaeological Excavation, “Archaeological documentary archives” IFA Paper No. 1, “Archaeological Archives – creation, preparation, transfer and curation” Archaeological Archives Forum etc., *Guidelines for the Preparation of Excavation Archives for Long Term Storage* (UKIC 1990) and “Archaeological Archives – A guide to best practice in creation, compilation, transfer and curation” by Duncan H. Brown, Archaeological Archives Forum, July 2007.

Documentary Archive

The documentary archive comprises all records made during the archaeological project, including those in hard copy and digital form.

This should include written records, indexing, ordering, quantification and checking for consistency of all original context sheets, object records, bulk find records, sample records, skeleton records, photographic records (including negatives, prints, transparencies and x-radiographs), drawing records, drawings, level books, site note-books, spot-dating records and conservation records, publication drafts, published work, publication drawings and photographs etc.

A summary account of the context record, prepared by the supervising archaeologist, should be included.

All paper-based material must at all times be stored in conditions that minimise the risk of damage, deterioration, loss or theft.

Do not fold documents

Do not use self-adhesive labels or adhesive or tape of any kind

High quality paper (low-acid) and permanent writing materials must be used.

Original drawings on film must be made with a hard pencil, at least 4H.

Do not ink over original pencil drawings.

Use polyester based film for drawings (lasts longer than plastic).

Store documents in acid-free, dust-proof cardboard boxes

Store documents flat

All documents must be marked with the project identifier (e.g. site code) and/or the museum accession number.

All types of record must use a consistent terminology and format.

Use non-metal fastenings, and packaging and binding materials that ensure the longevity of documents.

Copies of reports and appropriate drafts, with associated illustrative material, must be submitted for inclusion with the archive.

Material Archive

The material archive comprises all objects (artefacts, building materials or environmental remains) and associated samples of contextual materials or objects.

All artefacts and ecofacts retained from the site must be packed in appropriate materials.

All finds must be cleaned as appropriate to ensure their long-term survival

All metal objects retained with the archive must be recorded by x-radiograph (except gold or lead alloys or lead alloys with a high lead content and objects too thick to be x-rayed effectively e.t.c.)

All finds must be marked or labelled with the project and context identifiers and where relevant the small-finds number

Use tie-on rot-proof labels where necessary

Bulk finds of the same material type, from the same context, may be packed together in stable paper or polythene bags

Mark all bags on the outside with site and context identifiers and the material type and include a polyethylene label marked with the same information

Use permanent ink on bags and labels

Sensitive finds must be supported, where appropriate, on inert plastic foam or acid-free tissue paper. It is not advisable to wrap objects in tissue as the unwrapping could cause damage.

The archive will be placed in a suitable form in the appropriate museum (typically the Museum of Antiquities for Newcastle (stores in Bedson Building and at Team Valley) and Tyne and Wear Museums for the rest of Tyne and Wear (check with these institutions) with the landowner's permission. Contact Andrew Parkin at the Museum of Antiquities (0191 2228996) and Alex Croom at Tyne and Wear Museums (0191 4544093).

A letter will be sent to the County Archaeology Officer within six months of the report having been submitted, confirming where the archive has been deposited.

Digital Archive

See MoRPHE Technical Guide 1 – Digital Archiving & Digital Dissemination 2006.

SIGNPOSTING

OASIS

The Tyne and Wear County Archaeologist supports the Online Access to the Index of Archaeological Investigations (OASIS) project. This project aims to provide an online index/access to the large and growing body of archaeological grey literature, created as a result of developer-funded fieldwork.

The archaeological contractor is therefore required to register with OASIS and to complete the online OASIS form for their evaluation at <http://www.oasis.ac.uk/>. Please ensure that tenders for this work takes into account the time needed to complete the form.

Once the OASIS record has been completed and signed off by the HER and NMR the information will be incorporated into the English Heritage Excavation Index, hosted online by the Archaeology Data Service.

The ultimate aim of OASIS is for an online virtual library of grey literature to be built up, linked to the index. The unit therefore has the option of uploading their grey literature report as part of their OASIS record, as a Microsoft Word document, rich text format, pdf or html format. The grey literature report will only be mounted by the ADS if both the unit and the HER give their agreement. The grey literature report will be made available through a library catalogue facility.

Please ensure that you and your client understand this procedure. If you choose to upload your grey literature report please ensure that your client agrees to this in writing to the HER at the address below.

For general enquiries about the OASIS project aims and the use of the form please contact: Mark Barratt at the National Monuments Record (tel. 01793 414600 or oasis@english-heritage.org.uk). For enquiries of a technical nature please contact: Catherine Hardman at the Archaeology Data Service (tel. 01904 433954 or oasis@ads.ahds.ac.uk). Or contact the Tyne and Wear Archaeology Officer at the address below.

The tender

Tenders for the work should contain the following:-

1. Brief details of the staff employed and their relevant experience
2. Details of any sub-contractors employed
3. A quotation of cost, broken down into the following categories:-
 - * Costs for the excavation, incl. sub-headings of staff costs on a person-day basis, transport, materials, and plant etc.
 - * Post-excavation costs, incl. storage materials
 - * Cost of Environmental analysis and scientific dating per sample
 - * Estimated cost for full publication of results in an archaeological journal
 - * Overheads
4. An indication of the required notification period (from agreement to start date) for the field-work; the duration of fieldwork and the expected date for completion of the post-excavation work (a maximum of 6 months after completion of the fieldwork)

Monitoring

The Archaeological Contractor will inform the County Archaeologist of the start and end dates of the excavation to enable the CA to monitor the work in progress.

Should important archaeological deposits be encountered, the County Archaeologist must be informed. If further archaeological evaluation is required on this site, then the archaeological contractor must submit a written scheme of investigation for approval by the CA before extending the size of the trenches.

APPENDICES

1 Environmental Sampling, Scientific Analysis and Scientific Dating

This is a compulsory part of the evaluation exercise.

Scientific investigations should be undertaken in a manner consistent with "The Management of Archaeological Projects", English Heritage 1991 and with "Archaeological Science at PPG16 Interventions: Best Practice for Curators and Commissioning Archaeologists", English Heritage, 2003.

Aims of environmental sampling – to determine the abundance/concentration of the material within the features and how well the material is preserved, to characterise the resource (the site) and each phase, to determine the significance of the material and its group value, what crop processing activities took place on the site? What does this tell us about the nature of the site? Is there any evidence for changes in the farming practice through time? How did people use this landscape? Can we place certain activities at certain locations within the site? Function and date of individual features such as pits, hearths etc. Are the charred assemblages the result of ritual deposition or rubbish? Is the charcoal the result of domestic or industrial fuel?

Advice on the sampling strategy for environmental samples and samples for scientific dating etc. must be sought from Jacqui Huntley, English Heritage Regional Advisor for Archaeological Science (07713 400387) **before** the evaluation begins. The sampling strategy should include a reasoned justification for selection of deposits for sampling.

Deposits should be sampled for retrieval and assessment of the preservation conditions and potential for analysis of biological remains (English Heritage 2002). Flotation samples and samples taken for coarse-mesh sieving from dry deposits should be processed at the time of fieldwork wherever possible.

Sieving recovers fish, amphibian, small bird and mammal bone, small parts of adult mammals and young infused bones which may be under-represented otherwise. However it is noted that clay soils in this region make sieving difficult. Discuss the potential for sieving with Regional Advisor for Archaeological Science.

Environmental samples (bulk soil samples of 30-40 litres volume) will be collected by the excavator from suitable (i.e. uncontaminated) deposits. It is suggested that a large number of samples be collected during evaluation from which a selection of the most suitable (uncontaminated) can be processed. All tenders will give a price for the assessment, full analysis, report production and publication per sample.

The full 30-40 litre sample must be assessed by the laboratory, not just a small sub-sample.

Deposits will be assessed for their potential for radiocarbon, archaeomagnetic (guidance is available in the Centre for Archaeology Guideline on Archaeometallurgy 2001) and Optically Stimulated Luminescence dating. Timbers will be assessed for their potential for dendrochronology dating. Sampling should follow procedures in "Dendrochronology: guidelines on producing and interpreting dendrochronological dates", Hillam, 1998. All tenders will quote the price of these techniques per sample.

The following information should be provided with the environmental samples to be processed – brief account of nature and history of the site, aims and objectives of the project, summary of archaeological results, context types and stratigraphic relationships, phase and dating information, sampling and processing methods, sample locations, preservation conditions, residuality/contamination etc.

Laboratory processing of samples shall only be undertaken if deposits are found to be reasonably well dated, or linked to recognisable features and from contexts the derivation of which can be understood with a degree of confidence.

A range of features, and all phases of activity, need to be sampled for charred plant remains and charcoal. Aceramic features should not be avoided as the plant remains from these features may help to date them. Deep features should be sampled in spits to pick up changes over time. Part, or all of each of the contexts should be processed. In general samples should be processed in their entirety. All flots should be scanned, and some of the residues.

Pollen

Pollen samples can be taken from features such as lakes, ponds, palaeochannels, estuaries, saltmarshes, mires, alluvium and colluvium, and from waterlogged layers in wells, ditches and latrines etc. Substances such as honey, beer or food residues can be detected in vessels. Activities such as threshing, crop processing and the retting of flax can be identified. When taken on site, pollen samples should overlap. Your regional science advisor can advise on the type of corer or auger which would be most appropriate for your site. Samples need to be wrapped in clingfilm and kept dark and cool. Make a description of the sediments in which the pollen was found, and send this with the sample to be assessed.

Forams and diatoms

Coastal or estuary sites (even those which are now well drained) are suitable for sampling for foraminifera. Diatoms can also be found on marine sites, but also in urban settings (sewers, wells, drains, ditches etc). They only survive in waterlogged conditions. These aquatic microfossils are used as proxy

indicators of the former aquatic ecological conditions on site, changes in sea levels and temperature, salinity, PH and pollution. Forams are taken from cores, monolith tins or bulk samples. Diatoms are cut from monolith tins or cores or taken as spot samples.

Insects

Insects, which are useful as palaeoenvironmental indicators, survive best in waterlogged deposits such as palaeochannels and wells. They can provide information on climate change and landscape reconstruction as some species are adapted to particular temperatures, habitats or even particular trees. Certain insects can indicate the function of a feature or building (eg. Weevils, which were introduced by the Romans, often indicate granary sites, parasites will indicate the presence of particular animals such as sheep or horse, latrine flies survive in the mineral deposits in latrines, or in the daub of medieval buildings etc). Samples need to be sealed (eg. in a plastic box).

Industrial Activity

Where there is evidence for industrial activity, macroscopic technological residues should be collected by hand. Separate samples should be collected for micro-slugs (hammer-scale and spherical droplets). Guidance should be sought from the English Heritage Regional Science Adviser on the sampling strategy for metalworking features and advice on cleaning and packaging. Specialist on-site advice must be sought on identification of metalworking features. Slag and metal working debris must be assessed by a specialist. Scientific analysis (such as x-ray fluorescence, chemical analysis, metallography or scanning electron microscope) of slag can provide information on the melting temperature, chemical composition (is it iron, zinc, copper etc), microstructure (the type and shape of the crystals), physical properties (the hardness or viscosity), isotopic composition (strontium 87 or strontium 88 etc) and mineralogical composition. Guidance is available in the English Heritage "Archaeometallurgy" guidelines, 2001; "Archaeomagnetic dating", 2006 and "Guidelines on the X-radiography of archaeological metalwork", 2006.

See also Historical Metallurgy Society, 2008, "Metals and metalworking: a research framework for archaeometallurgy".

Buried soils and sediments

Buried soils and sediment sequences should be inspected and recorded on site by a recognised geoarchaeologist. Procedures and techniques in the English Heritage document "Environmental Archaeology", 2002 and "Geoarchaeology", 2004 should be followed.

Wood

Sampling strategies for wooden structures should follow the methodologies presented in "Waterlogged wood. Guidelines on the recording, sampling, conservation and curation of waterlogged wood" R. Brunning, 1996. If timbers are likely to be present on your site, contact a wood specialist beforehand. Pre-excavation planning – determine questions to ask, agree on a sampling strategy, allocate reasonable time and budget. Soil samples should be taken of the sediments surrounding the timber. Keep the timbers wet! Record them asap on-site – plan, photograph, record the size and orientation of the wood (radial, tangential, transverse), any toolmarks, joints, presence of bark, insect damage, recent breaks, and if another piece of wood was on top of or below the piece sampled. Both vertical and horizontal positioning of wattling must be recorded. Wood samples can provide information on woodland management such as medieval coppicing, type of taxa (native or foreign), conversion

technology (how the wood was turned into planks), building techniques and type of tools used.

Suitable samples should be submitted for dendrochronological dating. See English Heritage guidelines, 2004, "Dendrochronology".

Leather and organic materials

Waterlogged organic materials should be dealt with following recommendations in "Guidelines for the care of waterlogged archaeological leather", English Heritage and Archaeological Leather Group 1995.

2 *Animal Bone*

Animal bone can explore themes such as hunting and fowling, fishing, plant use, trade network, seasonality, diet, butchery, animal husbandry, food procurement, age structures, farrowing areas, species ratios, local environment.

Domestic animal bone was used in prehistoric and Roman cremation rituals.

Post medieval cattle bones – small cow bones invariably represent animals which produced high quality buttermilk for cheese. Big 'improved' cattle with large bones were produced for large quantities of meat and poorer quality milk. Large and small cattle bones are often found together on post medieval sites, usually with less of the small bones.

Animal bone assemblages should be assessed by a recognised specialist.

The specialist will need to know a brief account of the nature and history of the site, an account of the purpose, methods (details of sampling) for recovery of animal bones, and the main aims and results of the excavation, details of any specific questions that the excavator wants the animal bone specialist to consider, information about other relevant finds from the excavation (e.g. bone tools, fishing equipment, weaving equipment), specific information about each context that has produced significant quantities of animal bone (recovery method, phase, context type, position in relation to major structures, contamination by more recent material, some indication of the amount of bone (by weight or by container size). See "Ancient Monuments Laboratory Advisory Note, "Assessment of animal bone collections from excavations", Sebastian Payne, 1991 and "The Assessment of a collection of animal bones", S. Davis, n.d., Ancient Monuments Laboratory.

Fish bone – there was some herring exploitation in the early medieval period. Christian fasting from around 970 allowed fish to be eaten on Fridays which led to a huge demand for fish. There was an increase in marine fishing, fish trade and fish consumption (cod, haddock, ling, herring etc) around 1000 AD. Middens provide evidence of commercial fishing. There was a decline in freshwater fish (cyprinid or carp, salmon, smelt, eel, pike) from the eleventh century.

Smoking fish is a recent practice. They were previously air dried and salted.

Newcastle was a major port. Samples should be sieved to retrieve fish and bird bones along with small parts of other animal skeletons and young infused bones.

A crane bone was recovered from excavations at Tuthill Stairs, Newcastle – a rare find.

Herring bones are so small that they can only be retrieved by 2mm sieving.

Clay soils are difficult to sieve, hot water can help.

Acidic soils mean poor preservation of bone.

See English Heritage 2002, "Environmental Archaeology – a guide to the theory and practice of methods from sampling and recovery to post excavation", Centre of Archaeology Guideline 1.

Isotope analysis can determine where the fish were coming from – North Sea, Scandinavia, Newfoundland, Iceland etc.

There is an excellent reference collection of fish bone at York.

Fish bones should be archived to museums for future dating and isotope analysis where this is not undertaken as part of the post-excavation process.

www.fishlab.org

3 *Human Remains*

Human remains must be treated with care, dignity and respect.

Excavators must comply with the relevant legislation (essentially the Burial Act 1857) and local environmental health concerns. If found, human remains must be left in-situ, covered and protected. The archaeological contractor will be responsible for informing the police, coroner, local Environmental Health department and the County Archaeologist. If it is agreed that removal of the remains is essential, the archaeological contractor will apply for a licence from the Home Office and their regulations must be complied with.

Site inspection by a recognised osteologist is desirable for isolated burials and essential for cemeteries. The remains will be recorded in-situ and subsequently lifted, washed in water (without additives). They will be marked and packed to standards compatible with "Excavation and post-excavation treatment of cremated and inhumed human remains", McKinley and Roberts, 1993. After excavation, the remains will be subject to specialist assessment.

Analysis of the osteological material should take place according to published guidelines "Human Remains from Archaeological Sites, Guidelines for producing assessment documents and analytical reports, English Heritage, 2002.

Some of the potential benefits from the study of human skeletons – demography, growth profiles, patterns of disease, genetic relationships, activity patterns, diet, burial practices, human evolution. New scientific techniques available include DNA and stable isotope analyses.

Diseases which yield ancient DNA – leprosy, syphilis, tuberculosis, mycobacterium bovis (animal form of TB passed to humans when they shared a living space from Neolithic period onwards).

Cremation destroys the crown of the tooth so it cannot be dated (the closure of the cranium vault can be used in adults for dating instead). Cremation also fragments bone, distorts it due to lack of water, shrinks the bone, causes microstructural alteration and destroys organic components (so DNA analysis not possible).

The final placing of the remains after scientific study and analysis will be agreed beforehand.

Further guidance is available in:

"Guidance for best practice for treatment of human remains excavated from

Christian burial grounds in England”, The Church of England and English Heritage, 2005 (www.english-heritage.org.uk/upload/pdf/16602_HumanRemains1.pdf)

“Church Archaeology: its care and management”, Council for the Care of Churches, 1999

The Advisory Panel on the Archaeology of Christian burials in England can provide free well-informed advice with consideration of relevant religious, ethical, legal, archaeological and scientific issues. Panel’s website: <http://www.britarch.ac.uk/churches/humanremains/index.html> or email the secretary simon.mays@english-heritage.org.uk

4 *Treasure*

Defined as:

- Any metallic object, other than a coin, provided that at least 10% by weight of metal is precious metal and that is at least 300 years old when found
- Any group of two or more metallic objects of any composition of prehistoric date that come from the same find
- All coins from the same find provided that they are at least 300 years old when found, but if the coins contain less than 10% gold or silver there must be at least ten
- Any object, whatever it is made of, that is found in the same place as, or had previously been together with, another object that is Treasure
- Any object that would previously have been treasure trove, but does not fall within the specific categories given above. Only objects that are less than 300 years old, that are made substantially of gold or silver, that have been deliberately hidden with the intention of recovery and whose owners or heirs are unknown will come into this category

If anything is found which could be Treasure, under the Treasure Act 1996, it is a legal requirement to report it to the local coroner within 14 days of discovery. The Archaeological Contractor must comply with the procedures set out in The Treasure Act 1996. Any treasure must be reported to the coroner and to The Portable Antiquities Scheme Finds Liaison Officer, Rob Collins (0191 2225076 or Robert.Collins@newcastle.ac.uk) who can provide guidance on the Treasure Act procedures.

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23rd July 2009

Planning Application: 2009/0605/01/DET

If you need this information in another format or language, please contact Jennifer Morrison at the above address.

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