EXCAVATIONS AT BEAM PARK RIVERSIDE (PHASES 1 & 2): THAMES AVENUE, LONDON BOROUGH OF BARKING AND DAGENHAM RM9 6DE

AN ARCHAEOLOGICAL ASSESSMENT

SITE CODE: THV17

LOCAL PLANNING AUTHORITY: LONDON BOROUGH OF BARKING AND DAGHENHAM

DECEMBER 2018

PRE-CONSTRUCT ARCHAEOLOGY

An Assessment of Archaeological Excavations at Beam Park Riverside (Phases 1 & 2): Thames Avenue, London Borough of Barking and Dagenham & London Borough of Havering, RM9 6DE

Site Code: THV17

Central NGR: TQ 50021 82962

Local Planning Authority: London Borough of Barking and Dagenham & London Borough of Havering

Planning Reference: Pre-Application / 18/00349/FUL

Written/Researched by: Rosemary Banens & Matt Edmonds with a contribution by Robert Masefield

Project Manager: Helen Hawkins, MCIfA

Post Excavation Manager: Lucy Whittingham

Commissioning Client: CgMs part of RPS on behalf of Countryside Properties

Contractor:

Pre-Construct Archaeology Limited

Unit 54 Brockley Cross Business Centre

96 Endwell Road

Brockley

London SE4 2PD

Tel: **020 7732 3925**

E-mail: **hhawkins@pre-construct.com**

Web: **www.pre-construct.com**

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Beam Park Riverside (Phases 1 & 2): Thames Avenue, London Borough of Barking and Dagenham & London Borough of Havering, RM9 6DE

AN ARCHAEOLOGICAL ASSESSMENT
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	Name	Signature	Date
Text Prepared by:	R Banens, M Edmonds		30.11.2018
Graphics Prepared by:	R Murphy		29.11.2018
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Pre-Construct Archaeology Ltd
Unit 54
Brockley Cross Business Centre
96 Endwell Road
London
SE4 2PD

CONTENTS

Figures:

Plates:

1 ABSTRACT

1.1 This report details the results of archaeological excavations undertaken by Pre-Construct Archaeology Limited on land at Beam Park Riverside (Phase 1 and Phase 2), Thames Avenue, London Borough of Barking and Dagenham & London Borough of Havering, RM9 6DE. The site is located at central NGR TQ 50021 82962.

1.2 Three areas of excavation were commissioned by CgMs part of RPS on behalf of Countryside Properties as a result of mitigation following stages of evaluation. The evaluation results have been reported previously (Edmonds 2017a, 2017b and 2018) and are not reproduced in this assessment. The excavation works were undertaken between October 2017 and March 2018 in three main areas; Excavation Area 1, Excavation Area 2 and Excavation Area 3 (Fig. 3).

1.3 The archaeology encountered was multi-phase, with the features and deposits dating to three main historical periods: Prehistoric (Chalcolithic/Bronze Age), Roman and Post-Medieval

1.4 The underlying natural geology was encountered in two of the three mitigation areas excavated (Areas 1 and 2) and comprised sandy terrace gravels and Langley silts described as clay silt brickearth.

1.5 A complex sequence of natural alluvial and peat deposits was encountered at various depths in all of the areas excavated, especially in Excavation Area 2 where a large stepped trench was excavated (Fig. 4). In Excavation Area 1 deeper slots were carried out to further investigate these floodplain and natural deposits (Fig. 6).

1.6 Peat layers representing the prehistoric period were not encountered in Excavation Area 1 but were present in both Areas 2 and 3. Peat in Excavation Area 3 contained a number of preserved timbers including one with metal tool working dated to the Bronze Age (Appendices 3 and 11). The peat deposits in Area 2 were investigated and seem to follow the natural topography as this deposit falls towards the south at the confluence of the River Beam with the Thames. These peat deposits have also been the subject of further environmental assessment undertaken by QUEST (Appendix 12; Young et al. 2018d).

1.7 Features of a Roman date were encountered only in Excavation Area 1 as pitting. These pits were cut into brickearth and dated by fragments of Roman pottery recovered from the fills.

1.8 Alluvium was encountered in all of the excavation areas usually sealing the peat and beneath Made Ground. The upper flood deposits within Excavation Area 1 clearly formed from the Roman period onwards (as alluvium infilled the Roman pits) and is thought to have continued to form there in the medieval/post-medieval period. Upper alluvium in Excavation Areas 2 and 3 is likely to have formed from the Bronze Age onwards.

1.9 This report outlines the results of the three archaeological excavations/mitigations and assesses their importance. Recommendations for further post-excavation work are also made.

2 INTRODUCTION

2.1 This report details the results and working methods of an archaeological field excavation undertaken by Pre-Construct Archaeology Ltd (PCA). between October 2017 and March 2018 at Beam Park Riverside, Thames Avenue, Dagenham, RM9 6DE, (NGR: TQ 50021 82962). These works took place in advance of a proposed redevelopment of the site with the overall scheme comprising approximately 2,800 dwellings, with a primary school, a medical centre, and other retail uses with associated roads and landscaping.

2.2 The site boundary formed an irregular shaped piece of land with the east-west New Road (A1306) to the north and was bordered to the south by London, Tilbury and Southend (and HS1) railway. The site was located either side of the north to south flowing Beam River green corridor and was also crossed north-south by Thames Avenue (not a public road) and the elevated Marsh Way (Fig. 1).

2.3 This piece of land was formerly occupied by the Ford car assembly factory (Paint, Trim and Assembly plant) in the western area and its related car storage areas to the east on either side of the Beam River. The only remaining structures on the site comprised ten small brick buildings (Buildings 1,2,5,6,8-13) and bridges (Structures 3, 4 and 7) the majority of which were associated with this later 20th century use, including the factory's fire station and oil storage (Building 13). A National Grid compound associated with gas pipe-works was located to the east of the river. To the east of Marsh Way was hard-standing associated with the slab for the former Victor Engineering Works which once occupied this part of the site. These were recorded by Pre-Construct Archaeology Ltd from October-November 2017 and reported in a Built Heritage Recording report in December 2017 (Garwood 2017, 15-18).

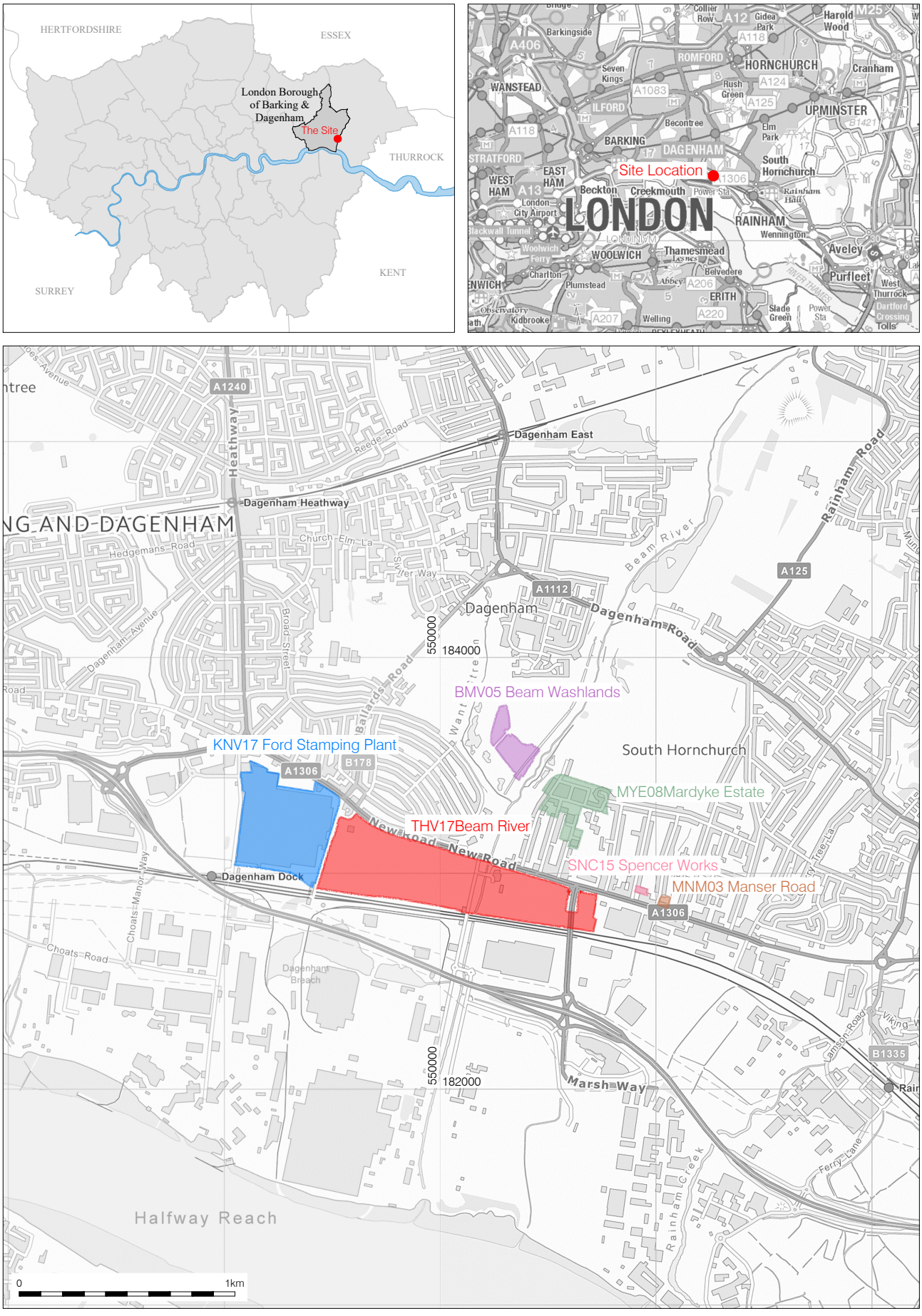
2.4 The site occupied an area of approximately 29ha within two conjoining Archaeological Priority Areas (APAs) as designated by the local planning authority; the London Borough of Barking and Dagenham and the London Borough of Havering. The APAs comprised the area east of the Beam for Havering (on the higher terrace and alluvium) and a separate APA west for the Beam for alluvium, as designated by Barking and Dagenham.

2.5 Several archaeological investigations have taken place previously in recent years (2017-2018). An Archaeological Desk-Based Assessment was written by CgMs part of RPS in 2016 with an update in 2017 (CgMs part of RPS 2017a). Following this a programme of geo-archaeological boreholes was undertaken by QUEST across the site and Desk-Based Geoarchaeological Deposit Model reports produced (Young and Batchelor 2017). These reports have been updated throughout the various stages of the project, either through new boreholes or additional information provided by PCA archaeological investigations (Young and Batchelor 2018a and 2018b). Two phases of evaluation (Fig. 2; Trenches 1-15) were undertaken across the Phase 1 and part of Phase 2 (east of the River Beam) site in early 2017 by PCA and are reported separately (Edmonds 2017a). These evaluations identified two mitigation areas which proceeded to excavation (Excavation Area 1 and Excavation Area 2; Fig. 3) discussed in this

report. A second Phase 2 evaluation (west of the River Beam), Trenches 16-25 (Fig. 2) was carried out by PCA during late 2017 and identified an area of preserved prehistoric timbers (reported separately in Edmonds 2017b). The discovery of large prehistoric timbers prompted the need for a third excavation/mitigation area (Excavation Area 3) discussed in this report (Fig 3). A final stage of Phase 2 evaluation (western extension Trenches 26-29) was conducted in June 2018 for the proposed access route alignment (Edmonds 2018).

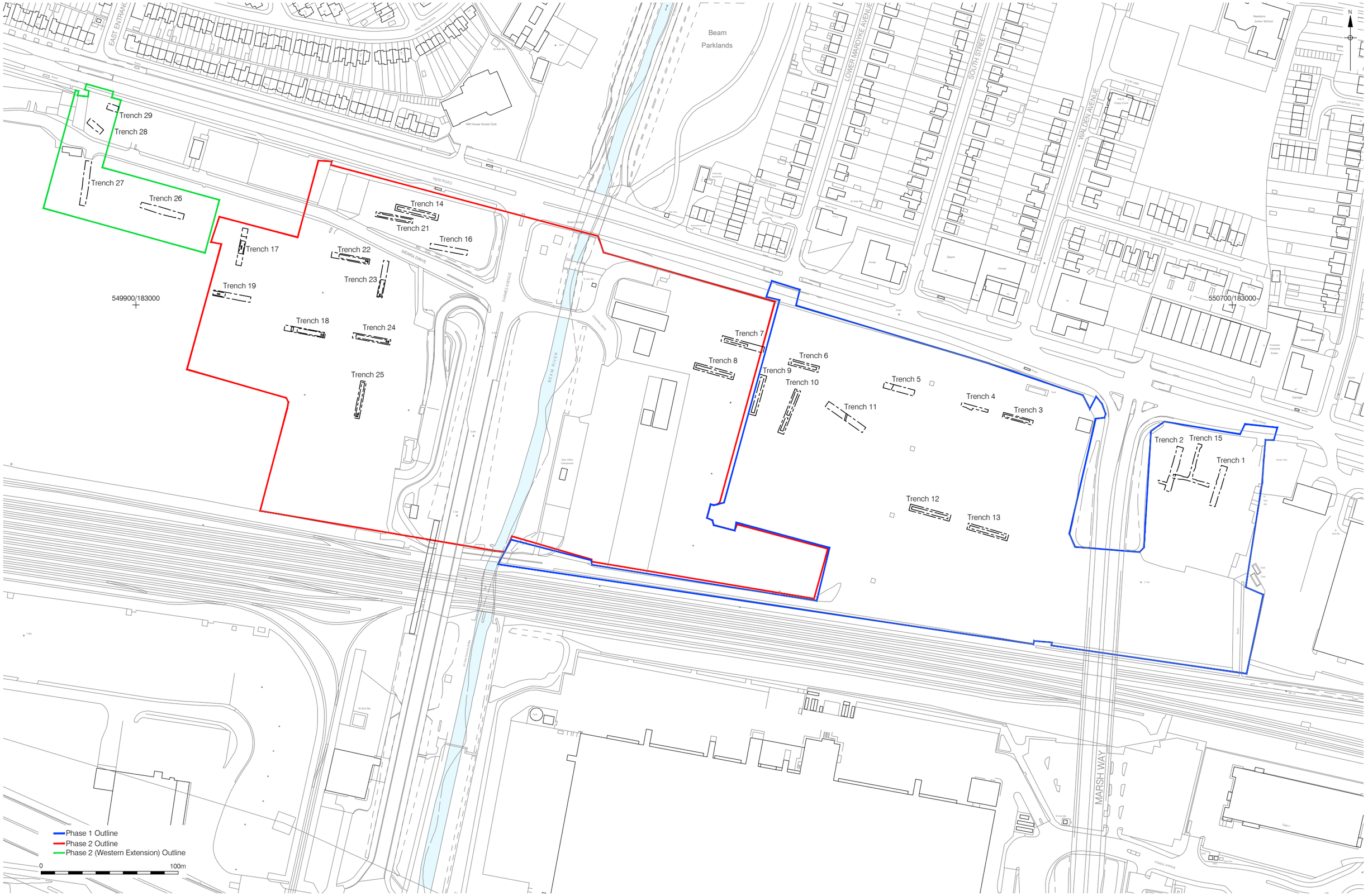
2.6 Along with the SARMS (Archaeological Strategy and Scheme of Archaeological Resource Management, CgMs part of RPS 2017, updated 2018) all of the current fieldwork methodology was detailed in a Written Scheme of Investigation (Hawkins 2017, Hawkins 2018a) and a site-specific Health and Safety Method Statement and Risk Assessment. These were prepared prior to the fieldwork and approved by the local authority.

2.7 The complete site archive comprising written, drawn and photographic records will be deposited at the Valence House Museum, Becontree Avenue, Dagenham RM8 3HT under the unique site code THV17.



06/11/18 RM

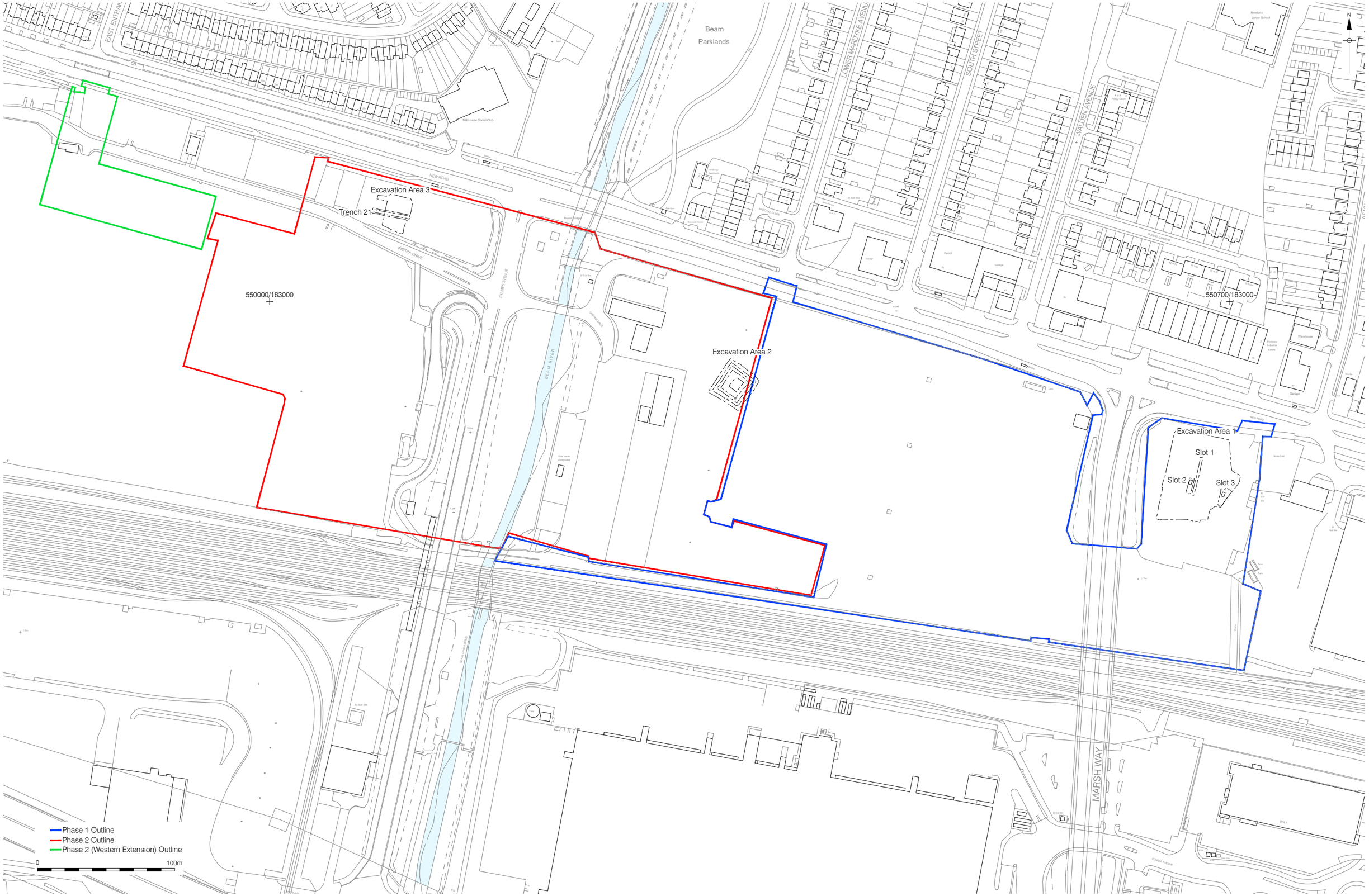
Figure 1
Site Location showing other sites in the vicinity
1:800,000, 1:250,000, 1:25,000 at A4



Based on Survey data supplied by the client, 2017

02/01/19 RM

Figure 2
Evaluation Trench Plan (1-29)
1:2,500 at A3



Based on Survey data supplied by the client, 2017

02/11/18 RM

Figure 3
Excavation/Mitigation Area Plan
1:2,500 at A3

3 PLANNING BACKGROUND

3.1 National Planning Policy Framework

3.1.1 The National Planning Policy Framework (NPPF) was adopted on March 27th 2012 (updated in July 2018) and now supersedes the Planning Policy Statements (PPSs). The NPPF constitutes guidance for local planning authorities and decision-takers both in drawing up plans and as a material consideration in determining applications.

3.1.2 In considering any planning application for development the local planning authority will be guided by the policy framework set by the NPPF, by current Local Plan policy and by other material considerations.

3.2 Regional Policy: The London Plan

3.2.1 The relevant Strategic Development Plan framework is provided by London Plan published 22 July 2011 and updated in 2016 and covers all the London Boroughs. Policy relevant to archaeology at the site includes Policy 7.8; Heritage assets and archaeology

Policy

Strategic

A London's heritage assets and historic environment, including listed buildings, registered historic parks and gardens and other natural and historic landscapes, conservation areas, World Heritage Sites, registered battlefields, scheduled monuments, archaeological remains and memorials should be identified, so that the desirability of sustaining and enhancing their significance and of utilising their positive role in place shaping can be taken into account.

B Development should incorporate measures that identify, record, interpret, protect and, where appropriate, present the site's archaeology.

Planning decisions

C Development should identify, value, conserve, restore, re-use and incorporate heritage assets, where appropriate.

D Development affecting heritage assets and their settings should conserve their significance, by being sympathetic to their form, scale, materials and architectural detail.

E New development should make provision for the protection of archaeological resources, landscapes and significant memorials. The physical assets should, where possible, be made available to the public on-site. Where the archaeological asset or memorial cannot be preserved or managed on-site, provision must be made for the investigation, understanding, recording, dissemination and archiving of that asset.

LDF preparation

3.2.2 F Boroughs should, in LDF policies, seek to maintain and enhance the contribution of built, landscaped and buried heritage to London's environmental quality, cultural identity and economy as part of managing London's ability to accommodate change and regeneration.

3.2.3 G Boroughs, in consultation with English Heritage, Natural England and other relevant statutory organisations, should include appropriate policies in their LDFs for identifying, protecting, enhancing and improving access to the historic environment and heritage assets and their settings where appropriate, and to archaeological assets, memorials and historic and natural landscape character within their area

3.3 Local Policy: Archaeology in the London Borough of Barking and Dagenham & the London Borough of Havering

3.3.1 The relevant local policy is provided by the London Borough of Barking and Dagenham & the Core Strategy, which was adopted in 2010. It contains the following policy statement with regards to the Historic Environment:

POLICY CP2: PROTECTING AND PROMOTING OUR HISTORIC ENVIRONMENT

Barking and Dagenham has a rich local history. Signs of our fishing, maritime and industrial heritage can still be seen for example at Barking Town Quay, the Ford works in Dagenham, and the Malthouse and Granary buildings on Abbey Road. The Becontree Estate, the Curfew Tower and remains of Barking and Abbey, Eastbury Manor House, Valence House and Dagenham Village are also important symbols of our past.

However, compared to many other areas the Borough has relatively few protected historic environment assets such as listed buildings and conservations areas. With this in mind the Council will take particular care to:

- Protect and wherever possible enhance our historic environment.
- Promote understanding of and respect for our local context.
- Reinforce local distinctiveness.
- Require development proposals and regeneration initiatives to be of a high quality that respects and reflects our historic context and assets.

3.3.2 The is also within the London Borough of Havering. The Borough's Core Strategy and Development Control Policies Development Plan Document Adopted 2008 contains the following polices relating to archaeology:

DC70 – ARCHAEOLOGY AND ANCIENT MONUMENTS

The Council will ensure that the archaeological significance of sites is taken into account when making planning decisions and will take appropriate measures to safeguard that

interest. Planning permission will only be granted where satisfactory provision is made in appropriate cases for preservation and recording of archaeological remains in situ or through excavation. Where nationally important archaeological remains exist there will be a presumption in favour of their physical preservation. Particular care will need to be taken when dealing with applications in archaeological 'hotspots' where there is a greater likelihood of finding remains.

Planning permission will not be granted for development which adversely affects the three Ancient Monuments in the Borough or their settings.

REASONED JUSTIFICATION

Archaeological sites of interest and their settings and Ancient Monuments are irreplaceable and, therefore, it is important that policy seeks their protection, enhancement and preservation for the benefit of current and future generations. There are three scheduled Ancient Monuments in Havering, the 14th Century Upminster Hall Barn or Tithe Barn in Hall Lane Upminster, the moated site at Dagnam Park and the Roman Road across Romford golf course.

The archaeological 'hotspots', which are areas that have a greater potential for containing remains, will be shown in the Heritage SPD. They are divided into Archaeological Priority Areas where important archaeology can be expected and Archaeological Priority Zones

Planning Permission

3.3.3 The archaeological excavations/mitigations in Areas 1, 2 and 3 were carried out in advance of an application for planning permission for the site, in order to inform the archaeological adviser to the council of the potential for archaeological survival on the site.

3.3.4 The Hybrid planning application description is as follows;

Cross boundary hybrid planning application for the redevelopment of the site to include up to 2,900 homes (35% affordable); two primary schools and nurseries (Use Class D1); railway station; up to 4,110sqm of supporting uses including retail, healthcare, multi faith worship space, leisure, community uses and management space (Use Classes A1, A2, A3, A4, A5, B1, D1 and D2); energy centres; open space with localised flood lighting; public realm with hard and soft landscaping; children's play space; flood compensation areas; car and cycle parking; highway works and site preparation/ enabling works.

3.3.5 Prior to development, surcharging of the site was necessary, which could be carried out prior to the determination of the planning application. However, as the surcharging would have an impact on potential archaeological remains, the draft conditions for the planning application were applied in advance of determination to the surcharging work.

Draft Archaeological Conditions

Condition 1:

No demolition or development shall take place in each phase of development until a stage 1 written scheme of investigation (WSI) has been submitted to and approved by the local planning authority in writing. For land that is included within each WSI, no demolition or development shall take place other than in accordance with the agreed WSI, and the programme and methodology of site evaluation and the nomination of a competent person(s) or organisation to undertake the agreed works.

If heritage assets of archaeological interest are identified by stage 1 then for those parts of each phase which have archaeological interest, a stage 2 WSI shall be submitted to and approved by the local planning authority in writing.

For land that is included within the stage 2 WSI, no demolition/development shall take place other than in accordance with the agreed stage 2 WSI which shall include:

A. The statement of significance and research objectives, the programme and methodology of site investigation and recording and the nomination of a competent person(s) or organisation to undertake the agreed works

B. The programme for post-investigation assessment and subsequent analysis, publication & dissemination and deposition of resulting material. This part of the condition shall not be discharged for each phase until these elements have been fulfilled in accordance with the programme set out in the stage 2 WSI.

Informative: Written schemes of investigation will need to be prepared and implemented by a suitably professionally accredited archaeological practice in accordance with Historic England's Guidelines for Archaeological Projects in Greater London. This condition is exempt from deemed discharge under schedule 6 of The Town and Country Planning (Development Management Procedure) (England) Order 2015.

Condition 2:

No development shall take place in each phase until details of the foundation design and construction method to protect archaeological remains have been submitted and approved in writing by the local planning authority. The development shall be carried out in accordance with the approved details.

Condition 3:

No demolition shall take place in each phase until a written scheme of historic building investigation (WSI) has been submitted to and approved by the local planning authority in writing. For buildings that are included within the WSI, no demolition or development shall take place other than in accordance with the agreed WSI, which shall include the statement of significance and research objectives, and

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

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

Informative: The written scheme of investigation will need to be prepared and implemented by a suitably professionally accredited heritage practice in accordance with Historic England's Guidelines for Archaeological Projects in Greater London.

3.3.6 An Archaeological Strategy and Scheme of Resource Management (SARMS) (CgMs part of RPS 2017b, updated 2018) was agreed as an appropriate 'umbrella document' for the archaeological project and was agreed at a meeting between Countryside Properties, Rob Masefield of CgMs part of RPS and Adam Single of GLAAS on 4th September 2017. The SARM outlined the process by which the archaeological resource on the site would be mitigated at each stage. The SARM was updating in 2018 following Phase 1 and 2 trial trenching and the completion of the subsequent Mitigation Area 1 excavation.

4 GEOLOGY AND TOPOGRAPHY

4.1 Geology

4.1.1 The geological and topographical background is taken in part from the Desk Based Assessment (CgMs part of RPS 2017a), SARMS (CgMs part of RPS 2017b as updated 2018) and environmental assessment reports prepared by QUEST (Appendix 12; Young *et al.* 2018d)

4.1.2 The British Geological Survey (BGS Website 2016) and British Geological Survey Solid and Drift Sheet 257 (BGS 1996; http://mapapps.bgs.ac.uk/geologyofbritain/home.html) records the solid geology of much of the overall site as Lambeth Group (Clay, Silt and Sand) with London Clay Formation at the extreme north-west end and extreme east end of the site. Superficial deposits of Pleistocene and Holocene date are recorded across the site.

4.1.3 Taplow Gravel Formation 'Sand and Gravel', formed up to 2 million years ago in the Quaternary Period, are present sealing the solid geology in the northern part of the site outcropping at the surface in the north-eastern corner of the Area 1 to the east of the Beam River. This was shown to be capped by late Devensian Langley Silt (Brickearth) deposits in the Phase 1 evaluation (Edmonds 2017a) and Area 1 excavation. Brickearth is only identified on the site in the northern part of Area 1 and these deposits are thought to have formed the drier ground away from the marshland associated with the River Thames at is confluence with the River Beam (Edmonds 2017a).

4.1.4 Recent geoarchaeological interventions and an updated deposit model carried out by Quaternary Scientific (QUEST), indicate that the Taplow Gravel Terrace may also occur in the extreme north-west corner of the site (Appendix 12; Young *et al.*2018d).

4.1.5 The remaining area of the site lies just to the south of the floodplain edge and is underlain by Late Devensian, late glacial gravels; Shepperton Gravel, overlain by a sequence of Holocene alluvial sediments including peat, clay, silty and sandy lenses which have accumulated and are present up to modern made ground (Appendix 12; Young *et al*.2018d)

4.1.6 A more detailed and comprehensive, site specific study and geo-archaeological deposit model was carried out by Quaternary Scientific (QUEST), which indicated that that the Pleistocene sand and gravel terrace was present at a high level in the northern part of the site (Young and Bachelor 2017, 2018 a and 2018b). The gravel terrace sloped down steeply to the south, being overlain with extensive deposits of alluvium and peat, reflecting the site's location on the periphery of the marshland of the River Thames.

4.1.7 The specialist geo-archaeological work carried out by QUEST has provided the detailed deposit model for both the Hybrid application site and the surcharging area (QUEST 2018a & 2018b). Approximately 600 borehole records have been input into a geo-archaeological model which is fine grained (Peat and Alluvium individually mapped) and relates to OD

heights. Made ground was found to be usually between 1m and 2m+ thick over alluvium which is present over most areas, apart from the higher Taplow Gravel Terrace outcropping immediately below made ground in the north-eastern area. It is considered that the gravel under the site is most likely equivalent in age to the Shepperton Gravel and is present in those areas as high as 0m to 1m OD in the north-eastern zone. The terrace edge is older – probably Kempton Park or earlier. The overlaying peat has a similar distribution but is less evident against the higher terrace.

4.2 Topography

4.2.1 The site is located within the lower valley of the River Beam and within the former floodplain of the River Thames, 1.25km to the south, on generally level ground. The site is generally flat with varying ground elevations varying between approximately 0.4m above Ordnance Datum (OD) to 2.4m OD. A decrease in elevation is present between the former Ford Paint, Trim and Assembly site (PTA) and the Beam Park site. Ground levels rise above the floodplain to the north of the Site. The Beam River tributary and its valley flows north-south through the eastern area of the Phase 2 site.

4.2.2 The Dagenham Breach is located to the south of the site and is an area of deliberately flooded marsh. The Gores Brook runs north-south c. 0.5km west of the site.

5 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

5.1.1 The archaeological and historical background is taken from the Desk Based Assessment (CgMs part of RPS 2017a) and the summary in the Archaeological Strategy and Scheme of Resource Management (CgMs part of RPS 2017b & 2018). Additional historical background information on the development of the Ford Works in Dagenham has been taken from the Historic Building Report (Garwood 2017).

5.2 Prehistoric

5.2.1 Palaeolithic

5.2.2 There are no certain Palaeolithic finds recorded on the GLHER within 1km of the centre of the site. The present Thames floodplain, within which the site is situated, represents the latest phase in the gravel terrace deposition sequence. The braided Pleistocene River Thames was a shallower and more dynamic, faster flowing river. Most former land-surfaces within the floodplain have been significantly re-worked since deposition, such that the potential for encountering in-situ 'sites' (e.g. kill sites or camp sites) within the gravels is low. Such gravels have the potential to contain redeposited flint artefacts such as handaxes and flintworking debitage and, in very rare instances, faunal remains, but the significance of these re-deposited finds is generally low given that they lack context.

5.2.3 Mesolithic and Neolithic

5.2.4 The GLHER includes several Mesolithic worked flints from the vicinity of the site including at Walden Avenue c.100m north of the eastern area of the site and c.70m to the north within a pit loosely dated as Mesolithic to Iron Age. The lower levels of peat beneath the date may date to the late Mesolithic.

5.2.5 Despite the advent of farming, the site area was almost certainly still characterised by natural low-lying wetlands of the Thames Valley floor and by the north-south flowing Beam River valley corridor. Thames-side peat deposits continued to be deposited throughout the Neolithic and the Bronze Age as confirmed by geo-archaeological and archaeological work at several locations within the study area. As in the Mesolithic, the site probably continued to be characterised by exploitation of natural resources (fishing and fowling). Local finds include the famous 'Dagenham Idol', an anthropomorphic wooden figurine radiocarbon dated to the Late Neolithic to earliest Bronze Age (Chalcolithic) period (2459-2110 BC), was discovered in 1922 during the installation of sewer pipes on the edge of the marshes near to Gores Brook, c.750m west of the western end of the overall site.

5.2.6 Bronze Age

5.2.7 Marshland exploitation continued in the Bronze Age. The transition from dry to marginal wetland environments and the importance of accessing the latter may be illustrated via a 1993 evaluation c.1km west of the site at Pooles Lane that located a Middle Bronze Age track constructed of gravel, burnt flint and sand. In terms of possible settlement, a number of

investigations beyond the site itself have located indicators. These include the 2009 investigation at the Former Mardyke Estate to the north, where a cremation was located.

5.2.8 The overall archaeological potential of the site for Mesolithic, Neolithic and Bronze Age archaeology was defined as moderate.

5.3 Iron Age

5.3.1 It seems likely that there was agricultural and possibly industrial salt production within the wider study area during the Late Bronze Age, Iron Age and Roman period. During these periods, settlement related activity and arable land would probably have been concentrated to the north, beyond the marsh land limit. The marsh itself may have been used for grazing. However, it is also possible that former marshy areas, former paleo-channels and in particular the river corridor itself, may contain isolated water management features such as revetments or bridge supports, or other water related finds (such as small boats). These were considered most likely to be located within the preserved River Beam green corridor of the development.

5.3.2 Iron Age archaeological features were identified by an excavation at 105-109 New Road Rainham, c.140m north-east of the site at the Beam Washlands site, along with a Late Iron Age/Early Roman settlement site. Archaeological potential for Iron Age settlement was, however, considered to be Low, although along with residual finds, the former presence of marsh trackways, water-management features and bridge supports of this date associated with alluvial or paleo-channels cut through alluvium could not be ruled out.

5.4 Roman-British

5.4.1 It is possible that the (apparent) farmsteads identified to the north of the site, suitably positioned above the flood plain, were the main settlements of this area. These include settlement evidence of Beam Washlands and at Lower Road/Walden Avenue (Former Mardyke Estate), c.400m to the north of the eastern area of the site, where three 'keyhole kilns' for the production of pottery have been investigated. Local Roman-British settlement activity also includes the aforementioned settlement site, cremations and industrial area at Beam Washlands. Excavation Area 1 also encountered probable clay extraction pits of Roman date along with a presently undated but potentially contemporary waterhole. Prior to the evaluations there was considered to be some potential for potential activity on the higher gravel terrace adjacent to New Road within the Phase 1 area, and a low potential for settlement presence within the Phase 2 site which was probably predominantly used as salt marsh grazing. Drainage features (cut into the surface of the alluvial marsh) were considered the most likely archaeological features to be present. On this basis it had been considered that there is a moderate potential for low density Roman archaeological remains of low (local) importance with a moderate potential for presence of other waterside activities – e.g. associated with the Beam River and former palaeo-channels (such as isolated water management features such as wooden revetments or bridge piles.

5.5 Saxon and Medieval

5.5.1 The settlement of Dagenham was first mentioned in a Charter of AD 687 and in 1086 the manor of Dagenham fell within the larger holding of Barking. Dagenham was recorded as Deccanhaam in c.690. Rainham (now with Havering) was a village by AD 811 when referred to, in a charter and in 1086 was known as 'Raineham', 'homestead village of a man called Regna'. However, there is no former Saxon or medieval village cores within close proximity of the site, with the Grade I Listed Church of St Helen and St Giles (dated from c.AD1170) central to the medieval settlement of Rainham well to the east of the site.

5.5.2 Archaeological evidence for early Saxon occupation is slight, but a gully and pit were excavated at the Beam Washlands excavation site suggesting some local settlement whilst medieval archaeology is restricted to a figurine and tokens from Lower Mardyke Avenue to the north of the site. It seems likely that the site would have been a salt marsh pasture. The archaeological potential for the site for these periods has thus been to be low for settlement and moderate for drainage features.

5.5.3 Whilst a settlement is believed to have existed at Dagenham as early as the 7th century AD, it was not mentioned in the Domesday Book, suggesting that it was then part of the substantial manor of Barking. The parish of Dagenham was in existence by the early 13th century, when reference was made to a church there. The southern part of the parish was dominated by marshland commons, which were mainly used for grazing sheep. The complex pattern of landholding in the marsh, together with the ever-present risk of flooding, discouraged local landowners from developing the marshes for commercial farming during the 17th and 18th centuries.

5.5.4 In the south-western corner of the parish lay the manor of Cockermouth, a free tenement held of Barking Abbey until 1330, when it was granted to the abbey in demesne (ibid: 267-281). The abbey retained Cockermouth until the Dissolution, following which it was leased, then sold, to Sir Anthony Browne. By the mid-19th century, the title to the manor was held by one Thomson Hankey, although it had been greatly reduced in extent during the intervening centuries.

5.6 Post-Medieval and Modern

5.6.1 The manor house of Cockermouth originally stood at the junction of Ripple Road and Chequers Lane, immediately south of the Chequers Inn. This building was demolished in the 19th century and replaced by Pound House, its name derived from the manorial pound, which occupied part of the yard. Pound House Farm descended with Westbury in Barking until 1879–80, when it was sold to Francis Sterry of Romford. In 1898, Sterry sold the farm to Samuel Williams, the developer of Dagenham Dock and founder of the eponymous shipping firm. The farm was subsequently let to tenants, before being acquired by the London County Council in 1922.

5.6.2 Although it had been proposed to build a dock at Dagenham linked by railway to the existing line at Chadwell Heath as early as 1846, it was not until Samuel Williams (d. 1899) purchased the land in 1887 that development of the dock commenced. During the next few years the foreshore was filled in and raised to the height of the river wall, following which new jetties were built, forming a tidal basin and quay. The acquisition of Pound Farm secured the remaining land on the west side of Chequers Lane, offering the company an opportunity to develop the remainder of the marsh for commercial purposes. In 1903 Samuel Williams & Sons completed a new deep-water jetty, the first concrete structure of its kind on the Thames. Five years later the company built Dagenham Dock station in conjunction with the London, Tilbury and Southern Railway. Having secured permanent access to the railway network, Samuel Williams & Sons set about building the Dagenham Dock estate. Four new factories designed by the firm of Charles Heathcote & Sons were built between 1909 and 1914 for leasing to other firms.

5.6.3 The map regression set out in the DBA (RPS/CgMs 2017) demonstrates that the site remained marshland with some use as agricultural land up to the mid 20th century with construction of the Briggs Motor Bodies and Kelsey-Hayes Wheel Company Works (Ford Stamping Plant) to the west in 1932 (now under demolition). The immediate surroundings have been developed, with residential areas to the north and the Ford Motor Works to the south. The western area of the site itself was occupied the now demolished Ford Assembly Plant c.1963.

5.6.4 The Historic Landscape Classification for the area provided by the GLHER currently identifies the site area and its surroundings as 'Industry' reflecting the remaining hard-standings associated with former Ford Motor Works. As noted above these concrete hard-standings were used for cart storage.

5.7 The Development of the Ford Works at Dagenham, 1923-1931

5.7.1 The history of the Ford Motor Company's business in Britain can be traced back to 1904, when Aubrey Blakiston imported a dozen Model A Fords, which he intended to sell to the public via the newly established Central Motor Car Company. Blakiston resigned from the company in 1906, when he was succeeded by Percival Perry as managing director. Perry (1878-1956) liquidated the firm the following year, when he set up Perry, Thornton & Schreiber Ltd to sell the newly introduced Ford Model N, which the company supplied to customers with British-made coachwork. The firm was the first to introduce the famous Model T to the global market at the 1909 London Olympia motor exhibition. Perry parted company with Thornton and Schreiber the same year, when he was invited by Henry Ford to head the Ford Motor Company's first branch in England.

5.7.2 In 1911 the Ford Motor Company (England) Ltd was established to manufacture Ford cars specifically for the British market, the first Ford company to be set up outside North America. Perry found a disused tramcar factory at the Trafford Park trading estate near Manchester

which the company converted into an assembly works for its cars. A local coachbuilder was acquired by the company in 1912 to build vehicle bodies for the British market. By 1914 the Trafford Park factory had been fitted with one of Ford's innovative moving assembly conveyors and was producing chassis at a rate of 21 per hour. During the First World War the factory was used to manufacture modified Model T cars for use by the armed forces, in addition to the production of shell casings. A subsidiary factory was established by the firm at Cork in southern Ireland, intended originally for the manufacture of Fordson agricultural tractors.

5.7.3 Following the end of the First World War, the company began to search for an alternative production site to Trafford Park, which was too small to permit future expansion. Although Perry found and purchased a site at Southampton, which offered the deep-water access demanded by Henry Ford, the scheme did not receive the wholehearted backing of the American company and it was subsequently sold off in the 1920s. Perry resigned from the company's service in 1919, entering into a partnership with Noel Mobbs of the Pytchley Autocar Company to acquire a disused military transport depot at Slough, which they developed as the phenomenally profitable Slough Trading Estate. Knighted for his services during the First World War, Perry retired to the Channel Islands three years later.

5.7.4 During the early 1920s Ford's share of the English market began to decline, as the company suffered from the effects of protectionist legislation such as the 1920 Motor Car Act and the import duties imposed upon components manufactured at the company's Cork factory following the creation of the Irish Free State in 1922. The company's search for a new manufacturing site in mainland Britain intensified, culminating in the discovery in 1923 by Edward Grace (manager of the Cork works) of an area of undeveloped land close to Dagenham Dock station. Although the site was notoriously marshy, comprising areas of rough grazing interspersed with rubbish tips piled high with London's waste, the company purchased 295 acres of land from Samuel Williams & Sons for £150,000 in May 1924. Owing to financial uncertainties brought about by continuing falls in Ford sales in Britain, development of the site was delayed until later that decade.

5.7.5 In 1927 Ford finally ceased production of the Model T after 19 years of continuous production. The launch of the new Model A was accompanied by an in-depth review of the company's European operations conducted by Henry Ford himself. Ford conceived an ambitious plan whereby the British operation would become "a Detroit in miniature, a virtually self-sufficient manufacturing colossus supplying and controlling a chain of 11 European assembly plants". In order to implement what became known as Ford's '1928 plan', Sir Percival Perry was coaxed out of retirement. Perry recruited A.R. (Rowland) Smith from Standard Cars to take charge of Ford Britain's new manufacturing operation. The new Ford Motor Company Ltd was successfully floated in December 1928.

5.7.6 Work on the new Dagenham factory began the following May, when a groundbreaking ceremony was held on the site, attended by Henry Ford's son Edsel and Sir Percival Perry.

Sir Charles Heathcote & Sons (architects of Samuel Williams' Dagenham Dock factories) were appointed architects to the scheme, whilst Sir Cyril Kirkpatrick was taken on as consulting engineer. An area of 66 acres was earmarked for the Ford factory itself, construction of which was preceded by a programme of site levelling and stabilisation, which necessitated sinking 22,000 concrete piles in the marshy ground to a depth of up to 80ft. The factory itself was built over a period of two years on concrete rafts laid on top of the piles. Amongst the buildings erected by Ford at Dagenham were a riverside power station, which from 1936 was illuminated at night by a Ford sign visible from 20 miles away, a foundry, coke ovens, gas plants and a blast furnace, together with the largest private wharf on the Thames. By the time that production commenced at Dagenham in the autumn of 1931, the company had spent some £5 million on the works and faced an uncertain future in an economy mired in the depths of the Depression.

5.8 The Briggs Motor Bodies and Kelsey-Hayes Wheel Factories at Chequers Lane, 1930-1954

5.8.1 Having previously made a fortune from the development of the Slough Trading Estate, Sir Percival Perry appreciated the potential profits that might be made from establishing a similar enterprise at Dagenham. The company therefore set about purchasing additional parcels of land adjoining the works, acquiring a total holding of approximately 600 acres by 1932. The first part of the estate to be developed lay on the east side of Chequers Lane, in an extensive plot bordered by the New Road to the north and the London to Tilbury railway line to the south. New roads named Kent Avenue and Norwich Road were laid out across the site in anticipation of the arrival of business tenants. In the event, the only companies to set up factories on the Chequers Lane estate were closely connected with Ford itself, most notably the British subsidiaries of existing North American Ford suppliers the Briggs Manufacturing Company and the Kelsey Hayes Wheel Corporation, both of Detroit. By the late 1930s these companies had been joined by W.J. Reynolds (Motors) Ltd, a main dealer of Ford cars and Fordson commercial vehicles (TNA HO 192/1486).

5.9 Briggs Motor Bodies Co. Ltd

5.9.1 The Briggs Manufacturing Company was formed out of an existing coach building company by Walter Owen Briggs of Detroit in 1909. From the outset the company manufactured interiors for the Model T, following which it concentrated the manufacture of closed coach bodies for Ford. The company was successfully floated in 1924, whilst the following year it manufactured half a million automobile bodies and turned a profit of $11 million, giving shareholders an astonishing 200% dividend. The United Kingdom subsidiary appears to have been established as two separate concerns, a private company called Briggs Motor Bodies and the Briggs Trust Limited, the latter of which held the company's assets (TNA BT 31/37769/303263). In a lease dated 6th June 1932 between the Ford Motor Company and Briggs Motor Bodies for 99 years from 24th June 1931 the former demised the Chequers Lane site (containing an area of approximately 80,433 square yards) to the latter for a rent of £2849 per annum.

5.9.2 On 24th July 1935 the nominal capital of Briggs Motor Bodies was increased from £1,000 to £1 million through the issue of 999,000 ordinary shares of £1 each, and the business was reconstituted as a public company. The company was established with the object of carrying on "the business of designers, builders and manufacturers of motor bodies for use in connection with motor vehicles of any description". The company purchased the undertaking, business and assets of Briggs Trust Ltd in consideration of 599,993 ordinary shares. Whilst the Earl of Granard was appointed Chairman of the new company, the Board was dominated by directors of the American parent company, including Walter Owen Briggs himself, Robert Pierce and William Dean Robinson.

5.9.3 The Briggs Motor Bodies plant manufactured all of the coachwork for Ford's Dagenham works, together with that for the company's eleven European satellites in the early 1930s. The earliest bodies built by the plant comprised ash frames to which steel panels were attached. The pressings were comparatively small, welded together in jig tools that located the body panels by pneumatic pressure. Whilst the method of construction was said to have resulted in stronger bodies than those assembled from larger panels, it meant that the plant was unable to stamp out metal roof panels during the 1930s. Aside from windows and seat trim, which were fitted in the Ford plant, Briggs supplied ready trimmed and painted bodies to the neighbouring works.

5.10 Post-Second World War

5.10.1 Within weeks of the end of fighting in Europe, the Ford plant at Dagenham was gearing up to build cars to meet the anticipated demands of peacetime. Post-war austerity, punitive tax rates on the motor industry, petrol rationing and fuel shortages combined to suppress demand for private cars in the United Kingdom, forcing Ford and other companies to concentrate on export sales. Notwithstanding the gloomy economic outlook, Ford Britain took over the Kelsey Hayes Wheel Company in 1947.

5.10.2 Following the expansion of its manufacturing activities during the Second World War, Briggs Motor Bodies reduced the extent of its operations during the post-war period. By 1948 the workforce had fallen to less than 6,000. In order to maintain the company's finances, Briggs continued to build bodies and components for rival motor manufacturers, including Austin, Rootes, Standard, Leyland and Chrysler. The death of Walter Owen Briggs in 1953 and the threat that Ford's American rival Chrysler would purchase his company provided an opportunity for Ford-Britain's Managing Director, Sir Patrick Hennessy to gain possession of the firm's British holdings. The Detroit parent company approved Sir Patrick's plan, and the British company was sold to Ford-Britain for the very reasonable sum of £3.2 million the same year.

5.11 The Briggs Motor Bodies Works under Ford ownership 1954-2002

5.11.1 The acquisition of Briggs Motor Bodies Ltd by Ford-Britain led to a number of significant changes at the Chequers Lane plant. In 1954 Sir Patrick Hennessy launched an ambitious

expansion and modernisation programme at Ford, which was intended to enable Dagenham to build as many as 2,000 vehicles per day. A critical element of the scheme was the remodelling and re-equipping of the Briggs plant (known as the stamping plant). In 1954, the layout, design and construction of a new Paint, Trim and final Assembly (PTA) building on the former 48 acre Ford sports ground on the opposite (east) side of Kent Avenue. The latter is shown on the Ordnance Survey map of 1950.

5.11.2 The new building was a two-storey construction that included a facilities block, receiving bay and final assembly section, including body upholstery and fitting known as body trim. The first floor contained the phosphating plant and rinse, new paint shop, the wet sand decks and the drying ovens. The first floor was also linked by means of a large conveyor to the 'Body in white' plant to the west of Kent Avenue. The new PTA occupied an area of 250,000 square feet and was to be totally automated. When finished, the PTA building contained nine miles of conveyor track controlled by 1,200 miles of electric cabling. The north side of the plant comprised the facilities block: for admin staff, canteens, kitchens and medical centre. Ancillary buildings, which housed plant or services, were situated along the north and south sides of the main building, including amongst others the Fire Station, Oil store and pump house, storm water pump house and sewage pump house. The latter was required due to the low level of the site and the need to elevate surface water and sewage by pumping to avoid flooding. To lessen the risk of surface water, the ground levels over the site were raised by c. four feet. The site of the PTA and a number of ancillary buildings are shown on a mid 1950s plan of the site while a later Estate Site Map published around 1970-1 shows the PTA and the Traffic Compound; the latter on land to the east of Thames Avenue.

5.11.3 In November 1960, Ford America announced that it intended to buy up the 45.4% shareholding in Ford-Britain that remained in private hands in order to further integrate its operations and increase marketing effectiveness in both countries. The parent company paid nearly £120 million for the outstanding 17,726,804 shares the following January. The move resulted in a diminution of Dagenham's role at the centre of the company's British operations, accompanied by a process of decentralisation that increased as the decade progressed. The styling, engineering and prototype divisions all migrated from Dagenham to Aveley (Essex) in 1960, while a new manufacturing plant capable of building 1,000 vehicles per day opened at Halewood on Merseyside in October 1963. The headquarters of Ford's operation in Britain, and subsequently Europe, relocated to a purpose-built office complex at Warley in Essex.

5.11.4 As other factories and divisions of Ford elsewhere in Britain and Western Europe took up an increasing share of production during the 1970s, so the importance of Dagenham to the company declined. While engine production continued to be a mainstay of the plant's output, the number of car lines built at the plant fell to one (the Fiesta) in the 1990s. Owing to falling sales and over-capacity in Europe, the company announced in early 2000 that it would axe 1,500 jobs at Dagenham. The same year the company announced that the PTA plant would close in 2002, with the loss of a further 1,900 jobs. As vehicle assembly ceased to be an

element of the company's operations at Dagenham, the company invested instead in the construction of a new diesel engine plant, which continues to operate to the present. The PTA plant was demolished in 2004.

5.12 Archaeological Investigations in the Vicinity

5.12.1 There have been a number of investigations in the surrounding area.

5.12.2 In 2004 an excavation by Compass Archaeology on land at Manser Road, approximately 600m to the north-east of the subject site yielded a blade of early Mesolithic to late Neolithic date. In addition, the area revealed several large pits and many other smaller features such as stake and postholes, as well as substantial quantities of burnt/fire-cracked flint, fired clay and charcoal. Several of the pits also exhibited evidence of in situ burning and the post-holes could be an associated structure. Many of these features were associated with a burnt mound which was provisionally dated to the mid/late Bronze Age (Compass Archaeology 2004).

5.12.3 An excavation by Oxford Archaeology in 2005 and 2006 at Beam Washlands, approximately 400m to the north of this excavation, discovered flint artefacts of Mesolithic date. These were encountered within alluvial deposits which filled the Wantz stream; a tributary of the Beam River (Champness and Donnelly 2011). Further fieldwork unearthed evidence of late Iron Age early Roman enclosure ditches, settlement features such as pits and post-holes and a concentration of hearths / kilns, which may relate to pottery production. Further Roman phases were also identified on the site with an open area to the south identified agricultural features such as water-holes, field boundaries and a cremation cemetery. Further evidence of pottery production with features such as kilns was also identified as well as late Roman phases of ditch maintenance and pits (Biddulph *et al*. 2010).

5.12.4 In 2009 Museum of London Archaeology (MOLA) carried out an excavation on 105-109 New Road, approximately 400m north-east of this excavation. At the centre of the excavation a group of four pits contained an assemblage of Beaker pottery dating to the Early Bronze Age. Associated finds comprise struck and burnt flints which include a barbed and tanged arrowhead. A number of features associated with the Iron Age and Roman were also revealed (Bull 2014).

5.12.5 In 2013 PCA excavated a multi-period site at the Former Mardyke Estate; approximately 600m north of this excavation, which revealed an agricultural landscape dating from the Bronze Age to the Roman period. Some similar features to the Washlands site were present with evidence including pits and post-holes associated with settlement activity to the north and evidence of field systems to the south. Evidence of pottery production was also present on site with the discovery of several Roman kilns (Hawkins 2018b).

5.12.6 In 2016 PCA also excavated a site, approximately 400m north-east of this fieldwork, on land at Spencer Works, Spencer Road where prehistoric pits, post-holes and ard marks were identified. Their excavation and analysis suggested they relate to relatively low-level

prehistoric activity, associated with agriculture and some peripheral activity to the more extensive prehistoric activity uncovered at the Manser road site close by (Buczak 2016).

5.12.7 Recent fieldwork in 2017 and 2018 has been undertaken, on a neighbouring site to the west of this excavation, at the former Ford Stamping Plant, Kent Avenue. A ten trench archaeological evaluation revealed early prehistoric peat beds and environmental features, pits dated to the Iron Age as well as medieval pits and post-holes (Seddon 2018).

6 ARCHAEOLOGICAL METHODOLOGY

6.1 Project Design, Sequence and Duration

6.1.1 The archaeological works were undertaken according to separate Written Schemes of Investigation for each excavation area (Hawkins 2017 and 2018a) which were approved in advance by Adam Single (GLAAS) Archaeological Adviser to the London Borough of Barking and Dagenham & the London Borough of Havering.

6.1.2 The archaeological fieldwork saw the excavation of three areas, Area 1, Area 2 and Area 3 (Fig. 3). The dimensions and highest and lowest levels of the excavation areas are tabulated below:

Excavation Area	Length	Width	Depth	Highest level	Lowest level
Area 1	67.00m	53.00m	1.17m	1.66m OD	0.49m OD
Area 2	25.00m	25.00m	5.49m	2.12m OD	-3.37m OD
Area 3	30.20m	15.00m	1.38	0.32m OD	-1.7m OD

6.1.3 Area 1 was located in the east of the Phase 1 site and was an irregular shaped area designed to avoid contaminated areas and encompasses the area where archaeology was found in the evaluation. The archaeology was located directly below the slab, in the top of the surviving brickearth and gravel. Alluvial deposits exposed in the south of the excavation area were investigated with a sondage to establish their depth and nature (Fig. 4).

6.1.4 Area 2 was located in the west of the Phase 1 and east of the Phase 2 area (to the east of the Beam River), where peat deposits were identified in the evaluation (Figs. 3 and 6). This excavation area was designed to be stepped (four steps in total) to reach the top of the natural gravel which was approximately 6m BGL (Below Ground Level). Initially the area was excavated by machine to the top of the peat after which it was hand-dug across the trench to investigate for any prehistoric cultural remains. Once the hand dug trench was complete the area was machined to the top of the natural sand and gravel (Plate 11).

6.1.5 Area 3 was located within Phase 2, to the west side of the Beam River, to include Trench 14 from the initial evaluation and Trench 21 from the second stage of evaluation, both of which found prehistoric timbers (Figs. 3 and 8). This area was designed to be stepped (one step in total) to achieve a maximum depth of 2m BGL where the peat could be fully investigated and the prehistoric timbers recorded. A central baulk was retained within Excavation Area 3 by which to record the stratigraphic sequence in Sections 60 and 61 (Fig.8)

6.1.6 Across the Phase 1 and 2 site all excavations were initially undertaken by a mechanical 360 excavator with a toothless bucket under archaeological supervision. This was carried out in controlled spits of up to 100mm until archaeological deposits, features or structures were encountered. These were then cleaned, investigated and recorded by archaeological staff using hand tools.

6.1.7 Trenches were CAT scanned after each spit was removed to check for buried services which were not marked on the service plan.

6.1.8 All site records were identified using the unique Museum of London site code THV17, which was allocated to the site by the London Archaeological Archive (LAARC) in 2017 at the start of the archaeological works.

6.1.9 The investigation of all significant archaeological deposits, features and structures were undertaken by full-time archaeologists employed by PCA. All significant deposits and features were assigned individual context numbers and recorded using the standard Museum of London single context recording system. Context information was recorded on pro-forma context sheets and all plans and sections were dawn at a scale of 1:20 and 1:10 respectively on polyester based drawing film (permatrace).

6.1.10 A full photographic record of the site was maintained in HQ digital photography.

6.1.11 All finds from the site were retained for off-site assessment. Samples were taken from appropriate contexts for off-site processing and assessment.

6.1.12 A grid was established in all three excavation areas and was tied into the Ordnance Survey Grid.

6.1.13 Site levels and datums were established from spot heights and Temporary Bench Marks (TBMs) were established on the site by the PCA surveyor using GPS survey equipment.

6.1.14 Upon completion of all phases of work the archive will be submitted to Valence House Museum, Dagenham, for the deposition under the site code THV17.

7 ARCHAEOLOGICAL SEQUENCE

7.1 Introduction

7.1.1 The following text is an overview of the archaeological sequence recorded during the excavation. Full individual context descriptions and Ordnance Datum levels are detailed in Appendix 1. The specialist assessments are referenced within the archaeological sequence, and the full specialist assessment reports reproduced as Appendices.

7.2 Phase 1: Natural Drift Geology

7.2.1 An updated geoarchaeological deposit model for the site undertaken by Quaternary Scientific (QUEST) determined that the majority of the site lies on the Lambeth Group bedrock and is overlain by Holocene alluvium across much of the site (Appendix 12; Young *et al.* 2018d). From the geoarchaeological deposit model created for the site, it can be demonstrated that Late Devensian Shepperton Gravel underlies most of the site and that a Taplow Gravel terrace is present to the north and seen in the north-east and north-west edge of the site. The Taplow Gravel terrace was recorded at the base of the archaeological sequence in Excavation Area 1.

Excavation Area 1

Sand and Gravels (Taplow Gravel terrace)

7.2.2 The majority of the natural deposits recorded during the Area 1 excavation were seen in the section of Slot 1 cut north-south across the excavation area (Fig 5; Section 34)

7.2.3 The earliest deposit recorded was a layer [92] of light yellowish grey sand with occasional lenses of grey silty clay. This natural deposit was 0.09m in thickness although it continued beyond the base of the slot and it was recorded at a highest level of 0.09m OD (Fig. 5; section 33).

7.2.4 Sealing this layer was another natural deposit [91] which was described as a mid to light orangey grey sand with bands of light yellowish grey sand and some patches of darker orange clay mottling (Plate 3). This natural deposit had a thickness of 0.35m and was recorded at a highest level of 0.49m OD (Fig. 5 section 33).

7.2.5 At the northern end of Slot 1 the earliest deposit recorded [100] was a layer of light yellowish sand with occasional lenses of orange sand and grey silty clay (Fig. 5 section 34). This natural deposit was 0.25m in thickness though it also continued beyond the base of the slot and was recorded at a highest level of 0.66m OD.

7.2.6 Sealing [100] at the northern end of Slot 1 was another natural deposit layer [105], was also recorded in section (Fig.5 section 34). It was described as a firm mid orange silty sand with yellowish grey mottling and occasional lenses of light-yellow sand. This natural deposit had a recorded thickness of 0.15m continuing beyond the base of the slot with a highest recorded level of 0.80m OD.

Langley Silts (Brickearth)

7.2.7 Sealing the natural sand and gravels in the northern part of the Excavation Area 1 was a layer [55] of mid orange brown sandy silty clay which was interpreted as natural brickearth (Langley Silt) (Fig. 5, section 34, Plates 1 and 2). This was encountered at a highest level of 1.30m OD in the northern half of Excavation Area 1. The top of the brickearth had a slight fall towards the south-east with a recorded level of 1.00m OD in this part of the excavation area.

7.2.8 This layer was also identified during the first evaluation and seemed to be present exclusively in this most northern part of the site.

7.3 Phase 2: Lower Alluvium

Excavation Area 1

7.3.1 The earliest deposits in this area were layers of Upper Alluvium [90], [94] and [99] recorded in the section located in Slot 1 and sealing natural sand and gravel layers (Fig 5; sections 33 and 34). These deposits were firm light grey with orange mottling silty clay with occasional lenses of yellow sand. They had a recorded thickness of between 0.25-0.35m with a recorded level of between 0.84m OD and 0.64m OD at the southern end of the excavation area and recorded levels of between 1.16m OD and 1.06m OD at the northern end of the excavation area.

7.3.2 Sealing these layers were further layers [89] and [93] of Upper Alluvium which were also recorded in the section located in Slot 1 (Fig 5; section 33). These deposits were very similar to [90] and [94] but did not have the mottled appearance or lenses of yellow sand. These layers were 0.40m in thickness and located between 1.04m and 0.74m OD.

7.3.3 A thin layer [96] of alluvium was also identified relating to this phase which was very similar to [90] and [94] but was encountered in Slot 1 and recorded in section (Fig. 5; section 34). This layer was described as firm mid to light grey clay with occasional lenses of sand. It was 0.10m in thickness and had a recorded level of between 1.36m OD and 1.16m OD.

7.3.4 No dating material was recovered from the alluvial layers, but their location and height suggests that they were of a later date to the lower alluvium found elsewhere on the site.

Excavation Area 2

7.3.5 The earliest recorded deposits encountered in this excavation area were a series of gravelly sand and silty Lower Alluvium layers. Layer [164] was a soft light grey sand with occasional lenses of angular gravels. The layer was recorded in section and encountered at a highest level of -3.37m OD (Fig. 7; section 100).

7.3.6 Sealing this earliest natural deposit was another layer [163] of soft light grey clay sand with some darker patches of orange yellowish sand. This layer was also recorded in section (Fig. 7; section 100) and encountered at a highest level of -2.97m OD. These layers were recorded

in column samples <1>-<4> in sections 100 and 102 where they have been categorised as Lower Alluvium (Young *et al.* 2018c).

7.3.7 Further natural sandy deposits were seen in layer [162] of Lower Alluvium (Plate 9) recorded in section (Fig 7; sections 100 and 102). The layer was described as a firm mid to light brownish grey silty sandy clay with occasional small sub-angular stones. It had a recorded thickness of 1.20m and a highest level of -2.18m OD.

7.3.8 Overlaying this main unit of Lower Alluvium was another thick layer [169] of Lower Alluvium. Slightly more mixed than the deposit [162] in this excavation area this layer was located in the northern half of the excavation area and recorded in section (Fig 7; sections 100 and 102).

Deposits associated with buried land surfaces (Excavation Area 2)

7.3.9 Located in the north-eastern corner of Excavation Area 2 was a sequence of deposits associated with potentially high dry ground on the edge of the peat marsh (Fig 7 section 100). These deposits were closely associated with the peat and may have formed under different, potentially drier conditions. These layers have been identified in the Environmental Archaeological Assessment (Phase 1) as part of the Lower Alluvial sequence (Young *et al.* 2018c, Table 8, Area 2, Section 100 column <3>) but further micromophological analysis was recommended for this column sample to test for soil formation (Young *et al.* 2018c, 22 and 69). The presence of a sherd of potential Neolithic/Bronze Age date in context [167] also indicates that these layers are associated with occupational activity.

7.3.10 The earliest deposit in this sequence was a layer [172] of alluvium and gravel which was described as a firm mid to light greyish brown, brownish grey sandy clay gravel with frequent small sub-angular stones. The layer was recorded in section with dimensions of 3.10m in length and 0.32m thick and was encountered at -0.83m OD (Fig. 7; section 100).

7.3.11 A sandy clay layer [168] was recorded in section in the north-east corner of the excavation area and was described as a firm mid to light grey brown clay sand with occasional small sub-angular stones and remains of rooting. The layer was recorded in section with dimensions of 1.87m in length and 0.22m thick, and it was encountered between -0.67 and -0.77m OD (Fig. 7, section 102).

7.3.12 Sealing layer [168] was another clay layer [167] which was also recorded in section in the north-east corner of the excavation. The layer was described as mid to dark grey brown silty clay with occasional small to medium sub-angular stones and had recorded dimensions of 2.35m in length and 0.40m in thickness. This layer was encountered between -0.27 and -0.37m OD. (Fig. 7, section 102). A very abraded flint-tempered pottery sherd potentially of Neolithic/Bronze Age date was found in context [167] (Appendix 6).

7.3.13 Sealing layers [167] and [172] was a thin layer of gravel [170] described as firm mid greyish brown silty clay gravel with frequent medium to large sub-rounded stones. The layer was

recorded in section and had recorded dimensions of 2.82m in length, 2.45m wide and a thickness of 0.20m, with an upper level of -0.17m OD (Fig. 7 section 100 and 102).

7.3.14 Sealing the gravel layer [170] was a layer of mixed alluvium [171] which was recorded in section in the north-eastern side of the excavation area. The layer was described as a firm mid to dark brown silty clay with occasional charcoal flecks and small to medium sub-angular and sub-rounded stones. The layer had recorded dimensions of 2.75m in length and 0.10m thick at a level of -0.73m OD (Fig. 7, section 100).

Excavation Area 3

7.3.15 The earliest deposit encountered during the excavation of Area 3 was grey sand layer [238]. Visible at the base of a small sondage through the peat, this layer was encountered at a height of -1.70m OD and could represent the Lower Alluvium stratified beneath the peat. A burnt piece of flint and a possible Neolithic-Bronze Age core-flake/?tool were recovered from the surface of [238].

7.4 Phase 3: Peat and Prehistoric Activity

Excavation Area 1

7.4.1 In Area 1 only one feature was recorded relating to Phase 3, a well/waterhole [84] located in the southern half of the Excavation Area 1 in Slot 1 (Fig 4, Plates 4 and 5). This deep circular feature [84] measured 1.40m in diameter and 1.00m in depth at 1.04m OD (Fig 5; section 33). Cutting into the natural Phase 1 deposits [89] and [93], the hole was filled by [83] and [88] (Fig. 5, section 33). The primary fill [83], of 0.30m thickness, was a soft dark brown silty sand with peat/organic material, occasional sub-rounded stones and charcoal flecks. In addition the recovered assemblage of 28 butchered animal bones, mainly composed of cattle and pig, was reminiscent of a Roman collection of animal waste (Appendix 7). The upper fill [88] was a firm mid to dark brownish grey silty clay with occasional charcoal flecks and had a recorded thickness of 0.25m.

7.4.2 This feature was initially interpreted as a well or waterhole, most likely from the Roman period. The primary fill of peat/organic material suggested that this feature was cut into the natural gravel terrace and through peat which had accumulated from the Late Mesolithic period onwards. The animal bone assemblage was more typical of a Roman assemblage (Appendix 7), suggesting that this feature could be of a later date than first thought or subsequently backfilled again in the Roman period. Examples of well/waterholes have also been identified in the nearby site at the Beam Washlands Reservoir site (Fig. 1; BMV05) where they were dated as Roman (Biddulph *et al.* 2010, Biddulph *et al*. 2007,) Burnt flint debris and a 'burnt mound' usually associated with the mid to Late Bronze Age have been identified at Manser Road to the east of Beam Park (MNM03; Compass 2004, 4).

Excavation Area 2

Peat Deposits

7.4.3 Sealing the Lower Alluvium was a thick layer [161] of peat described as a soft dark brown sandy silt with a high organic content which consisted of fragments of twigs, leaves and larger fragments of wood as well as fragments of less identifiable organic material. The layer had a recorded thickness of 0.80m and was encountered at -1.38m OD (Fig. 7; section 100). The occurrence of a single piece of disarticulated human bone (fibula) (Appendix 9) in this peat layer [161] most likely represented a flooding event having disturbed a burial site further to the north or is an isolated bone from a dispersed prehistoric exposure burial and did not represent the use of this floodplain for articulated burial.

7.4.4 One of the earliest deposits towards the northern end of Excavation Area 2 was layer [166] of organic clay. The layer was described as a firm mid brownish grey to dark grey silty clay with occasional small to medium sub-angular and sub-rounded stones and lenses of organic material such as decayed plant roots and vegetation. This layer had overall dimensions of 7.45m in length, 2.25m wide and a thickness of 0.30m. It was recorded between -0.27m OD and -0.37m OD.

7.4.5 Layer [166] (Fig. 7, section 102) has been interpreted as being a layer of peat. This deposit contained a single fragment of weathered animal bone identified as the tibia of a large red deer (Appendix 10).

7.4.6 A further thinner layer of alluvial peat [165] was identified in the north-western corner of Excavation Area 2, overlaying peat layer [166]. This layer was similar to peat layer [161], although it seemed to have the characteristics of an organic rich soil rather than the full units of peat identified in other parts of the excavation area and during earlier stages of fieldwork. This layer was placed in the Upper Alluvial sequence upon review of the column samples (Quest 2018). This layer was described as a soft dark brown clay silt with frequent fragments of identifiable plant and tree remains. The layer had overall dimensions of 7.45m in length, 2.25m wide and a thickness of between 0.20m and 0.50m. It was recorded at -0.17m OD (Fig. 7, section 102).

7.4.7 A large timber was discovered in this peat layer [165] which was initially thought to have been worked but on closer inspection it was concluded to be a naturally rotted out tree that had collapsed into the edge of the marsh (Plate 10). The top half was largely rotted away which is common in prehistoric felled trees (Goodburn pers comm). The main part of the tree which had survived was the bark and the outer wood, this suggests that it was oak or alder as these species have bark that often survives better than the timber itself in the Thames flood plain peat (Goodburn pers comm). The survival of this wood gives an insight into the environment in this part of the Thames flood plain, creating the image of trees lining the edge of this watery environment.

Excavation Area 3

7.4.8 A peat layer, recorded in plan as [208] (Plate 12), covered the entirety of the excavation area, overlying earlier sand deposit [238] of Lower Alluvium. A mid-dark grey brown clayey peat, this layer contained occasional small round wood. Possible evidence of episodic drying was demonstrated by clean alluvial clay infilling cracks within the peat. A possible Mesolithic/early Neolithic struck flint blade (Appendix 7) was recovered from this layer. Across the site, thirteen timbers were recorded within this peat layer in Excavation Area 3 (Fig. 8, Plate 14). The majority of these timbers were unworked yew x7, oak x3 and ash x1 which had been felled naturally (Appendix 5 Table 1). In the north-east corner of the site were two possible oak trees, [231] and [232], which extended to the north-west and south-west respectively. Measuring between 2.4m and 2.7m in length, these timbers continued into the limit of excavation. They were encountered between -0.91m OD and -1.06m OD, with diameters ranging from 0.2m to 0.4m. Seven samples of timber were identified from the previous evaluation Trench 21 as yew x4, and alder x3 (Appendix 5).

7.4.9 Of particular note was a Yew tree [215] <33> of 5.9m in length, which, after having fallen naturally, had been worked (Figs. 8 and 10, Plate 18). An area of neatly cut regular notching was observed; these chiselled grooves are thought to have been cut by an early metal chisel, as some of the grooves appear to be too fine for a bone or antler chisel (Appendix 3) and may be Chalcolithic in date (Plates 19-22). This tree also had localised charring, both at the roots and on the top of the log to the south-east of the chisel notched area. The worked tree trunk and its significance is discussed in detail by Damian Goodburn (Appendix 3). A burnt timber, [237] <30>, immediately to the west of the roots of tree [215] <33>, is thought to have possibly been part of the root system of [215]. Radiocarbon dating of these timbers has returned a date range of 2470–2297calBC (SUERC-79156 (GU47859); Appendix 11) for [215] <33> and a date range of 2466–2296 calBC for [237] (SUERC-79161 (GU47861) Appendix 11). When [215] <33> fell, it knocked over a smaller tree, [236] <24>; this small yew has been radiocarbon dated to 2498–2344 calBC (SUERC-79157 (GU47860) Appendix 11). Tree [236] was overlain by both [215] and [230], another small yew.

7.4.10 Extending north-south across the site was a large oak tree [216] <31> (Plate 15). Measuring 14.48m in length and 0.8m in diameter, this timber was originally observed in evaluation Trenches 14 and 21. The ‘crown end’ of the tree lay to the south, with decay along the trunk indicating that the oak fell from the slightly higher ground to the north into the wetland extending southward. During the evaluation stage, wood fragments resting on top of [216] were radiocarbon dated to 2706–2566 calBC (SUERC-76662 (GU46221) Appendix 11).

7.4.11 Near the root end, [216] <31> was overlain by small yew tree [233] <27>. This timber measured 1.07m in length and was roughly 65mm in diameter. The timber was aligned east to west and was encountered at between -1.08m OD and -1.21m OD. To the north-west of [233] lay timber [228]. Only partially visible, this yew had a 40mm diameter and was at least 1m in length. Recorded at a height of -0.99m OD, [228] ran north-east to south-west, extending into

the north and west limits of excavation. This group of timbers was overlain by clayey peat layer [213]. This blue/brown grey layer extended 3.88m east to west and 3.1m north to south. It ranged in height from -0.82m OD to -1.03m OD, sloping down to the east.

7.4.12 Towards the centre of the site was a small collection of timber. The smallest, [229], extended north-eastwards from the central baulk, measuring 1.12m in length and between 70mm and 120mm in width; it was encountered at a height of -1.13m OD. This timber, likely a branch of yew, was overlain by north-west running timber [218] <29>. Also a yew, this timber measured 3.6m in length and had a diameter of 90mm. It was recorded between -1.03m OD and -1.09m OD. Overlying both large oak tree [216] and timber [218] was north-east running timber [219]. Measuring 3.5m in length, it had a diameter of 80mm and tapered to a point to the north-east.

7.4.13 Timbers [216] <31> and [218] <29> were also overlain by peat layer [210] to the north. A firm orange brown layer, it measured at least 2.3m north to south and 4.04m east to west, extending into the north and east limits of excavation for that area. Containing frequent wood fragments, this layer was recorded between -0.95m OD and -1.12m OD.

7.4.14 To the south of the central baulk, [216] <31> was overlain by east to west running ash timber [217] <25>. This timber had cracked and split at various intervals, most noticeably where [216] <31> ran beneath it. Measuring 4.1m in length and 0.4m in width, timber [217] <25> was encountered between -1.3m OD and -1.6m OD. Two smaller Yew timbers, [234] and [235], overlay [217] <25> to the east (Plate 15) and were observed in Evaluation Trench 21 (Edmonds 2017b, Fig. 7). These timbers ran parallel to one another, stretching from north-east to south-west. Ranging from 60mm to 90mm in diameter, these yew timbers measured 1.72m and 3.62m in length and were recorded between -1.29m OD and -1.35m OD.

7.4.15 To the west of [216] <31> lay a large sheet of bark [220]. The bark measured 1.52m by 1.12m, possibly originating from oak tree [216]; it was positioned horizontally at a height of -1.26m OD. Sealing bark [220] was an alluvial clay layer, [214]. Also recorded as layer [224], this firm grey brown clay measured 2.38m by 5.70m.

7.4.16 Within the central baulk, timber [216] <31> was overlain to the west by light brown grey peaty clay layer [227] (Plate 15). Only recorded in section, this layer measured 0.31m thick; it was observed between -1.19m OD and -1.35m OD. This was in turn sealed by peat layers [226] and [225]. These clayey peat layers were dark grey/black; wood fragments, while present in layer [225], were absent from layer [226]. The layers were encountered at a maximum height of -1m OD, both sloping down to the east to approximately -1.2m OD. An alluvial deposit, [224], overlay [225] and [216] to the east. Recorded in plan as [214], this layer was a light grey brown clay containing occasional small wood fragments. It measured 0.51m thick, with the top of the layer observed between -0.98m OD and -1.16m OD. Sealing the eastern part of [224] was a laminated peat and clay layer, [223]. A dark grey/brown, this layer was 0.15m thick and encountered at a maximum height of -1m OD, sloping down to -1.2m OD. A dark brown friable peat layer, [222], capped these layers. Containing occasional small wood

fragments, this 0.20m thick layer was in turn sealed by clayey woody peat layer [221]. Layer [221] was recorded as [208] in plan and covered the entirety of the site. In section however, it was recorded as 0.1m thick, with the layer being encountered at a maximum height of -0.9m OD to -0.99m OD.

7.4.17 The terminus of a natural channel, [212], was cut into [208] in the northern part of the site, exposing clayey peat layer [211]. This channel had filled with a 0.18m thick collection of round wood, [213] (Plate 13), and was recorded at a height of -0.83m OD. extended 1.70m north to south and 1.52m east to west.

7.4.18 Extending north from the central baulk was a layer of alluvial fanning [209]. Overlying [208], this layer was a blue grey peaty clay measuring 2.26m north to south and 4m east to west. Also recorded in section, it was observed at a maximum height of -0.82m, with the top of the layer at a minimum height of -0.96m OD.

7.5 Phase 4: Roman Activity

Excavation Area 1

Roman Pits

7.5.1 The main features relating to this phase were twelve pits cutting directly into the natural brick-earth from Phase 1. They were mostly located in the northern half of the excavation area with a small group towards the south-east (Fig. 4) and may have been quarry pits for clay extraction.

Area	Cut	Fill	Length	Width	Depth	Highest Level	Spot dates
1	[57]	[56]	0.86m	0.90m	0.26m	1.20m OD	
1	[59]	[58], [64]	1.78m	1.00m	0.30m	1.24m OD	AD 50-400
1	[61]	[60]	0.77m	0.73m	0.20m	1.19m OD	
1	[63]	[62]	1.90m	1.32m	0.29m	1.30m OD	
1	[66]	[65]	3.22m	1.98m	0.25m	1.25m OD	
1	[69]	[68]	3.12m	2.26m	0.30m	1.23m OD	
1	[72]	[70], [71], [75], [76]	3.70m	2.40m	0.55m	1.23m OD	AD50/120-160
1	[74]	[73]	1.10m	0.80m	0.15m	1.26m OD	
1	[78]	[77]	2.78m	2.42m	0.23m	1.33m OD	AD70-200
1	[80]	[79]	2.50m	1.20m	0.30m	1.31m OD	AD50-160
1	[82]	[81]	1.06m	0.78m	0.14m	1.29m OD	
1	[107]	[106]	2.30m	2.30m	0.15m	1.29m OD	

7.5.2 The pits were generally sub-circular in shape, with the majority containing a single fill. These fills were described as firm orangey grey sandy silty clay with occasional charcoal flecks and occasional small and medium rounded stones, some of these stones were also burnt or showed signs of heating. Pottery dated to the late 1st early 2nd Century AD was also recovered from pits [78] and [80] (Appendix 7), (Plate 7).

7.5.3 Two additional pits, [59] and [72], in this phase had multiple fills. Pit [59] was filled by [58] which was a firm yellowish grey clay sand with occasional small to medium sub-rounded stones (Plate 6). This overlay fill [64] which was a primary fill and was recorded as a firm grey sandy clay with occasional charcoal flecks and occasional medium sub-rounded stones. The upper fill [58] contained pottery dated to between AD50-400 (Appendix 7). The upper fills of the pits probably occurred during flood episodes, suggesting they were left open to silt up naturally.

7.5.4 Just to the west of pit [59] was pit [72] which had four fills in total [70], [71], [75] and [76]. Fill [71] was recorded as soft dark grey clay with moderate to frequent charcoal flecks and moderate small fragments of CBM. This fill also contained fragments of pottery dated to between AD50-160 (Appendix 7).

7.5.5 Cutting into the alluvium [87] in the southern part of Area 1 several more pits were identified in the northern end of the section in Slot 1. As these pits ([86], [98], [102] and [104], Fig. 5 section 34), were recorded in section only their shape in plan is not known. These features contained single fills described as firm orangey, grey sandy silty clay with occasional charcoal flecks and occasional small stones.

Area	Cut	Fill	Length	Width	Depth	Highest Level
1	[86]	[85]	0.80m	N/A	0.66m	1.36m OD
1	[98]	[97]	1.60m	N/A	0.30m	1.26m OD
1	[102]	[101]	1.30m	N/A	0.20m	1.16m OD
1	[104]	[103]	0.30m	N/A	0.30m	1.16m OD

7.5.6 Unfortunately, no dating evidence was recovered from these pits but as the fills were very similar to the surrounding excavated pits and they were recorded towards the northern half of the excavation area thus spatially grouping them with the surrounding features, they were interpreted as also being of early Roman date.

7.5.7 The remaining context relating to Phase 4 was a layer [67] located in the western side of the excavation area. This layer comprised a compact mottled grey orangey brown clay with occasional small and medium angular and rounded flints, flecks of charcoal and some flecks of burnt material. The layer was recorded at a highest level of 1.17m OD and had a maximum thickness of 0.29m. Recovered from this layer were sherds of pottery dated to between AD70-130 (Appendix 7).

7.6 Phase 5: Upper Alluvium

Upper Alluvium was recorded in all three areas of excavation overlying the peat or Lower Alluvium where the peat was missing. In Excavation Area 1 a deposit of upper alluvium overlay a well/waterhole feature [84]. Radiocarbon-dating of the waterhole will establish the relative date of this episode/s of flooding but it may be Roman or later in date.

Excavation Area 1

7.6.1 The earliest deposits in this area were layers of Upper Alluvium [90], [94] and [99] recorded in the section located in Slot 1 and sealing natural sand and gravel layers (Fig 5; sections 33 and 34). These deposits were firm light grey with orange mottling silty clay with occasional lenses of yellow sand. They had a recorded thickness of between 0.25-0.35m with a recorded level of between 0.84m OD and 0.64m OD at the southern end of the excavation area and recorded levels of between 1.16m OD and 1.06m OD at the northern end of the excavation area.

7.6.2 Sealing these layers were further layers [89] and [93] of Upper Alluvium which were also recorded in the section located in Slot 1 (Fig 5; section 33). These deposits were very similar to [90] and [94] but did not have the mottled appearance or lenses of yellow sand. These layers were 0.40m in thickness and located between 1.04m and 0.74m OD.

7.6.3 A thin layer [96] of alluvium was also identified relating to this phase which was very similar to [90] and [94] but was encountered in Slot 1 and recorded in section (Fig. 5; section 34). This layer was described as firm mid to light grey clay with occasional lenses of sand. It was 0.10m in thickness and had a recorded level of between 1.36m OD and 1.16m

7.6.4 As noted sealing the well/waterhole feature [84] from Phase 3 and covering most of the southern half of the excavation area was a layer of alluvium [87] (Fig. 4). This layer was a firm dark brown silty clay with approximate dimensions of 30m in length and 45m wide. This layer was recorded between 1.29m OD and 1.24m OD and had a maximum thickness of 0.20m.

7.6.5 In the northern half of the excavation area a similar layer of alluvium [95] infilled the Roman pits recorded in section and discussed in Phase 4. This deposit was recorded in the section of Slot 1 and was a firm mid brown silty clay with approximate dimensions of 10.40m in length and a thickness of 0.25m. This layer was recorded between 1.39m OD and 1.36m OD.

Excavation Area 2

7.6.6 Sealing the various deposits from Phase 3 was a thick layer [160] (Fig. 7, section 100) of upper alluvium which was seen across the whole excavation area (Plate 8). It was described a firm mid to dark blueish grey clay with occasional medium sub-rounded and sub-angular stones. It had a recorded thickness of 2.00m and was encountered at 0.62m OD. The deposit is likely to have formed from the Later Prehistoric period (later Bronze Age and Iron Age and perhaps later at its upper levels).

Excavation Area 3

7.6.7 Although it was primarily removed during machining, the remainder of alluvial layer [203] overlay the peat deposits (namely [208]/[221] and [209]) in the north-west area of the site (Fig. 9, section 61, Plate 17) and may have represented the Later Prehistoric period (Young *et al*. 2018c, 26). Composed of a mid-yellow/grey brown silty clay, the layer measured 7.92m by 6.75m and was 0.26m thick. A stake-hole [206] was recorded cutting into this layer to the north. Although observed, the remains of the wooden stake [207] were lost during machining; however, the cut indicated that the stake had a pencil faceted point. This stake-hole measured 60mm by 50mm, extending vertically to a depth of 70mm.

7.6.8 Alluvial interface layer [203] was also recorded in section (Fig. 9, section 60) and was sealed by dark yellow-orange brown silty clay layer, [202]. Measuring 0.25m thick, this layer was encountered between -0.56m OD and -0.74m OD (Plate 16). Alluvial layer [202] was in turn overlain by dark blue/grey brown silty clay layer [201]. This alluvial layer was encountered between -0.36m OD and -0.62m OD and was 0.20m thick. Capping [201] was alluvial layer [200]/ [204]. An orange brown clay silt mottled with grey, this layer contained very small stones and was 0.22m thick. Although recorded between -0.32m OD and -0.47m OD, these maximum heights are arbitrary as the layer was horizontally truncated during machining.

7.7 Modern (20th Century)

Excavation Area 1

7.7.1 Layers of made-ground and concrete beams were associated with the Victor Engineering Works were present within Excavation Area 1 (Fig. 4).

Excavation Area 2

7.7.2 Layers of made ground were to a depth of 1.80m were removed to facilitate Area 2.

Excavation Area 3

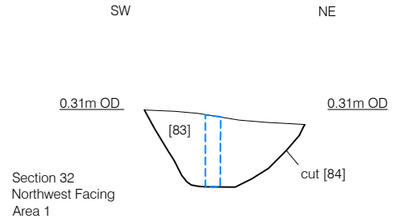
7.7.3 Modern deposits were identified in this excavation area and comprised ground raising and levelling deposits, sub-formation and formation levels, concrete and tarmac hard-standing, modern service cuts and other recent intrusions. All these deposits relate to the construction, use and disuse of the Ford Factory. All modern levels and intrusions were denoted as unstratified [+].

Archaeological Cut Feature
Archaeological Deposit
Walls from Victor Engineering Works

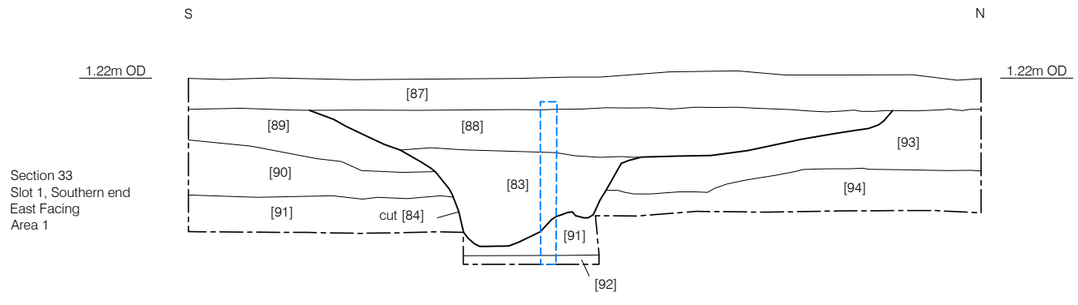
0 20m

02/11/18 RM

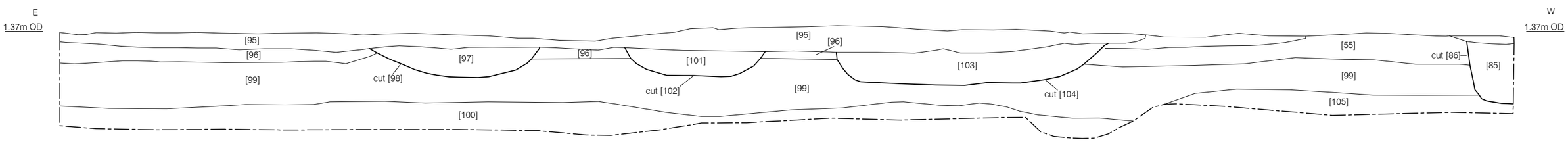
Figure 4
Plan of Excavation Area 1
1:400 at A4



Section 32
Northwest Facing
Area 1



Section 33
Slot 1, Southern end
East Facing
Area 1



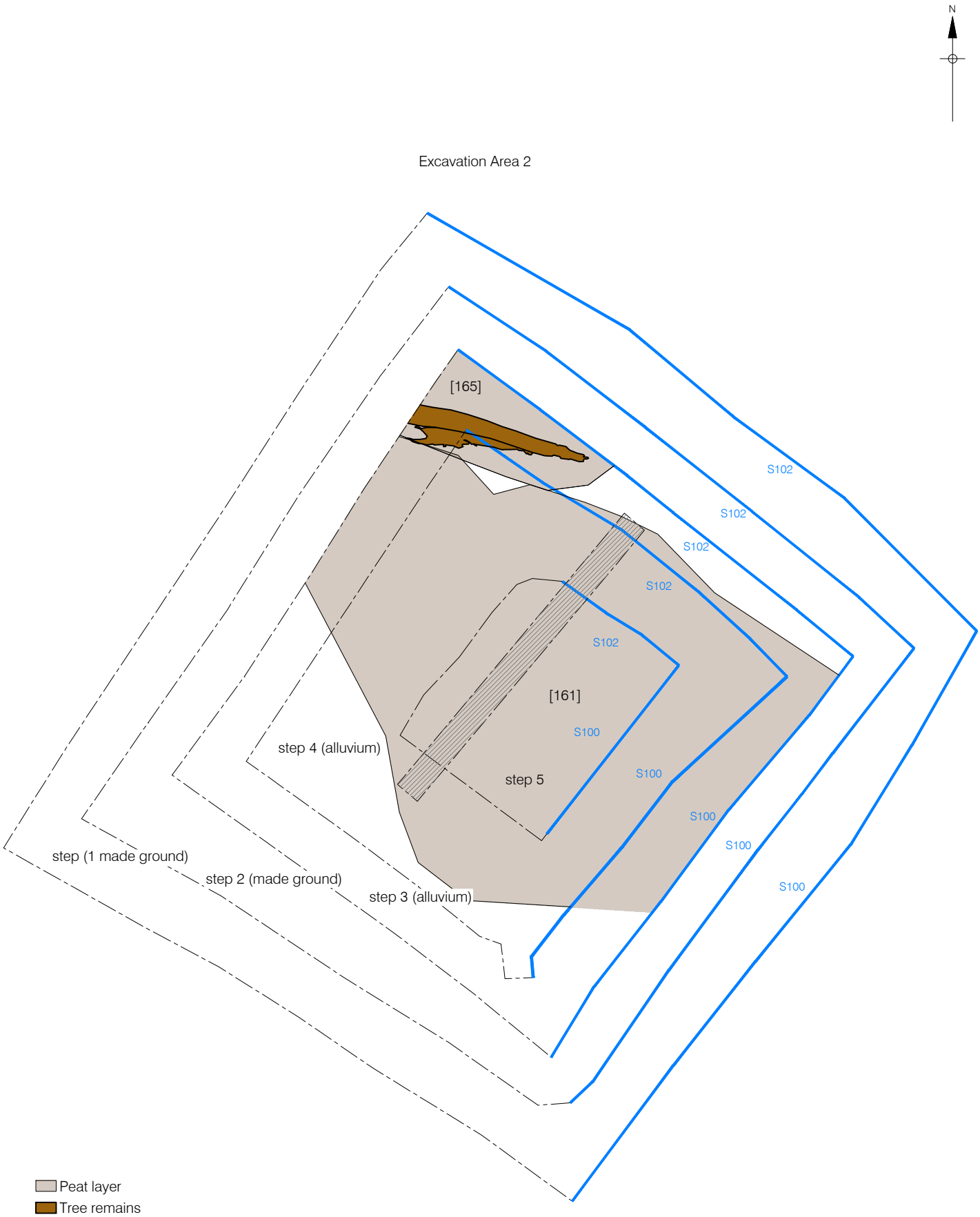
Section 34
Slot 1, Northern end
East Facing
Area 1

Column samples, numbers unknown

0 2m

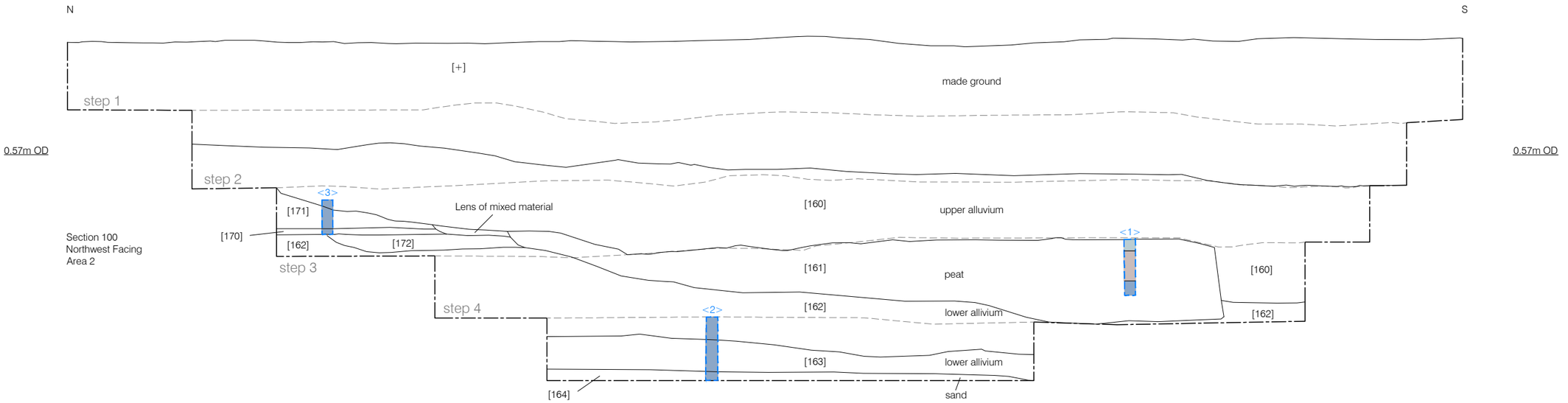
05/11/18 RM

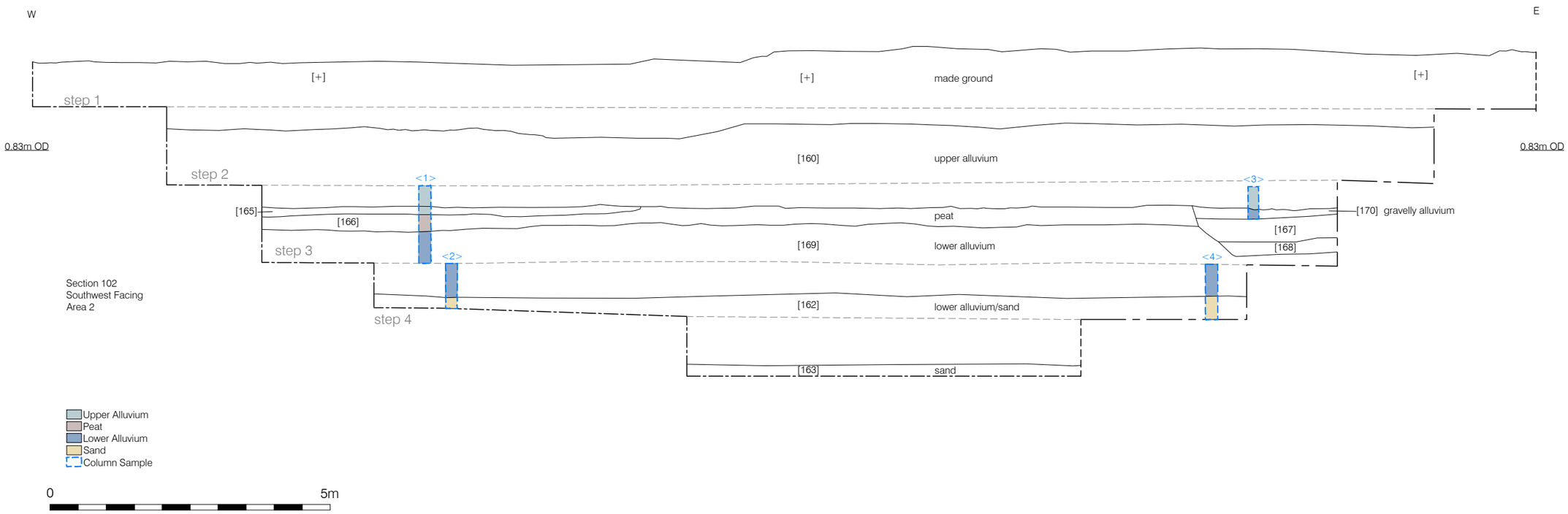
Figure 5
Area 1 Sections with Location of Column Samples
1:40 at A3



02/11/18 RM

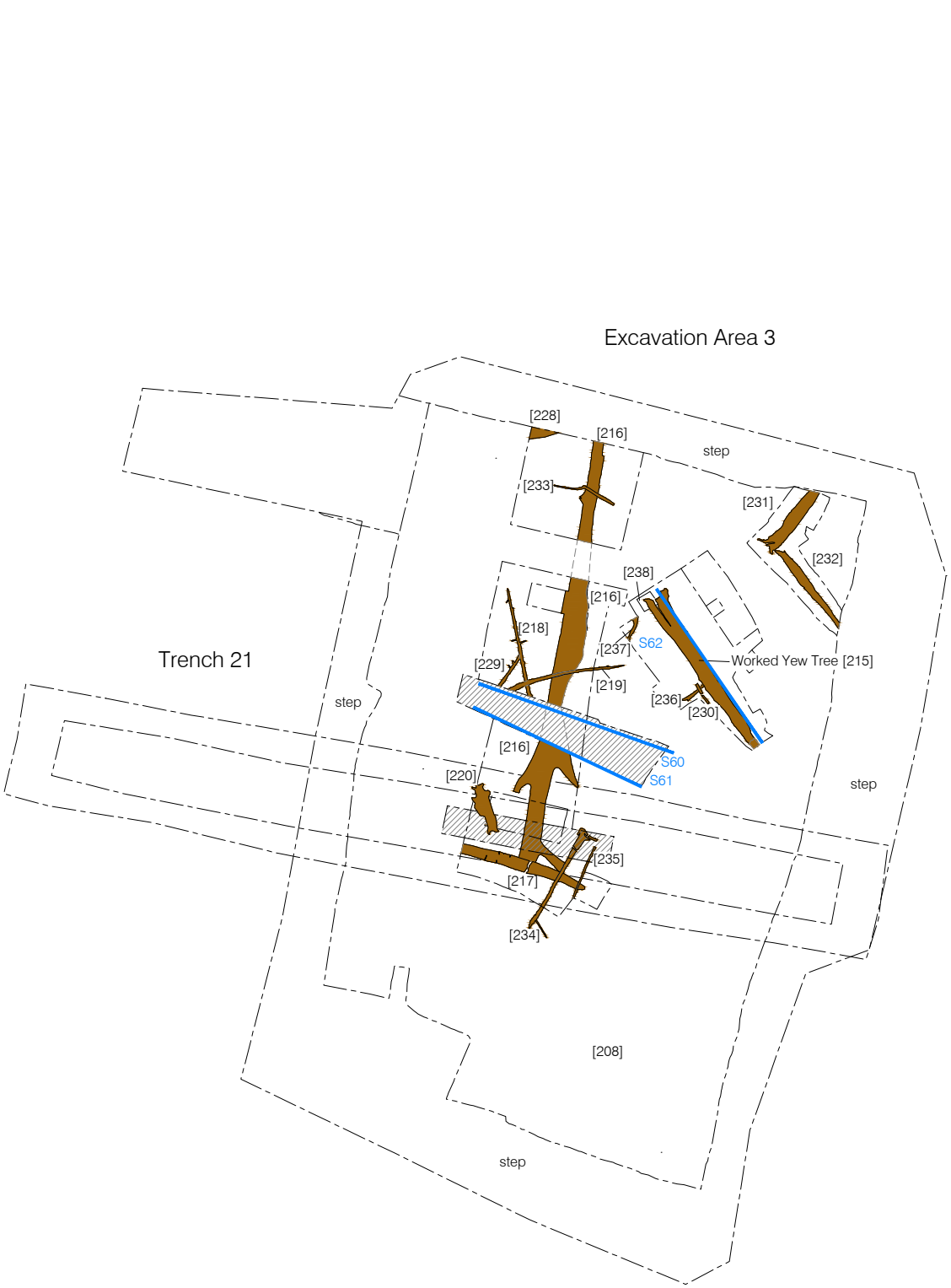
Figure 6
Plan of Excavation Area 2
1:200 at A4





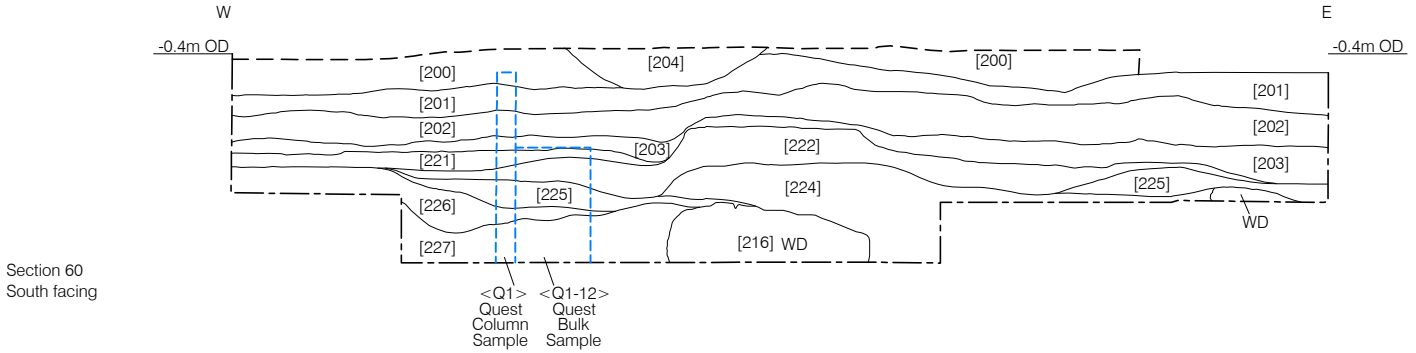
02/11/18 RM

Figure 7
Excavation Area 2 Sections
1:80 at A3

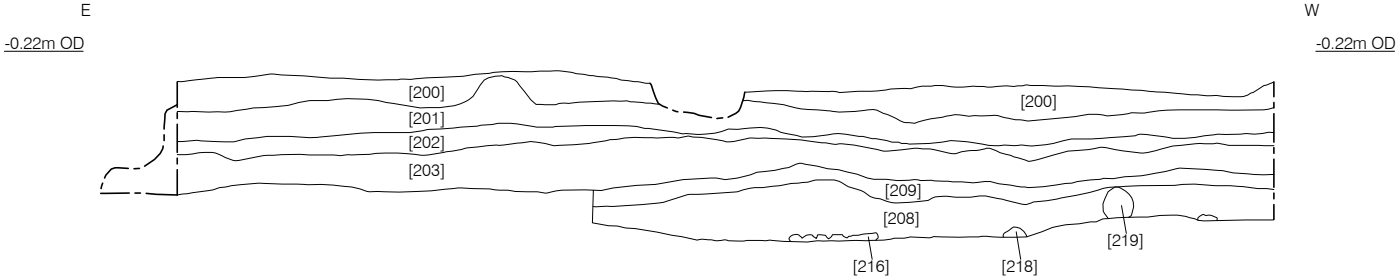


06/11/18 RM

Figure 8
Plan of Excavation Area 3
1:200 at A4



Section 60
South facing

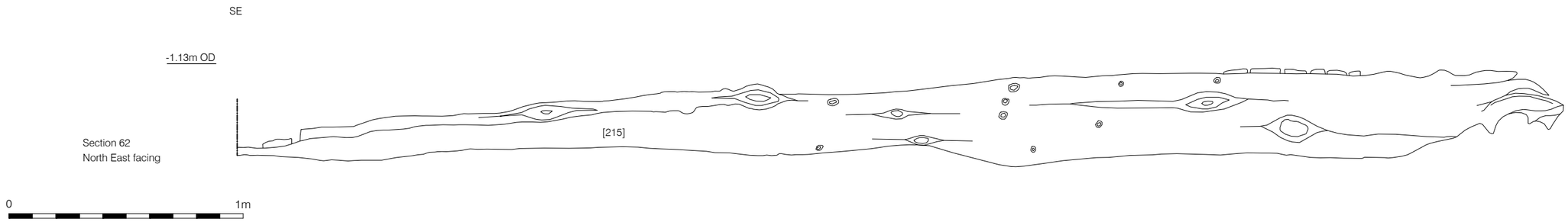


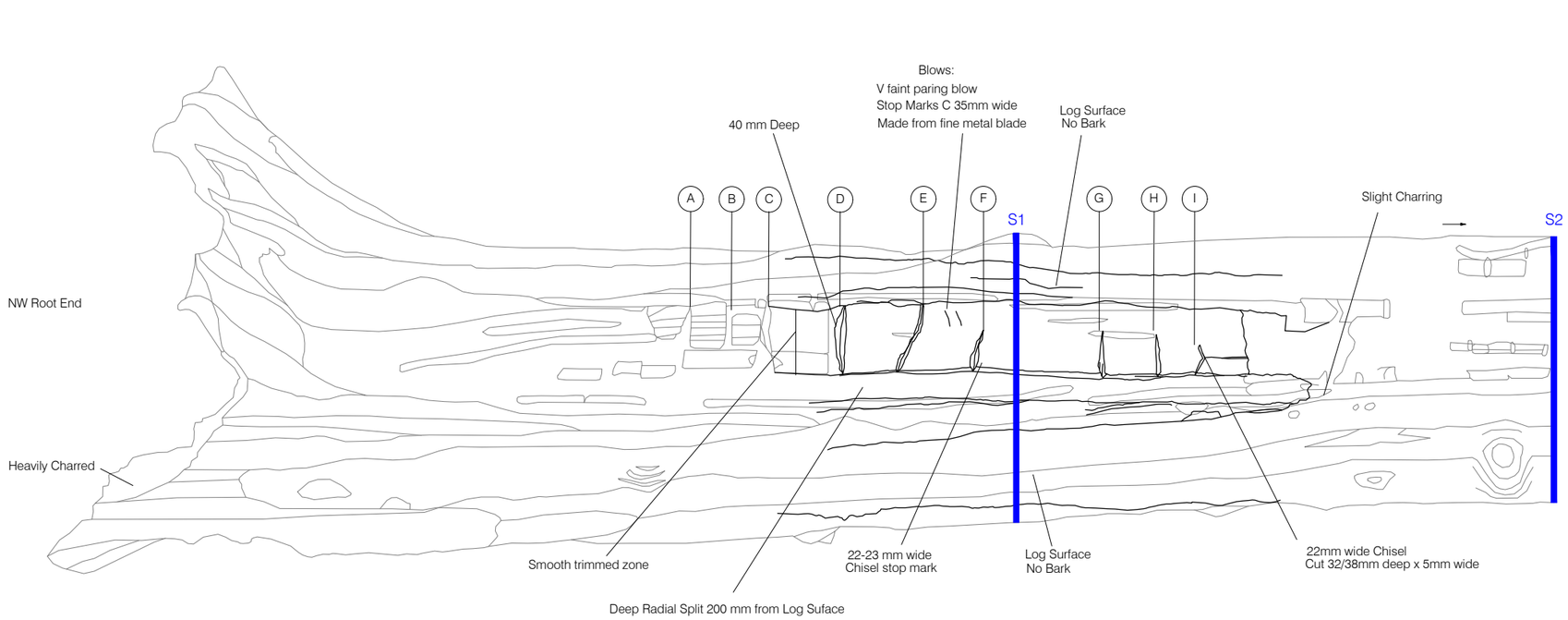
Section 61
North facing

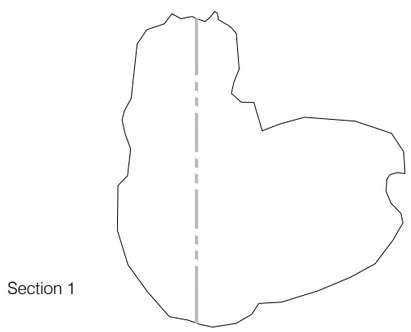
0 2m

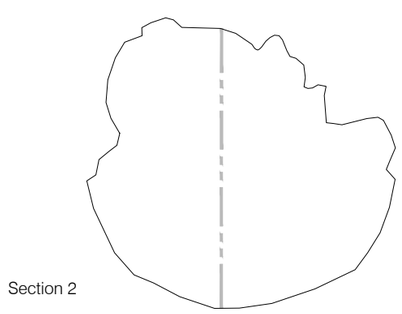
16/08/18 RM

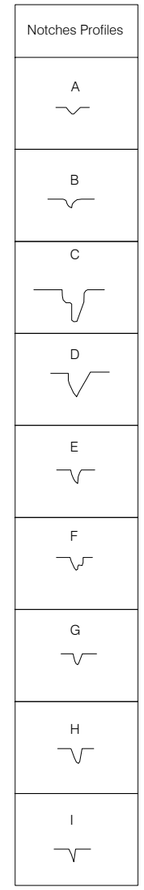
Figure 9
Area 3 Sections
1:40 at A4











16/08/18 AT

Figure 10
Excavation Area 3 Plan and Section of Yew Tree [215]
Section 1:20, Plan 1:10 at A3

8 PLATES

Plate 1: Excavation Area 1 looking west – Natural deposits of Langley silts (brickearth) [55]

Plate 2: Excavation Area 1 looking south-west – slot through natural deposits [55] & [87]

Plate 3: Excavation Area 1 looking north, slot through natural deposits with sandy/gravel in the base [91]

Plate 4: Excavation Area 1 looking west – section showing prehistoric well / waterhole [84]

Plate 5: Excavation Area 1 looking west – section and column sampling of waterhole [84]

Plate 6: Excavation Area 1 looking north – partially excavated Roman pit [59]

Plate 7: Excavation Area 1 looking north-west. Half-sectioned Roman pit [80]; animal jaw in the base

Plate 8: Excavation Area 2 looking north – large area of upper alluvium [160]

Plate 9: Excavation Area 2 looking north – revealing the peat [162]

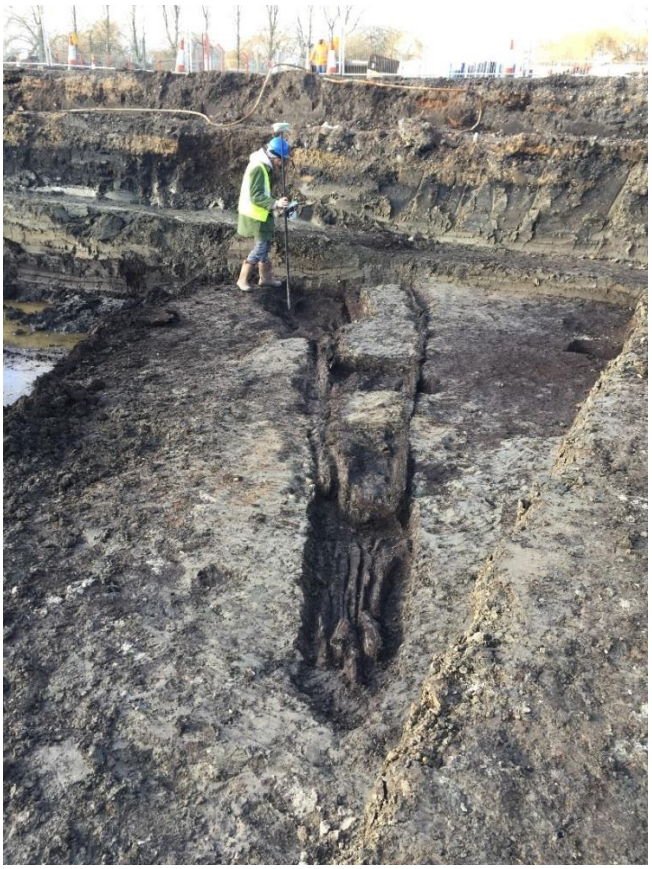


Plate 10: Excavation Area 2 looking west. Collapsed remains of a tree preserved in the peat

Plate 11: Excavation Area 2 looking south. Stepped trench excavated through a sequence of alluvium and peat deposits to the natural sand/gravel

Plate 12: Excavation Area 3 looking east – Trench 14 sondage visible within peat layer [208]

Plate 13: Excavation Area 3 looking north – terminus of natural channel [212] filled with roundwood [211]

Plate 14: Excavation Area 3 looking east – working shot showing timber [216]<31> extending north-south across the trench through the peat

Plate 15: Excavation Area 3 looking north. Working shot of south facing section [60] and timbers [216], [217], [234] and [235] within peat [208]

Plate 16: Excavation Area 3. Section 60 looking north

Plate 17: Excavation Area 3. Section 61 looking south

Plate 18 Excavation Area 3 looking south-east. Worked Yew tree trunk [215] <33> overlying smaller Yew [236] <24>

Plate 19: Excavation Area 3 looking south-west – recording notches cut into timber [215] <33>

Plate 20: Excavation Area 3 looking north-east – cut notches in timber [215] <33>

Plate 21: Excavation Area 3 looking north-east – detail of worked/cut timber [215] <33>

Plate 22: Excavation Area 3 looking north-east – detail of worked/cut timber [215] <33>

Plate 23 Timber [215] <33> root end showing traces of charred wood/burning on the root branch to the right of this photograph

9 PHASED DISCUSSION

9.1 Phase 1: Natural

9.1.1 The earliest deposits encountered during the archaeological investigations were natural gravel deposits (Taplow Gravel terrace) identified only in Excavation Area 1 and at the northern limit of the site. These deposits were seen in the sections of deeper archaeological slots (Slot 1) and geoarchaeological sondages in Area 1 created to find the earlier sands and gravels. Similar natural gravels identified as Shepperton Gravels were seen across most of the site in the geotechnical investigation boreholes and in sondages put in in Excavation Area 2. These natural sands and gravels were also encountered in some of the evaluation trenches.

9.1.2 The majority of the natural sand and gravel deposits ([100], [105], [91] and [92]) were seen in the section of Slot 1 in Excavation Area 1 (Fig. 5, sections 33 and 34). These deposits of light yellowish grey sand with lenses of grey silty clay were recorded at 0.09mOD and 0.66m OD and interpreted as the natural Taplow Gravel terrace.

9.1.3 The underlying gravel geology was also found in two of the geo-archaeological sondages in the Excavation Area 2 trench and was consistent with the expected Shepperton Gravels (Plate 11). The gravel was found to survive at heights ranging from -2.89m OD in the north to -3.50m OD in the south. Though there was the potential for Palaeolithic artefacts on the site, no archaeological finds of this date were encountered.

9.1.4 The Taplow Gravel terrace was also encountered in evaluation Trenches 3-7 and Trench 11 at levels varying from of 0.81m OD in Trench 7 to 2.06m OD in Trench 4 (Edmonds 2017a). The height suggests a gravel ridge with a highest point of 2.06m OD (in Trench 4) dropping towards the south-west. A similar high ridge of gravel with a drop to the south-west was noted during the geoarchaeological borehole exercise and subsequent deposit model (Young at al 2018d, 24).

9.1.5 Overlying the highest areas of Taplow Gravel terrace in Excavation Area 1 were lenses of orange brown sandy silty clay [55] (Fig. 5; section 34, Plates 1-3) identified as natural brickearth (Langley Silt). These were found at the highest level of 1.30m OD.

9.1.6 Natural deposits of orange brown clay brickearth had previously also been identified in the evaluation Trenches 1 and 2 as well as Trench 15 at levels of 1.17-1.20m OD (Edmonds 2017a). Brickearth was also encountered as a high point in Phase 2 western extension Trench 29 where it was found at a level of 0.71m OD (Edmonds 2018). These brickearth deposits suggested the forming of an area of high dry ground in the extreme north-east corner of the Phase 1 site and a higher potential for archaeological features to be present which proved to be the case in further excavation as the majority of cut features were found in this part of the site. However, the brickearth deposits were directly below the concrete overburden

which indicated that the construction of the industrial factory had caused some horizontal truncation. The areas of terrace gravel where encountered by evaluation trenches close to New Road at the northern edge of the Phase 1 and 2 site (to the east of the Beam River and west of Area 1), appear to have suffered some truncation, as brickearth deposits capping the gravel were largely absent. Trench 29 at the extreme western extent of Phase 2 was similarly at the edge of the gravel terrace adjacent to New Road, but despite preservation of brickearth no archaeological features were identified (Edmonds 2018).

9.1.7 The brickearth or Langley Silts are thought to represent drier land to the north away from the marshy land associated with the confluence of the River Beam and River Thames that falls away to the south.

9.1.8 A layer of sand [164] lying at the base of Excavation Area 2 may represent the base of the lower Holocene alluvial sequence lying directly above the natural Shepperton gravels. These sands are seen in layer [164] in Excavation Area 2 and are identified at the base of the Area 2 section 102 column sample <4>. However, the environmental assessment comments that it is difficult to differentiate between the various sands of the Lower Alluvium (Appendix 12; Young *et al.* 2018d, 24) and these sands may therefore not be those that overlay the Shepperton Gravel but could possibly be part of the Lower Alluvium.

9.1.9 There were no artefacts found associated with the sand deposits capping the gravel in Excavation Area 2 and therefore this location is not directly comparable to the A206 'Bronze Age Way', Erith on the south bank of the Thames, where very extensive spreads of Late Mesolithic flintwork (including microliths and a tranchet axe broken in manufacture), burnt flint and a carinated bowl of initial Neolithic date, were recovered from within and on the surface of sand mantling gravel during construction of the A2016 (Bennell 1998). Sidell *et al.* (2000, 199-124) stated that 'although the fluvial sands are generally non-artefact bearing, this is not always the case - for example the site at Erith…where a substantial Late Mesolithic flint scatter was located within such deposits.' Such locations emphasise the benefits of new areas of foreshore becoming available and illustrate the use of so-called 'marginal land' in the Late Mesolithic.

9.1.10 More locally at Rainham both Mesolithic and Neolithic type finds have also been recorded at the same location, 'on a spur of gravel at the interface of terrace and alluvium' (Greenwood 1993). This stratigraphically similar location to the Erith site also produced microliths, although (unlike at Erith) this was considered to be principally an early Neolithic site due to the presence of pottery and a similarly extensive area of flint knapping. Silva and Farr (2010, 24 citing Meddens, 1996) include the evidence from Rainham to support the use of pottery by forager societies; stating that 'evidence from south-east England indicates that a good deal of chronological overlap may exist in material culture, as instances of 'Mesolithic' flintwork and 'Neolithic' pottery have been found together in well stratified archaeological contexts, such as at Brookway in Rainham, Greater London'.

9.2 Phase 2: Lower Alluvium

9.2.1 A sequence of Lower Alluvium was encountered in all of the excavation areas. The deposits were found at levels ranging from 1.04m OD to -0.47m OD, which followed the natural fall in the original topography to the south of the site.

9.2.2 The Lower Alluvium represented the extensive early alluvial inundation of the area through flooding. Dating this deposit is problematic, but it is likely that it was part of the early flooding of the area, possibly during or from the Late Mesolithic period. The dating is based on comparisons with radiocarbon dated deposits of Lower Alluvium elsewhere in the Lower Thames, including downslope of the main artefact concentrations at the A2016 Bronze Age Way investigations (Bennell 1998; Sidell 2000). The geoarchaeological investigations by QUEST suggest that the Lower Alluvium was deposited during the early to mid- Holocene (Appendix 12; Young *et al*. 2018d, 25) which equates to the start of the Mesolithic period.

9.2.3 A Lower Alluvium deposit lying below the peat in Excavation Area 3 was described as a grey sand layer [238] at a height of -1.70m OD. Of note is the recovery of a burnt flint chunk and a possible Neolithic-Bronze Age core-flake/?tool from its surface. This possibly represents transient Neolithic activity at the base of the peat and the flint report (Appendix 2). However, neither of these pieces is dateable and this finding more probably represents 'background noise' associated with activity on the adjacent dry land to the north.

9.2.4 With respect to early alluvium formation excavations by Oxford Archaeology at Beam Washlands Reservoir, c. 450m north of the excavation area, identified two small flint scatters dated to the Early Mesolithic period at the interface between the peat and sandy silt (assumed to be Lower Alluvium). However, at this excavation; the peat at 0.23m OD was radiocarbon dated to 2455±30BP placing accumulation within the middle Iron Age (Biddulph *et al.* 2007) which is later than the sequence found here at Beam Park Riverside and indicates that the episodes of alluvium and peat formation there do not demonstrate temporal continuity and thus cannot be directly compared with the sequence in the adjacent Thames floodplain at the confluence with the Beam River tributary.

9.3 Phase 3: Peat Sequence and Prehistoric Activity

9.3.1 Peat deposits were widely present across the excavation area, except towards the north where the peat was absent, which was most evident in Excavation Area 1.

9.3.2 Overlying the Lower Alluvium across Excavation Areas 2 and 3 was a sequence of organic peat deposits encountered also Trenches 9-14, 16, 17-19, and 21-25. The peat was seen in the geoarchaeological trial holes and varied in thickness from 0.23m in Trench 21 to 3.00m in Trench 19. In Excavation Area 3 the peat surface rose from -0.88m OD in Trench 21 Section 42 to -0.96m OD (section 60). Across the site the peat was present in thicknesses of between ca. 2 and 3m and was indicative of a transition towards semi-terrestrial (marshy) conditions, supporting the growth of sedge fern/reed swamp and/or woodland across the floodplain (Appendix 12; Young *et al.* 2018d, 25). The presence of the physical timber remains from Yew, Alder, Ash and Oak in the archaeological sequence (Appendix 5) is supported by the results of the pollen analysis indicative of a floodplain surface dominated by alder carr woodland with an understorey of grasses, sedges, ferns and various herbs. The pollen analysis records hazel, elm, ash and birch but also notes Yew pollen present in all sequences of peat examined, although in low density. This may indicate that Yew was growing on the peat throughout much of the period of peat formation and it is possible that this was a yew-alder dominated woodland as found elsewhere in the Lower Thames Valley (Appendix 12; Young *et al.* 2018d, 70).

9.3.3 Dating the peat can be difficult given the changing nature of how the peat forms and is subsequently eroded. Based on similar deposits nearby that have been dated using C14, it is likely that the peat encountered at these lower levels probably started to form during the Late Mesolithic/Early Neolithic period and continued to form in the Late Neolithic to Chalcolithic period and at least until the mid to Late Bronze Age. The presence of the Yew trees and two C14 samples suggest that these trees grew within the Late Neoltihic/Chalolithic period ([215] dated 2470-2297 calBC and [236] dated 2498-2344 cal BC

9.3.4 Marshland exploitation seemed to be a key aspect of prehistoric life and this usage continued into the Late Neolithic period and Bronze Age. The worked wood identified in Trench 21 and in Excavation Area 3 seems to be linked to the Neolithic/Bronze Age transition otherwise known as the Chalcolithic or Copper Age period, as indicated by the metal tool marks on Yew tree [215] and the stratigraphy, as well as the associated radiocarbon date. Evaluation Trench 21 was deliberately placed to the south of Trench 14 to establish whether the substantial timber [216] found there continued to the south. The timbers and tree trunks in Excavation Area 3 appear to be naturally felled, though some charring was noted on the roots of [237] <30>. The surviving timbers did not appear to have been deliberately laid as a 'trackway' or as other structure components as had been considered a possibility prior to excavation.

9.3.5 Prehistoric features have been identified on 'dry land' close by in the vicinity for example in an evaluation and subsequent excavation of the Former Mardyke Estate (MYE08; Hawkins

2018b) where a possible Beaker burial, several prehistoric pits, postholes and ditches marking enclosures were excavated. Prehistoric features including pits, postholes and agricultural features were recorded at nearby Spencer Road (SNC15; Buczak 2016) and a substantial number of prehistoric features; including a burnt mound found at Manser Road (MNM03; Compass 2004).

9.3.6 Artefactual evidence associated with the peat layers found in excavation is poor, but of note is a possible Mesolithic/early Neolithic struck flint blade found in peat layer [208] in Excavation Area 3 (Appendix 2). The only two ecofacts associated with the peat layer [166] in Excavation Area 2 was a single fragment of weathered animal bone identified as the tibia of a large red deer and a fragment of human tibia in layer [161] (Appendices 9 and 10).

9.3.7 A well or waterhole [84] of potential Roman date was recorded in the southern half of Excavation Area 1 (Fig. 4, section 33, Plates 4 and 5). This deep circular feature [84] measured 1.40m in diameter and 1.00m in depth at 1.04m OD and cut through the Upper Alluvial deposits in this area. The primary fill [83] was a soft dark brown silty sand with peat/organic material which although similar in nature to Late Mesolithic to mid/late Bronze Age peat is likely to be much later in date as the domestic animal bone assemblage found within the fill is typical of Roman methods of butchering cattle and pig (Appendix 10).

9.3.8 Bronze Age waterholes are sometimes associated with burnt mound site and such a burnt mound was identified at Manser Road (MNM03; Compass 2004). However, in this case as the animal bone assemblage which is more typical of a Roman assemblage (Appendix 10) this feature could well be of a later date than first thought. Parallel examples of waterholes have also been identified in the nearby site at the Beam Washlands Reservoir site (Fig. 1; BMV05) where they are dated as Roman (Biddulph *et al.* 2010, Biddulph *et al.* 2007).

9.4 Phase 4: Roman Activity

9.4.1 The potential for Roman activity on this site was thought to be low with the possibility of grazing taking place on the marsh edge during this period. Therefore, it was thought that evidence for this activity might take the form of drainage channels and wooden structures associated with the maintenance and management of these marginal agricultural areas. However, the drier ground proved to be more extensive and twelve pits, possibly for clay extraction (and the waterhole if it is of Roman date) were recorded in Excavation Area 1, suggesting a concentration of early Roman activity. Although these features are still seen as evidence of marginal activity taking place on the periphery of the main sites to the north, it demonstrates the association with a nearby settlement on the drier ground.

9.4.2 Extensive early Roman activity was also encountered at the nearby Former Mardyke Estate excavations where ditches, pits, and activity associated with a small-scale domestic settlement were recorded (Hawkins 2018b) The Roman activity at Beam Park can therefore be interpreted as representing peripheral occupation to a larger nearby settlement, or perhaps also to a satellite settlement to the Beam Washlands (Biddulph *et al*. 2010).

9.5 Phase 5: Upper Alluvium

9.6 During the evaluation, deposits from the upper alluvial sequence were encountered in almost all of trenches excavated, and this was also the case in the excavation areas. There was no direct dating of the layers forming the overall unit, but it is believed that the material was deposited over a broad length of time from the later Bronze Age up to the Roman period and perhaps with later episodes in the late medieval/ early post-medieval period. The alluvial sequence would suggest frequent flooding, which would have restricted human exploitation in this area and explain why there is no evidence of human activity from a broad range of later periods.

9.7 There were some variations in the clay like deposits sealing the upper alluvial sequence. These were interpreted as more recent flood deposits most likely formed during the post-medieval period. Overbank flooding from the River Beam is another likely source of flood deposits in addition to those from the Thames. Some of these deposits were relatively thin, possibly as a result of truncation from later ground consolidation.

9.8 Modern (20th Century)

9.9 The evaluation identified extensive impacts from modern truncation across all areas, with the remains of demolished concrete structures being visible throughout the evaluation trenches excavated in northern areas iof the Phase 1 and 2 site.

9.10 In particular the foundations from the Victor Engineering Works that were located in the north-east corner of the Phase 1 site during evaluation were exposed in plan in Excavation Area 1 (Fig. 4). The post depositional impact from these foundations caused the high levels of truncation of the Brickearth in this area. It has also been noted that as terrace gravel was identified directly below modern made ground in northern areas of Phase 1 to the east side of the Beam River valley, with no evidence of Brickearth or former soils sealing it, the higher ground in this area is likely to have been stripped of Brickeath/former topsoil prior to the deposition of made ground. This conclusion was further supported by the uneven nature of the gravel indicating deeper truncation hollows into the underlying gravel (perhaps for extraction) within some of the trenches. This southern projection of the terrace edge, to the south of New Road, had been considered to have good potential for prehistoric and later archaeology but if present any such archaeology may have been removed by the modern truncation.

Many of the trenches within the Phase 2 area to the west of the Beam River encountered extensive foundations of buried facilities, services and foundations associated with the Ford assembly plant. However, truncation within Excavation Areas 2 and 3, relatively close to the Beam River, was less significant ranging from buried services to the landscaping and deliberate dumping of material to consolidate the ground before the laying of tarmac. The areas associated with Areas 2 and 3 were used by the Ford Motor Company to store manufactured vehicles before export during the later 20th Century.

10 RESEARCH OBJECTIVES

10.1 Original Research Objectives

10.1.1 The research objectives were contained within the WSIs for the archaeological mitigation (Hawkins 2017, 2018a) of Excavation Area 1 and Excavation Area 2, as detailed by the Archaeological Strategy and SARMS (RPS/CgMs 2017b, updated 2018):

10.2 Establish whether the Site contains evidence for Mesolithic to early Neolithic riverside camps and if so the specific nature of camps within the edge of the floodplain location;

10.2.1 The site contained very little evidence of Mesolithic or early Neolithic settlement activity. However the presence of a possible Neolithic-Bronze Age core-flake/?tool on the surface of Lower Alluvial layer [238] at the interface with overlying peat [208] may represent some transient activity. A second record of flint in the form of a burnt flint chunk and a possible Mesolithic/early Neolithic struck flint blade was also found associated with the peat layer [208] in Excavation Area 3 (Appendix 2). Isolated occurrences of flint do not, however, represent occupational activity and may have been washed into these deposits in flood action. These are the only indications of human activity of prehistoric date other than the presence of the carved/worked Yew tree trunk [215]<33> also associated with peat layer [208] in Excavation Area 3 dated 2470–2297calBC (SUERC-79156 (GU47859); Appendix 11).

10.2.2 The occurrence of a single piece of disarticulated human bone (fibula) (Appendix 9) in peat layer [161] of Excavation Area 2 is most likely the result of flooding having disturbed a burial site further to the north, or is derived from an exposure burial, and does not necessarily represent the use of this floodplain for Neolithic or Bronze Age burials.

10.2.3 The presence of a well/waterhole found during deeper excavation of Slot 1 in Excavation Area 1 may be indicative of mid to Late Bronze Age or Roman activity within the close vicinity. These features would normally be associated with providing fresh water to a nearby settlement. A 'burnt mound' of flint, typically associated with mid to Late Bronze Age waterholes, was also identified at Manser Road (MNM03; Compass 2004), a site to the east of Beam Park Riverside.

10.3 Further inform how the local landscape was used and to what level of intensification in the prehistoric periods;

10.3.1 The environmental assessment of the peat which formed across most of the site provided evidence for a local landscape. This was indicative of a floodplain surface dominated by alder carr woodland with an understorey of grasses, sedges, ferns and various herbs. The pollen analysis recorded hazel, elm, ash and birch but also noted Yew pollen present in all sequences of peat examined. This may indicate that Yew was growing on the peat throughout much of the period of peat formation and it is possible that this was a yew-alder dominated

woodland as found elsewhere in the Lower Thames Valley (Appendix 12; Young *et al*. 2018d, 70).

10.3.2 Areas of prehistoric activity in the wider landscape have recently been identified on the higher dryland to the north of this site as seen at the excavations on the Former Mardyke Estate (MYE08, Hawkins 2018b) and Beam Washlands (BMV05; Biddulph *et al.* 2010) to the north and at Spencer Road (SNC15; Buczak 2016) and Manser Road (MNM03; Compass 2004) to the east. At the Ford Stamping Plant, directly to the west of the site, a late Mesolithic/Early Neolithic bog oak was identified at the base on one of the trenches during an evaluation. Prehistoric features were also present on the site, which were tentatively dated to the late Iron Age, although no dating was recovered (Seddon 2017). These areas of settlement would have exploited the wetland resource on the Thames/Beam floodplain but very low levels of activity were encountered in the evaluation and within Excavation Areas 1-3 of the Beam Park Riverside project. The wetland-dryland margin identified during the evaluation in northern fringes of Phases 1 and 2 would have had the most potential for identifying activity on the higher gravel terraces to the north of the site, but even these areas showed only low levels of activity.

10.4 Establish, as far as practicable, the presence/absence of preserved prehistoric (or later) worked wood or structures within peat via Phase related trenching and if present devise suitable mitigation;

10.4.1 A large area of peat was exposed in Excavation Area 2 and a hand dug slot was used to investigate this deposit for worked wood or structures but none were found. A large timber that was initially thought to be worked was revealed to be a collapsed tree which provided some information on the local environment but no prehistoric wood working activity was identified in this area of the floodplain at its confluence of the Beam River.

10.4.2 Evaluation Trench 21 identified a potentially worked tree trunk of Late Neolithic/Early Bronze Age date (2706-2566 calBC (SUERC-76662 (GU46221) Appendix 11). As a consequence of this an extensive area of peat was excavated as mitigation in Excavation Area 3. A total of thirteen naturally felled trees/timbers were found. One particular Yew tree [215] <33> although not the potentially worked tree identified by evaluation, which provided not to have been worked, is of significance having been worked with cut notches on one side of the tree trunk. The likely felling date of the tree was dated to 2470–2297calBC (SUERC-79156 (GU47859); Appendix 11). This particular tree and its significance is discussed in further detail by Damian Goodburn (Appendix 3).

10.4.3 No structural timbers were found either in either the evaluation or the excavation.

10.5 Further inform how the landscape was used and to what level of intensification in the Romano-British period;

10.6 There was a small concentration of pits dated to the Roman period in the north-eastern margins of the site in Excavation Area 1. This location was significant in the wider landscape

in that it demonstrated Roman activity was taking place on the brick-earth where these pits are located and in close proximity to more concentrated areas of activity as demonstrated by the excavations at the Former Mardyke Estate (MYE08, Hawkins 2018b) and Beam Washlands (BMV05 Biddulph *et al.* 2010). In particular the pits may have been used to extract clay for pottery manufacture as pottery kilns were found at the Former Mardyke Estate. The late 1st to early 2nd century AD recorded the first evidence for a more widespread Roman occupation of the Mardyke site, located 585m to the north of the Beam Park site. The Roman settlement was represented by field boundary ditches, pitting and multiple groups of ard marks, illustrating ploughing and early agriculture. The second quarter of the 2nd century AD at Mardyke saw a dramatic increase of activity across the site and represented the zenith of Roman occupation. Dense Roman settlement was recorded across the entire area of the site consisting of enclosures and field systems and can be seen as a direct continuation of the rural Roman agricultural settlement already identified on the Beam Washlands site to the west of the River Beam. Roman pottery kilns were recorded *in situ* during the excavation which were producing a local sand-tempered, coarse sand-tempered and shell-tempered wares. This Roman activity was multi-phase throughout the 2nd century with the enclosures and field boundaries being remodelled and alignments altered. No Roman features or material culture post-dating AD 200 was encountered on the site and suggests that Roman occupation of the site did not continue into the 3rd century (Hawkins 2018b).

10.6.1 The waterhole in Area 1 at Beam Park may also be of early Roman date, subject to C14 dating, and if so would demonstrate a fresh water source used for human and/or livestock associated with the nearby settlement. Its location beside the floodplain might illustrate use in summer months when the water-table was low. This distribution of features and sites would strongly suggest that other parts of the site towards the south were too close to the marsh and floodplain and therefore too wet during the Roman period for associated activity. In the other excavation areas there is no evidence of any Roman activity which further supports this theory.

10.7 Inform how the landscape was used and to what level of intensification in the Anglo-Saxon period;

10.7.1 There was no evidence of Saxon activity during any phase of work across this site. The potential for features from this period was expected to be low and the work carried out in both the evaluation and excavation areas proved this to be the case. The various alluvial and flood deposits in the upper sequence were attributed to a post-Roman date in Excavation Area 1 of development Phase1 but without any dating evidence this dating cannot be refined.

10.8 To further inform how the landscape was used and to what level of intensification in the medieval period and to identify landscape features that may be contemporary with that site;

10.8.1 No medieval activity or landscape features were encountered during the various phase of work across the site. Flood deposits, seen in the uppermost alluvium, could conceivably have

formed during seasonal storms as late as the medieval period (given documentary references to such storms) but there is no supporting dating evidence from the archaeological sequence to confirm this. At present the Roman period is the latest period to which flooding can be attributed (with secondary fills of the Area 1 early Roman pits comprising alluvium),

10.9 To further establish whether the nature of post-medieval agricultural land-use at the site and to relate the evidence to cartographic and historical sources;

10.9.1 Early cartographic sources have shown the area was a marsh until the late 18th century. Eventually the land was managed and drained sufficiently enough to be exploited for some form of agriculture. Although there was no direct evidence for early post-medieval agricultural activity there were some dump deposits from the late post-medieval (modern) period when the land was being claimed for industrial use. This activity seems to have removed any agricultural soils that might have informed the agricultural land-use during this period.

10.10 To excavate, record, and remove any human burials legally;

10.10.1 There were no human inhumations found during this fieldwork. One fragment of disarticulated bone (fibula) was found in Excavation Area 2 in peat layer [161] (Appendix 9) but is most likely the result of a dispersal from an exposure burial or from flooding having disturbed a burial site further to the north and does not represent the use of this floodplain for articulated burials.

10.11 Determine the extent, date(s) and function of the poorly understood prehistoric activities on the floodplain edge, and whether these were contemporary with activities investigated by PCA to the north of New Road via an open area investigation of the Victor site;

10.12 There are no areas of prehistoric activity at Beam Park Riverside to compare with sites to the north of New Road such as the Former Mardyke Estate (MYE08, Hawkins 2018b) which may compare with 'burnt' mounds found to the east at Manser Road (MNM03; Compass 2004). One example of a Beaker burial at the Former Mardyke Estate (MYE08) indicates that there is early Bronze Age activity to the north of the site and also on a site further to the east at 105-109 New Road (NEU09; Bull 2014). The majority of features found at the Former Mardyke Estate (MYE080) are of Late Iron Age or Roman date (Hawkins 2018b)

10.13 Determine the presence/absence of human activity at the confluence of the Beam and the Thames at the western extent of Phase 1/eastern extent of Phase 2 – this work would also firmly establish the palaeo-environmental sequence with bulk samples accessible via open exposure of the alluvium, and peat sequence.

10.13.1 The presence of prehistoric activity in the lower Beam Valley at the confluence of the Beam and Thames is only indicated by marginal pieces of evidence from the archaeological investigation. In Excavation Area 1 residual Neolithic/Bronze Age flintwork was identified and possibly the more substantial evidence of a waterhole [84] in Excavation Area 1 of potential Roman date. Quarry pits also of Roman date were identified.

10.13.2 In Excavation Area 2, undated burnt flint and a human tibia in peat were found and also a Neolithic-Bronze Age pottery sherd in ?soil horizon [167].

10.13.3 IN Excavation Area 3 a Neolithic-Bronze Age core-flake/?tool and the Chalcolithic/early Bronze Age worked Yew tree trunk [215] <33> were identified.

10.13.4 The important palaeo-environmental sequence has been studied in detail across the whole site as part of the environmental assessment carried out by QUEST (Appendix 12; Young *et al.* 2018d). This concludes that the floodplain surface is dominated by an alder carr woodland with an understorey of grasses, sedges, ferns and various herbs, with the occasional presence of pools of standing or slow moving freshwater. The pollen analysis records that alder, hazel, elm, ash and birch may have occupied the peat surface but were possibly more likely to have been growing on the dryland to the north forming mixed deciduous woodland with oak and lime. (Appendix 12; Young *et al.* 2018d, 70). Of note is the possibility that Yew might have been growing on the floodplain throughout the formation of the peat (Late Mesolithic to mid/late Bronze Age) (Appendix 12; Young *et al.* 2018d, 71).

10.14 Additional research objectives were proposed by the WSIs for the archaeological mitigation (Hawkins 2017 and 2018a) of Excavation Area 3, as also defined in the Archaeological Strategy and SARMS (CgMs part of RPS updated 2018):

10.15 To confirm whether structural remains relate to a prehistoric trackway or other form of structure such as boundary, and if a trackway function is confirmed, to establish its relationship to the River Beam to the east and River Thames to the south;

10.16 Upon further investigation, it was established that the timber uncovered in evaluation Trench 21 and Excavation Areas 2 and 3 were naturally felled trees of Oak, Ash, Yew and Alder. There was no evidence to suggest that any of these timbers had been laid as a trackway or used as structural timbers for round houses. The worked Yew tree trunk [215] <33> may have been cut in preparation for a trough or perhaps the woodworkers were intending to create a hollow in the upper face of the log, as in the manner used to make a large trough, dug out coffin, small dugout boat or even a dugout drum. (Goodburn, Appendix 3).

10.17 However, given the choice of Yew as raw material, which has certain ritual connotations in later cultures including associations with death and rebirth, other non-utilitarian interpretations cannot be ruled out. In particular, it is possible that the notches cut into the fallen tree trunk were not the product of unfinished hollowing of the trunk but were in some way symbolic. One avenue of research will be to establish whether the very similarly dated Dagenham Idol was may also have been made of Yew rather than Scots Pine as has been previously suggested (given that Yew is a reddish hard wood with a different colour and texture to other deciduous trees growing on the marsh). The idol's ritual associations are not in question and its nearby deposition in an analogous location in peat close to the edge of the marsh may not be coincidental, potentially demonstrating that a liminal interpretation attributed to the marsh edge in the Chalcolithic to Early Bronze Age. These themes will be further explored with reference to

both ethnographic and bibliographical sources at analysis and publication stage. The worked section of the Yew is currently subject to conservation at York University prior to being placed on display at Valance House Museum in Dagenham.

10.18 To confirm the function of the sealing 'bank-like deposit of clay and apparent later posts which cut into it (suggested by Trench 21);

10.19 The 'bank-like' deposit of clay was determined to be of natural origin, composed of alluvial layers forming over the large oak tree running north-south across the site. The size of the tree meant that these layers appeared to form a bank; however, these layers continued on both sides of the tree and extended across the trench. No posts were observed cutting into the 'bank-like' deposit of clay during the excavation.

10.20 To confirm the detailed stratigraphic sequence and in particular whether earlier versions are buried beneath the elements observed in Trenches 14 and 21;

10.20.1 The earliest deposit observed in Excavation Area 3 was a layer of grey sand [238] recorded at the base of a sondage through the peat. A Neolithic-Bronze Age core-flake/?tool from the surface of this Lower Alluvial layer [238] is at the interface between the Lower Alluvium and the formation of peat [208] in which the numerous timbers were found. There are no further elements of archaeological features underlying the peat.

10.20.2 The excavation in Area 3 was covered by a layer of peat, within which numerous timbers were recorded. A large oak tree [216], observed in Trenches 14 and 21, ran north-south across the trench. It was established that this tree had fallen naturally and there was no evidence present that suggested it had been used as a trackway; no earlier timbers were observed below this tree. A north-west to south-east angled yew tree [215], also naturally felled, was recorded to the east of the oak tree within the peat. Notches cut into the tree and areas of burning indicate human activity; however, it is unclear why this work commenced on the timber and was subsequently abandoned. The tree and surrounding timbers have been dated to c. 2498 BC – 2296 BC, indicating that they had collapsed during the late Neolithic/early Bronze Age.

10.20.3 The work undertaken by QUEST on a column sample taken through section 60 in Excavation Area 3 throws into question the dating of the peat in this area. The results retuned two dates between of 1875-1645 calBC (early Bronze Age) from the base of the peat (Appendix 12; Young *et al.* 2018d, 26) which is later than a date of 2470 BC – 2297 calBC (SUERC-79156 (GU47859); Appendix 11) determined from the Yew Tree which sat within the peat. Further clarification is recommended

10.21 To establish via specialist worked wood analysis whether the axe cut marks on worked items are indeed derived from a metal axe (as provisionally suggested);

10.21.1 On specialist examination of the tree it has been concluded from the narrowness and depth of the grooves cut into Yew tree timber [215] that they could only have been made by a metal blade and were probably chisel cut (Appendix 3).

10.22 To establish a reliable chronology for the worked wood remains via multiple radiocarbon dates, or (preferably) dendro-chronology, in order to confirm/refute the initial radiocarbon date suggestive of a Late Neolithic or very early Chalcolithic date;

10.22.1 Radiocarbon dating of the worked timber [215] <33> has returned a date range of 2470 BC – 2297 calBC (SUERC-79156 (GU47859); Appendix 11), while a nearby timber thought to be part of the root system [237] <30> has been dated to 2466 BC – 2296 cal BC (SUERC-79161 (GU47861; Appendix 11); a small yew [236] <24> knocked over by the collapse of the worked timber has been radiocarbon dated to 2498 BC – 2344 cal BC (SUERC-79157 (GU47860); Appendix 11). These dates are indicative of a Late Neolithic or Chalcolithic/earliest Bronze Age date. Two samples of timber were suitable for dendrochronology but comparisons with reference data from the British Isles and elsewhere identified that neither of these samples strongly matched at any position and they remain undated by dendrochronological analysis (Appendix 4).

10.22.2 A complete slice across Oak timber [216] was submitted for possible tree-ring dating (see Tyers, Appendix 4). Whilst a 223-year sequence was obtained for this sample no match could be made from comparative data from the British Isles and elsewhere and the sample remains undated. The complete sample of Yew tree trunk [215] identified 206 rings but similarly no match could be found in comparative reference sequences and the sample remains undated. (Appendix 4)

10.23 In the event of confirmed use of metal (copper) axes/adzes and of a date for this working pre-dating the conventional beginning of the Chalcolithic/Early Bronze Age (of around 2,500 cal BC) – to establish the significance of early copper tool use by the Thames and whether this implies the Thames Estuary was a very early entry point of entry metal/ metal technology to Britain.

10.24 The narrowness and depth of the grooves cut into Yew tree timber [215] indicates that only a metal blade could have been used as a ground stone, bone or antler chisel would have been too thick to achieve such narrow cuts. It appears that the woodworkers were intending to create a hollow in the upper face of the log, as in the manner used to make a large trough, dug out coffin, small dugout boat or even a dugout drum. This period, when the first metal tools were being introduced in Britain, is one of special interest from the point of view of evidence for woodworking and woodland history (Goodburn, Appendix 3). The evidence will be further considered at analysis with additional reference to the working of the very similarly Dagenham Idol.

10.25 Additional Research Questions and Aims

10.25.1 The results of the archaeological excavation raised several new research questions relating to the archaeological remains uncovered which should be addressed in further analysis.

- Can the alluvial sequence be more precisely understood with comparison to other sites in the floodplain of the Thames valley?
- Can a more accurate understanding of the flooding (Upper Alluvial deposits) be determined and how much it is influenced by the Beam River?
- Examine the significance of waterhole [84] in Area 1 with reference to the common association of waterholes with burnt mounds in the nearby vicinity and in particular if relevant to set this feature into context by comparison with the excavation results from Manser Road (MNM03). A related aim is therefore to C14 date this feature from the animal bone or carbon present in fill [83].
- Can we build up a more precise / accurate picture of the environment of the site over the prehistoric period? Compare the type of woodland landscape and the presence of Yew-Alder dominated woodland with other sites such as Erith in the Lower Thames Valley. This is included in a discussion of the Vegetation History by QUEST (Appendix 12; Young *et al.* 2018d, 70).
- Can we understand the presence and absence of prehistoric activity in relation to the deposit modelling and its relation to the river valley? Establish that prehistoric settlement is likely to be further north and not on this floodplain.
- What is the significance of the worked Yew tree [215]<33> in terms of Chalcolithic / Early Bronze Age marsh edge use and was the purpose of the working likely to have been domestic or profane (or a combination, if for example the tree was being hollowed for use as a coffin)? What can be inferred from the analogous location of the very similarly dated Dagenham Idol within peat at the edge of the Dagenham marsh?
- Further work is recommended on the stratigraphic sequence of Lower Alluvium found in Excavation Area 2. As stated in the environmental assessment (Young 2018c, section 4.4, 22 and 69) an apparent hiatus in deposition was evident on the surface of the Lower Alluvium in Section 100 column <3>, along with a possible Neolithic-Bronze Age sherd of pottery retrieved from context [167] of this same stratigraphic sequence (Appendix 6). This possible evidence for prehistoric human activity may indicate that land surfaces and soil levels were present in this particular sequence. Although evidence for a possible land surface in this sequence was limited in the lithostratigraphic description, micromorphological analysis of this column sample is recommended in order to identify any evidence for soil formation (Young 2018c, 22 and 69).
- Further C14 dated is recommended to establish the date of the one disarticulated fragment of human bone in Excavation Area 2 context [161] and if this relates to Beaker burials at the

Former Mardyke Estate (MYE08; Hawkins 2018b) to the north of the site and to the Early Bronze Age beaker domestic site at 105-109 New Road, Rainham (NEU09; Bull 2014). Is the location of human bone in the peat another possible example of a perceived liminal character of the marsh edge in the Neolithic/ Bronze Age?

- There is limited evidence from the Roman period from this site but further work on the column sample taken through the backfill of waterhole [84] (if confirmed as Roman feature as expected) might build up a more precise / accurate picture of the environment and its human exploitation, for example as summer grazing meadow, during the Roman period?
- The presence of twelve pits alone will contribute little to a further understanding of Roman activity taking place on this terrace edge but merely extends the distribution of known Roman activity in the areas (for example at Beam Washlands (BMV05) and the Former Mardyke Estate (MYE08) further south to the edge of the floodplain. In particular is brickearth extraction for pottery manufacture at the pottery kilns found to the north at the Mardyke Estate a credible interpretation of their function?
- Is the land too marginal for Saxon and medieval activity other than use as floodplain meadow pasture?
- Can we understand the laying out of the 17th century field system and how it changed over time?
- How was the early post-medieval field system changed by the formation of an industrial landscape?

11 IMPORTANCE OF THE RESULTS, FURTHER WORK AND PUBLICATION PROPOSALS

11.1 Importance of the Results

11.1.1 Overall the results of the excavation are important at a regional level as they demonstrate some use of the area during the prehistoric period, with the presence of peat preserving evidence of Chalcolithic/Early Bronze Age wood working and a potential Late Bronze Age or Roman feature associated with accessing water. There is also potential to establish if a prehistoric land surface is present in the Early to Mid-Holocene Lower Alluvium below the peat in Excavation Area 2 where one abraded sherd of potentially Neolithic/early Bronze Age pottery was retrieved.

11.1.2 The majority of the stratigraphy recorded at Beam Park relates to a sequence of Lower Alluvium, peat and Upper Alluvium largely formed in a sequence from the Mesolithic through to late prehistoric period in Excavation Areas 2 and 3, although Roman alluviation was also noted in Area 1. On the northern parameters of the site and in Excavation Area 1 some peripheral early Roman quarrying and water provision activity is taking place on the edge of the marsh and on the higher ground, possibly contemporaneously and associated with Roman activity found to the north of the site at the Former Mardyke Estate (MYE05; Hawkins 2108b and at the Beam Washlands reservoir site (BMV05; Biddulph *et al*. 2007. Biddulph *et al*. 2010).

11.1.3 The artefactual evidence for prehistoric settlement activity is very minimal at this site; residual flintwork in Area 1, an abraded sherd of potentially Neolithic/Bronze Age pottery, one disarticulated human bone in Excavation Area 2 and a few flint tools of potential Neolithic-Bronze Age date in the basal alluvial sands and Mesolithic/early Neolithic struck flint blade in the prehistoric peats of Excavation Area 3. A possible stake–hole [206] in the later prehistoric (upper alluvial) surface in Excavation Area 3 may represent the Later Bronze Age/Roman period. More significant finds representing prehistoric activity in this vicinity were the carved/worked Chalcolithic/early Bronze Age Yew Tree [215] <33> in Excavation Area 3 and maybe the presence of a Roman waterhole [84] in Excavation Area 1.

11.1.4 With the exception of the naturally felled trees in Excavation Area 3 and the waterhole in the north-eastern part of the site (Excavation Area 1) these finds are very slight indicators of potential Neolithic to Late Bronze Age activity, associated with Lower Alluvial and peat deposits in Excavation Areas 2 and 3. However, one sherd of pottery and three pieces of flint are not indicative of intensive occupation and a more likely conclusion is that occupational settlement was further to the north and not on this floodplain. These artefacts are more likely to have been washed into the Lower Alluvium and peat than to represent in-situ activity.

11.1.5 The partially worked fallen Yew [215] is rather more significant as a very rare example of the early stages in the making of a large hollow wooden vessel in the Chalcolithic/ Early Bronze

Age, possibly a small dugout boat, or a large trough, coffin, or even a drum. If it was worked as some form of 'trial or training project' for a junior Early Bronze Age woodworker then its significance is enhanced and can be said to be of regional importance. The dating to the early part of the Early Bronze Age, when metal woodworking tools were still rather new at around 2,300 BC or a little earlier is also of regional significance (Goodburn, Appendix 3).

11.1.6 The significance of the alder carr woodland landscape recovered from borehole and column samples in Excavation Area 3 is of regional importance and should be set within a regional context and compared with sites such as Erith and Wennington. It is possible that this alder-carr woodland (hazel, elm, ash, birch, alder) was growing on the dryland and that Yew was growing on the peat surface throughout much of the period of peat formation. Comparative research with other sites in the Lower Thames Valley which also have a yew-alder dominated woodland at this time (e.g. Seel, 2001, Branch *et al*., 2012, Batchelor *et a*l., in prep) is proposed as part of the ongoing work being undertaken by QUEST (Appendix 12; Young *et al.* 2018d,70-72). A dry peat surface was almost certainly required to enable the growth of Yew on the Lower Thames Valley peat surface and this is indicated by the decline in tree taxa towards the top of sequence (particularly in Trench 21 Section 42, evaluation / Excavation Area 3), with an increase in the number and variety of herbaceous taxa, from approximately 3500 cal BP onwards, and with a stronger dryland signal within this sequence closest to the dryland (Appendix 12; Young *et al.* 2018d, 71).

11.1.7 Damian Goodburn (Appendix 3) also discusses the woodland environment on the peat deposits found in the Greater Thames Estuary, particularly in the area surrounding Dagenham, such as at Wennington (to the east of Beam Park) which include many species commonly associated with current only moderately damp or even dry woodlands in England today i.e. not really wet alder carr evidence. Typically the species range includes much oak and yew reflecting a type of flood plain woodland now extinct in England where naturally growing yew is associated with steep downland 'hanger woods' growing with species such as hornbeam, hazel, beech, ash and oak. This extinct and very distinctive valley bottom woodland type has also been found in some other areas of later prehistoric coastal and estuarine woodlands in Belgium, Germany and the Netherlands (Deforce and Bastiaens 2004).

11.1.8 The naturally accumulated drowned woodland deposit in Excavation Area 3 is therefore locally important as another example of the form of flood plain woodland that occupied the site around 2,300 BC, but as there are many other sites yielding similar information in the area its significance must be seen as local (Goodburn Appendix 3). The full scale excavation work carried out in Area 3 provided a slightly different picture to the summary pollen analysis as it showed that large oak and yew were more dominant and growing on the peat during a dryer phase.

11.1.9 The environmental archaeology assessment by QUEST notes that there are spatial and temporal variations in the pollen counts/analysis across the area which show trends such as a relative lack of Yew pollen in the peat sequence associated with Excavation Area 2 (as shown in the top of the column sequence for the Section 100 sequence). This suggests an absence of Yew from this part of the site which may be as a result of a wetter landscape at the transition from the Neolithic to Bronze Age (Appendix 12; Young *et al.* 2018d,71-2). The peat recorded in Excavation Area 2 might potentially be earlier (Early to Middle Neolithic) in date than that in Excavation Area 3 (Middle Bronze Age), though the base of the peat was not reached in Excavation Area 3 (Young *et al.* 2018c, Tables 6, 7 and 8) and in reality it is likely that there is chronological overlap.

11.1.10 A later sequence of woodland clearance and the possible opening up of the landscape and cultivation is seen in the marked increase in seeds of Brassica/Sinapis sp. (e.g. field mustard) occurring at the top of the sequence in Excavation Area 3, Section 60. The Brassicaceae family includes several species of economic value, and many are weed species associated with cultivation, although wild forms do occur. Although not unequivocal evidence for human activity, the occurrence of Brassica/Sinapis sp. may be associated with the general reduction in woodland cover and opening up of the landscape in this area, and perhaps cultivation or as an associated weed (Appendix 12; Young *et al.* 2018d, 72-3). As this is at the top of the sequence in Excavation Area 3 this may be an indicator of Bronze Age land clearance and cultivation.

11.1.11 The cultural significance of the hollowed/worked Yew Tree [215] dated as 2470 BC – 2297 calBC (SUERC-79156 (GU47859); Appendix 11) is of regional significance. Damian Goodburn (Appendix 3) concludes that the tree was most likely being hollowed out, possibly as a demonstration or 'trial piece' or a dugout boat, large trough, coffin or large drum abandoned in the early stages of making. The size of the log was just big enough for use as a small dugout boat which would also have required the closure of the rot void at the root end with a cross wise plank 'transom', as are known in many British dugout boat finds from the Bronze Age to medieval period. However, the choice of Yew for making a very large hollow wooden vessel is unique as other examples in Britain are commonly of Oak. Yew is sometimes clearly used for high status or ritual items but was clearly also common in the flood plain woodland at the time.

11.1.12 The environmental assessment comments that Yew is of great cultural significance and has been utilised from the Palaeolithic through to the modern day. The prehistoric importance of yew is demonstrated by its use in: (i) creating weapons and tools such as spears, swords, bows, knives and musical pipes (e.g. Clark, 1963; Coles *et al.* 1978; Gowen, 2004, Sheridan, 2005), and (ii) constructing trackways, platforms and boats (Coles and Hibbert, 1968; Coles *et al.*, 1978; Wright *et al.*, 1965, 2001). Previously, only at Golfers Driving Range, Beckton has the direct use of Yew been recorded on the Lower Thames Valley floodplain; there it was incorporated into the sub-structure of an early platform structure (dated 1630-2000

calBC/3580-3950 calBP). The worked Yew tree [215] from the current Beam Park site is therefore particularly important, providing evidence for its use in a different way during the Chalocolithic/ Early Bronze Age (2300-2470 calBC/4250-4420 calBP) (Appendix 12; Young *et al.* 2018d, 71).

11.1.13 Of particular interest is the similar date of the worked Yew in Area 3 to the Dagenham Idol (an anthropomorphic wooden figurine as discovered in 1922 during the installation of sewer pipes on the edge of the marshes near to Gores Brook, c.750m west of the western end of the overall site). There is little doubt concerning the ritual context of the Dagenham Idol's use and deposition. However, it may also be possible that the choice of Yew for chisel notching of uncertain function in Area 3 combined with its location in the marsh, also has symbolic or ritual connotations (Yew trees having a particular symbolism in many cultures, including its reference as 'the death tree' as well as the apparent appropriation of its pagan associations in the context of Christian churchyards).

11.1.14 The results of the excavation also demonstrate that the site had some peripheral Roman activity taking place on the edge of the marsh in comparison with concentrations of Late Iron Age and Roman activity taking place at the Former Mardyke Estate (Hawkins 2018b) and Beam Washlands (Biddulph *et al*. 2010) to the north of Beam Park. In this way, the results can again be seen as important at a local level, as much of this part of the landscape is believed to have witnessed only marginal Roman activity, being too close to the marsh for any concentrations of settlement activity.

11.1.15 The date of the Roman well/waterhole [84] needs further investigation and is pertinent to establishing the type of settlement associated with the higher ground to the north of the site at Beam Park. Wells/waterholes of this type are typical of a Late Bronze Age or Roman date but the only dating evidence associated with this feature comes from the animal bone assemblage which has been characterised as typically Roman (Appendix 10). Examples of well/waterholes have also been identified in the nearby site at the Beam Washlands Reservoir site (Fig. 1; BMV05) where they were dated as Roman (Biddulph *et al.* 2010, Biddulph *et al.* 2007) though there is also a mid to Late Bronze Age 'burnt mound' identified at Manser Road to the east of Beam Park (MNM03; Compass 2004, 4).

11.2 Further Work

11.2.1 A number of recommendations for further work have been suggested as a result of this assessment

11.2.2 Further C14 dates may clarify the date of the human bone in peat layer [161] Excavation Area 2, Section 100. Similarly, a C14 date from the single large red deer tibia may provide a date for the colluvium/peat layer [166] in Excavation Area 2 (although its residuality cannot be discounted), Section 102. A third C14 date is recommended to clarify the date of the animal bone assemblage found in the backfill of waterhole [84] in Excavation Area 1.

11.2.3 The lithic assemblage is of local significance in that it demonstrates flintworking occurring at the site during the Mesolithic or Early Neolithic and possibly during the later prehistoric period. However, its size and the lack of secure contextual associations means that its interpretational value is limited beyond that indicated in this report, and no further analytical work is recommended. Nevertheless, both the struck flint and unworked burnt flint can contribute to a wider understanding of prehistoric occupation in east London and short descriptions, based on this catalogue and report, should be included in any published account of the excavations.

11.2.4 The following work is recommended for the worked wood depending on the format of the final report. Research evidence for Early Bronze Age edge tools that could have been used to carry out the work on yew timber [215] should be carried out. Socketed or palstave-type chisels are well known for later periods but what was available in the early Early Bronze Age is far less certain. It is also recommended to compile an updated version of this text with more complete referencing of comparative evidence. Five simple draft explanatory figures and further consideration of the distinctive yew oak woodland and comparative evidence are also proposed.

11.2.5 Further research regarding the possible function of the notches on the worked wood is proposed.

11.2.6 A discussion and comparative research of the environmental landscape will be required as part of further analysis. The yew tree and various timbers in Excavation Area 3 should be discussed within a broader framework of yew-alder dominated woodland within the Lower Thames Valley. This work is recommended as part of QUEST's ongoing involvement with the Beam Park Riverside project (Appendix 12; Young *et al.* 2018d, 76), but the results should be included in any publication of the archaeological investigations.

11.2.7 Additional micromorphological analysis of column sample <3> within Section 100 of Excavation Area 2 is recommended in order to identify any evidence for soil formation (Young 2018c, 22 and 69). This is proposed within the framework of QUEST's further work but pertinent to the interpretation of the archaeological investigations This would determine if there were any land surfaces present in Excavation Area 2 and if the one pottery sherd from context [167] in this sequence does in fact represent Neolithic/Bronze age activity.

11.2.1 Also within QUEST's environmental assessment is a recommendation for one further C14 date from the base of the peat in Section 60 (Excavation Area 3) as there was some uncertainty as to the age of the peat at the base of the column sample. An additional sample might clarify the chronological relationship between the peat and the worked yew tree [215] (Appendix 12; Young *et al.* 2018d, 26 and 69). The base of the peat was not reached in Area 3 Section 60, but the peat here was radiocarbon dated to between 3595 and 3825 cal BP (Early Bronze Age) despite its close proximity (c. 5m apart) to the worked yew [215], radiocarbon dated to 2300-2470 cal BC/4250-4420 cal BP.

11.2.2 The small size and the lack of diagnostic sherds in the Roman pottery assemblage limits the discussion beyond dating, however, the presence of possible Mardyke kiln products can provide a link between the two sites and future investigations have the potential to contribute to our knowledge of the distribution of Mardyke and Beam Valley products in the area and to develop the regional context for this site.

11.2.3 It is recommended that the small animal bone collection is worthy of further work, essentially clarifying the information already described and hopefully comparing this data with bone collections from other sites in this general region. There is some uncertainty related to the dating of the major part of this collection (from pit [84]) and efforts should be made to rectify this situation. Whether it is prehistoric and Roman or just Roman, the absence of evidence related to animal husbandry in this local area will certainly justify any further work. Animal bone collections were discovered at the previously mentioned Roman settlement sites at Beam Washlands and Mardyke, however the bone assemblages from these sites were small, in poor condition and highly fragmented (Strid 2010, 140-1 and Deighton 2018). A final point concerns the red deer tibia from Excavation Area 2 which is also placed in the earlier period (Phase 3). This may well represent the sole prehistoric component of the animal bone assemblage and it may be worthwhile attaining a carbon date for this example as well as from bone(s) from well/waterhole fill (83).

11.2.4 There is limited evidence for the Roman period from this site but further work on the column sample taken through the backfill of waterhole [84] might build up a more precise / accurate picture of the environment of the site during the Roman period?

11.3 Publication Proposal

11.3.1 The results of the archaeological excavation will be published as an article in the peer reviewed journal Transactions of the Essex Society for Archaeology & History. This article will concentrate on the archaeological remains recorded of all periods and discuss them within the context of the Environmental landscape for the prehistoric period as well as within a regional context for all periods. The format of the publication will follow these headings;

- Abstract
- Introduction
- Geological and topographical background
- Archaeological background
- Archaeological evidence, by phase
- Environmental evidence for the Prehistoric landscape and woodland type
- Finds assemblage reports

- Discussion

The illustrations will include:

- Location plans
- Phase plans
- Plans of features and groups of features
- Sections
- Photographs
- Finds illustrations

12 CONTENTS OF THE ARCHIVE

12.1 Paper Records

Contexts	105 sheets
Plans	98 sheets
Sections	28 sheets

12.2 Finds

Pottery	7 bags
CBM	2 bags
Animal Bone	9 bags
Burnt Flint	12 bags
Worked Flint	10 bags
Stone	1 bags
Worked Timber / Timber Samples	12 bags
Environmental samples	8 samples (24 buckets)

12.3 Digital archive

Photographs	581 digital images

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APPENDIX 1: CONTEXT INDEX

Context	Type	Fill of	Excavation Area	Interpretation	Length (Metres)	Width (Metres)	Depth	Levels high (m OD)	Phase	Spot Date
55	Layer	N/A	1	Layer of Natural Brick-Earth	37.00	54.00	Unkno	1.3	1	
56	Fill	57	1	Fill of Pit	0.86	0.9	0.26	1.2	4	
57	Cut	N/	1	Cut of Pit	0.86	0.9	0.28	1.2	4	
58	Fill	59	1	Upper Fill of Pit	1.78	1	0.2	1.24	4	Pot Date: AD50-400
59	Cut	N/A	1	Cut of Pit	1.78	1	0.3	1.24	4	
60	Fill	61	1	Fill of [61]	0.77	0.73	0.12	1.19	4	
61	Cut	N/A	1	Cut of Pit	0.77	0.73	0.2	1.19	4	
62	Fill	63	1	Fill of Pit	1.9	1.3	0.29	1.3	4	
63	Cut	N/A	1	Cut of Pit	1.9	1.32	0.29	1.3	4	
64	Fill	59	1	Primary Fill of Pit	1	0.5	0.12	0.94	4	
65	Fill	66	1	Fill of Pit	3.22	1.98	0.25	1.25	4	
66	Cut	N/A	1	Cut of Pit	3.22	1.98	0.25	1.25	4	
67	Layer	N/A	1	Layer of Alluvium	3.95	1.6	0.29	1.17	4	Pot Date:

Context	Type	Fill of	Excavation Area	Interpretation	Length (Metres)	Width (Metres)	Depth	Levels high (m OD)	Phase	Spot Date
										AD70-130
68	Fill	69	1	Fill of Pit	3.12	2.26	0.3	1.23	4	
69	Cut	N/A	1	Cut of Pit	3.12	2.26	0.3	1.23	4	
70	Fill	72	1	Fill of Pit	3.7	2.2	0.3	1.23	4	
71	Fill	72	1	Fill of Pit	1.9	1.4	0.2	0.97	4	Pot Date: AD 50-160
72	Cut	N/A	1	Cut of Pit	3.7	2.4	0.55	1.23	4	
73	Fill	74	1	Fill of Pit	1.1	0.8	0.15	1.26	4	
74	Cut	N/A	1	Cut of Pit	1.1	0.8	0.15	1.26	4	
75	Fill	72	1	Fill of Pit	3.7	0.1	0.3	1.23	4	
76	Fill	72	1	Fill of Pit	3.7	0.15	0.5	1.23	4	
77	Fill	78	1	Fill of Pit	2.78	2.42	0.23	1.42	4	Pot Date: AD 70-200
78	Cut	N/A	1	Cut of Pit	2.78	2.42	0.23	1.33	4	

Context	Type	Fill of	Excavation Area	Interpretation	Length (Metres)	Width (Metres)	Depth	Levels high (m OD)	Phase	Spot Date
79	Fill	80	1	Fill of Pit	2.5	1.2	0.3	1.26	4	Pot Date: AD 50-160
80	Cut	N/A	1	Cut of Pit	2.5	1.2	0.3	1.31	4	
81	Fill	82	1	Fill of Pit	1.06	0.78	0.14	1.29	4	
82	Cut	N/A	1	Cut of Pit	1.06	0.78	0.14	1.29	4	
83	Fill	84	1	Primary Fill of Pit / Water Hole	1.4	1	0.3	0.79	3	
84	Cut	N/A	1	Cut of Pit	1.4	1	1	1.04	3	
85	Fill	86	1	Fill of Pit - Recorded in Section	0.8	0.55	0.66	1.36	4	
86	Cut	N/A	1	Cut of Pit - Recorded in Section	0.8	0.55	0.66	1.36	4	
87	Layer	N/A	1	Brown Flood Deposit - Alluvium	30	45	0.2	1.29	5	
88	Fill	84	1	Upper Fill of Pit - Recorded in Section	3		0.25	1.04	3	
89	Layer	N/A	1	Natural Alluvial Layer - Recorded in Section	1	1.5	0.4	1.04	2	

Context	Type	Fill of	Excavation Area	Interpretation	Length (Metres)	Width (Metres)	Depth	Levels high (m OD)	Phase	Spot Date
90	Layer	N/A	1	Natural Alluvial Layer - Recorded in Section	1.7	1.5	0.35	0.84	2	
91	Layer	N/A	1	Natural Sandy Layer - Recorded in Section	1.75	1.5	0.35	0.49	1	
92	Layer	N/A	1	Alluvial Layer - Recorded in Section	1.75	1.5	0.15	0.09	1	
93	Layer	N/A	1	Natural Alluvial Layer - Recorded in Section	2.5	1.5	0.4	1.04	2	
94	Layer	N/A	1	Natural Alluvial Layer - Recorded in Section	2.5	1.5	0.25	0.64	2	
95	Layer	N/A	1	Brown Clay Layer Recorded in Section Part of Upper Alluvium	10.4		0.25	1.39	5	
96	Layer	N/A	1	Layer of Grey Clay Recorded in Section	12		0.1	1.36	2	
97	Fill	98	1	Fill of Pit Recorded in Section	1.6	1.6	0.3	1.26	4	
98	Cut	N/A	1	Cut of Pit Recorded in Section	1.6	1.6	0.3	1.26	4	

Context	Type	Fill of	Excavation Area	Interpretation	Length (Metres)	Width (Metres)	Depth	Levels high (m OD)	Phase	Spot Date
99	Layer		1	Orange Clay/Sandy/Silt Layer Recorded in Section Part of Lower Alluvial Sequence	19	N/A	0.43	1.16	2	
100	Layer	N/A	1	Natural Sandy Layer Recorded in Section	10.2	N/A	0.25	0.66	1	
101	Fill	102	1	Fill of Pit Recorded in Section	1.3	N/A	0.2	1.16	4	
102	Cut	N/A	1	Cut of Pit Recorded in Section	1.3	N/A	0.2	1.16	4	
103	Fill	104	1	Fill of Pit Recorded in Section	2.6	N/A	0.3	1.16	4	
104	Cut	N/A	1	Cut of Pit Recorded in Section	2.6	N/A	0.3	1.16	4	
105	Layer	N/A	1	Natural - Orange Sandy Layer Recorded in Section	3.6	N/A	0.15	0.8	1	
106	Fill	107	1	Fill of Pit	2.3	2.3	0.15	1.29	4	

Context	Type	Fill of	Excavation Area	Interpretation	Length (Metres)	Width (Metres)	Depth	Levels high (m OD)	Phase	Spot Date
107	Cut	N/A	1	Cut of Pit	2.3	2.3	0.15	1.29	4	
160	Layer	N/A	2	Layer of Upper Alluvium	25	22	2	0.62	5	
161	Layer	N/A	2	Layer of Peat	13.5	19	0.8	-1.38	3	
162	Layer	N/A	2	Layer of Lower Alluvium	15.7	14.7	1.2	-2.18	2	
163	Layer	N/A	2	Layer of Clay/Sand Recorded in Section	9	7.5	0.2	-2.97	1	
164	Layer	N/A	2	Layer of Natural Sand	9	7.5	0.5	-3.37	1	
165	Layer	N/A	2	Layer of Alluvium	7.45	2.25	0.2	-0.17	3	
166	Layer	N/A	2	Layer of Peat Recorded in Section	N/A	20	0.3	-0.27	3	
167	Layer	N/A	2	Buried Land Surface Recorded in Section	N/A	2.35	0.4	-0.27	3	
168	Layer	N/A	2	Sandy Sub-Soil Recorded in Section	N/A	1.87	0.22	-0.67	3	
169	Layer	N/A	2	Mixed Layer Recorded in Section Part of Lower Alluvial Sequence	N/A	19.4	1.3	-0.47	2	

Context	Type	Fill of	Excavation Area	Interpretation	Length (Metres)	Width (Metres)	Depth	Levels high (m OD)	Phase	Spot Date
170	Layer	N/A	2	Layer of Gravelly alluvium Recorded in Section	2.82	2.45	0.2	-0.17	3	
171	Layer	N/A	2	Mixed Alluvial Layer Recorded in Section	2.75	N/A	0.1	-0.73	3	
172	Layer	N/A	2	Layer of Alluvium and Gravel Recorded in Section	3.1	N/A	0.32	-0.83	3	
200	Layer	N/A	3	Alluvial Layer	5.8	1.4	0.22	-0.32	5	
201	Layer	N/A	3	Alluvial Layer	5.8	1.4	0.20	-0.36	5	
202	Layer	N/A	3	Alluvial Layer	5.8	1.4	0.25	-0.56	5	
203	Layer	N/A	3	Alluvial Layer	5.8	1.4	0.26	-0.67	5	
204	Layer	N/A	3	Alluvial Layer	1.5	N/A	0.21	-0.37	5	
205	Void	N/A	3							
206	Cut	N/A	3	Stake Hole – for timber [207]	0.06	0.05	0.07	-0.66	5	
207	Timber	207	3	Timber Stake	0.06	0.05	0.07	-0.66	3	
208	Layer	N/A	3	Peat Layer	27.16	14.4		-0.82	3	
209	Layer	N/A	3	Alluvial Layer	2.26	4.00	0.12	-0.82	3	
210	Layer	N/A	3	Peat Layer	2.30	4.04		-0.95	3	

Context	Type	Fill of	Excavation Area	Interpretation	Length (Metres)	Width (Metres)	Depth	Levels high (m OD)	Phase	Spot Date
211	Timber	212	3	Accumulation of wood in gully [212]	1.70	1.52	0.18	-0.86	3	
212	Cut	N/A	3	Cut of natural gully	1.70	1.52	0.18	-0.83	3	
213	Layer	N/A	3	Alluvial Layer	3.88	3.10		-0.82	3	
214	Layer	N/A	3	Alluvial Layer	2.38	5.70		-1.07	3	
215	Timber	N/A	3	Large Worked Timber – Yew Tree	5.53	0.85		-0.96	3	
216	Timber	N/A	3	Large oak tree	14.48	0.80		-1.04	3	
217	Timber	N/A	3	Fallen tree overlying [216]	4.10	0.40		-1.30	3	
218	Timber	N/A	3	Small yew tree overlying [229	3.60	0.09		-1.03	3	
219	Timber	N/A	3	Small yew tree	3.50	0.08		-0.89	3	
220	Timber	N/A	3	Sheet of Bark	1.52	1.12		-1.26	3	
221	Layer	N/A	3	Layer of Clay/Peat	2.28		0.10	-0.9	3	
222	Layer	N/A	3	Layer of Peat	4.65		0.20	-0.79	3	
223	Layer	N/A	3	Layer of Peat/Clay	1.40		0.15	-1.00	3	
224	Layer	N/A	3	Blue Grey Clay	2.92		0.51	-0.98	3	
225	Layer	N/A	3	Layer of Clay Peat	1.96		0.15	-1.00	3	

Context	Type	Fill of	Excavation Area	Interpretation	Length (Metres)	Width (Metres)	Depth	Levels high (m OD)	Phase	Spot Date
226	Layer	N/A	3	Layer of Clay/Peat	2.02		0.22	-1.00	3	
227	Layer	N/A	3	Layer of Brown/Grey Clay	1.54		0.31	-1.19	3	
228	Timber	N/A	3	Small Yew Tree	1.00	0.14	0.04	-0.99	3	
229	Timber	N/A	3	Small Yew Tree/Branch	1.12	0.12	0.07	-1.13	3	
230	Timber	N/A	3	Small Yew Tree	0.74	0.08		-1.25	3	
231	Timber	N/A	3	Possible Oak Tree	2.40	0.40	0.30	-0.91	3	
232	Timber	N/A	3	Possible Oak Tree	2.70	0.26	0.20	-0.95	3	
233	Timber	N/A	3	Yew Tree overlying [216]	1.07	0.60	0.70	-1.08	3	
234	Timber	N/A	3	Yew Tree overlying branch [216] and [217]	3.62	0.12	0.09	-1.29	3	
235	Timber	N/A	3	Yew Tree overlying [217]	1.72	0.05	0.06	-1.3	3	
236	Timber	N/A	3	Yew tree below [215]	0.84	0.08	0.09	-1.22	3	
237	Timber	N/A	3	Yew tree/branch	0.66	0.10	0.05	-1.32	3	
238	Layer	N/A	3	Grey Sand Layer	0.30	0.30		-1.70	1	

APPENDIX 2: LITHIC ASSESSMENT

Barry Bishop

Introduction

The archaeological investigations at Beam Park resulted in the recovery of assemblages of struck flint and unworked burnt stone. The pieces have all been individually catalogued and this includes details of their contextual origins, raw material and condition, and where possible a suggested date of manufacture (Catalogue L01 site archive). This report summarises the information contained in the catalogue and assesses the assemblage's archaeological significance and its potential to contribute to the further understanding of the nature and chronology of activity at the site. All metrical descriptions follow the methodology established by Saville (1980).

Quantification and Deposition

	Decortication flake	Core rejuvenation flake	Flake	Blade-like flake	Blade	Flake / blade fragment	Core: flake	Conchoidal chunk	Retouched implement	Burnt stone (no.)	Burnt stone (wt:g)
Excavation Area 1 Roman Pits	1	1	4	1		3	1	2	3	61	146
Excavation Area 3 Alluvial deposits					1		1	1		3	131
Total	**1**	**1**	**4**	**1**	**1**	**3**	**2**	**3**	**3**	**64**	**159**

Table L01: Quantification of Lithic Material from Beam Park by Excavation Area

A total of 19 pieces of struck flint were recovered from the Area 1 – 3 excavations at Beam Park (Table L01). The majority came from a series of pit fills in Excavation Area 1 that have been dated to the Roman period. Burnt flint was recovered from the lower peat layer in Area 2 but not retained. Three pieces were recovered from Excavation Area 3; two of these from basal sand deposits and the other from prehistoric peats. Over 1.5kg of unmodified but burnt stone were also recovered during the excavations (see Table L01). Again, the majority of this (92% by weight) came from the Excavation Area 1 Roman pits with the rest coming from prehistoric peat and Lower Alluvial deposits in Excavation Area 3.

Description

Unworked Burnt Stone

The unworked burnt stone all consists of rolled alluvial flint pebbles and cobbles, including some Tertiary pebbles, that have been heated to a variable but generally intense degree, causing them to change to a red or grey-white colour and become 'fire-crazed'. The majority came from the Roman pits in Excavation Area 1 and, additionally, at least four struck flints from these features had been burnt. The heating of stone for craft activities such as glass making was occasionally undertaken during the Roman period but, as the pits also produced fairly sizeable quantities of prehistoric struck flint which presumably had been residually deposited, it is perhaps just as likely that the burnt flint had been residually deposited as well. Although still not large, the quantities recovered from these features may indicate that flint was being deliberately burnt in the vicinity. The deliberate heating of flint is often documented from prehistoric sites and a variety of reasons have been forwarded for its production, including for cooking and a variety of craft and industrial processes (e.g. Barfield and Hodder 1987; Barfield 1991; Jeffery 1991). Further quantities of burnt flint were also recovered from prehistoric peats and post Roman deposits in Excavation Area 3.

Struck flint

The raw materials used for the struck flint assemblage comprise fine-grained translucent or mottled 'glassy' flint that is predominantly brown to dark grey in colour. Cortex, which is commonly present, is either rough but weathered or rolled smooth, and heavily recorticated thermal surfaces also present. Although the flint is generally of good quality, its knapping potential is limited by the frequency of internal thermal flaws. The mix of different flint types and the state of the raw materials indicate that they were most likely to have been obtained from the alluvial deposits that are present to the north of the site (BGS 2007).

Most of the struck pieces are in a good or only slightly chipped condition, indicating that they are unlikely to have experienced any significant post-depositional displacement and were probably recovered close to where they were originally discarded. The bulk of the material, from the Roman pits, has evidently been residually deposited and, given the quantities of material recovered, they may have originated from a knapping scatter later disturbed by the pit digging. It is likely that the blade from the peat in Excavation Area 3 has also been 'washed in' as the deposit was forming, but the two remaining pieces, from the basal sands in Excavation Area 3, could represent minimally disturbed flintwork. However, neither of these is dateable and without larger areas being available for examination it is impossible to assess if they represent *in situ* flint working or casually discarded pieces.

No typologically diagnostic pieces are present but technological traits indicate that flintworking had commenced at the site by the Mesolithic or Early Neolithic. This is best demonstrated by the blade recovered from the peat deposits in Excavation Area 3 and a heavily worked down single platformed core from Roman pit [63] which had most probably produced blades earlier in its productive life. Other pieces that can be dated to these periods include a flake struck from a blade core from Roman pit [69] and a longitudinal core rejuvenation recovered from Roman pit [78]. The Roman pits also produced all three of the retouched implements identified from the site. These comprise a small burnt fragment of a serrated flake or blade, a wedge-like implement and a side-and-end scraper, all of which would be most typical of Neolithic inventories. None of the other pieces are closely dateable and whilst they could all fit into the Mesolithic / Neolithic time frame suggested above, there is no reason to exclude the possibility that some could be later and relate to Bronze Age activity at the site.

Significance

The struck flint can be dated to the Mesolithic or Neolithic period and testifies to the widespread occupation that the terrace and alluvial edges of the lower Thames witnessed, as demonstrated by numerous finds in this area, including close by at the Beam Washlands site and at the Mardyke Estate (Oxford Archaeology 2011; Bishop 2013). At those sites and from others along the lower Thames margins, intensive and often *in-situ* flintworking dating from the late Glacial through to the Bronze Age has been demonstrated (e.g. Guttmann and Last 2000; Leivers *et al.* 2009; Howell *et al.* 2011; Stafford 2012).

Recommendations

The assemblage is of significance in that it demonstrates flintworking occurring at the site during the Mesolithic or Early Neolithic and possibly during the later prehistoric period. However, its size and the lack of secure contextual associations means that its interpretational value is limited beyond that indicated in this report, and no further analytical work is recommended. Nevertheless, both the struck flint and unworked burnt flint can contribute to wider understanding of prehistoric occupation in east London and short descriptions, based on this catalogue and report, should be included in any published account of the excavations.

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APPENDIX 3: SUMMARY ARCHAEOLOGICAL WOODWORK ASSESSMENT REPORT

DM Goodburn BA Phd Archaeological Woodwork Specialist MOLA

Background and terms of reference of this specialist assessment contribution

This writer was asked by PCA to provide advice on-site as part of the archaeological evaluation and targeted excavation at the former Ford plant at Beam Park, Dagenham (Limited to the north eastern Area 3 location). This specialist summary assessment report attempts to cover features related to the worked and un worked natural wood found. For the wider outline of the evaluation and excavation project please see the main site assessment for Excavation Area 3 by R. Banens.

The archaeology of prehistoric wooden structures and isolated wooden finds in the flood plain of the tidal Thames and Greater Thames Estuary; a very brief outline

Knowledge of ancient deposits of peat and clay/silts on the lower Thames flood plain goes back to the 17th century with references made by Pepys covering preserved trees found during early dock building at Poplar. Later more detailed accounts of typical lower Thames estuary floodplain deposits with preserved trees and roundwood were made by Perry covering material revealed during repair of the Dagenham river embankment breach (Perry 1721).

A now well known, complete anthropomorphic wooden figure was found in 1922, a short distance south of the Beam Park Site. A cast of the figure is on display in the Museum of London, together with a close replica made by this writer. Though identified in the literature as made of 'pine' it is probably more likely that this figure was made of yew timber which has a very similar appearance to the pine family and is well known in other similar figures such as the LBA Roos Carr figures from Humberside (Coles 1990, 326). The purpose and function of the idol is much debated but some form of ritual use seems likely (Cotton 2017,31) and the probable use of yew may just be relevant to the interpretation of the partially worked large yew log, Timber [215], discussed below.

Systematic excavation of prehistoric sites in this waterlogged flood plain zone did not really begin till as late as the 1980s, mostly lead by archaeological teams from The Passmore Edwards Museum and later Newham Museum Services. As summary publications, some

individual site reports and several detailed 'grey literature' accounts of the results of these archaeological investigations are available they will not be further summarised here except to note that a range of wooden structures of Bronze Age date have been found including; trackways of brushwood and small logs sometimes supported by stake cradles, woven hurdlework trackways, timber and roundwood platforms, fence lines and deposits of distinct woodwork debris have been found (Meddens 1996 for a brief summary...). Similar structures have also been found in smaller numbers south of the river and simple implements possibly used in cooking (Bennell 1998).

In the last few years finds of timber structures of BA and IA date range have also been made during foreshore survey work by the Thames Discovery programme including a major bridge or jetty at Vauxhall (Cohen 2017). More local to the Dagenham area are the results of a series of excavations along the line of the A13 road that runs E-W towards the northern edge of the current estuary flood plain. This project involved many archaeologists from RPS, PCA, MOLA, Wessex Archaeology and other specialists. In addition to trackway finds a pile footbridge, fence lines, a possible building wall, part of a small timber platform with reused timbers in, a beaver dam and possible simple cooking implements, were found of timber and roundwood. This large project provided an opportunity to report on the various excavations but also compile an overview of the archaeological evidence for 'Landscape and Prehistory of the East London Wetlands' drawn together by Oxford Archaeology assisted by this writer and many others (Stafford, Goodburn and Bates 2012). This latter work still provides the over view setting the scene for the interpretation of the natural and worked prehistoric wood found at Beam Park Excavation Area 3.

The published and unpublished results of excavations of late prehistoric deposits and wooden structures found earlier in the Somerset Levels, Fens, Severn Estuary, Lower Lea Valley and very recently the Outer Thames estuary have also been held in mind when assessing the Beam Park material. Finally, other very recent archaeological evaluations by PCA, MOLA and AOC close to the Beam Park site, which this writer has visited, are also comparative evidence for the natural accumulation of drowned woodland but no worked wood or timber was found on those very recent projects.

Experimental prehistoric and early historic woodworking, specifically making hollow wood ware and dugout boat replicas and how it helps us to interpret the [215] part worked timber

The interpretation of the key find of the partially worked log Timber [215] at Beam Park would

be extremely difficult without having familiarity with the published ethnography of making large hollow woodware, such as troughs and dugout boats in many parts of the world in the recent past. This writer has also carried out a number (14+) of archaeology -lead experimental projects for the late prehistoric and early historic periods where replicas of large hollow wood ware and dugout boat finds were made (e.g. Goodburn and Redknap 1988). Whilst most of these projects have dealt with material of early historic date some have covered woodwork of the Bronze Age directly relevant to the interpretation of the large partially worked log, Timber [215] discussed here (e.g. Goodburn 2004, 2010). The experimental archaeology mirrored the details recorded in prehistoric and early historic evidence, such as using the ancient tool mark traces as guides to the tool kits used and how the various tools were used for different stages of large scale woodworking, including hollowing operations. The general finding of archaeological recording of British dugout boat finds and the more detailed ethnographic accounts of key relevance here is the widespread record of hollowing by grooving and splitting out waste. This involved cutting scores across the grain where the wood was to be hollowed out and then splitting out the waste timber between the grooves. The rough surface created was then smoothed and pared back afterwards. By happy circumstance one of the PCA excavation team D. Britain had recently returned from work in Borneo where he had seen members of a remote village using a large wind felled tree to make large dugout vessels and this helped focus attention on Timber [215] even before this writer made the second site visit!

Due to the depth of most dugout boats and large troughs this grooving and splitting process has to be repeated several times before the intended internal hollowing can be finished. The scores were cut with a variety of blade tools from region to region and period to period including axes, adzes and chisels. The recorded materials used for these edge tools included stone, shell, bone, antler, a variety of metals and in recent times tip cutting with a chain saw. The weakening effect of cutting the scores to break the longways fibres into short lengths can be easily appreciated by anyone with practical hand woodworking experience and in the case of timber [215] one of the chunks of timber between scores was found loose on the surface of the worked area.

Brief summary of the key features of the assemblage of waterlogged prehistoric wood found in Area 3 at Beam Park

The evaluation trenches later expanded into Excavation Area 3 revealed a deposit of large and small fallen trees and branches set in mixed deposits of peat and estuarine clay /silt. This writer visited while the southernmost of the pair of adjacent evaluation trenches was open and a large N-S aligned fallen oak was examined and showed evidence of possible limited working, perhaps to a blunt point at the south end (Timber [216]). Other material included

smaller yew stems and a small amount of pale, soft deciduous material (Edmonds 2017b, Plate 6). A decision was made that the two trenches should be expanded to a full excavation which became Excavation Area 3, to check for the presence of possible worked wood and further record and sample the naturally fallen ancient woodland deposit. At this stage the peat in which the tree stems and branches lay had an initial C14 date of the interface of the Neolithic and Early Bronze Age or 'Chalcolothic', c. 2,500 BC (R. Masefield *pers comm*). The dating has now been checked further and brought forward several hundred years though is still EBA (see Appendix 11; 2470 BC – 2297 calBC (SUERC-79156 (GU47859)). This period when the first metal tools were being introduced in Britain being one of special interest from the point of view of evidence for woodworking and woodland history. The greater efficacy of metal tools had a large impact in woodworking and woodland management.

The further excavation revealed more of the natural fallen woodland deposit including items of oak and yew and on the east side the partially worked large log, Timber [215], the main focus of this report. This log lay NW –SE and survived c. 5.9m long and up to c. 600mm diameter at the root end. Part of the top of the log had been split off and then a series of rather regular grooves cut into that surface. Using archaeological and ethnographic parallel evidence it seems that the partially worked log was in the process of being hollowed before it was abandoned. It also had two areas of clear charring that could be seen when it was lifted off site and washed, this also showed that it was clearly yew rather than just eroded oak heartwood as initially thought! Although the interpretation of this unusual object is not totally clear cut it seems most likely that it was being hollowed out, possibly as a demonstration or 'trial piece' or a dugout boat, large trough, coffin or large drum abandoned in the early stages of making. The size of the log was just big enough for use as a small dugout boat which would also have required the closure of the rot void at the root end with a cross wise plank 'transom', as are known in many British dugout boat finds from the Bronze Age to medieval period. However, the choice of yew for making a very large hollow wooden vessel is unique as other examples in Britain are commonly of oak. Yew is sometimes clearly used for high status or ritual items but was clearly also common in the flood plain woodland at the time and also used for more mundane items such as trackway and platform makeup.

Another result of the work of PCA and associated specialists at the site is that it provides a view of the dramatically changing ancient landscape of the area which includes the very unusual, now extinct, valley bottom woodland dominated by large oaks and yews for a period in later prehistory. Rising sea levels drowned the woodland fairly rapidly resulting in the development of alder car and forms of reed swamp and eventually mud flats before the area was enclosed by protective seawalls in post medieval times.

Relative Sea Level (RSL) change, and its link to both the preservation and interpretation of the prehistoric, naturally deposited and worked wood found.

The typical sedimentary sequences recorded over the last 35 years, over most of the east London Thames flood plains, indicate a general rise in relative sea levels after the last Ice Age but a rise that was broken by several periods of falling levels lasting often more than a hundred years (See Geo Archaeological assessment for this project and Stafford , Goodburn and Bates 2012 for summary and further references). In most areas of the flood plain this has produced alternating bands of estuarine silt/clays and peats of various types and in some cases sandy and /or gravel deposits, all reflecting different watery environments. The softer, highly water retentive, peat and silt/clay deposits have preserved most of the best preserved prehistoric woodwork and natural deposits of drowned woodland found, as is the case at this Dagenham site.

As a generality, in this writer's experience over the last 30 years, the alternating later prehistoric sediment sequences in the Greater Thames Estuary commonly include a peaty layer full of relatively well preserved naturally accumulated fallen tree trunks and branches as well as stumps and root systems in situ. This direct, sub-fossil record of a unique phase of woodland in what is now low lying east London has implications that are hard to visualize even for well travelled woodland ecologists. Not only is the botanical evidence from such sites important for telling the story of Greater London's landscape evolution but the environment was also that in which later prehistoric inhabitants lived, hunted, gathered, travelled, worked and even made ritual offerings. The survival of actual trees, even if found lying roughly horizontal, rather than just secondary evidence such as pollen provides an incomparable graphic four-dimensional record of the landscape of the time unknown on the vast majority of prehistoric excavation sites. The woodland with its, often very large, standing and fallen trees was the dominant landscape setting for these activities. Individual trees or groups of trees must have been way markers and landmarks and possibly territorial markers just as they still can be today. This is particularly true in the flat topography of the flood plain in the Dagenham area. This means that even where no clear evidence of working of timber or roundwood was found, plan and photographic recording together with sampling of key elements, is justified to gain a view of the 3-dimensional living landscape actually seen by the later prehistoric people of the locale and region.

Briefly, we can note that there are many complex factors to consider in relation to archaeological evidence for relative sea and estuary level changes in later prehistory and beyond, though general trends can often be observed over wide areas. Complexities include absolute ordnance datum levels of normally dry ground alongside estuaries at different dates being effected by compaction of soft sediment below, crustal movements, dipping of Britain down to the SE following the disappearance of the ice in the north and even the activities of

beavers dam building in constricted zones, etc. Here we can just note a few fundamental facts relevant to the immediate area of the site, which lies just south of a low terrace that must have formed the edge of the habitable, normally dry, estuary side land in later prehistory. Over much of flood plain London and the Greater Thames Estuary wetland and shoreline wooden structures spanning the Bronze Age lie around 5m -6m below the equivalent shore side occupation level today of c. + 5m OD (Though this varies with the slope of the estuary and exposure to waves). The survival of waterlogged woodwork from this period c. 2500 BC to c. 750BC typically spans quite a wide OD level range from c.- 1.5m OD to approximately + 0.7m OD, unless the structure concerned was intended to function some way down a wet foreshore like a fish trap etc. The top of the principal timber of interest here, the part worked yew log [215], was found at c. -1.13m OD. In practice the recently made ground for the Ford works in this area has the remarkable low OD level of only c. + 1m indicating that it would be massively flooded every high water now if it were not for an massive earthen embankment to the south next to the current estuary shore.

(It should be noted that the later Roman shoreside occupation levels overlap with those of the Bronze Age reaching as low as c. 0.0m OD)

Typical species range in the naturally accumulated wood found in previous excavations of the woody peats of the flood plain

It might be expected that the tree rich peat layers would principally contain tree species adapted to very wet conditions such as alder and willow and this is true for some of the wood peat layers (See palaeo-environmental assessment for this project; Appendix 12; Young *et al.* 2018d , also Stafford, Goodburn and Bates 2012, 109-110 and bibliography for further detailed comparative information). But some of the wood peat deposits found in the Greater Thames Estuary, particularly the area surrounding Dagenham, such as at Wennington, include many species commonly associated with only moderately damp or even dry woodlands today in England i.e. not really wet alder carr. Typically the species range includes much oak and yew reflecting a type of flood plain woodland now extinct in England where naturally growing yew is associated with steep downland ‘hanger woods’ growing with species such as hornbeam, hazel, beech, ash and oak. This extinct and very distinctive valley bottom woodland type has also been found in some other areas of later prehistoric coastal and estuarine woodlands in Belgium, Germany and the Netherlands (Deforce and Bastiaens 2004).

The worked wood and wooden structures of later prehistoric date found in the immediate

region in the last 35 years have mainly been made of alder, but also of yew, oak, ash and hazel. It is likely that the alder was found very close by and sometimes the oak and yew during the dryer phases, though at other times the species not particularly adapted to very wet conditions must have grown on low raised areas of the terrace to the north and on low sand and gravel islands which occur in places.

RSL rise and preservation of the waterlogged prehistoric wood

This woodland grew during a period of reduced water levels and as the well preserved fallen oak and yew stems are often large and relatively straight we can see that that the dryer period relevant to this site must have lasted at least 2-300 years (due to the age of the larger trees) overlapping the very late Neolithic and early Bronze Age (See section 7.4.9 this report). The reason this sub fossil woodland was so well preserved was that the relative sea level rose comparatively fast, (possibly on more than one occasion) and flooded the woodland slowing the growth of the oaks and yews and eventually killing them. Severe storms then blew over these weakened dying or dead trees and they fell into wetland peats and silts where they were preserved by water logging up to the present. The same intense and relatively rapid rise in water levels also preserved worked wood items and structures such as trackways etc.

Methodology

This writer was asked to visit the excavation of Area 3 three times in total, from the evaluation phase to full excavation, to provide on-site advice on the interpretation, recording and sampling of the prehistoric waterlogged wood found. During the 3rd visit some on-site records were updated and aid memoir notes and sketches made, by this writer in addition to the records started by the PCA site team. Advice was also given as to key items to plan, draw in elevation and section, as well as general and detailed photography and sampling. During these visits it was also possible to liaise with the Archaeological Consultant and Historic England planning archaeologist.

Initially, it appeared that the south end of a large fallen oak tree (Timber [216]) was possibly axe trimmed on the, hard to see underside, but later, after further excavation, this was found not to be the case and the curious shape was due to growth irregularities. Once the partially worked nature of timber [215] became clear during the second visit detailed drawing and photography were carried out on-site by the site team and this writer. Advice was also provided on the lifting of the timber should its conservation be considered. During the third site visit it was decided by the Planning Archaeologist and Archaeological Consultant that lifting the bulk of the partially worked large log would be useful for possible further recording and potential conservation. The lower end of the parent tree, i.e. its north western section

was lifted from the excavation and after further cleaning and washing some more details were recorded, it also became quite clear that the blue/black stained log was not oak as it first appeared in the ground, but actually a large yew. Detailed site drawings were slightly amended and several features became visible that were not so in situ, such as clear patches of charring (see below). It was also possible to examine the basal face of the timber for any working traces, though none were in fact seen. All recording of the naturally accumulated late prehistoric wood, and the recording of the partially worked yew log was in keeping with standards set out in the English Heritage guidelines on waterlogged wood (Brunning 1996).

Quantification

Twelve sections of fallen branch or tree stems were attributed individual numbers and pro-forma Timber Sheets. The author was asked to comment on the worked timber and surrounding associated timbers. These included the partially worked yew stem log [215], the large N-S fallen oak tree [216], a small yew log lying under the NW end of [215] timber [236], a charred yew stem [237]or branch found near the NW end of [215] , timber [237] and a decayed cream coloured deciduous branch log [217] lying E-W at the south end of Area 3. Timber [217] has subsequently been identified as Ash (Appendix 5).

In addition to the main Area 3 fallen woodland plan (Fig. 8), Timber [215] was planned in situ at 1:20 and 1:10 and a detailed drawing made of the main worked area showing tool marks at 1:5 (Fig.10). A side elevation was also drawn to show the form of the log more fully and major knots marking one-time branches in the parent yew (Fig. 10 section 62). In addition numerous photographs were taken as working shots and plan views and details with scales (for example Plates 18-22).

Dating

On the initial discovery of timber from evaluation Trench 21 timber samples were collected and sent for C14 dating. Timber [129] sample <14> (Edmonds 2017b Fig 17) was dated 2706-2566 cal BC (SUERC-76662 (GU46221) Appendix 11) and has subsequently been identified as Alder (Appendix 5). Subsequent to excavation in Area 3 further radiocarbon dating samples were sent to SUERC dating the partially worked Yew log [215] <33>and associated yew logs or branches [236] and [237]. The small yew [236] <24> lying under [215] dated to 2498 BC – 2344 cal BC (SUERC-79157 (GU47860); Appendix 11) and [237] <30> has been dated to 2466 BC – 2296 cal BC (SUERC-79161 (GU47861; Appendix 11). The initial dates centering on c. 2,500 BC now have C 14 dates centring on c. 2,300 BC. Whilst this is a little later it is still well within the early phases of the EBA

A complete slice across Oak timber [216] was submitted for possible tree-ring dating (see Tyers, Appendix 4). Whilst a 223-year sequence was obtained for this sample no match could be made from comparative data from the British Isles and elsewhere and the sample remains undated. The complete sample of Yew tree trunk [215] identified 206 rings but similarly no match could be found in comparative reference sequences and the sample remains undated. (Appendix 4)

The sample of lifted key 'timbers' from Area 3

Timber [215], the large, partially worked, fallen yew

The only substantial and clearly worked timber found during the archaeological investigations in Area 3, and therefore the excavated area of the site, was a partially worked log abandoned after preliminary working, Timber [215] (Figs. 8 and 10). When first seen in the ground this fallen main stem appeared to have been oak as it was stained the typical blue black colour of oak heart wood, but following washing off site it became clear that it was actually a large yew stem including the root end and running up towards the crown (Plate 18). The overall maximum dimensions of the partially worked stem were c.5.9m long from the root end in the NW to the, decay truncated, upper end in the SE. It had a maximum width of 0.6m just above the roots tapering to c. 350-400mm in diameter before appreciable decay at the slightly higher SE end. The depth of the part worked log just above the roots was c. 0.4m. Thus, the lower half of the log approached a 'D' shaped cross section. The attached root buttress at the NW end, lack of bark and traces of weathering indicate, that the parent tree had died standing and weathered upright for some time before a great north westerly storm caused it to fall to the SE. Some slight decay of the upper most side of the tree then took place before the first traces of human working of the tree as it presumably lay just above the surface of the waterlogged zone. The form of the tree stem was straight and included the slightly fluted surface typical of yews, with many low branches that had died off, suggesting that it started life in moderately open woodland in which the canopy closed as the trees in the vicinity grew. The core of the tree had a major rot fissure running up from the base tapering to nothing at c. 2.2m up. Yew has a tendancy to develop a rotten core but to continue to grow outward eventually forming large hollow stems many hundreds of years old.

Traces of charring, apparently humanly induced

After washing off-site, it could be seen that the root end bore traces of clear intense charring and slight charring was also visible on a small area of the middle of the surviving stem just SE of the clearly worked area (Figure 10, section 62, Plates 21 and 23). Clearly the upper parts of the fallen yew must have dried out substantially for the charring to be able to occur. Although natural fires can occur on peat bog surfaces after prolonged summer dry weather, the burning would be expected to be more evenly spread, so it would seem that this charring was humanly induced and possibly used as part of the woodworking processes started but not finished. No clear traces of a systematic attempt to fell the tree deliberately with fire or edge tools were found, but the charred end of yew branch log Timber [237] did lie close to the charred root end and might just have been the remains of fuel used against the base of the dead yew? Perhaps the wood workers wished to burn off the dirty and difficult to cut roots?

Clear traces of the early stages of hollowing with edge tools of the NW, basal, end of the yew log

Working towards the SE from just above the root buttress, an irregular area of fairly flat upper surface of the log could be seen extending at least 2.5m up the stem. This appeared to be an area split off tangentially, presumably with wedges, giving the log a roughly 'D' shaped cross section. Faint traces of trimming with some form of edge tool were found at the base of this flattened area (Fig. 10 section 1, Plates 19 and 21). Faint ridges or 'stop marks' left by the edge tool used could just be seen and felt on this flattened surface in places and these marks were up to 35mm wide. The orientation and sharpness of these marks suggest that they were made by a small metal blade hafted as an adze and swung towards the upper part of the tree.

Cut into this surface were 12 narrow grooves to the east of the line of the rot hollow which ran out just before the end of the zone of grooving. The narrow crisp grooves were set c.70-100mm apart running across the grain of the timber and the deepest reached c. 40mm down with a width of only c.30mm. Distinct marks from some form of chisel type tool only c. 22mm wide were seen (Figure 10, Plates 20-22). The narrowness and depth of these grooves indicates that only a metal blade could have been used as a ground stone, bone or antler chisel would have been too thick to achieve such narrow cuts. As the grooves did not extend to the edge of the log it appears clear that the woodworkers were intending to create a hollow in the upper face of the log, as in the manner used to make a large trough, dug out coffin, small dugout boat or even a dugout drum (e.g. Goodburn 2010, 107). Over much of the world and across a large period of time, up to the present, hollowing large wooden vessels usually involves cutting grooves across the grain and splitting out the waste between the grooves, followed by smoothing blows. This basic process often leaves traces here and there where the in cut grooves went a little deep and these can be found in many excavated troughs and dugout boats when closely examined.

The presence of the rot void near the root end, might be seen as a defect in the timber for most purposes such as use as a trough or coffin, but many prehistoric and early historic dugout boats are fitted with cross wise 'transom' boards to block off the open basal ends which clearly often contained rotten heart areas (Strachan 2010). The lack of a solid heart can aid and speed up hollowing out, particularly for those using a small prehistoric tool kit with relatively soft early bronze blades on a very hard timber, such as slightly dried out yew. Based on experimental experience of building dugout boats of oak and working yew with replica bronze tools, including chisels for the Dover Boat project (Goodburn 2004), the limited work carried out on this log could have been carried out in just one day by perhaps two people.

The abandonment of the hollowing work on fallen tree [215]

Several aspects of this unusual woodwork find provoke further thought such as, why the work was abandoned? Of this we can only guess, perhaps a serious flood event took place, or the worker(s) decided that the rot void extending up from the root end was too large after all? Perhaps the limited working was a kind of 'trial piece' where someone experienced in such woodwork was trying to demonstrate such work to a younger less experienced worker? This sort of occurrence is known in recent and medieval woodwork craft training but might be too formal for the EBA? It might even be that the work was a trial piece for the edge tools used a small bronze chisel and an adze?

Another key question concerning timber [215] is why yew was the chosen timber and one that would have been a little harder than a freshly felled tree. It is tempting to imagine a father or grandfather teaching a younger relative using a difficult to work timber, such as partially dried yew, to see if the youth was up to the work? Of course we have no certainty of the genders of the workers involved, though this writer is unaware of any ethnographic accounts of such woodwork typically being with in the female realm in traditional societies over the last few hundred years. As yew is also associated with apparently ritual objects like the Dagenham Idol there might even have been a ritual reason for starting the work in yew though this writer is not aware of any large hollowed woodwork of this species known from British prehistory. The wide availability of yew trees locally in the EBA may also have been a factor. Whatever the precise circumstances of the work and its cessation the object remains mysterious and provokes thought. It is also clear that the debris from the work done on the log was either deliberately removed, probably for fuel, or was washed away, though it is difficult to imagine all the heavy yew woodwork debris being washed away.

Some of the other natural fallen woodland elements and a charred branch, in brief

Timber [216], this object was a large, naturally fallen oak with part of a crotch and growth distortions at the south end that initially looked like a possible blunt axe cut end (when they could be felt more than seen). On further excavation no trace of working was found. The large tree fell from the north to the south which was towards the crown end. Though the root end of the tree lay outside Area 3 to the north it is clear that the main stem was over 20m tall from ground to crown and 0.8m dia.

This oak would have been one of the larger trees in the local but not the largest if the size of some other oaks from similarly dated regional deposits are considered.

Timber [217]; this object was a decayed log of a soft deciduous species lying E-W over the large fallen oak [216]. The log of 0.4m width bore no clear traces of working but its position illustrates how the fallen tree deposit must have accumulated piece meal over a few years, probably in fits and starts.

Timber [236]; this object was a small stem or branch log lying directly below the partially worked Timber [215]. It appeared to be of yew and survived c, 90mm in diameter by 0.84m long and was sampled for C14 as discussed above. It bore no traces of working or charring.

Timber [237] was similar to the above but had one clearly charred, end and was found near the root end of the fallen yew tree [215]. This survived 0.66m long and up to 100mm in diameter. It is perhaps possible that this branch or small stem section had been used as fuel to burn the ragged dirty roots of timber [215] away.

The significance of the material

The naturally accumulated drowned woodland deposit in Area 3 is locally important as another sample of the form of flood plain woodland that occupied the site around 2,300 BC, but as there are many other sites yielding similar information in the area its significance must be seen as local.

The partially worked fallen yew is rather more significant as a very rare example of the early stages in the making of a large hollow wooden vessel in the EBA, possibly a small dugout boat, or a large trough, coffin, or even a drum. If it was only worked as some form of 'trial or training project' for a junior EBA woodworker then its significance would also be enhanced and can rightly be said to be regional or possibly national importance. The dating to the early part of the Early Bronze Age, when metal woodworking tools were still rather new at around 2,300 BC or a little earlier may also be significant.

Potential for further analysis

This naturally fallen drowned woodland is worthy of a summary description and illustration in the overall project analysis as part of the environmental reconstruction for the EBA period. Here the fact that the larger trees would have been local landscape features even when fallen is also significant. More consideration of why the oak / yew flood plain woodland was once so widespread in SE England and the coastal and estuarine regions opposite on the continental shore may also be valuable as it is an extinct and unusual form of woodland beyond modern ecological knowledge. It will be possible to develop a simple graphic representation of what this woodland looked like around 2,300 BC to scale, that will be accessible to non specialists, as was carried out for parts of the A13 project.

The partially worked fallen yew requires some further discussion and the drawing together of the various graphic and photographic records to present a comprehensive account of it. Also as evidence of EBA woodworking technology not long after the introduction of metal tools, it also warrants further analysis such as a search for EBA tools of the right form and size to have left the edge tool marks recorded (the small chisel and small adze). Again a moderately

accurate, graphic reconstruction of the work in progress is also possible.

Further Work - Method statement

Given access to a few remaining records related to the excavated naturally occurring wood the following work is recommended depending on the format of the final report. Checking the last remaining timber records and a range of photographs together with liaison with the main analysis/ report authors. Researching evidence for EBA edge tools that could have been used to carry out the work on yew timber [215]. Socketed or palstave-type chisels are well known for later periods but what was available in the early EBA is far less certain. Compiling an up dated version of this text with more complete referencing of comparative evidence. Compiling c. 5 simple draft explanatory figures for possible reworking by PCA graphics team and further consideration of the distinctive yew oak woodland and comparative evidence.

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APPENDIX 4: TREE-RING SPOT-DATES OF ARCHAEOLOGICAL SAMPLES:

Dendrochronological Consultancy Report 1042

Ian Tyers

Summary

Two timbers, one oak, and one yew, from excavations at Beam Park Riverside, Thames Avenue, Dagenham (sitecode THV17, NGR *c*. TQ TQ500 830) were submitted for dendrochronological analysis. Neither of these timbers was successfully dated.

Tree-ring dating or dendrochronology

Tree-ring or dendrochronological analysis relies upon a number of basic concepts. Trees in temperate zones of the world have a single growing season and a single resting season each year. The anatomical result of this is an identifiable tree-ring within the trunk of the tree that has a distinct boundary marking the end of one growing season and the start of the next. Since the growing point of the trunk is the cambium layer directly under the bark, it follows that each year of growth appears on the outside of the previous year of growth. The oldest rings of a trunk are thus in the middle and the most recent rings are directly under the bark. Counting the rings provides as easy method of ageing trees but does not provide a method of dating the trees.

In contrast, dendrochronology attempts to provide absolute dates for the rings present in individual timbers. This is achieved by measuring very precisely the widths of each successive ring within a sample and comparing the pattern of narrow and wide rings with reference chronologies built up by previous work. The technique can be successful and reliable only when a number of conditions are met. Firstly, there have to be contemporary chronologies of the relevant species, or genus, of timber from sufficiently nearby that some degree of cross-correlation is possible. For Britain and Ireland there is now a composite tree-ring chronology for oaks stretching back just over 7000 years. There are some periods and areas that are under-represented in this composite. The timbers have to contain a long enough sequence of tree-rings that they match in only one position to other chronologies. In previous studies of archaeological and sub-fossil oaks from Britain samples of material with less than 100 annual rings have proven difficult to date, archaeological material with less than 30 rings is not routinely analysed.

Analysis of many thousands of timbers across Britain has also revealed that there is a consistent number of samples for which no reliable date can ever be obtained, even when many more than the minimum number of rings are present. Usually, for any sample group, between a quarter and a half of all samples cannot be reliably dated, although at some sites virtually every timber dates and at a few sites none can be dated.

Methodology

These 2 timbers were provided as complete cross-sections. It is assumed these sections were obtained wherever possible from the optimum location for outermost rings or sapwood survival from these timbers.

Each sample was assessed for the wood type, the number of rings it contained, and whether the sequence of ring widths could be reliably resolved. For dendrochronological analysis samples usually need to be oak (Quercus spp.), to contain 30 or more annual rings, and the sequence needs to be free of aberrant anatomical features such as those caused by physical damage to the tree whilst it was still alive. Standard dendrochronological analysis methods (see e.g. English Heritage 1998) were applied to each suitable sample. A surface equivalent to the original horizontal plane of the parent tree was prepared on each sample with a sequence of increasingly fine bladed tools; surform or plane, Stanley blades, medical scalpel blades, razor blades. This is usually undertaken whilst the samples are frozen as they are not solid enough to take a sharp edge in ordinary circumstances. Their sequences of ring widths were revealed by this laborious preparation method, and once thawed out they could be assessed again for suitability. The complete sequence of the annual growth rings in the suitable samples were then measured to an accuracy of 0.01mm using a micro-computer based travelling stage. The sequences of ring widths were then plotted onto semi-log graph paper to enable visual comparisons to be made between the sequences and reference data. In addition cross-correlation algorithms (e.g. Baillie & Pilcher 1973) were employed to search for positions where the ring sequences were highly correlated. Highly correlated positions were checked using the graphs and where these were satisfactory, these locations were used to identify the calendar dates of the measured series.

Tree-ring analysis usually dates the rings present in some timbers within an assemblage of material. The interpretation of these dates relies upon the nature of the final rings in the sequence. Oak timber contains 2 types of wood, heartwood and sapwood, the latter is on the outside of the tree and thus contains the most recent growth rings, this material is softer and is not always preserved under archaeological conditions. If the sample ends in the heartwood of the original tree, a terminus post quem (tpq) date for the felling of the tree is indicated by the date of the last ring plus the addition of the minimum expected number of sapwood rings

which are missing. This tpq may be many decades prior to the actual date that a tree was felled, particularly where poor preservation or other loss of outer heartwood has occurred. Where some of the outer sapwood or the heartwood/sapwood boundary survives on the sample, a date range for the felling of a tree can be calculated by using the maximum and minimum number of sapwood rings likely to have been present. For dated samples where the bark edge survived intact, a precise date for the felling of the tree can be directly identified from the date of the last surviving ring. Yew does not always have differentiated heartwood and sapwood and thus provides either a tpq interpretation, or a felling date.

Results

The supplied material comprised 2 large diameter samples; 1 oak (Quercus spp.), and 1 yew (Taxus baccata L.). The latter came from a timber with carved notches. Both contained suitable tree-ring sequences for analysis. These 2 timbers were each measured successfully (Table 1).

No relative cross-matching was found between these sequences. Comparisons with reference data from the British Isles and elsewhere identified that neither of these samples strongly matched at any position and they remain undated by dendrochronological analysis (Table 1).

A radiocarbon determination (SUERC-79156 (GU47859)) was obtained of timber [215] as sample <33>. Hopefully the sample was from the outermost part of its 200 year sequence, if so this indicates the sequence ends in the latter part of the 3rd millennium BC (3902 ± 30bp, ~2470-2297cal BC 95%, Lucy Whittingham pers comm), and probably starts around the middle of the millennium.

Dendrochronologists working from excavated timber in London and the surrounding region have analysed several thousand timbers from both the Roman and early medieval periods. The replicated strength of the resultant regional reference sequences means that tree-ring dates are typically obtained from at least some samples from assemblages of suitable timbers of these periods excavated within the region. The prehistoric period by contrast is very poorly covered throughout England and the available data sets are concentrated into a number of ‘hot-spots’ for naturally deposited or archaeological samples that provide the bulk of the current prehistoric data sets; Somerset Levels, Cambridgeshire Fens, Trent Gravels, Thorne Moor, Lancashire Mosses, with some additional material from one-off archaeological features. Ireland and Northern Ireland contribute the vast bulk of the prehistoric tree-ring data elsewhere in the British Isles, and gives a western bias to the sequence, though there are also datasets within continental Europe that provide some cross-matching to some eastern

English material.

Different periods throughout the prehistoric millennia have different geographical biases but throughout the levels of replication are significantly less than those that have been built up within the historic periods. The London region is particularly poorly covered. To my knowledge there are individual sample data sets of prehistoric timbers from just 10 other excavations and spot-finds across Dagenham, Wennington, Beckton, Barking, North Woolwich, East Rainham, Belvedere and Lewisham. These have each yielded small groups of suitable timbers and in total they appear to amount to less than 20 different oaks and 3 yew timbers, excluding the 2 from this site. The tree-ring sequences from these are mostly between 100 and 200 years in length and theoretically could lie anywhere within a multi-thousand year period. There is some cross-matching between samples within several individual sites, but this probably reflects multiple fragments from single trees. Such a situation means there is currently no indication whether these are data sets that may be 'useful' for intra- or inter- regional cross-dating. Perhaps unsurprisingly given these minimal amounts of data and their potential lack of contemporaneity there has thus far been no cross-matching identified between groups from different sites. We therefore do not have even the initial skeleton of a replicated tree-ring sequence for any part of the prehistoric period for the London region. Quantities of material need to be recovered with greater regularity from sites within the London region if there is to be any opportunity to create data sequences that routinely help with the interpretation of excavated groups such as this one. The 223-year sequence obtained from THV17 oak sample 216 probably has some potential for cross-matching in the longer term.

The nationally recommended guidance for dendrochronology projects (English Heritage 1998) is to undertake sampling and analysis of assemblages that comprise groups of contemporaneous timbers, this is a particularly appropriate for prehistoric material due to the weak points within the national/regional framework of reference sequences and the vast time span involved. The analysis of prehistoric timber is most likely to prove successful when large assemblages of contemporaneous oak trees are recovered. Analysing small numbers of timbers will have a poor success rate.

Acknowledgements

The sampling and spot-dating of this material was funded by Pre-Construct Archaeology. My thanks to Lucy Whittingham for providing administrative and site background, and the radiocarbon result from timber [215], and Sevinc Duvarci for sending the samples.

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Table 1. Details of the 2 dendrochronological samples from Thames Avenue (sitecode THV17). Sample 216 is oak (*Quercus* spp), sample 215 is yew (*Taxus baccata*). *+10* indicates *c*. 10 additional unresolved sapwood rings were present at the outside of this sample.

[Context] <Sample>	Size (mm)	Rings		Sap	Growth mm/yr	Result	Interpretation
[215]	**<32>** *c*. 0 500	206	-	1.17	not dated	-*	
[216]	**<31>** *c*. 0 500	223	13+*10*	1.08	not dated	-	

*A radiocarbon determination (SUERC-79156 (GU47859)) was obtained of timber [215] as sample <33>. This was a yew trunk with carved notches. This radiocarbon date indicates this tree-ring sequence lies somewhere around the middle of the 3rd millennium BC (3902 ± 30bp, ~2470-2297calBC 95%; hopefully this dating is from a known sub-part of the tree-ring sequence).

APPENDIX 5: WOOD IDENTIFICATIONS

P. Austin

Introduction

This report presents the results of the examination of x12 samples of waterlogged wood from Beam Park, Barking & Dagenham (THV17). This assessment was undertaken to identify the wood present in each sample. Each sample, with the exception of sample <25> context (217), was composed of a single wood element. Sample <25> was made up of x2 separate wood elements. Preparation and examination of wood elements followed standard procedures for the analysis of waterlogged wood as described in Hather (2000). During analysis the presence/absence of bark, outermost wood (omw), innermost wood (imw), and pith was recorded as appropriate. When possible diameter (ø)/radius (r) and growth ring (gr) characteristics (e.g. quantity & relative widths) were recorded. Full results are listed in table 1. Nomenclature follows Stace (2010).

Results.

Three taxa were identified: *Alnus glutinosa* (Alder), *Fraxinus excelsior* (Ash) both hardwoods, and *Taxus baccata* (Yew), a softwood. All three taxa are trees native to the British Isles. Yew accounted for x8 of the wood elements, Alder accounted for x3 wood elements, and Ash was represented by x2 elements (both from the same sample). Most of the wood elements examined derived from unmodified small to medium sized branch-wood and most retained bark and/or outermost wood (round-wood). Only sample <9>, a piece of Yew wood, appears to have been purposefully modified. In this instance a branch originally approximately round in cross section had been made approximately square in cross section.

Table 1. THV17: Wood Identifications.

Context	Context description	Sample	Taxon	Wood description
110	Natural; Layer of peat	6	*Alnus glutinosa*	Bark & *omw* present; *gr* = details indeterminate; round-wood
129	Layer of scattered wood	14	*Alnus glutinosa*	Bark & pith absent; TS poor: *gr* = details indeterminate
130	Timber	15	*Alnus glutinosa*	Ø = 30mm (min.); small round-wood: bark & *omw* present; *gr* = details indeterminate; round-wood: branch/stem
131	Timber	16	*Taxus baccata*	*r* = 34mm (min.). Pith & *imw* present; *gr* = >30
132	Timber	17	*Taxus baccata*	Ø = >50mm; pith & *omw* present; *gr* = >10
133	Timber	18	*Taxus baccata*	Ø = 50-54mm; bark, *omw*, pith present; *gr* = >5; round-wood (branch)
134	Timber	19	*Taxus baccata*	'Squared' round-wood, 49x54mm; *gr* = >50, most v. narrow (slow-grown); pith & some *omw* present
217	Natural; fallen tree overlying [216]	25	*Fraxinus excelsior*	*r* = 50mm (min.); *gr* = >40-50;
			Fraxinus excelsior	*r* = >155mm; *gr* = >50, many narrow (slow-grown); branch/stem-wood
219	Natural; small yew	26	*Taxus baccata*	Ø = 72-75mm; bark, *omw*, pith present; *gr* = >35;

Context	Context description	Sample	Taxon	Wood description
	tree overlying [216] and [218]			round-wood
233	Natural; Yew tree overlying [216]	27	*Taxus baccata*	Ø = 60mm; *gr* = >40; bark, *omw*, pith present; round-wood
229	Natural; small yew tree, possibly branch, below [218]	28	*Taxus baccata*	?section of multi-stem - x3 centres of growth (min. width = 180mm+)
218	Natural; Yew tree overlying [229]	29	*Taxus baccata*	Ø = 80-88mm; *gr* = 80-100, narrow (slow-grown); round-wood

Comments

The ecological preference of the woods identified indicate a wetland or riverine type environment. Alder is typically confined to such environments and is the dominant taxon in Alder Carr. Whilst Yew and Ash can, and do, grow in wet soils, as evidenced here, they have broader ecological tolerances and are found in various other plant communities (Polunin & Walters 1985). Most of the Yew wood was very slow grown, evident as concentrations of very narrow growth rings. The Ash wood also displayed narrow growth rings indicating that it too was slow grown, probably indicating less than optimal growing conditions. The Alder elements were less well preserved and details of growth and form were not discernible.

The wood elements examined remain close to their original form when living, often retaining bark, and most derive from branch-wood. The context descriptions indicate that some of the wood elements probably represent structural use. It is not uncommon, depending to some extent on the nature of the structure, for wood of the required properties to be used in an unmodified form. The apparently worked Yew wood examined had not been extensively modified. Possibly because slow grown Yew wood is extremely hard, and thus notoriously difficult to work or, simply because extensive modification was unnecessary.

No further work is needed on these samples.

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APPENDIX 6: PREHISTORIC POTTERY ASSESSMENT

Lucy Whittingham

One sherd of coarse flint-tempered pottery was recovered from context [167] (Lower Alluvium) in Excavation Area 2.

The sherd is a coarse earthenware with oxidised surfaces and reduced core and approximately 1 cm in thickness, but has no diagnostic features or surfaces preserved as it is very abraded and worn. All external surfaces are abraded with no surviving traces of decoration and all edges are rounded as if water worn. The sherd measures 48mm x 42mm and weighs 29g.

The moderate flint-tempering is of coarse crushed burnt flint between 0.03-0.5mm added to a fine grained sand quartz matrix with abundant quartz of less than 0.01mm.

With no surviving diagnostic features and in a very abraded condition this sherd is difficult to date other than potentially of Neolithic/Bronze Age date (as confirmed from a photograph supplied to Jon Cotton pers comm).

APPENDIX 7: ROMAN POTTERY ASSESSMENT

Eniko Hudak

The archaeological investigations at Beam Park Riverside, Thames Avenue, London Borough of Barking and Dagenham & London Borough of Havering (THV17) produced a very small assemblage of Roman pottery totalling 22 sherds (0.191 kg, 0.06 Estimated Vessel Equivalents) from Area 1. The pottery was fully quantified and catalogued using the standard measures of sherd count, weight, and Estimated Vessel Equivalents (EVEs). The assemblage was recorded using standard Museum of London fabric codes (Symonds 2002) into an MS Access database.

The assemblage was recovered from five individually numbered contexts of Phase 4: fills of pits [59], [72], [78], [80], and alluvial layer (67). The very low mean sherd weight (8.7 g), and the observed high abrasion in the assemblage imply a degree of redeposition had taken place.

Context	SC	Wt(g)	EVEs	Spot date
58	3	1		AD50-400
67	9	142	0.06	AD70/120-130
71	6	42		AD50/120-160
77	3	5		AD70-200
79	1	1		AD50-160
TOTAL	22	191	0.06	

Table 1 – Distribution of the Roman pottery and spotdates

There is a restricted range of fabrics present in the assemblage all of which are well attested from the area and most of which can be dated to the Early Roman period (mid-1st to 2nd centuries AD). Coarse wares are most common with Alice Holt Surrey Ware, Early Roman Micaceous Sandy ware, Patch Grove Ware, and unsourced oxidized and reduced sandy wares, some of which are very likely to be products of the pottery kilns excavated at Former Mardyke Estate north of the excavation area (Hudak 2018), which are dated to after AD120. These fragments were recovered from layer (67) and fill (71) of pit [72].

Fine wares are scarce with a single fragment of an unsourced fine ware (possibly NKWS) of a Monaghan type 5B flanged dish (1987: 138 – 5B6) dated to AD70-130; and three very small fragments of NKFW. There are no fragments of amphorae, Samian, or mortaria in this assemblage.

Fabric	SC	Wt(g)	EVEs
AHSU	4	49	
ERMS	1	13	
FINE	1	8	0.06

Fabric	SC	Wt(g)	EVEs
NKFW	3	5	
OXID	4	3	
PATCH	1	74	
SAND	8	39	
TOTAL	22	191	0.06

Table 2 – Quantification of the assemblage by fabric

Further Work

The small size and the lack of diagnostic sherds limits the discussion beyond dating, however, the presence of possible Mardyke products can provide a link between the two sites and future investigations have the potential to contribute to our knowledge of the distribution of Mardyke and Beam Valley products in the area.

References

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APPENDIX 8: CERAMIC BUILDING MATERIAL

Kevin Hayward

Introduction and Methods

This small ceramic building material assemblage (1 example 656g) from the excavation at Beam Park, Riverside, Borough of Dagenham of Redbridge was reviewed to determine its overall character, and to provide a spot date.

The application of a 1kg masons hammer and sharp chisel to each example ensured that a small fresh fabric surface was exposed. The fabric was examined at x20 magnification using a long arm stereomicroscope or hand lens (Gowland x10). Matches were then made with the London fabric collection.

Fabrics and Forms

Roman

The solitary example from this site from the fill [68] of Roman pit [69] in Trench 1, consists of part of a large sheared *tegulae* fragment, made out of the later Roman fabric 2459b (AD120-250).

Fabric 2459b, which is widely used in *Londinium* and Southwark from AD120-250, is distinguished by having a very fine moulding sand and a fine sandy micaceous texture. This tile is widely believed to have been manufactured on the north bank to the east of the City (Ian Betts & Sue Pringle pers. comm.). So its identification by a Roman site on the north bank of the Thames should not be seen as surprising at all.

Distribution

Context	Fabric	Form	Size	Date range of material		Latest dated material		Spot date	Spot date with mortar
68	2459b	Roman Tegulae Fresh later 2nd-3rd century fabric	1	120	250	120	250	120-250+	No mortar

Review

The value of this small building material assemblage lies in its ability to date [68] the fill [68] of Roman Pit [69] in Trench 1 from the mid 2nd to mid 3rd century, supporting evidence from other material groups (Hudak; Appendix 7) that this part of the excavation has evidence for Roman occupation. Such sizeable chunk of *tegulae* is also indicative of a tiled roof structure in the immediate vicinity.

APPENDIX 9 OSTEOLOGICAL ASSESSMENT OF THE HUMAN REMAINS

James Young Langthorne

Introduction

During the archaeological investigation in Excavation Area 2 at Beam Park Riverside a single disarticulated fragment of human bone was recovered from peat deposit [161]

Methodology

The disarticulated bone was assessed to identify the type of bone, its condition, the presence of any pathological lesions or notable morphological idiosyncrasies and, if possible, the age and/or sex of the individual from which the bone originated.

After the disarticulated human bone had been assessed the minimum number of individuals represented was calculated (McKinley 2004). All results were entered into the PELICAN database.

Results

The single bone from layer [161] was a well preserved fragment of the left shaft of a fibula, extending from midshaft to distal shaft. Though the fragment was probably from an adult this cannot be confirmed, and it was not possible to sex the individual. There was no evidence of pathology on the bone and it represents a single individual.

Recommendations for further work

No further work is recommended on the fibula fragment from layer [161].

Bibliography

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APPENDIX 10: ANIMAL BONE ASSESSMENT

Kevin Rielly

Introduction

The study area formed an elongated strip of land just south of Beam Valley Country Park sandwiched between the New Road (A1306) and the railway line travelling between Dagenham Dock (to the west) and Rainham (to the east). This area extended west from Kent Avenue just beyond Marsh Way with an approximate breadth of 1.3km. Excavations consisted of an initial evaluation stage incorporating a series of strip trenches, this followed by two phases of excavation within three large trenches (Excavation Areas 1, 2 and 3). The various incursions provided evidence for prehistoric (Bronze Age), Roman and post-medieval activity, essentially following previous evidence for marshland activity, then agricultural usage perhaps related to possible farmsteads located north of this site and finally 20th century usage following the construction of the Ford Motor plant in this area in 1923.

Animal bones were recovered from the later excavations and principally from Excavation Area 1, although a minor amount was also taken from the large stepped trench (Excavation Area 2).

Methodology

The bone was recorded to species/taxonomic category where possible and to size class in the case of unidentifiable bones such as ribs, fragments of longbone shaft and the majority of vertebra fragments. Recording follows the established techniques whereby details of the element, species, bone portion, state of fusion, wear of the dentition, anatomical measurements and taphonomic including natural and anthropogenic modifications to the bone were registered.

Description of faunal assemblage

The site provided a grand total of 37 hand collected animal bones, comprising 36 from Trench 1 and a single bone from Trench 2 (see Table 1). These are divided between Phases 3 and 4, corresponding to Prehistoric and Roman activity respectively. Poor to moderately preserved bones made up all or the majority of the bones from each feature or layer, with the exception of fill (83) from pit [84] dated to Phase 3 where 25 out of the total of 28 bones were well preserved. Poorer preservation consisted of areas or sometimes the whole bone showing degrees of surface damage often accompanied by lamination. Such damage is conducive with weathering i.e. waste which had been left out in the open, either deliberately or through redeposition. Fragmentation was notably high within all deposits, again with the exception of (83) and the single large red deer tibia from alluvial layer (166) also dated to Phase 3 and representing the sole animal bone taken from Area 2 deposits.

Phase 3 - Prehistoric

A large part of a red deer tibia was found in an alluvial deposit (166) in Excavation Area 2 (see Tables 1 and 2). The bone displayed patches of weathering as well as lamination, although it was generally better preserved than the majority of the bones found at this site (apart from those taken from pit [84]). This bone was clearly from a rather large animal, presumably a stag, the unfused state of the proximal end suggestive of a mature animal but not one of advanced years (this epiphysis fuses at about 4 years, after Habermehl, 1985, 40-6).

Phase/Deposit	**Feature**	**Trench**		**Total**
		1	**2**	
Phase 3				
83	Pit [84]	28		28
166	Alluvium		1	1
Phase 4				
65	Pit [66]	1		1
67	Alluvium	2		2
68	Pit [69]	1		1
70	Pit [72]	1		1
77	Pit [78]	1		1
79	Pit [80]	2		2
Grand Total		**36**	**1**	**37**

Table 1. The distribution of the hand collected bones by Phase, trench, feature type and deposit/cut.

Phase:	**3**	**4**	**Total**
Species			
Cattle	10	5	15
Equid		3	3
Cattle-size	10		10
Sheep/Goat	2		2
Pig	5		5
Sheep-size	1		1
Red deer	1		1
Grand Total	**29**	**8**	**37**

Table 2. The distribution of species by Phase.

Phase 4 – Roman

Animal bones were taken from the contents (83) of pit [84] in Excavation Area 1. Pit [84] is described as a possible waterhole dated potentially to the Roman period. All the bones were taken from the basal fill (83), the good preservation reminiscent of notable Roman collections found in the city and Southwark which were also found in silty deposits and which also featured good survival of organic materials. This collection was mainly composed of cattle and pig bones (generally 25-50% complete), the former with a pair of mandibles, a near complete pelvis, one proximal and two distal humerii, part of a sacrum and two tibia shafts. One of the tibias was poorly preserved and presumably derived from

another deposition event. Another bone, a distal humerus is well preserved on the lateral side but poor on the medial surface. Here it can be proposed that the lateral half was submerged while the

A small number of bones were taken from five pits and an alluvium layer (Table 1), all in Excavation Area 1. Dates were available for two of the former features, namely [78] and [80] both suggesting deposition within the 1st/2nd centuries AD. Entirely composed of cattle and equid fragments, the former include a mandible, scapula (all 25% complete apart from the mandible - <25%) alongside an equid mandible, femur and metatarsus, the femur 25% complete and the other two at least 75% complete. Most of these were poorly preserved with the exception of the cattle metatarsus from pit [78] and the cattle mandible and equid metatarsus from alluvium layer (67). This better condition allowed for the survival of cut marks, these observed on the equid metatarsus consisting of two small knife marks on the anterior surface of the shaft just proximal to the distal end. These can be interpreted as skinning cuts. All these bones derive from adult individuals, the equid mandible probably from a relatively young adult between about 3 and 5 years (after Levine 1982 and Goody 2008, 106-7) medial part was exposed to the elements. Each of these bones is from or probably from a mature individual (a suggestion of a minimum number of at least 2 animals), the mandibles from an animal of advanced years (possibly 7 to 10 years following Jones and Sadler 2012, 18). Accompanying the cattle component and probably representing the same species, there are 9 cattle-size rib shaft pieces and a long bone shaft fragment. The pig bones include the posterior part of a skull, a distal humerus, two pelves and a distal femur. There is again a suggestion of at least two individuals, both possibly subadult or young adult. The identified component also includes two sheep/goat mandibles, both from juvenile (1st year) individuals as well as potentially a pig cervical vertebra, here described as sheep-size. Numerous cut marks were observed on the cattle and cattle-size bones including chop marks to the pelvis (splitting adjacent to the pubic symphysis) and sacrum (splitting removing the sacral wing) and several of the cattle-size ribs (sectioning cuts); and knife cuts adjacent to a proximal and also to a distal humerus. Both the heavy and lighter cuts were clearly made with metal instruments, which suggests a later prehistoric date or more likely considering the wealth of heavier cuts that this collection was principally deposited in the Roman era.

Conclusion and recommendations for further work

This small collection is of interest due to the potential prehistoric date and indeed regarding Roman usage of an area which essentially was within the Thames floodplain and therefore of little development value until fairly recently. A notable collection of food waste would, however, suggest that some settlement activity was taking place nearby. The concentration of bones recovered from the basal fill of pit [84] in Excavation Area 1, may in fact date to the Roman period. This is suggested by the butchery evidence, the observed cut marks almost certainly made with metal instruments. It may be worthwhile showing these marks to a relevant specialist in order to confirm this. In addition, it is recommended that at least one of the bones from this deposit be sent for carbon dating. The potential Roman date of this collection would certainly comply with the pottery dating evidence recovered from this same excavation area, perhaps describing settlement activity comparable to that

recently observed a short distance to the north-east at the Beam Washlands site (Biddulph *et al.* 2010) and also at Mardyke (Hawkins 2018b), this dated to the Late Iron Age/Early Roman period (Bannens and Edmonds, this report).

Whatever the date of this pit collection, there are too few bones to allow for more than a brief review of animal husbandry in this area. Notably, each of the major domesticates are represented and a large proportion of these can supply age evidence, thus providing some information concerning exploitation practices. The size of the various domesticates could fit in with those dating to the Early Bronze Age although they could also compare to Roman stock. Of interest is the butchered equid metatarsus from one of the Roman pits (Phase 4) suggestion some use of post-mortem products. It is unknown if horsemeat was regularly consumed in earlier prehistory (here coinciding with their introduction in the Early Bronze Age, after Serjeantson 2011, 33-4) but there is certainly frequent evidence for jointing and defleshing marks on horse bones derived from Iron Age sites in this country (Hambleton 2008, 71). Hippophagy then markedly decreased moving into the Roman period (Poole 2013, 6), although there is ample butchery evidence from this later period to show that skinning was relatively commonplace (as for example shown in London, see for example Cowan *et al.* 2009, 173).

In conclusion, it is recommended that this small collection is worthy of further work, essentially clarifying the information already described and hopefully comparing this data with bone collections from other sites in this general region. Obviously, there is some concern related to the dating of the major part of this collection (from pit [84]) and efforts should be made to rectify this situation. Whether it is Prehistoric and Roman or just Roman, the absence of evidence related to animal husbandry in this local area will certainly justify any further work. Animal bone collections were discovered at the previously mentioned Roman settlement sites at Beam Washlands and Mardyke, however the bone assemblages from these sites were small, in poor condition and highly fragmented (Strid 2010, 140-1 and Deighton 2018). A final point concerns the red deer tibia from Excavation Area 2 which is also placed in the earlier period (Phase 3). This may well represent the sole prehistoric component of the bone assemblage and it may be worthwhile attaining a carbon date for this example as well as from bone(s) from well/waterhole (83).

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APPENDIX 11: SUERC; RADIOCARBON DATING

Scottish Universities Environmental Research Centre
Rankine Avenue, Scottish Enterprise Technology Park, East Kilbride, Glasgow G75 0QF, Scotland, UK
Director: Professor F M Stuart Tel: +44 (0)1355 223332 Fax: +44 (0)1355 229898 www.glasgow.ac.uk/suerc

RADIOCARBON DATING CERTIFICATE

02 May 2018

Laboratory Code	SUERC-79156 (GU47859)
Submitter	Lucy Whittingham Pre-Construct Archaeology Ltd Unit 54 Brockley Cross Business Centre 96 Endwell Road Brockley, London SE4 2PD
Site Reference	Beam Park, LB Barking and Dagenham
Context Reference	[215]
Sample Reference	<33>
Material	Wood (worked) : Yew
$\delta^{13}C$ relative to VPDB	-23.0 ‰
Radiocarbon Age BP	3902 ± 30

N.B. The above ^{14}C age is quoted in conventional years BP (before 1950 AD) and requires calibration to the calendar timescale. The error, expressed at the one sigma level of confidence, includes components from the counting statistics on the sample, modern reference standard and blank and the random machine error.

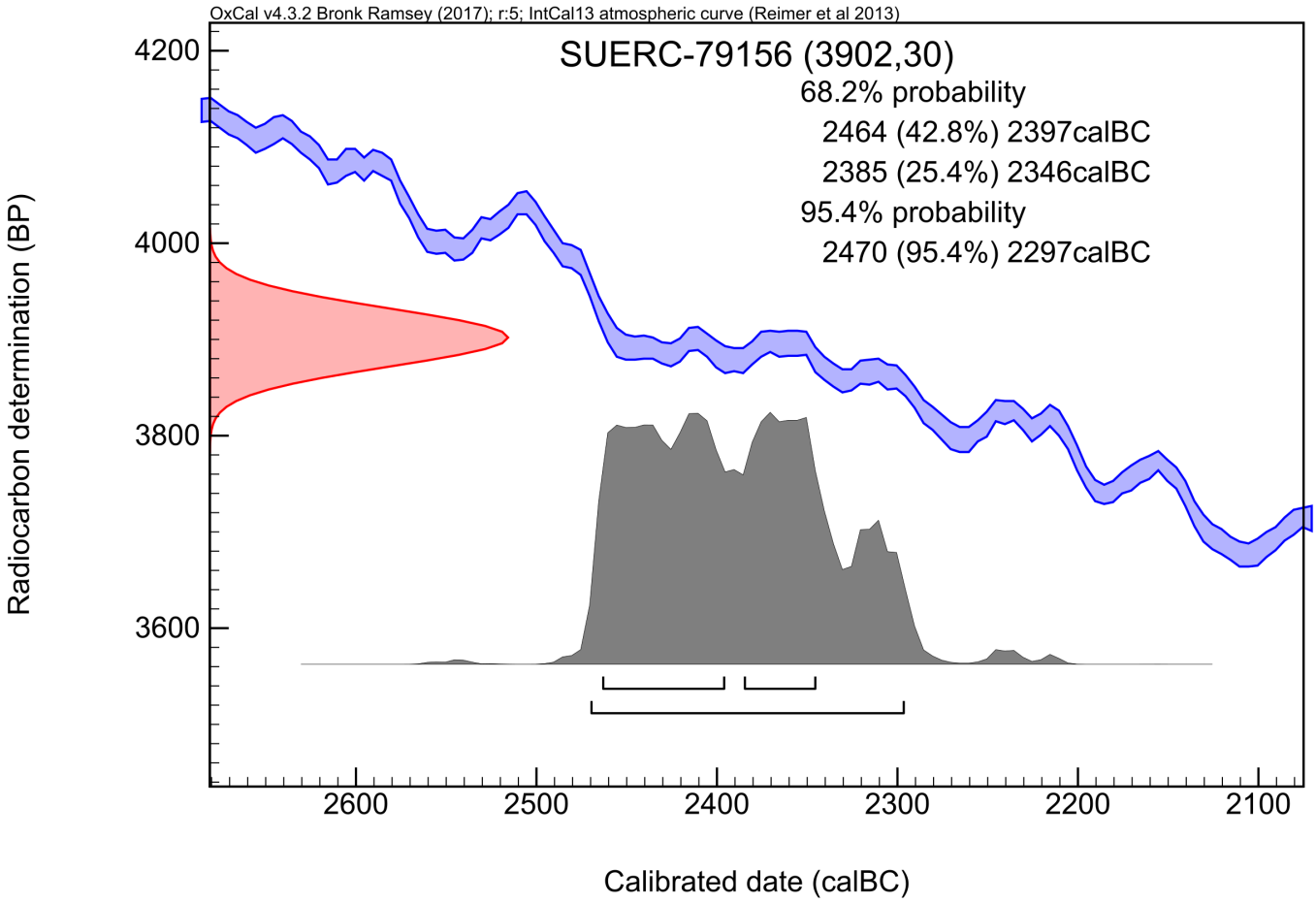
Samples with a SUERC coding are measured at the Scottish Universities Environmental Research Centre AMS Facility and should be quoted as such in any reports within the scientific literature. The laboratory GU coding should also be given in parentheses after the SUERC code.

Detailed descriptions of the methods employed by the SUERC Radiocarbon Laboratory can be found in Dunbar et al. (2016) *Radiocarbon 58(1) pp.9-23.*

For any queries relating to this certificate, the laboratory can be contacted at suerc-c14lab@glasgow.ac.uk.

Conventional age and calibration age ranges calculated by : E. Dunbar

Checked and signed off by : P. Nayont



The radiocarbon age given overleaf is calibrated to the calendar timescale using the Oxford Radiocarbon Accelerator Unit calibration program OxCal 4.*

The above date ranges have been calibrated using the IntCal13 atmospheric calibration curve†

Please contact the laboratory if you wish to discuss this further.

* Bronk Ramsey (2009) *Radiocarbon 51(1) pp.337-60*

† Reimer et al. (2013) *Radiocarbon 55(4) pp.1869-87*

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RADIOCARBON DATING CERTIFICATE

02 May 2018

Laboratory Code	SUERC-79157 (GU47860)
Submitter	Lucy Whittingham Pre-Construct Archaeology Ltd Unit 54 Brockley Cross Business Centre 96 Endwell Road Brockley, London SE4 2PD
Site Reference	Beam Park, LB Barking and Dagenham
Context Reference	[236]
Sample Reference	<24>
Material	Wood : Yew
$\delta^{13}C$ relative to VPDB	-25.1 ‰
Radiocarbon Age BP	3948 ± 30

N.B. The above ^{14}C age is quoted in conventional years BP (before 1950 AD) and requires calibration to the calendar timescale. The error, expressed at the one sigma level of confidence, includes components from the counting statistics on the sample, modern reference standard and blank and the random machine error.

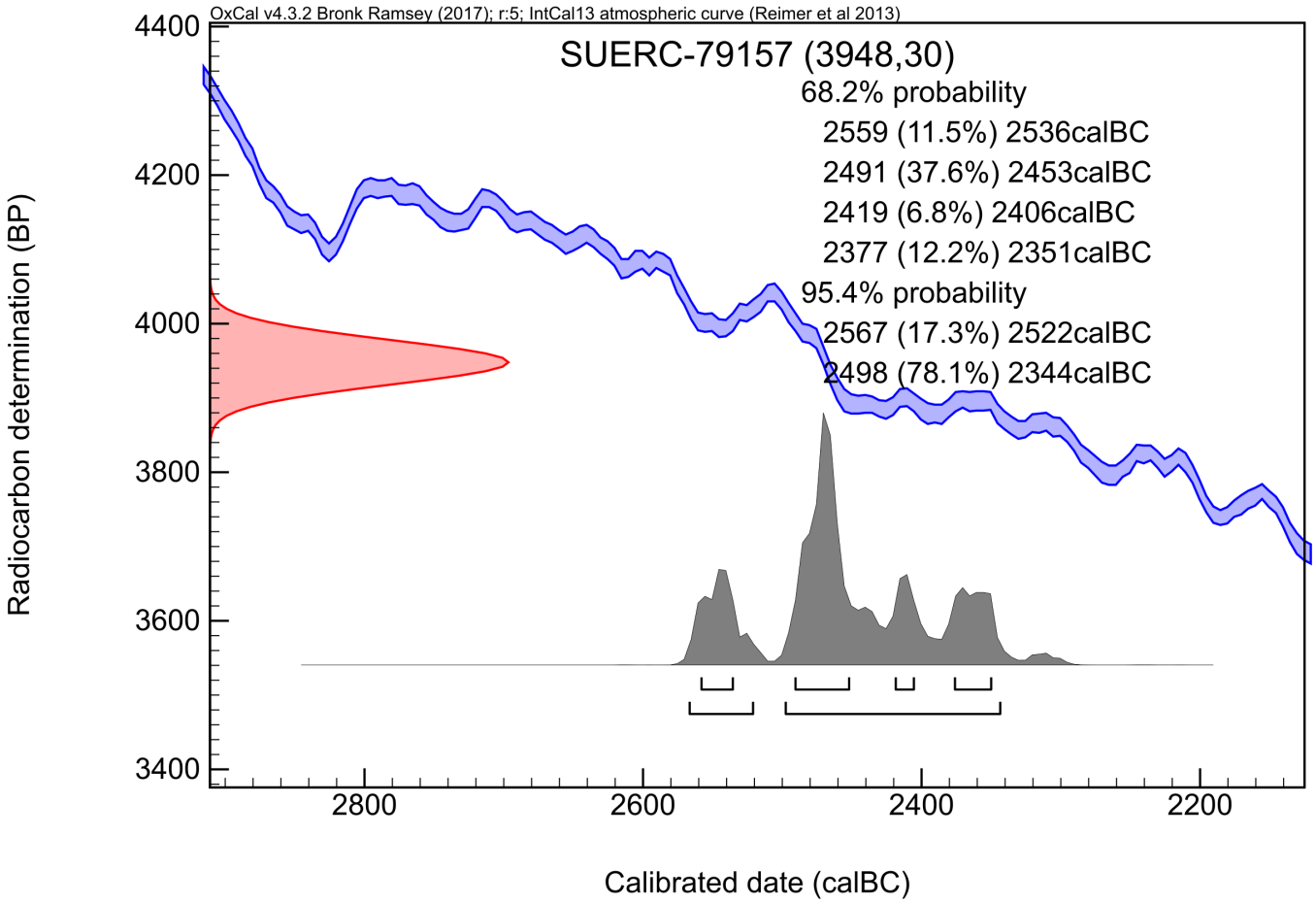
Samples with a SUERC coding are measured at the Scottish Universities Environmental Research Centre AMS Facility and should be quoted as such in any reports within the scientific literature. The laboratory GU coding should also be given in parentheses after the SUERC code.

Detailed descriptions of the methods employed by the SUERC Radiocarbon Laboratory can be found in Dunbar et al. (2016) *Radiocarbon 58(1) pp.9-23.*

For any queries relating to this certificate, the laboratory can be contacted at suerc-c14lab@glasgow.ac.uk.

Conventional age and calibration age ranges calculated by : E. Dunbar

Checked and signed off by : P. Nayont



The radiocarbon age given overleaf is calibrated to the calendar timescale using the Oxford Radiocarbon Accelerator Unit calibration program OxCal 4.*

The above date ranges have been calibrated using the IntCal13 atmospheric calibration curve†

Please contact the laboratory if you wish to discuss this further.

* Bronk Ramsey (2009) *Radiocarbon 51(1) pp.337-60*

† Reimer et al. (2013) *Radiocarbon 55(4) pp.1869-87*

Scottish Universities Environmental Research Centre
Rankine Avenue, Scottish Enterprise Technology Park, East Kilbride, Glasgow G75 0QF, Scotland, UK
Director: Professor F M Stuart Tel: +44 (0)1355 223332 Fax: +44 (0)1355 229898 www.glasgow.ac.uk/suerc

RADIOCARBON DATING CERTIFICATE

02 May 2018

Laboratory Code	SUERC-79161 (GU47861)
Submitter	Lucy Whittingham Pre-Construct Archaeology Ltd Unit 54 Brockley Cross Business Centre 96 Endwell Road Brockley, London SE4 2PD
Site Reference	Beam Park, LB Barking and Dagenham
Context Reference	[237]
Sample Reference	<30>
Material	Wood (from burnt end) : Yew
$\delta^{13}C$ relative to VPDB	-24.7 ‰
Radiocarbon Age BP	3892 ± 28

N.B. The above ^{14}C age is quoted in conventional years BP (before 1950 AD) and requires calibration to the calendar timescale. The error, expressed at the one sigma level of confidence, includes components from the counting statistics on the sample, modern reference standard and blank and the random machine error.

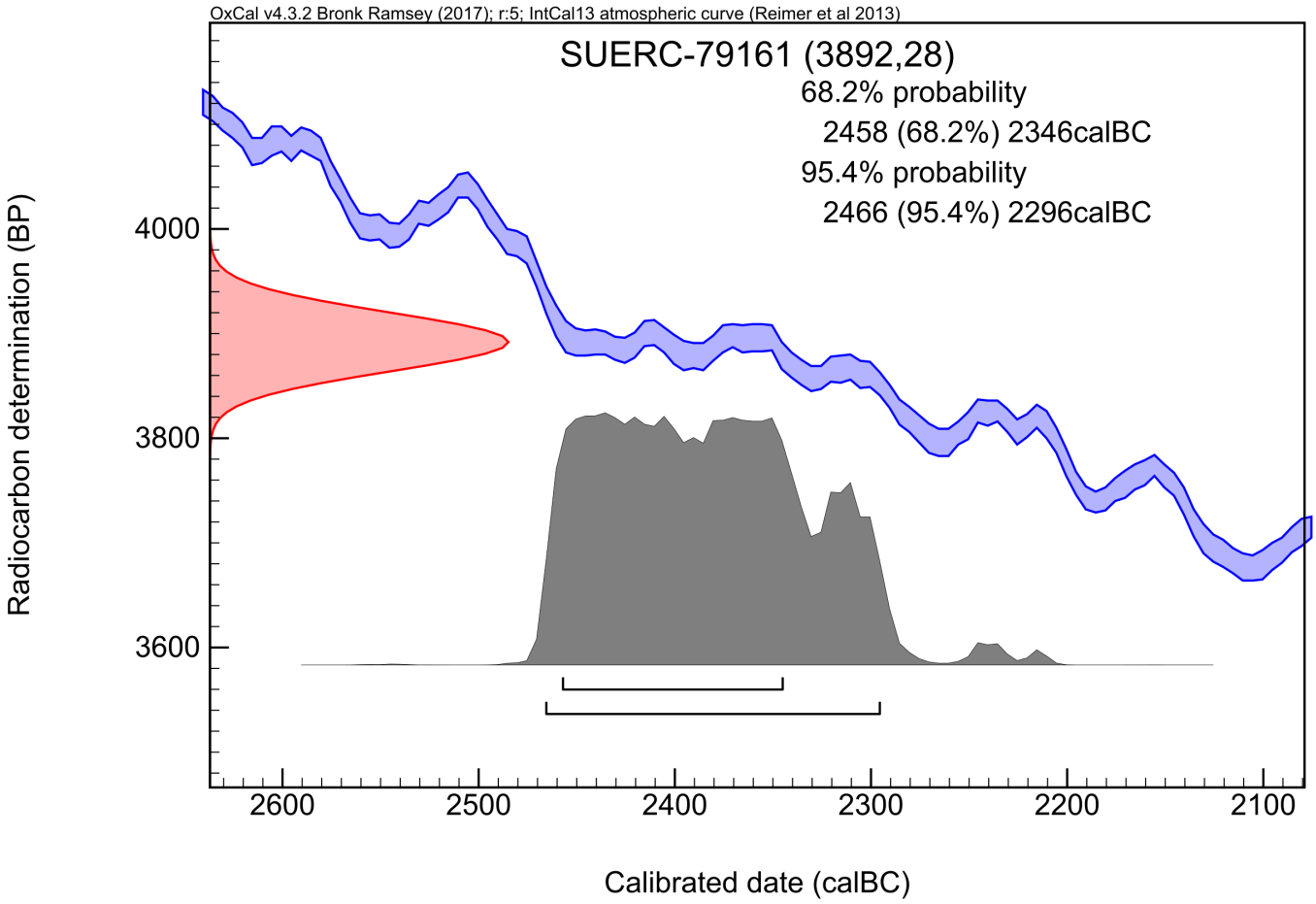
Samples with a SUERC coding are measured at the Scottish Universities Environmental Research Centre AMS Facility and should be quoted as such in any reports within the scientific literature. The laboratory GU coding should also be given in parentheses after the SUERC code.

Detailed descriptions of the methods employed by the SUERC Radiocarbon Laboratory can be found in Dunbar et al. (2016) *Radiocarbon 58(1) pp.9-23.*

For any queries relating to this certificate, the laboratory can be contacted at suerc-c14lab@glasgow.ac.uk.

Conventional age and calibration age ranges calculated by : E. Dunbar

Checked and signed off by : P. Nayont



The radiocarbon age given overleaf is calibrated to the calendar timescale using the Oxford Radiocarbon Accelerator Unit calibration program OxCal 4.*

The above date ranges have been calibrated using the IntCal13 atmospheric calibration curve†

Please contact the laboratory if you wish to discuss this further.

* Bronk Ramsey (2009) *Radiocarbon 51(1) pp.337-60*

† Reimer et al. (2013) *Radiocarbon 55(4) pp.1869-87*

APPENDIX 13: OASIS FORM

OASIS ID: preconst1-336907

Project details

Project name	Beam Park Riverside (Phases 1 and 2) Assessment
Short description of the project	This report details the results of work undertaken between October 2017 and March 2018 on three excavation areas. The archaeology encountered was multi-phase with three historical periods; prehistoric, Roman and post-medieval. the underlying natural geology was encountered in two areas and comprised sandy gravels and Langley silts (brickearth). A sequence of Lower Alluvium, peat and Upper Alluvium was encountered at various depth in all of the excavation area, especially in Excavation Area 2 where a stepped trench was excavated. Deeper slots were excavated in Area1 to investigate floodplain and natural deposits (Taplow Gravel). The peat was not encountered in Excavation Area 1 but in the other two areas peat was encountered of an Early to Middle Neolithic date (Area 2) and Early/Middle Bronze Age (Area 3). Area 3 exposed 13 timbers (Yew, Oak and Ash) within the peat of Early Bronze Age date, one of which was worked with cut notches used in the process of hollowing out the Yew tree trunk. The peat deposits follow the natural topography and fall towards the south. Roman features in the form of pits were found in Area 1 cut into the brickearth and associated with Roman pottery. Flood deposits thought to have been formed in the medieval/post-medieval period were encountered in all excavation areas.
Project dates	Start: 02-10-2017 End: 22-03-2018
Previous/future work	Yes / Yes
Any associated project reference codes	THV17 - Sitecode
Type of project	Recording project
Site status	Local Authority Designated Archaeological Area
Current Land use	Vacant Land 3 - Despoiled land (contaminated derelict and ?brownfield? sites)
Monument type	LAYERS Modern
Monument type	PITS Roman
Monument type	LAYERS Late Prehistoric
Significant Finds	FLINT Late Prehistoric
Significant Finds	POT Late Prehistoric
Significant Finds	POT Roman
Significant Finds	ANIMAL BONE Uncertain
Significant Finds	HUMAN BONE Uncertain

Project location

Country	England
Site location	GREATER LONDON BARKING AND DAGENHAM BARKING AND DAGENHAM Beam Park Riverside

Postcode	RM9 6DE
Study area	4629 Square metres
Site coordinates	TQ 50021 82962 51.525110513926 0.162802918289 51 31 30 N 000 09 46 E Point
Height OD / Depth	Min: -3.37m Max: 2.12m

Project creators

Name of Organisation	Pre-Construct Archaeology Limited
Project brief originator	RPS Planning
Project design originator	Rob Masefield
Project director/manager	Helen Hawkins
Project supervisor	Matt Edmonds
Type of sponsor/funding body	Property Developers
Name of sponsor/funding body	Countryside Properties

Project archives

Physical Archive recipient	LAARC
Physical Archive ID	THV17
Physical Contents	''Animal Bones'',''Ceramics'',''Environmental'',''Human Bones'',''Wood'',''Worked stone/lithics''
Digital Archive recipient	LAARC
Digital Archive ID	THV17
Digital Contents	''Animal Bones'',''Ceramics'',''Environmental'',''Human Bones'',''Survey'',''Worked stone/lithics''
Digital Media available	''Database'',''Survey'',''Text''
Paper Archive recipient	LAARC
Paper Archive ID	THV17
Paper Media available	''Context sheet'',''Drawing'',''Matrices''

Entered by	Lucy Whittingham (lwhittingham@pre-construct.com)
Entered on	14 December 2018