AN ASSESSMENT OF THE ARCHAEOLOGICAL RESOURCE IN AGGREGATE AREAS OF WEST BERKSHIRE

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MUSEUM OF LONDON ARCHAEOLOGY

West Berkshire COUNCIL

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Executive Summary

This document is an archaeological resource assessment of the aggregate producing areas of West Berkshire. It was undertaken by Museum of London Archaeology in partnership with West Berkshire Council in 2009–2011, with funding from the Aggregates Levy Sustainability Fund, as administered by English Heritage. The aim of the project has been to improve knowledge of the archaeological resource within all past, present and potential future aggregate producing areas in West Berkshire, with the intention of increasing public, industry and other stakeholders' awareness of archaeological remains within aggregate geology areas. The study will assist strategic planning decisions regarding future aggregate extraction, along with the management of buried heritage assets, including setting out research agenda and appropriate archaeological mitigation strategies where archaeological assets are under threat of removal by quarrying.

The aggregates resource was identified from the British Geological Survey and extraction areas shown on historic maps and the British Pits database and current minerals permissions. Three Study Areas comprising River Sands/Gravels, Plateau Sands/Gravels and Chalk were defined, in consultation with the West Berkshire Historic Environment Record (HER) and the Berkshire Joint Strategic Planning Unit (JSPU). Historically, aggregate extraction has been extensive, with just over 715 historic quarries across the District.

The project includes a Geographical Information System (GIS) analysis of archaeological data, as contained within the West Berkshire HER and with data from English Heritage's National Mapping Programme survey (a digital plot of archaeological features visible as cropmarks and earthworks on aerial photographs). The project area dataset of assets was enhanced by applying a consistent chronology, along with classification of features by 'asset type' (e.g. industrial, domestic or defence functions), and this was used to generate a series of asset density maps showing the distribution of various asset types for each chronological period. This has allowed an invaluable overview of the archaeological resource within the aggregate producing areas of West Berkshire and the nature of human activity over time, which has not previously been possible. The report analyses the known resource by chronological period, and attempts to identify patterns in human activity.

The West Berkshire project included an assessment of levels of dissemination in relation to past archaeological investigations carried out as a result of aggregates extraction (a 'backlogs' report). It also included the digitisation of the results of the extensive Lower Kennet Fieldwalking Survey within GIS. Both are stand-alone reports.

Clear patterns in the asset densities of different periods were revealed. The Bronze Age, Roman, post-medieval and Modern periods have high densities whilst the early prehistoric and early medieval periods have low densities. This generally reflects trends in resource assessments in other counties and may reflect the nature of the material evidence associated with a particular period (e.g. elusive, ephemeral, difficult to recognise). Whilst asset density to a large extent reflects the level of past archaeological investigation (generally lower density areas have seen little investigation), it is nevertheless clear that the highest densities are associated with River Sands/Gravels and that this geology was preferred for a range of activities. The gravels provide fertile soils close to a major river and natural communication/transport route, with associated resources (water, game, fish, reeds etc).

Assets identified from active and past Sand/Gravel extraction represents c 15% of the total of all assets in the Project Area. Assets recovered from active and recently historic Sand/Gravel (both Plateau River) extraction sites (ie extraction sites active up to thirty years ago) account for c 85% of the assets recovered from all extraction sites within the Project Area. However, Active extraction sites have a density of 1.36 assets per km^2 across both Sand/Gravel Study Areas, whereas past extraction areas (both Recent and Historic) have an asset density of 1.44 assets per km^2. Furthermore, the Resource Assessment has identified that based on present information preferred proposed extraction sites would have a potential impact on a possible 1% of assets within the Sand/Gravel Study Areas with a density of 0.14 assets per km^2.

The study has demonstrated that the aggregate areas, in particular the River Sand/Gravel, are very important archaeologically and this needs to be a key consideration for both minerals planners and minerals extraction companies, in any future extraction programme. Early planning and consultation with heritage curators and consultants is recommended.

The report outlines a process of prospection, evaluation (either invasive or non-invasive) and mitigation, associated with future aggregates extraction. Preliminary historic environment (desk-based) assessment is considered to be the most effective means of identifying and assessing risk to archaeological assets pre-planning application. A range of techniques is discussed, including fieldwalking, to identify early prehistoric remains that lie close to the surface (potentially lost through initial topsoil stripping). Geoarchaeological, palaeoenvironmental and deeper trenches might be required to evaluate and mitigate impacts on remains within River Terrace Deposits and alluvium. Impacts from extraction on areas of low archaeological potential and significance could be mitigated by watching brief, whilst for large areas of impact, 'strip, map and record' with targeted excavation of localised highly significant remains is considered appropriate.

The asset densities and accompanying archaeological resource assessment provided the basis for a research strategy and agenda. This identified a number of general priorities comprising: research into unmapped River Terrace Deposits; extension of the NMP survey across the rest of the Project Area; re-assessment of assets recovered by antiquarians (where possible); and targeted investigation of assets of uncertain nature/date. Specific research priorities for the improved understanding of particular periods are also set out and could be applied to any future investigation carried out prior to aggregates extraction.

Note: whilst this report was finalised to incorporate stakeholder comments in November 2013, it details the results of a project carried out between 2009 and 2011. The project assesses the HER and other baseline data available at that time, along with planning policy and minerals permissions extant at that time. The subsequent introduction of the National Planning Policy Framework in 2012 post-dates the project work and has not been referred to. However, it introduction does not materially affect the conclusions of the assessment.

1 Introduction

1.1 Background

1.1.1 This project comprises an archaeological resource assessment of the aggregate producing areas of West Berkshire. It was undertaken as a partnership between Museum of London Archaeology (MOLA) and the West Berkshire Council, between 2009 and 2011, and incorporates input from period experts and English Heritage in 2012. The project was funded by the Aggregates Levy Sustainability Fund (ALSF) as administered by the English Heritage (EH) Historic Environment Enabling Programme (HEEP; superseded in 2011 by the National Heritage Protection Plan). The study follows similar projects in Gloucestershire (Brightman 2010), Worcestershire (Jackson and Dalwood, 2007), Warwickshire (Alexander 2008), Norfolk (Tremlett 2009), Suffolk (Good, Hegarty, Pluoviez and Rolfe, 2007), Bath and North East Somerset (Dawson and Featherby 2011), the Isle of Wight (Pethen 2010) and East Sussex.

1.1.2 The project has adhered to English Heritage MoRPHE guidance on project management and procedures (English Heritage 2008a). It meets the aims and objectives set out in a Project Design, produced by MOLA in 2009 (Pethen 2009).

1.1.3 The project has met two strategic objectives set out in the English Heritage Strategic Framework for Historic Environment Activities and Programmes (English Heritage 2008b):

- Corporate Objective 1A: '*Ensure that our research addresses the most important and urgent needs of the historic environment'*. This has been achieved through research programme G2 'Defining the questions: Devising research strategies, frameworks and agenda' within sub programme number 11172.110 'Supporting research Frameworks: national, regional, local, diachronic and thematic frameworks'.
- Corporate Objective 4B: '*Develop and disseminate policies, principles, guidelines, standards and exemplars to promote better management of change in the historic environment'*. This has been achieved though empowerment programme D4 'Guidance for Local Government' within sub programme number 42244.110 'Promoting Characterisation in Strategic Planning'.

1.1.4 The project fulfils English Heritage research themes (A): 'Discovering, studying and defining historic assets and their significance'; and (D) 'Studying and assessing the risks to historic assets and devising responses' (English Heritage 2005a, 4, English Heritage 2005b).

1.1.5 An historic asset as defined in this assessment comprises any evidence of past human activity that is of heritage interest, including above ground and buried remains, structures, features, landscapes, earthworks, and deposits, whether designated or not. These remains may still be present and extant, or have been recorded in some way prior to removal (from an HER entry through to a published record and archive). Essentially, an historic asset equates with a discrete record on the West Bershire HER.

1.1.6 The project meets the published criteria for ALSF projects 1; in particular:

- developing the capacity to manage aggregate extraction landscapes in the future
- delivering to public and professional audiences the full benefits of knowledge gained through past work in advance of aggregates extraction
- reducing the physical impacts of current extraction where these lie beyond current planning controls and the normal obligations placed on minerals operators

- addressing the effects of old mineral planning permissions
- promoting understanding of the conservation issues arising from the impacts of aggregates extraction on the historic environment.

1.1.7 Minerals have been extracted from West Berkshire for the past two centuries at least, with over 715 past and active quarries identified as part of the current project. The main aggregate resource areas comprise superficial Sand and Gravel deposits, largely along the main valleys of the Kennet, Lambourn and Pang rivers. Although historically Chalk has been extracted across the district, Chalk is no longer a prime target for extraction and much of the chalk deposits found in the study area are within the Area of Natural Beauty (AONB) covering the Berkshire Downs. Sand and Gravel remains the primary target of aggregate extraction within West Berkshire with the main sand and gravel resource areas that are currently exploited being located outside the AONB.

1.2 Aims

1.2.1 The primary aim of the project, as set out in the Project Design (Pethen 2009) was to improve the quality and quantity of available archaeological data in respect of potential aggregate producing areas within West Berkshire, and to facilitate more informed advice concerning the impacts and mitigation of aggregates extraction. The specific aims are to:

- inform the minerals planners of the archaeological sensitivity of aggregate areas in order to guide future minerals strategy and assist with decision making in respect of existing and future minerals permissions;
- provide planning archaeologists with an overview of the archaeological resource within aggregate areas, which will assist with the management of assets potentially affected by quarrying, along with the development of archaeological research frameworks
- enhance the current understanding of the nature and significance of archaeological assets within aggregate areas for minerals extraction companies, archaeological contractors, academics and the general public.

1.2.2 Associated aims of the project comprised:

- Defining the spatial extent aggregate geologies digitally within West Berkshire, using a Geographical Information System (GIS) and including past, present and potential areas of aggregate extraction.
- Enhancing the West Berkshire Historic Environment Record (HER), including incorporating information from English Heritage's National Record for the Historic Environment. The HER is the primary repository of archaeological information within the district.
- Using GIS to creating a series of asset density maps of types of site (e.g., defence, domestic) by chronological period.
- Producing a report analysing the state of archaeological knowledge of each aggregate producing area (Resource Assessment).
- Providing recommendations for archaeological research agenda and archaeological mitigation strategies.

1.2.3 It is hoped that the results of the project and the project outputs (enhanced HER data, report and features maps) will facilitate dialogue between archaeologists, minerals planners, the public and aggregates industry in respect of archaeological remains and aggregate extraction.

1.2.4 The project includes two additional elements. These comprise an associated 'backlogs' report, which has assessed the levels of dissemination of past archaeological investigations resulting from aggregates extraction within West Berkshire (Featherby 2010). The second element is the digitisation of the results of the Lower Kennet Valley Fieldwalking Surveys, which includes a GIS database and

associated report (Featherby 2011). The results will be integrated into the HER following the completion of the project.

1.3 Objectives

1.3.1 In order to meet the aims of the project, the objectives, as set out in the Project Design, were as follows:

- **Objective 1**: produce baseline archaeological data to facilitate decision making associated with archaeological remains and aggregate extraction.
- **Objective 2**: define aggregate geology study areas (the 'aggregates resource') within GIS.
- **Objective 3**: collate HER Monument data within the study areas.
- **Objective 4**: enhance the HER Monument data with information from additional data sources, along with the application of consistent Asset type and Asset date attributes.
- **Objective 5**: provide the HER with enhanced data in an appropriate format so that it can be incorporated back into the HER.
- **Objective 6**: assess the state of archaeological knowledge of each aggregate producing area (Resource Assessment).
- **Objective 7**: develop an archaeological Research Agenda and Strategy for aggregates areas.
- **Objective 8**: develop historic environment policies and mitigation strategies for aggregates areas.
- **Objective 9**: increase understanding of archaeology and aggregates and facilitate further dialogue between archaeologists, minerals planners, the public and the aggregates industry.

1.4 The Project Area

1.4.1 West Berkshire covers an area of 704.3km^2 (Fig 1). This has been defined by modern administrative requirements and has no spatial meaning in terms of the nature and extent of past human activity, and simply acts as a 'cookie cutter' in extracting a sample from a far wider canvas.

1.4.2 Within West Berkshire, a Project Area (Fig 2) comprising a broad zone of economically viable aggregate geologies was defined by the Project Board as the target of the present assessment, as outlined in Section 2.2. This covers an area of approximately 395km^2, or around 56% of West Berkshire, and focusses primarily on the Lower Kennet Valley in the southern half of West Berkshire, excluding the Chalk uplands of the Berkshire Downs, which are designated as an Area of Outstanding Natural Beauty.

1.4.3 The topography of the Project Area is varied (Fig 3); it lies at a height of *c* 140m Ordnance Datum (OD) on its northern boundary dropping to *c* 55m OD on the Lower Kennet valley floor before rising again to *c* 120m OD on the southern boundary.

1.4.4 Within the Project Area are three study areas defined by the aggregate geology type in section 2.2. These comprise: the Plateau Sands and Gravels; the River Sands and Gravels; and Chalk. The study areas are compared in the report to the non-aggregate ('other') geologies within the Project Area.

1.5 Management and Personnel

1.5.1 This project was managed by MOLA. The Project Executives were David Bowsher of MOLA and Duncan Coe, the West Berkshire Council Archaeological Officer. Jon Chandler of MOLA was the Project Manager. Rupert Featherby of MOLA was the project coordinator and principal author. HER data was provided by Sarah Orr (HER Officer). Graham Spurr, MOLA Geoarchaeologist, contributed to the description of

the aggregate resource. Rosemary Morton of the Berkshire Joint Strategic Planning Unit (JSPU) provided information regarding the current state of Minerals Planning Policy. The EH Project Officer was Barney Sloane. The EH Inspector with responsibility for the West Berkshire is Chris Welch and the EH ALSF advisor was Peter ('Buzz') Busby.

1.5.2 The period experts comprised: Dr Rob Hosfield (University of Reading) Lower and Middle Palaeolithic; Dr Catherine Barnett (Wessex Archaeology) Upper Palaeolithic and Mesolithic; Professor Richard Bradley (University of Reading) Neolithic and Early Bronze Age; Dr Andrew Fitzpatrick (Wessex Archaeology) Late Bronze Age and Iron Age; Professor Mike Fulford (University of Reading) Roman period; Dr Steve Clark Early medieval, Professor Grenville Astill (University of Reading) Medieval; and Duncan Coe (West Berkshire Council) post-medieval and modern periods.

1.5.3 Archaeological Research and Consultancy at the University of Sheffield (ARCUS; now Wessex Archaeology Sheffield) provided a variant of the database for the *Identification and Quantification of Past Archaeological Investigations resulting from Aggregates Extraction* which formed the backlogs project (Featherby 2010).

1.6 Report structure

1.6.1 Section 1, the introduction, provides the project origin and scope, aims, objectives, project area, personnel and report structure.

1.6.2 Section 2 outlines the methodology, including how the study areas were defined; the method used to enhance and validate the data, and the production of asset density figures.

1.6.3 Section 3 describes the aggregate resource within the Project Area including an overview of past aggregate extraction.

1.6.4 Section 4 provides a general archaeological and historical background of the Project Area (West Berkshire), with an overview of past archaeological investigation associated with quarrying activity.

1.6.5 Section 5 provides an overview of the density of assets for each period within each study area.

1.6.6 Sections 6 and 7 comprise the archaeological resource assessment for the Study Areas. Each section begins with a short discussion of the distribution and density of known finds and sites across the study area, identifying spatial trends, and discussing the known sites and their significance.

1.6.7 Section 8 sets out the current archaeological research agenda and strategy and how the findings of the study fit with published research priorities.

1.6.8 Section 9 provides recommendations for archaeological mitigation strategy.

1.6.9 The project conclusions are in Section 10, with a bibliography in Section 11. A series of period-based asset distribution maps is included at the back of the report. A gazetteer of all assets within the study areas forms a separately bound report.

1.7 The backlogs project

1.7.1 The project included an additional element comprising an assessment of the current situation regarding archaeological investigations in aggregates extraction sites in the West Berkshire, including the levels of dissemination of results from such investigations (a 'backlogs' project). The results are presented in a stand-alone report (Featherby 2010).

1.7.2 The extraction of aggregates has been responsible for the identification and recording of a number of archaeological sites and finds in West Berkshire over the last 200 years. These include those sites and finds recorded by interested antiquarians and those excavated by professional or voluntary archaeological groups in more recent times. In many cases these past excavations and discoveries

have been inadequately disseminated, either because of the era when they took place or as a result of the backlog in the publication of results by archaeological units or voluntary groups. In Berkshire this situation has been exacerbated as the main archaeological journal for the area – the Berkshire Archaeological Journal – has not been published annually in recent years. There are also a number of unfinished or on-going archaeological fieldwork projects of varying levels of significance. In many cases the currently inaccessible information could transform understanding of the district and assist in the curation of the historic environment, particularly in aggregates extraction areas.

1.7.3 The project identifies all archaeological investigation resulting from aggregate extraction and quantifies its present status with regard to the completion of the investigation and the level of dissemination. The backlogs project entailed a comprehensive search of relevant publications and consultations with curators and local community and archaeological groups to identify as far as possible any archaeological investigation resulting from aggregates extraction. The results have been included in a version of the database developed by ARCUS (now Wessex Sheffield) for similar projects in Derbyshire, Nottinghamshire and Oxfordshire (Baker and May, 2007), Greater London (Pethen 2009) and the Isle of Wight (Pethen 2010).The database will be archived with the project at the Archaeological Data Service (ADS).

1.8 Kennet Valley Fieldwalking Survey digitisation

1.8.1 The project included an additional element comprising the digitisation of the Lower Kennet Valley Fieldwalking Surveys (LKVFS) in GIS. The results are presented in a stand-alone report (Featherby 2011).

1.8.2 The LKVFS were undertaken during the 1970s and 1980s to assess the archaeological resource of an area threatened by development, including the demand for gravel. The results were published as a Wessex Archaeology monograph in 1996 (Lobb and Rose 1996). The fieldwalking projects represent the only large scale investigation of the archaeological potential of this significant area of the aggregate resource. However, the results had only been partially entered into the HER.

1.8.3 The digitisation undertaken as part of the present project included a re-assessment of the fieldwalking data (pottery, lithics, burnt flint, tile and other finds) and the creation of ArcGIS based graded spatial plots showing the relative distribution of finds across the surveyed areas, which were entered with consistency into the associated database.

1.9 Acknowledgements

The assessment was funded by English Heritage, through the Aggregates Levy Sustainability Fund (ALSF). MOLA would like to thank and acknowledge the help and support of all those who have assisted with the project including Peter (Buzz) Busby, EH National Terrestrial Aggregates Advisor for his help and comment during the preparation of the Project Design and the course of the project, along with the period experts Dr Rob Hosfield, Dr Catherine Barnett, Professor Richard Bradley, Dr Andrew Fitzpatrick, Professor Mike Fulford, Dr Steve Clark, Professor Grenville Astill, University of Reading; Rosemary Morton of the JSPU who provided advice on aggregates geologies and current minerals permissions; and especially Duncan Coe and Sarah Orr at the West Berkshire HER who provided regular involvement and support throughout the project and reviewed the period summaries.

2 Methodology

2.1 Introduction

2.1.1 The project methodology is set out in the Project Design approved by English Heritage, and detailed in this section. It has been used in archaeological resource assessments by MOLA for the Isle of Wight (Pethen 2010) and the London Borough of Havering (Rodenbüsch 2010) and in assessments by other archaeological organisations, including South Gloucestershire (Blackwell 2010), Gloucestershire (Mullin 2004), and Worcestershire (Jackson and Dalwood 2006).

2.1.2 Essentially the project entailed the following:

- Defining the nature and extent of aggregate resources within the Project Area. Three aggregate types define three separate Study Areas;
- Enhancing the HER monument data ('assets') within the Project Area in GIS by applying consistent chronological period and asset type to each record, along with grouping or separating asset records where necessary.
- Use of GIS to map distribution of archaeological assets by period and asset type followed by an analysis of the results in a Resource Assessment.

2.1.3 The project is GIS based and used ESRI ArcGIS (ArcMAP 9.1) to analyse enhanced HER data within a spatial environment, in order to assess asset distribution and density. The GIS spatial data and associated attribute table is referred to throughout as a 'layer' (feature class). 'Table' refers to data extracted from the GIS into a Microsoft Excel or other database programme.

2.2 Defining the Project Area and Study Areas

2.2.1 The Project Area was defined in consultation with Duncan Coe of West Berkshire Council and Rosemary Morton of the Berkshire JSPU, in order to meet the needs of both the archaeological curator and the minerals planners. The area, shown on Fig 1, focusses on the Lower Kennet Valley in the southern half of the district. The northern edge of the Project Area is largely influenced by the line of the M4 motorway (including upper parts of tributary valleys of the Kennet, Lambourn and Pang valleys); the southern edge is the District boundary; the western boundary borders Hungerford to the west; and the eastern boundary follows the eastern limit of the District, thus excluding the majority of Reading's built up area.

2.2.2 The Study Areas (Fig 2) were identified by the nature and extent of the aggregate resource. These are fully defined in Section 3 and comprise:

- Plateau Sands/Gravels
- River Sands/Gravels
- Chalk.

2.2.3 Outside the three Study Areas are non-aggregate ('other') geologies such as Clay, and also main urban areas. The latter were excluded because the nature of tenure (i.e. perpetual ownership of bricks and mortar) makes future minerals extraction unlikely to take place. The extent of urban areas was based on mapping provided (under licence) by West Berkshire Council. In addition to the large towns, some of the larger villages were also included. All Urban Areas were buffered by 100m to allow for growth and development and because a project assumption is that aggregate extraction is unlikely to be permitted in close proximity to such areas.

Defining the aggregate resource

2.2.4 The district is underlain by three types of mineral – Plateau Sand/Gravel, River Sand/Gravel, Chalk, and non-aggregate geologies such as Clay. Head deposits of mixed Sand/Gravel and Clay were excluded as they were often within small rivulet tributaries of main rivers and having little potential for exploitation.

2.2.5 The spatial extent of the Plateau and River Sands/Gravels and Chalk aggregate geologies within West Berkshire was digitised within GIS. These were primarily defined the using the British Geological Survey (BGS) Digital Geological Map of Great Britain at the 1:50,000 scale (DiGMapGB-50), supplied in digital format under licence from West Berkshire Council's JSPU. The spatial extent was refined with information on existing and proposed aggregate extraction sites identified by:

- the BGS Directory of Mines and Quarries (BGS 2008);
- the British Pits Database (obtained under licence);
- Spatial data (GIS polygons) of existing, inactive and proposed minerals extraction sites, supplied by the JSPU and the HER;
- Spatial data (GIS polygons) of river and plateau terrace gravels identified as having the potential to provide aggregate, supplied by the JSPU;
- Preferred proposed extraction sites identified in the Council's Replacement Minerals Local Plan (RMLP 2001);
- quarries digitised from historic Ordnance Survey maps (see below).

2.2.6 Generally the distribution of past quarries matched the aggregate areas mapped by the BGS. Existing and past quarries located just outside the BGS mapped area were incorporated into the mapping defining the aggregates resource. The areas of aggregate geology identified were buffered by 100m to allow for aggregate potentially extending outside the mapped boundary to take into account the low resolution (small scale) of the mapping, mapping errors, and aggregate that potentially extends beneath adjacent non-aggregate deposits.

Past exploitation

2.2.7 Areas of past aggregate extraction were identified from digital scans of historic Ordnance Survey (OS) mapping, which was incorporated and georeferenced in GIS. Digital Landmark Epoch Ordnance Survey 6 inch to the mile (1:10,000) scale maps were obtained under licence from West Berkshire Council covering the period from the Ordnance Survey 1st edition in the late 19th-century to the present day. The quarries and pits shown on the historic maps were digitised as a layer in ArcGIS to provide a distribution map of past aggregate extraction for the Project Area (Fig 4). The information was also used to refine the aggregate resource extent (see above). Any quarry or pit labelled as such on the OS maps was included in the layer except where these were specifically labelled 'Brick Pit' or 'Clay Pit' on the map (Brickearth and Clay are not aggregate geologies). 'Chalk Pit' and 'Chalk Quarry' were included because of the potential for the provision of 'crushed rock' aggregate (1.1.7). 'Sand Pits' were included because of the potential to be used as aggregate.

2.2.8 For digitising and assessment figure purposes, the resulting data was divided into three groups

- Historic which represents sand and gravel extraction sites beyond 30 years old
- Recently Inactive which represents sand and gravel extraction sites 10 to 30 years old
- Historic and Recently Inactive Chalk quarry sites which represents chalk extraction sites beyond 10 years

Current and potential extraction sites

2.2.9 Since 1998 the County of Berkshire has been governed by the six unitary authorities of Bracknell Forest Borough Council, Reading Borough Council, Royal Borough of Windsor and Maidenhead, Slough Borough Council, West Berkshire District Council and Wokingham Borough Council.

2.2.10 These six unitary authorities are the Mineral Planning Authorities and Waste Planning Authorities for their respective areas. Following the transferral of the

minerals and waste development plan-making responsibilities to the Berkshire Unitary Authorities in 1998 from the County, the six Authorities continued to work together in respect of Minerals and Waste Planning Policy, with this work being coordinated through the Joint Strategic Planning Unit (JSPU).

2.2.11 The JSPU led on the production and submission of a Joint Minerals and Waste Core Strategy (JMWCS) that aimed to set out the overarching strategy for minerals and waste planning across Berkshire for the period of 2006 - 2026, which was submitted to the Secretary of State for consideration and examination in February 2009.

2.2.12 The Joint Minerals and Waste Core Strategy was considered at an Examination in Public in April 2009. During the examination the inspector expressed serious concerns relating to the delivery of the waste strategy and after discussions between all six Berkshire unitary authorities the JMWCS was formally withdrawn. Whilst work continued on the production of a revised JMWCS for Berkshire and the quantification of the inspectors' concerns, substantive progress was not made. Therefore in March 2011 all work on the production of a revised JMWCS was suspended.

2.2.13 The Berkshire wide Joint Strategic Planning Unit closed on the 30th September 2011, therefore the work on a Joint Minerals and Waste Core strategy ceased and no further consultations or publications will be undertaken. The minerals and waste plan-making function has consequently passed to the Berkshire unitary authorities. There have been a number of discussions undertaken between the Berkshire unitary authorities in respect of the future of minerals and waste development plans and, at this stage, a number of the Authorities remain undecided in respect of the way forward. This hiatus was not acceptable to the elected members in West Berkshire or the officers, and a decision was made by the Council to produce a West Berkshire specific Minerals and Waste Local Plan in 2012.

2.2.14 The Replacement Minerals Local Plan for Berkshire, including the alterations adopted in December 1997 and May 2001 therefore remains the key mineral planning policy document that relates to the study area until it is replaced by the West Berkshire specific Minerals and Waste Local Plan in due course.

2.2.15 The Berkshire Replacement Minerals Local Plan (RMLP) (adopted 2001) anticipates that the district will continue to need to provide Sand and Gravel resources, primarily for national consumption. Chalk is not considered a priority for extraction and this would only be allowed if it can be shown to meet a specific local need which cannot be met from existing permitted sites or by secondary and recycled aggregates, and that this need outweighs all environmental, agricultural, amenity and other relevant planning considerations.

2.2.16 The aggregate resources may be divided further into those which are commercially viable for extraction and those where extraction would not be economic. The commercial viability is likely to vary with time due to changes in demand, changes in use, development of new extraction methods, and the varying cost and availability of alternative aggregate resources.

2.2.17 The JSPU provided the location and extent of current extraction sites. These were compared with BGS data and the BGS British Pit database; no discrepancies were noted.

2.2.18 For mapping purposes for this assessment, current and proposed sites were divdided into two groups

- Active, which represents all sites that are or were active up to ten years from the start of this assessment. This was done to take into account the fluid nature of the minerals planning situation at that time.
- Preferred Proposed, which represents those proposed sites preferred by the JSPU.

2.2.19 The identified 'preferred' quarry sites set out in the RMLP were identified from JSPU's RMLP document and a GIS layer created by the archaeology service to aid

their advisory role.

2.2.20 The West Berkshire Core Strategy is aimed to be adopted in 2012 and carries full weight in decision-making as a development plan document (DPD). The Development Plan for West Berkshire comprises the West Berkshire Local Plan, made up of the West Berkshire Core Strategy (2006–2026), the Saved Policies of the West Berkshire District Local Plan (WBDLP) 1991–2006, the Berkshire Replacement Minerals Local Plan (RMLP) and the Waste Local Plan for Berkshire (WLPB).

2.3 HER enhancement

Introduction

2.3.1 The West Berkshire Historic Environment Record (HER) is a computerised database of designated and non-designated historic assets. These are sites of archaeological and historic interest, whether designated or not, and whether extant or surviving as an HER record (see para. 1.1.5). The HER is maintained by West Berkshire Council. It is a primary repository of all historic environment information in the area, and includes information from past investigations, local knowledge, find spots, and records of documentary, cartographic and photographic sources. The original data model used was that of 'Event-Monument-Archive/Source'. The project looked at all the Monument records in the West Berkshire HER database; those that fell within the Project Area were enhanced by applying a consistent chronological date, and Asset type, with grouping or splitting of records as necessary. This was carried out in order to produce period specific Asset Density figures for the Project Area enabling, for the first time, a spatial and temporal overview of the nature and distribution of human activity.

2.3.2 The HER only contains those assets which have been identified through investigation or found by chance and recorded ('known' archaeology). It is therefore a record of work undertaken rather than representing the spatial distribution of all archaeological remains that might be present within the ground. Those assets within the HER (i.e. those which have been identified or found already) are therefore a sample of the total remaining archaeological evidence (i.e. those assets which have survived, have been identified or found already, or could potentially be found in future), which is itself a sample of the totality of anthropogenic remains which were originally created by human activity (i.e. all archaeological remains which have ever existed including those previously lost to decay and past human activity). New assets are being recovered all the time and continuously improve our understanding.

2.3.3 HERs and their predecessors the Sites and Monuments Records (SMRs) originated with the Ordnance Survey Field Inspectors' records and were subsequently developed by local councils from the 1970s onwards with the addition of newly discovered sites and excavations. During these early stages technological limitations meant that objects were not often recorded in detail and aspects of the historic landscape were not recorded at all.

2.3.4 More detailed recording of archaeological fieldwork began in the 1990s, when the introduction of PPG15 and PPG16 increased the number of developer-funded investigations. More recently the emphasis has been on a more holistic understanding of the historic environment comprising both built and buried remains within an entire landscape; the HERs now record diverse information from findspots of individual objects, to multi-period archaeological sites, historic buildings and landscapes. However, HERs often do not have the resources to undertake exhaustive revisions of more simplistic entries, originally compiled under earlier systems. As a result an HER contains a variable level of detail and precision.

2.3.5 The West Berkshire HER enhancement took place in accordance with national guidelines and HER recording practice, and in consultation with the West Berkshire

HER. The HER was generally found to be consistent, but a number of corrections were necessary prior to the creation of the asset density figures.

2.3.6 A gazetteer of assets within the study areas is bound separately from this report. Each asset has a unique period ID number (Resource Assessment Number). The entry includes the asset type and asset date range as assigned under the project.

2.3.7 The reliance on the HER data means that has not been possible within the scope of the project to take account of changing views as a result of recent academic research, whilst the limitations of a rigid chronological framework imposed by electronic databases is noted.

National Record of the Historic Environment (NRHE)

2.3.8 After discussion with the West Berkshire HER it was determined that the NRHE database for the Project Area had largely been included within the HER and thus no further action was needed.

Built heritage

2.3.9 Designated built heritage assets, ie Listed Buildings and a few Scheduled Monuments), have been excluded from the dataset as these would be a subset of the publicly accessible primary English Heritage database and are protected. Most are occupied and/or in use. Undesignated above ground heritage assets (buildings, earthworks or other remains visible above ground) are however included as they are a material consideration in minerals planning.

National Mapping Programme (NMP)

2.3.10 The NMP is funded and managed by English Heritage and is on-going. The aim of the project is to plot digitally all archaeological earthworks, cropmarks and soilmarks visible on aerial photography, in order 'to enhance our understanding about past human settlement, by providing information and syntheses for all archaeological sites and landscapes from the Neolithic period to the twentieth century' (Bewley, 2001, 78).The NMP provides a consistent and systematic framework for the identification of archaeological remains visible across large areas from aerial photographs.

2.3.11 Three NMP surveys have been undertaken across West Berkshire, comprising a total of 463.62km^2 (see Fig 1). The surveys cover 161.5km^2 or *c* 42.4% of the Project Area. These comprise Ordnance Survey quartersheets SU46NW, SU46SW, SU46NE at the western end of the Project Area (covering the Newbury area and land to the west of it) and OS quartersheet SU67SE in the eastern edge of the Project Area (covering south Reading and land to the south). Transcribed archaeological features identified by the NMP had been incorporated into the HER prior to this project, therefore no further work was required.

Portable Antiquities Scheme (PAS)

2.3.12 Data from this source is regularly downloaded and viewed but has not been imported into the West Berkshire HER as there are a number of unresolved issues concerning its updating and provision to HER users. Following discussions with West Berkshire HER it was decided not to incorporate this data.

The Backlogs Project and The Lower Kennet Fieldwaking Survey Digitisation

2.3.13 The methodology for the backlogs (Featherby 2010) and LKVFS (Featherby 2011) elements of the project are set out in detail in these reports.

2.3.14 The backlogs resulted in 27 additional HER entries which were incorporated into the HER enhancement.

2.3.15 Due to the quantity of data created by the LKVFS digitisation it was agreed that it

would not be possible within the timescale of the project to enter the entire dataset as individual records for the purposes of the HER enhancement and density maps.

Refining dating

2.3.16 An additional data field for 'chronological period' was added to each HER record, with the aim of applying dating information consistency for the purposes of using GIS to create asset distribution maps by chronological period. The chronological period date ranges are those used by both the HER and English Heritage. These were developed in the 19th century and the date ranges, in particular the prehistoric, are occasionally revised. The ranges have been used to ensure continuity with other ALSF reports, the NRHE and the HER.

2.3.17 The HER currently records as precise a date range as possible for new recently discovered assets, but precise dates are often not available for older assets and a number of earlier HER entries have very broad date ranges (this is partly due to the organic nature in which the HER has developed and been maintained over time, i.e. with input from paid staff, volunteers and students).

2.3.18 Within the new chronological period data field, date ranges were inputted in a format that would facilitate querying the database and allow simple period-based database/GIS searches: negative dates (e.g. –4000) were used for periods Before Christ (BC); date ranges were added without overlap (e.g. Neolithic is –4000 to –2351, Bronze Age is –2350 to –750) which, although spurious, avoids overlapping chronological periods in order to allow period based searches of the data in GIS. The date ranges for the 'overlapping' Late Bronze Age and Early Iron Age assets were separated, in consultation in with the HER Officer, Sarah Orr, so that in project database HER entries dated to the Bronze Age or Late Bronze Age were changed to end in 751BC (recorded in the database as –751) and entries dated to the Iron Age or Early Iron Age were changed to start at 750BC (recorded in the database as –750). This would permit differentiation between the Bronze Age and Iron Age when the asset density figures were developed.

2.3.19 Assets have been grouped by period (shown in bold) but the sub-period (shown in plain) date ranges have been retained in the database for future research.

- **Prehistoric (–500000 to 42)**
- It should be noted that current understanding indicates that the earliest date for hominid activity within the UK can be pushed back to *c* –900,000 (Parfitt et al 2010). However, for the sake of continuity of other projects that have been undertaken within the ASLF scheme the start date of -5000000 is used.
- **Early Prehistoric (i.e. Palaeolithic and Mesolithic) (–500000 to –4001)**
- **Palaeolithic (–500000 to –10001)**
- Lower Palaeolithic (–500000 to –1500001)
- Middle Palaeolithic (–150000 to –40001)
- Upper Palaeolithic (–40000 to –10001)
- **Mesolithic (–10000 to –4001)**
- Early Mesolithic (–10000 to –7001)
- Late Mesolithic (–7000 to –4001)
- **Late Prehistoric (i.e. Neolithic, Bronze and Iron Age) (–4000 to 42)**
- **Neolithic (–4000 to –2351)**
- Early Neolithic (–4000 to –3251)
- Middle Neolithic (–3250 to –2851)
- Late Neolithic (–2851 to –2351)
- **Bronze Age (–2350 to –751)**

- Early Bronze Age (–2350 to –1501)
- Middle Bronze Age (–1500 to –1001)
- Late Bronze Age (–1000 to –751)
- **Iron Age (–750 to 42)**
- Early Iron Age (–750 to –401)
- Middle Iron Age (–400 to –101)
- Late Iron Age (–100 to 42)
- **Roman (43 to 409)**
- **Early Medieval (Saxon)(410 to 1065)**
- **Medieval (1066 to 1539)**
- **Post Medieval (1540 to 1900)**
- **Modern (1901 to 2050)**
- **Unknown**

2.3.20 There were a number of assets recorded in the HER which had not been assigned to any period. This was particularly true of cropmarks and other aerial photograph evidence for which entries were often limited. Typically earlier assets were more likely to be undated. It was not within the scope of the project to re-assess the dating of any asset from primary sources, although a broad likely date range was allocated based on professional judgement and using NMR Monument Class Descriptions (http://www.eng-h.gov.uk/mpp/mcd/index.htm) and the monument type thesaurus (http://thesaurus.english-heritage.org.uk).

2.3.21 Cropmarks (e.g. Linear Feature; Enclosure) were frequently found to be undated on the HER, based on the lack of any site-based dating evidence. The following principles were used to assign broad date ranges to these:

- LINEAR FEATURE – allotted the date range Neolithic, –4000, to post-medieval, 1900 on the basis that such features would not typically have arisen or are likely to survive prior to the Neolithic.
- RING DITCH – allocated Neolithic (–4000) to early medieval (–1085) on the basis that these represent the ploughed out remains of barrows of likely Late Neolithic to Bronze Age date, although some potentially date to the early medieval period, or contain early medieval burials
- RECTILINEAR FIELD SYSTEM – Bronze Age to post-medieval (–2350 to 1900)
- CURVILINEAR CROPMARKS or ENCLOSURE – Neolithic to Roman (–4000 to 409)
- RECTILINEAR ENCLOSURE (or ENCLOSURE) – Neolithic to post-medieval (–4000 to 1900).
- HUT CIRCLES or ENCLOSURES containing HUT CIRCLES – Middle Bronze Age to Roman (–1500 to 409).

2.3.22 Earthworks were also frequently found to be undated. The following principles were used to assign broad date ranges to these:

- Ridge and Furrow - Medieval to post-medieval (1066 to 1900).
- Lynchet - Neolithic to post-medieval (–4000 to 1900).
- Trackway- Neolithic to post-medieval (–4000 to 1900).
- Hollow Way- Early Medieval to post-medieval (801 to 1900).
- Earthworks – other earthworks, e.g. terrace, bank, boundary, mound – Neolithic to post-medieval (–4000 to 1900).

2.3.23 With such broad date ranges assigned to some assets, it was felt necessary to include a ‘confidence rating’ field in the project database to allow the HER Officer to

distinguish those entries which had a date based on information solely contained within the HER, and those entries for which the date range was refined as part of this project, using professional judgement and the broad interpretative principles as outlined above. This field was entitled 'Current_Understanding' and assets were either described as 'Sufficient' or 'Insufficient'. In order to be 'Sufficient' the HER entry had to contain information on the date of the asset. Asset described as having 'Insufficient' current understanding, were those that had had broad dates assigned. The Current Understanding field was not intended to assess the accuracy of the HER entry itself, but only whether it contained sufficient information to allow a date to be confidently assigned.

Adding an 'Asset Type' field

2.3.24 An additional data field for 'asset type' was added to each HER record, in order to apply this data consistently and facilitate the querying of the GIS project for the period based resource assessments.

2.3.25 The 17 asset types conformed to the glossary of the NRHE Monument Class descriptors, and are top level / general thesaurus categories. Examples of monument types within each type are given below:

- *Agriculture and subsistence.* Includes field systems, farm buildings, stables, barns, granaries, cart shed, cow sheds, brewhouse, cow houses, dairy, pigsty, kill sites, churn stand, ridge and furrow, lynchet, sheep dip, fish ponds, mills and farmhouses.
- *Civil*. Jails, County Halls, libraries, market places, forums, boundary markers and 'boundary banks', radio stations, signal stations (unless HER makes it clear they're defensive or maritime), toll house
- *Commemorative*. War memorials, memorials to famous people
- *Commercial*. Shops, warehouses, inns, public houses and other commercial premises
- *Communications*. Telephone booths
- *Defence*. Beacons, forts, castles, hill forts, WWII defences, WWII plane crash sites, Cold War defences, Firing Range provided there is evidence of military usage (rather than recreational gun club use)
- *Domestic*. Roman villas, Manor houses, settlements of all kinds, hut circles and enclosures containing hut circles, houses, coach house, boat house, garage.
- *Education*. Schools and colleges.
- *Find Spot*. Isolated artefacts, including metal-detected finds, flint and artefact scatters.
- *Gardens and parks.* Public and private gardens and parklands, Lodges, gatehouses and garden features, and follies.
- *Health and welfare*. Hospitals.
- *Industrial*. Flint working sites, mills for steel, textiles or providing power to factories, factories, blacksmiths, pottery and tile kilns.
- *Recreation*. Golf course, golf houses and theatres
- *Religious, ritual or funerary*. Ring ditches, 'D-shaped' ritual enclosures, barrows, churches, cemeteries, wayside crosses, Monastic Granges, non-conformist chapels
- *Transport*. Trackways, roads, bridges, railways, stations, mile stones, navigations, canals. Including quays, wharves and dry docks
- *Unassigned*. Asset type used where the HER contains insufficient information to determine an alternative asset type (e.g. Linear features, enclosures, pits).

- *Water and drainage*. Drainage ditches, water management features, mill ponds, aqueducts

2.3.26 As the project progressed, it was felt that two additional asset types were necessary, and these were added to the database:

- *Hoard* – used for greater clarity and because of the question of whether hoards should be considered ritual (i.e. Religious, ritual or funerary) or part of the operating activities of ancient metal smiths (i.e. Industrial or Commercial)
- *Palaeoenvironmental* - covers records of pollen studies, palaeochannels and other natural features of interest to archaeology but not anthropogenic in themselves.

2.3.27 As with the date range, the asset type assigned to each asset was based entirely on the monument type already associated with each HER entry and no additional level of interpretation was added as part of the project. For a number of assets, it was not possible to assign an asset type, and these were categorised as 'unassigned'.

Grouping and separating entries

2.3.28 Separate HER entries for individual finds or features that were clearly of the same period and asset type at a single location were grouped together within a single monument entry, in order to better reflect a single area of activity in the GIS asset distribution and GIS analysis.

2.3.29 Multi-period HER records were separated into individual chronological periods, for the purposes of GIS asset distribution and data analysis.

2.3.30 HER records were also separated where a single HER record had been used to group objects that were not associated by archaeological context (such as metal detected finds from the same field) and where there were clearly different, discrete phases of activity. This was carried out to avoid an incorrectly low number of assets appearing in the asset densities for the periods concerned. In cases where an existing HER needed to be split, new records were created in the GIS layer of the project database for the additional assets. After discussion with the West Berkshire HER staff it was agreed that the same HER number would be retained and if, when this database is made available to the HER, they decide to incorporate the 'new' entry, they would issue a new number.

Duplicate entries

2.3.31 A small number of assets were identified which appeared more than once on the HER generally as a result of a change in interpretation, resulting in the creation of a new record, whilst the original record was retained. In order to ensure these dual entries did not affect the asset density figures, the older entry was deleted from the project database GIS layer.

2.4 Data analysis

Asset density maps

2.4.1 Once the HER database had been validated and enhanced, the database was queried within GIS to determine the number, type, and distribution of assets of each chronological period, and a series of asset density figures produced (Fig 6 to Fig 20). Using GIS technology, this was the first time that such overview of assets within the aggregate producing areas of West Berkshire has been possible. The strength of GIS is the ability to interpret and analyse the relationship of sites and finds against various other datasets, including topography and geology.

2.4.2 The data interrogation and asset density figures were analysed and the results used to produce the archaeological resource assessment (Section 6). In addition, top-level unenhanced HER data was acquired in GIS for the whole of West Berkshire, in

order to provide a baseline context in which to set the asset density within the Project and various Study Areas, to allow broad comparisons between the non-aggregate and aggregate geology areas of the district.

2.4.3 Asset density tables provide the numbers of all assets of each chronological period within the Project Area and Study Areas, and is also expressed in density per km^2 in order to assess the concentration of assets. The results were extracted by queries of the GIS data which identified any asset which fell within or partly within a given period. Thus an asset dated from the Neolithic to Post-Medieval period would appear in the figures for all periods from the Neolithic to the Post-medieval period. As a result of this process a degree of overlap was expected between the different periods. These assets were included to avoid them being entirely ignored by the study and ensure the asset densities included an indication of the maximum possible assets of a given period as well as the density of securely dated assets.

Period summaries

2.4.4 The assessment used the enhanced HER and GIS asset density analysis to produce an archaeological resource assessment for the Project Area and Study Areas, which discusses the nature and distribution of past human activity and identifies whether there are any patterns in the data. The assessments were reviewed by Duncan Coe and the period experts, and their comments have been incorporated into the assessment.

2.4.5 The archaeological resource assessment contributed to the consideration of research agenda and strategy for archaeological remains (Section 7), by highlighting important areas where further research is necessary in relation to assets that may be affected by future aggregate extraction. The assessment and strategy helped define appropriate archaeological mitigation strategies used in areas of aggregates extraction (Section 6).

Limitations

2.4.6 It is important to note the limitations the asset density figures in that they are based entirely on (enhanced) HER data, and reflect the limitations inherent within that data. To a large extent the HER is a record of chance finds, surveys, and archaeological investigation, entered by various individuals over time, rather than representing a true record of the geographical distribution of past human activity.

2.4.7 The asset density maps are a simplified representation of the nature and distribution of human activity, attempting to model the asset density by data collection and by identifying key variables and/or patterns. The density maps show assets as individual points in order to provide an overview of the distribution of human activity: they do not reflect the density of features or activity at each location. A single point on an asset density maps could comprise a larger number of individual finds or features for a particular period, or an isolated single feature or find.

2.4.8 The resource assessment itself formed the core of the project. Within the short time available to produce this assessment it was realised, both by the author of this report and the HER, that there is a need for further work. The period sections had to be very brief and concise and in the amount of time available only a very brief overview could be provided for each period, and these are essentially an analysis of the results of the data enhancement in GIS and the asset mapping.

2.5 Dissemination

Seminar

2.5.1 Following distribution of the draft report to the specialists and English Heritage for comment, a seminar was held at Shaw House in Newbury on the 3rd March 2011. The seminar comprised a presentation on the aims of the project and the

methodology and approach, along with presentations on the chronological summaries and their context by local period experts. These comprised Dr Rob Hosfield, Dr Catherine Barnett, Professor Richard Bradley, Dr Andrew Fitzpatrick, Professor Mike Fulford, Dr Steve Clark, Professor Grenville Astill, and Duncan Coe. The seminar included discussion sessions chaired by English Heritage. Comments from the seminar have been incorporated into the present report.

2.5.2 The primary outcome of the seminar was the recognition that at present the significance of the Kennet River, particularly where it passes through West Berkshire, is not fully understood. The period specialists used the findings of the study to highlight important differences between the Project Area and the Thames River valleys into which the Kennet flows ie the paucity of finds from the Kennet Valley and the quantity from the Middle Thames. Such difference would indicate that the latter was more important than the former during this period.

2.5.3 The importance of accurate HER data was noted, and the need for further work to ensure that entries are correctly dated and described. This was particularly pertinent to the early medieval period which had a very lower asset density and where the majority of the assets were the result of documentary sources.

2.5.4 The results of the digitisation of the LKVFS were presented, which will bring into the public domain all the data recovered from fields walked during three surveys undertaken in 1976–7, 1982–7 and 1988–9.

2.5.5 The seminar discussed the need for a wider application of a range of geoarchaeological, geomorphological, environmental and fieldwalking surveys in aggregate areas as an evaluation tools, particularly for the earliest prehistoric periods. Archaeological excavation is useful for later periods when there is increased use of structures for habitation that leave some archaeological record. However, for the very early periods, when domestic activity was undertaken within natural locations or in structures that would not leave any material remains, excavation as an evaluation tool is less useful.

Project GIS data deliverable

2.5.6 On completion of the project the project GIS data will be provided to English Heritage and West Berkshire archaeology service, the latter for integration into the HER. A copy of the data will be retained at MOLA.

Project report deliverable

2.5.7 MOLA retains copyright for the project report. Unconditional licences will be granted by MOLA to English Heritage and West Berkshire Council. Hard copies of the completed report will be disseminated to English Heritage (3 copies), the West Berkshire HER. CD copies of the report with all figures will be disseminated to EH, the West Berkshire HER and Planning teams. These will include a version to be sent to the Archaeological Data Service (ADS) website.

3 Description of the aggregates resource

3.1 Introduction

3.1.1 The geologies of West Berkshire in which aggregate minerals occur and have been extracted are illustrated on Fig 2 and can broadly be divided into two types:

- Solid (bedrock) aggregate deposits – solid geologies extracted and crushed to produce aggregate products, e.g. Chalk.
- Superficial (drift) aggregate deposits – Quaternary Sand and Gravel deposits; this have been further subdivided for the purposes of this assessment into Plateau Sands/Gravels, and River Sands/Gravels.

3.2 Bedrock geology

3.2.1 The solid bedrock aggregate deposits include the Chalk group laid down in the Upper Cretaceous, the Lambeth Group (Upnor and Reading formation) of the Palaeocene and the Bracklesham group (or Bagshot formation) of the Eocene.

3.2.2 Chalk is a soft, fine grained limestone laid down in marine conditions and comprises largely of the skeletal debris of planktonic algae. The Chalk group outcrops in the north and west of Berkshire and comprises of two sub groups: the White Chalk (Upper Chalk) and the Grey Chalk (Middle Chalk).

3.2.3 The younger White Chalk was deposited between 93 and 71 million years ago (Ma) and consists of five units (Sherlock, 1960). The older Grey Chalk is more clay rich and consists of two units and was laid down between 98 and 93 Ma. The clayey nature of the Grey Chalk is indicative of its near shore deposition whereas the cleaner, White Chalk was deposited in waters further from the shoreline. The thickness of the chalk varies across the county but reaches a maximum of 190m in places (Dunlop, 2009). It is the Chalk which today forms the rolling and open expanses of the Berkshire Downs, a southerly dipping plateau, dissected by a network of dry valleys.

3.2.4 Forming within the three upper units of the White Chalk is flint, which later accumulates as the primary rock type in Berkshires gravels (see below). All flints are derived from skeletons of sponges and other creatures that existed in the Cretaceous seas. Since the Cretaceous many of the flints have eroded from the chalk and accumulated downslope in the river valleys.

3.2.5 The Lambeth Group, which can be divided into the Upnor and Reading formations, overlies the Chalk and consists of sands and muds laid down in near shore marine, lagoonal and estuarine environments. The Upnor formation is the older of the two and a shallow marine deposit of dense to very dense, glauconitic fine to medium grained sand (Sherlock, 1960). Thin clay beds (‘clay stringers’) may also be present. Flint gravel may occur at any depth but is generally found in courses at the base or near the top of the formation. The Reading formation is typically between 18 and 28m thick and consists of non-marine mottled clays and estuarine sands. The clay sediments in particular have been altered by pedogenic and biogenic processes. The clays have been used for ceramics and brick and tile production in the area from pre-history (Dunlop 2009).

3.2.6 Overlying the Reading formation in places is the London Clay. The dark bluish to brownish London Clay outcrops in West Berkshire along the valley of the River Kennet towards Newbury. Although containing no aggregates, the London Clay forms a largely concealed but widespread geological deposit was laid down in a shallow sub-tropical sea during the Eocene some 56 to 49 million years ago. On the high ground to the south and east of Newbury (for example, around Greenham Common), the London Clay is overlain by the sandy Bagshot Formation. An aggregate rich bed of rounded black flint pebbles delineates the base of this formation. Overlying the pebble bed is a 20m to 25m sequence of quartz rich, often

glauconitic sands (Dunlop, 2009). The deposit occurred as the seas depositing the London Clays shallowed due to sea-level fall. In this deposit and the Reading Beds, another characteristic rock type of the Berkshire area known as Sarsen stones, formed as silica cemented sands to create light coloured, hard sandstone monoliths some of which are over six metres in length. Natural erosion has revealed the sarsens much like the flint and, similarly, some sarsens have accumulated in river gravels having moved down and into the valleys during the Quaternary. Sarsen stones are often found on prehistoric archaeological sites, most famously at Stonehenge.

3.3 Superficial aggregate deposits

3.3.1 Between the deposition of the solid bedrock material and the superficial deposits there is an unconformity (or time gap during which no sediments were preserved) of some 40 million years. During this period the climate changed markedly from hot and humid to cold and ice-bound. The superficial deposits include the river terrace deposits on the slopes of the valleys (principally those of the Kennet and Lambourn) and weathered ancient chalk deposits on the hilltops, most of which were laid down or developed in the Quaternary period known widely as the Ice Age. The 'Ice Age' really consisted of several cold phases interspersed by warm periods known as interglacials. The last glaciation occurred during a period known as the Devensian (115,000 to 10,000 years ago). Two important glaciations before the Devensian were the Wolstonian (around 240,000 years ago) and the Anglian (about 450,000 years ago) (Eyers 2003). The ice sheets associated with these glaciations did not advance as far south as Berkshire although the area would have suffered periglacial tundra-like conditions, freezing and thawing and ice-melt rivers responsible for the deposition and erosion of the gravels in particular. Under these arctic conditions the dry valleys of the Chalk probably formed (Dunlop 2009). The Chalk is a very permeable rock, but during the various glacial periods, deep permafrost would have made the ground impermeable and allowed gradual erosion of the frozen surface to occur, particularly during summer thaws (Sherlock 1960).

3.3.2 The weathered chalk exposed on the hilltops of West Berkshire would have created Clay-with-flints and Head deposits. Clay-with-flints represents what was left of the chalk after the prolonged erosion and weathering, which expose the harder flint within the chalk – a process which had probably been taking place over many millions of years prior to the Quaternary. The Head deposits are soliflucted material which occurs when deeply frozen ground becomes semi-fluid and 'sludges' downslope. Commonly the Head material which is often flint-rich is found to merge with the floodplain terrace gravels.

3.3.3 River Terrace Deposits can be divided into:

- Plateau Sands/Gravels, representing older raised river terraces sequences.
- River Sands/Gravels, including younger, lower floodplain terraces associated with existing rivers and in some areas present beneath extant alluvium.

3.3.4 West Berkshire is dominated by the River Kennet. The Kennet's floodplain is limited on either side by steep slopes, rising to the county boundary with Hampshire to the south and up to the Berkshire Downs to the north. The Downs are characterised by smaller valleys, draining into the Rivers Lambourn, Pang, and their tributaries (Hosfield, 2007). Both the Plateau and Terrace gravels of the Kennet have been mapped by Thomas (1961) and Chartres *et al.* (1975) (Table 1). Not all terraces are visible at any one point and some discrepancies exist as to whether the terraces as mapped by Thomas on altimetric data (which he then attempted to correlate with the Thames sequence) are accurate (Chartres 1981).

Table 1: Gravel terraces of the Kennet River (adapted from Chartres, 1981)

Height above floodplain (metres)	Thomas 1961	Chatres & Cheetham 1975/76	Years before Present	Approximate Period
0	Current floodplain	Woolhampton terrace	10,000	Holocene
2–3	Floodplain terrace	Beenham Grange terrace	115,000 – 10,000	Devensian to Holocene
9–10	Lower Taplow terrace	Thatcham terrace	230,000 – 130,000	Post Anglian/Pre-Devensian
18	Upper Taplow terrace	Not named	230,000 – 130,000	Post Anglian/Pre-Devensian
47	Lower Winter Hill terrace	Hamstead Marshall Terrace	230,000 – 130,000	Post Anglian/Pre-Devensian
52	Upper Winter Hill terrace	Not named	480,000 – 430,000	Anglian
70	Harefield terrace	Not named	480,000 – 430,000	Anglian
80	Higher gravel spreads	Not named	750,000 +	Pre-Anglian

3.3.5 The Plateau gravels (or simply, high level gravels) consists of large spreads of gravel at heights exceeding 40m above present river levels (Chartres 1981). These gravels were deposited at the interfluves such as between the Kennet and the Lambourn and the Enborne rivers. They occur in patches with irregular boundaries and are clearly the remnant of much large spreads which have been cut and reworked throughout the intervening millennia. In Table 1 the plateau terraces extend down to and include the Hamstead Marshall terrace.

3.3.6 In contrast, the terrace gravels of West Berkshire, as elsewhere, are considered to accumulate as redundant floodplain deposits within valleys which, during periods of sea level fall associated with cold glacial periods are left high and dry as the river downcuts trying to maintain equilibrium with sea level. Typically this leads to a ‘staircasing’ effect with the older terraces being the higher and the more recent terraces being the lower when the river valley is viewed in crossection. In Table 1 the major gravel terraces include the Thatcham and Beenham Grange terraces (9–10m and 2–3m above river levels respectively).

3.3.7 Sub-alluvial River Terrace Deposits of Sand and Gravel (ie aggregate deposits located beneath floodplain alluvium) have been inferred to lie beneath modern river floodplains, but their nature, extent and economic viability is often unknown and the extent of the sub-alluvial River Terrace Deposits (as opposed to the alluvium) are not shown on BGS mapping. In accordance with the Project Design, areas of alluvium were not automatically included in the aggregate geologies, although buffering of exposed aggregate resulted in many sub-alluvial deposits being included. River gravels of the Woolhampton terrace fall into this category (Table 1).

3.4 Alluvium

3.4.1 Alluvium lining the river valleys is the most extensive of the drift sediments, and can overlie Sand and Gravel aggregates targeted for extraction. Alluvium is a broad term referring to fine-grained and well-sorted material deposited in a river channel or floodplain and is characteristic of the Holocene (the last 10,000 years). Over the Holocene river valleys have gradually filled up with silt and clay alluvium due to a warmer climate, calmer environmental conditions and river level rise. Alluvium is archaeologically important as it may be rich in remains such as molluscs, pollen,

plant macrofossils that provide information on past environments. Sediments are often laminated with visible bedding and alluvial sequences can provide excellent conditions for the preservation of information on environmental and landscape change as well as archaeological structures and sites.

3.5 Aggregate extraction

Introduction

3.5.1 Quarrying has been carried out in Berkshire for at least 1600 years, probably longer, although there is little archaeological evidence of such activity during the prehistoric or Roman periods. For much of the time quarrying has been confined to small local quarries, either hand or machine dug, on the upland areas. Table 2 sets out the relationship between of quarrying/extraction within the Project and Study Areas.

Table 2 Total areas of historic, active and potential aggregate extraction as percentages of the total area of the Project Area and the three Study Areas

Type / status	Total quarry area in relation to total Project Area	Total quarry area in relation to total of all three Study Areas	Total no. of quarries in Project Area	% of total no. of quarries in Project Area
Historic Chalk extraction	0.1% (0.25km^2)	0.1% (0.25 km^2)	181	37%
Historic (pre-late 20th century) Gravel/Sand extraction	0.6% (2.20 km^2)	0.6% (2.20 km^2)	195	41%
Recently inactive (late 20th century) Gravel/Sand extraction	2.5% (10 km^2)	3.0% (10 km^2)	54	11%
Active Gravel/Sand extraction	2.1% (8.4 km^2)	2.5% (8.4 km^2)	47	10%
Preferred Proposed Gravel/Sand extraction	0.4% (1.4 km^2)	0.4% (1.4 km^2)	4	1%
Total	**7% (22.25 km^2)**	**8% (22.25 km^2)**	**481**	**100%**

Past quarrying

3.5.2 A total of 376 historic extraction sites were identified within the Project Area (Fig 4), representing 53% of the total of 715 historic and active extraction sites identified within the whole of the West Berkshire. Fig 4 shows the location of past extraction sites in West Berkshire (pre-late 20th century) and recently inactive extraction sites (active until 10 to 30 years ago). Table 2 shows that recently inactive extraction sites (those becoming inactive in the late 20th century, between 10 to 30 years ago), comprise only 2.5% of the total within the Project Area. These do however include some very large quarries, representing 37% of the total area affected by extraction.

3.5.3 Until the 20th century Chalk was the principal mineral extracted in the region and was quarried from across the whole district but in the most part through very small areas as small-scale hand-dug extraction, as can be seen on Fig 4. Much of the Chalk was either used for the production of marl (fertiliser greater by the mixing of clay and chalk) or for local construction.

3.5.4 Historically, gravel extraction for the most part was also from relatively small extraction operations, also feeding local demand. During the late 19th and early 20th centuries the demand for gravel aggregate rose with the expansion of the road and rail networks. After World War 2, demand for gravel rose sharply and it became the main type of mineral extracted in the District, primarily for the construction industry.

3.5.5 Fig 4 shows that the river terrace gravels on valley floor of the Kennet River Valley have been the prime target for extraction, with the largest number of operations

being undertaken just to the south of Reading at the eastern edge of the Project Area. Plateau gravels around Brimpton Common, Pamber (Hampshire) and Burghfield in the south of the Project Area have also been subject to extensive extraction operations. Much of the land subject to previous quarrying has been reinstated either as small reservoirs or lakes for leisure and wildlife use, as agricultural land or as forestry common land on some of the plateau gravel areas.

Active sites

3.5.6 At the time of writing 10 quarries are considered 'active' by West Berkshire Council, six of which are producing Sand and Gravel and two of which are producing Sand. Their location is shown on Fig 5. They comprise:

- Old Kiln Farm, Chieveley ;
- Copyhold Farm, Chieveley;
- Hartshill Copse, Upper Bucklebury;
- Midgham Quarry, Bath Road;
- Aldermaston Wharf;
- Kennetholme Farm, Midgham; and
- Lower Farm, Greenham.
- Larkwhistle Farm (it should be noted that this site is still included within the District's 'preferred' sites, the reason being that when the West Berkshire RLMP was drafted in 2008 it was a proposed site of extraction but subsequently was opened and reserves exhausted)
- South-east of Theale (it should be noted that this site is still included within the District's 'preferred' sites, i.e. Site No 5, the reason being that when the West Berkshire RLMP was drafted in 2008 it was a proposed site of extraction but subsequently was opened and reserves exhausted)
- Raghill, Aldermaston (it should be noted that this site is still included within the District's 'preferred' sites, the reason being that when the West Berkshire RLMP was drafted in 2008 it was a proposed site of extraction but subsequently was opened and reserves exhausted)
- Woolhampton Quarry, Woolhampton (it should be noted that this site is still included within the District's 'preferred' sites i.e. Site No 3, the reason being that when the West Berkshire RLMP was drafted in 2008 it was a proposed site of extraction but subsequently was opened and reserves exhausted)

3.5.7 The majority of current aggregate is extracted from the river gravels within the Kennet Valley. Extraction is now focussed on the valley floor and all proposed operations, apart from two adjoining current operations near Chieveley at the northern boundary of the Project Area that exploit soft sand deposits not sharp sand and gravel deposits, are on the valley floor. Historically a small number of extraction companies have operated within the Lambourn and Pang Valleys but there are no current or preferred extraction sites within these valleys. Smaller earlier concerns are also identifiable within these valleys, which produced small quantities of aggregate for local construction.

3.5.8 All active extraction sites represent approximately 2% of the Project Area. It represents 3% of the area of potential aggregate (ie, the combined Study Areas; see Table 2).

3.5.9 Active extraction represents 30% of the total area affected by extraction, both past and present, in the Project Area.

Preferred Proposed sites

3.5.10 The existing West Berkshire RMLP identifies eight preferred sites of all the preferred extraction sites within the Project Area for the extraction of minerals. However, given

the age of the RMLP (first adopted in 1995) four of the identified preferred areas in the RMLP have gained planning consent and have been worked, or are in the process of being worked (see 3.5.6 above). Of the preferred areas within West Berkshire Preferred areas 3, 5, 6 and 7 have been considered 'Active' as they have all gained planning consent and the reserves within these sites have been exhausted. The location of the remaining preferred proposed sites is shown on Fig 5. They comprise:

- Chamberhouse Farm, Thatcham (Berkshire preferred RLMP Site no 1);
- Bath Road/Brimpton Road, Midgham (Berkshire RLMP preferred Site no 2);
- Kennetholme Farm, Midgham (Berkshire RLMP preferred Site no 2A);
- South of Theale (Berkshire RLMP preferred Site no 4),

3.5.11 Preferred areas 2 and 2A have been granted planning consent are in the process of being worked. Preferred areas 1 and 4 have not gained planning consent and there is currently no prospect that these sites will be worked. .

3.5.12 The preferred proposed sands/gravel extraction sites represent 0.4% of the area of potential aggregate in the Sands/Gravel Study areas (see Table 2), while representing only 1% of the quarries

3.5.13 In combination with Recently Active and Active sites, the figures clearly show the increase in scale of gravel extraction operations from the later decades of the 20th century.

4 Archaeological and historical overview

4.1 Introduction

4.1.1 This section provides a brief chronological overview for each period in order to provide background context. It includes a discussion of past archaeological investigations on aggregate geologies. There is no recent synthesis focusing specifically on the current state of knowledge of the archaeology of West Berkshire, although the district is included in the *Solent Thames Archaeological Research Framework* (2010). The bulk of background information summarised here has been drawn from that report.

4.2 Overview of past archaeological investigation on aggregate geologies

4.2.1 Exploitation of aggregate has occurred in an area of rich archaeological heritage, from the Neolithic domestic sites to medieval villages. Gravel geology typically provides well-drained and fertile land which has been the focus of human activity from the earliest times onwards, creating a palimpsest of assets. The gravel aggregates have the potential therefore to provide information of all periods of human occupation.

4.2.2 The Backlogs Project is an assessment of the levels of dissemination of the results of past archaeological investigation in aggregate areas in West Berkshire, and provides a detailed overview of past investigation in the District. This is summarised briefly here.

4.2.3 The nature and origin of archaeological fieldwork has changed dramatically from its 19th century beginnings to the present day. The earliest reported investigations for West Berkshire's aggregrate areas concerned chance finds, such as the possible Saxon cemetery at Shefford (outside the Project Area), discovered during construction of the Lambourn Valley Railway *c* 1888. The discoveries were initially published in Volume 1 of the Berkshire Archaeological and Architectural Society journal in 1889. In 1891, the Society proposed to start collecting all records, past present and future of archaeological discoveries made within Berkshire. From that point, discoveries of an archaeological context were recorded in the Notes and Queries section of the journal, unless an excavation by an archaeologist was being published, otherwise the journal primarily dealt with the documented history of Berkshire.

4.2.4 It was not until 1937 that a separate section in the journal was given over to the recording of archaeological discoveries. It continued the following year but then did not appear again until 1946. In the journal of 1946 the author noted that:

> "...there have been considerable works involving soil disturbances up and down the County. The speed at which such undertakings were carried out and the necessity for disregarding extraneous objects for the work in hand would be contributory to many things being missed which would otherwise have been brought to expert attention. Much of the labour used has been strange to the district, and workmen had no the interest in the locality or knowledge of where they should report finds. The times have also been unfavourable to tracking down and recording material at the compiler's end. It is, therefore, hoped that now real efforts will be made by the members of Berkshire Archaeological Society to seek out specimens put aside during the war and to note down known sites that have been disturbed, in order that the evidence they reveal may be made available for study in local museums." (F. M. Underhill, The Berkshire Archaeological Journal, No 49, 1946, p 49)

4.2.5 The following year witnessed the introduction of the *Town and Country Planning Act 1947*, introducing a requirement for the first time for aggregate extraction to obtain planning permission. The process did not however make provisions for the protection of cultural heritage, and consequently, the number of archaeological investigations remained relatively low, and continued to comprise mostly 'rescue'

excavations (ie rapid recording carried out as archaeological remains were exposed during quarrying).The Backlogs Report notes that Act did not have much impact until the 1970s, when soft gravels become a primary resource within the county.

4.2.6 Although most antiquarians and early excavators took trouble to record their work as well as possible at that time, they were hampered by the technology of the period and the lack of the scientific dating techniques that are commonly used today. Knowledge has also increased and relative dating techniques (including pottery and artefact typologies) refined. As a result the extant records of 19th and early 20th-century archaeological investigations do not necessarily provide the dating information that could be retrieved from more recent investigations and this has an impact upon the nature of the data available to the HER. At the same time, antiquarian and early 20th century investigations were typically included in the HER at a very early stage in its development. Due to the technological limitations, the early HER records relating to these investigations were often limited in scope and this continues to affect the nature of the HER record today.

4.2.7 The introduction of the *Town and Country Planning Act 1971* had a significant impact, whereby planning permission was tied to provision for archaeological investigation. The legislation also brought a shift in the way archaeological investigation was funded, with much of the responsibility now falling on the aggregate industry rather than the Government or interested individuals. The number of archaeological projects increased dramatically, particularly during the 1980s. Interventions were still carried out by local groups or societies, although there was the emergence of professional archaeological units carrying out some of the excavations. The boom in the 1980s is representative of two important trends: a) the rise in large area gravel extraction and b) the corresponding rise in professional archaeology. Despite the changes many archaeological investigations were still under-resourced and relied upon voluntary labour or students from universities.

4.2.8 With the introduction of Planning Policy Guidance note 16 (PPG16) in 1990 (recently replaced by PPS5 in 2010) archaeology became a material consideration in the planning process. Under this national and local planning framework, there has been a proliferation of archaeological projects undertaken by professional archaeological contractors as part of aggregate extraction permissions. The connection between archaeological work and planning has resulted in a geographical bias towards areas of residential or commercial development, road schemes and pipelines.

4.2.9 The backlogs report identified 74 archaeological projects distributed across 59 quarries and quarry pits located primarily within the Kennet Valley between Newbury and Reading, with only four projects within other river valleys in West Berkshire. There is a relatively high level of dissemination of the results of fieldwork, with over three quarters (77%) of archaeological projects associated with quarrying having an adequate level of dissemination in proportion to the significance of the findings. For the remaining 23% (16) of the projects, further dissemination is recommended.

4.3 Palaeolithic (*c* 780,000BC – 10,001BC)

4.3.1 Palaeolithic archaeology is the study of the middle to late Pleistocene geological epoch (*c* 780,000BC – 10,000BC) and is often studied together with the geology and natural environment as Quaternary Science. The period is normally divided into chronological periods based on oxygen or marine isotope stages (OIS or MIS), equivalent to periods of climatic and environmental change. Glacial periods are identified by even OIS/MIS numbers and interleave with interglacials, identified by odd OIS/MIS numbers. Within these periods are short events of climatic change: stadials which short cold intervals within interglacials and interstadials which are short warm intervals within glacials. This resource assessment will use the dating framework provided by marine isotope stages (MIS) as used by the *Solent Thames Archaeological Resource Assessment* (Wenban-Smith 2008). However, it should be noted that recent work (Parfitt et al, 2010) indicates that first human presence could be pushed back as far as MIS25. The chronological phases of the Palaeolithic are

shown in Table 3 below.

Table 3 Palaeolithic cultural stages in relation to geological and environmental periods

Date	Marine Isotope Stage	Period	Cultural stage
pre 475,000BC	MIS17– MIS13 (as above, this is now open to revision)	Cromerian	Early Lower/Middle Palaeolithic with Clactonian and Acheulean industries (no Levalloisian)
475,000 – 425,000 BC	MIS12	Anglian	
425,000– 125,000 BC	MIS 11 – MIS5e	Hoxnian/ Wolstonian complex	Later Lower/Middle Palaeolithic (with Levalloisian)
135,000 – 73,000 BC	MIS6 – MIS4	Ipswichian interstadial	Later Lower/Middle Palaeolithic (with Levalloisian) to early British Mousterian with bout coupé handaxes (It should be noted that there is no widely accepted human presence in Britain between early MIS6 and MIS3)
115,000 – 50,000 BC	MIS5d – MIS3	Devensian	British Mousterian (see above)
50,000 – 10,000 BC	MIS2 – MIS3	Devensian	Upper Palaeolithic

4.3.2 The period can also be divided into Lower, Middle and Upper Palaeolithic on the basis of the material culture, but the conventional (Roe 1981) distinction between Lower and Middle Palaeolithic, based on the appearance of Levallois knapping technology or *bout coupé* handaxes, is no longer considered to be a reliable basis for the differentiation of these periods in Britain (Wenban-Smith 2008, 2). This resource assessment will not therefore attempt to distinguish between Lower and Middle Palaeolithic and will follow the *Solent Thames Archaeological Resource Assessment* (*ibid*) in identifying Levallois material alone or together with handaxe and flake/core industries as 'Lower/Middle Palaeolithic'. *Bout coupé* material is identified as 'British Mousterian' (or later Palaeolithic) to reflect its association with a distinct chronological and cultural phase of occupation from *c* 60,000BC.

4.3.3 Lower/Middle Palaeolithic remains are typically found within Pleistocene geological deposits and usually comprise stone tools, faunal remains and palaeoenvironmental data. Structural remains of this date are not found, and human remains are very rare. Lower/Middle Palaeolithic assets are often residual (i.e. located outside the deposit or layer in which they were originally deposited) and *in situ* sites of tool manufacture or butchery are consequently very important (Wymer 1968).

4.3.4 The Resource Assessment has revealed that surviving evidence of either the Lower/Middle Palaeolithic within the Project Area is very limited. Assets tend to be abraded isolated chance finds indicating that they have been fluvially reworked and redeposited in Pleistocene river terrace gravel and sand deposits. The paucity of such assets within the Kennet compared with that from the Middle Thames (the Middle Thames is generally considered to be from Dorchester through to Richmond) (R Horsfield *pers. comm*.) may suggest that the latter may have been more of a focus of activity. While this primarily reflects trends in archaeological investigation, with much of the interest located in the Thames valley, it also reflects the questions of regional variation which have arisen over the last decade (R Horsfield *pers. comm*; Wendan-Smith and Allen, 2010).

4.3.5 The continued erosion, re-sorting and deposition of the gravels in the Project Area have reduced the chances of surviving Lower and Middle Palaeolithic 'working

floors'. These are areas of flint waste from tool construction or retouching, they can represent locations used only once or those that have seen consistent seasonal reuse), although Upper Palaeolithic material discarded on late Pleistocene gravel/sand terraces could also be vulnerable. Evidence for the Lower and Middle Palaeolithic is however often deeply buried, within Middle Pleistocene fluvial gravels, sometimes towards the bottom of the gravels, and thus would only be exposed during aggregates extraction.

4.3.6 Evidence for the Upper Palaeolithic typically lies on or close to the surface of Devensian gravels and surface finds may be the only representation of Upper Palaeolithic habitation. Such evidence may be lost during the initial surface strip prior to gravel extraction. Archaeological survey, including both fieldwalking and geotechnical investigations, may help to identify potential sites. While there is a slight increase in the quantity of Upper Palaeolithic material it is also still limited (Wendan-Smith and Allen, 2010). It should also be remembered that this period covers and a very long time frame of greatly varying climatic conditions and opportunities for settlement in Britain.

4.1 Mesolithic (*c* 10,000–4,001 BC)

4.1.1 Following the Last Glacial Maximum (*c* 18,000 BC), the environment of the Project Area was probably open arctic-alpine tundra landscape until *c* 10,000–9500 BC. Then, with the climatic improvement at the end of the last glaciation (Devensian), this tundra was superseded by forest (Rackham and Sidell 2000, 20–2). This period of climatic change created a new environment and mobile hunter-gatherer communities exploited this in a completely different manner. This led to the development of new exploitation strategies and thus different tools, including axes and tiny projectile points or microliths. Evidence of human activity is largely characterised by finds of flint tools and waste and possibly faunal remains. Traces of Mesolithic sites usually only survive in valley floor or floodplain edge locations, beneath alluvium, and are often not in a stratified contexts. Palaeoenvironmental remains and some evidence of occupation (e.g. hearths) may also be found but structural remains are unlikely to survive (Bradley 1978).

4.1.2 The transition from the Upper Palaeolithic to the Mesolithic is still little understood. Although the asset density is low compared to other periods, it is very high when compared to the Mesolithic period across the UK (Dr C Barnett, *pers. comm*.). The Project Area includes a number of domestic sites of national significance in that they can provide valuable information on the transition of Upper Palaeolithic societies into Mesolithic.

4.1.3 Throughout the Mesolithic period the Kennet Valley appears to have been a key location for habitation in southern England. The tributary rivers feeding the Kennet River and the Kennet River itself were a predictable source of food from game and fishing and formed natural communications/transport routes (Carter 1976, Carter 2001). Many of the key assemblages for this period have been identified within the Sand/Gravel Study area, indicating that these would be at great risk through gravel extraction.

4.1 Neolithic (*c* 4000–2351 BC)

4.1.1 The Neolithic period is traditionally seen as the time when hunter-gathering gave way to farming and settled communities, and forest clearance occurred for the cultivation of crops and the construction of communal monuments. It is likely that still continued. Evidence of communal activity in the fourth millennium BC is represented by long barrows and causewayed enclosures, replaced in the third millennium BC by henges, stone circles and ceremonial centres (Bradley 1978).

4.1.2 The transition between the hunter/gatherer communities of the Mesolithic and the agriculturists of the Neolithic remains indistinct in the archaeological record and some continuity of hunting and gathering is likely (Ford 2008). It is becoming

increasingly clear that there is some overlap between the two groups within the Thames and Kennet Valleys (*ibid*).

4.1.3 The Resource Assessment appears to indicate a decline in activity in the Neolithic. Research to date, or at least to 2010 actually shows that there is less Neolithic evidence than one might expect from the valley between Hungerford and the confluence of the Kennet and the Thames (Ford 1987a). This may form part of a wider pattern as fieldwork across the Dorset border in Cranborne Chase suggests that the distribution of earlier Neolithic artefacts and monuments complemented that of late Mesolithic rod (a straight-backed bladelet) microliths (Bradley 2010). There are certain areas in which it is possible to compare the distributions of artefacts belonging to both Mesolithic and Neolithic traditions. The Kennet Valley provides an opportunity to compare distributions of Mesolithic and Neolithic assets as there is evidence for a long Mesolithic sequence (Hey *et al*. in press).

4.1.4 The Project Area highlights the differences of this area to areas further west, for example Silbury hill and Avebury, and problems of chronology, for example whether certain ring ditches are of Neolithic rather than Bronze Age date as is normally supposed (Bradley *pers. comm*.), and the location and extent of early and middle Neolithic activity. The Sand/Gravel areas, and primarily the river gravels, attracted activity. Such areas are key to increasing our understanding of the continuity, or lack of, between the Mesolithic, Neolithic and Bronze Age.

4.2 Bronze Age (*c* 2350–751 BC)

4.2.1 The Bronze Age is characterised by technological change, when copper and then bronze eventually replaced flint and stone as the main material for everyday tools. It is seen as a period of increasing social complexity and organised landscapes, probably due to increasing pressure on available resources. The construction of round barrows is associated with the appearance of a particular ceramic form of 'beaker'. In the later Bronze Age, burial practice takes the form of cremated remains in pottery 'urns'. Remains of Bronze Age agricultural fields and trackways have been found with greater frequency than evidence of Neolithic agriculture. In some cases remains of Bronze Age agricultural landscapes include domestic sites, but these are rare, and little is known about burnt mounds (Bradley 1978).

4.2.2 The Resource Assessment shows that density of assets in the Project Area increases dramatically during the Bronze Age, nearly three-fold when compared to the Mesolithic and Neolithic periods. In common with the other earlier prehistoric periods, the Resource Assessment shows that the focus of Bronze Age activity remained concentrated within the Kennet Valley and that there was also increased activity along the tributary rivers such as the Lambourn. There is also a relatively dense grouping of assets on the plateau gravels south of Reading in the Burghfield Common area. There was an increase in the number of assets identified through archaeological investigations carried out ahead of extraction activity, further highlighting the importance of these areas to early communities.

4.2.3 The Resource Assessment also highlights a number of issues affecting our understanding of this period, although the primary issue is that of chronology. Although it is clear that the Kennet River is a focus of activity, the difficulty in being able to date securely artefacts from these periods restricts our understanding of morphological changes in settlement features, such as ritual features or habitation features. Extensive Bronze Age field systems, common to many other areas are rare in West Berkshire.

4.1 Iron Age (*c* 750BC–AD 43)

4.1.1 During the Iron Age, the climate deteriorated with colder weather and more rainfall. The period is characterised by expanding population, which necessitated the intensification of agricultural practices and the utilisation of marginal land. Hilltop enclosures (e.g., Fig 11; RA 15), early hillforts (e.g., RA 20) and developed hillforts

(e.g. RAs 17–9 and 23), which appear to be for both domestic and defensive purposes and linked to tribal land ownership, are a distinctive feature of this period. Remains of field systems, enclosures, round houses, and other agricultural features of Iron Age date occur where current and past land use has allowed remains to survive (ie not deep ploughing, quarrying or other development). Towards the end of the Iron Age there is evidence of increasing contact with continental Europe in the form of foreign coins and pottery types.

4.1.2 What assets there are suggests a continued concentration within or close to gravel bearing geologies, particularly on the river floodplain. It also suggests that while there is some continuity between the Bronze and Iron Ages, there is a change in the focus of areas of activity. Whilst the Kintbury area appears to have been important during the Bronze Age, it was apparently no longer such in the Iron Age. Activity focusses elsewhere on the gravels on the south side of the Kennet between Newbury and Reading.

4.1.3 The Resource Assessment shows a drop in asset density across the Project Area for the Iron Age, suggesting a decline in activity from the Bronze Age. This may however reflect the difficulties of differentiation, as evidence of the early Iron Age is difficult to identify as settlement remained open like the Bronze Age and can be confused with the earlier period. There is the also question of the rate that forest clearance actually proceeded. Comparison with other areas along the Thames suggests that perhaps it did not proceed as quickly within the Kennet Valley thus restricting the amount of land available for agricultural use.

4.1.4 There are clear changes with the previous periods, for example in ritual activity, but the changes are still understood and lacking in evidence. There are few burial sites evident. Like the earlier periods, a better understanding of the chronology of the period is needed, thus the routine application of radiocarbon dating and improved collection palaeoenvironmental data would help.

4.1 Roman (*c* 43–410AD)

4.1.1 In AD 43 the Romans invaded through the south-east of England, creating the Roman province of Britain. The Romans founded *civitates*, urban and administrative centres, supporting a framework of regional government, along with an extensive road network.

4.1.2 For at least a century prior to the invasion, southern Britain was already experiencing the influence of Roman material culture through trade. Evidence can be found in the changes in pottery and housing styles, types of food and sometimes clothing in the late Iron Age across the southern and midland regions of Britain (Gaffney and Tingle 1989). The demands of the Empire expanded existing industries and introduced new ones, along with the development of the infrastructure needed to move the goods not just from Britain to the rest of the Empire but also from town to town and from the continent to Britain.

4.1.3 The Roman period is relatively well represented archaeologically across the Project Area compared to earlier periods, with activity still concentrated within the river terrace gravels. The number of assets is higher than any single prehistoric period. This may be associated with an increase in activity, but it is also possibly due other factors, such as local antiquarian interest, and the nature of remains themselves. Roman artefactual evidence is distinctive and easily identifiable, from chance finds and through metal detecting and fieldwalking surveys (Lyne 2008, 1–2), favouring their collection and dating. There is also an increase in the range of surviving structural evidence, including roads, kilns, buildings etc., which were often constructed from durable building materials, such as metalled roads, stone and ceramic material (tiles).

4.1.4 The Resource Assessment shows a wider use of the landscape than previously, with a broader range of assets. A number of the villa estates appear to be focussed within the river valleys along with transport assets along the Kennet River Valley

floor indicating the importance that the river still held for the inhabitants – Roman roads often followed the easier terrain but generally out of valley floors where they could be flooded.

4.1 Early Medieval period (*c* AD 411–1065)

4.1.1 Following the withdrawal of the Roman army from England in the early 5th century AD the Roman administration of Britain collapsed. Germanic settlers arrived from the Continent; the basis of their economy was agriculture and early Saxon settlement was exclusively rural. In the 7th to 9th centuries, rural settlement developed with minsters (religious centres) and royal estate centres. Around the 9th and 10th century, the local parochial system began to replace the earlier Saxon Minster system, with formal areas of land centred on nucleated settlement served by a parish church.

4.1.2 The early medieval period is the first for which written evidence for what is now West Berkshire survives. Although the documentary evidence of limited scope and coverage, it is a useful source of information for the period. Written records emerge after the introduction of Christianity in the latter half of this period, in medieval compilations of church records and also from the archives of Abingdon Abbey, and much concerns boundary issues, which provide valuable insights into the topography and landscape of the peripheral areas of estates during this period. The Anglo-Saxon Chronicle and the Burghal Hidage provide fleeting insights into the politics and administration of the area. Domesday Book (AD 1086) provides the first comprehensive source for land use, settlement and estate ownership at the very end of the period. Evidence of settlement, land use and territorial organisation can also be found through place-names of Saxon origin, including the names of fields and woods.

4.1.3 The Early Medieval period is not nearly as well understood archaeologically as are the late prehistoric and Roman periods within the Project Area. Anglo-Saxon pottery is rarely found, even in large scale fieldwalking exercises, partly because much of it was handmade and fired at low temperatures, making it susceptible to breaking up in the soil and partly because it is difficult to distinguish between organic tempered Anglo-Saxon pottery and similar later prehistoric material. Coins only begin to circulate again from the mid Saxon period and in general are rarely found. Buildings were predominantly of wooden construction rather than stone, leaving only the faintest of remains in the forms of post holes and occasionally sill beam slots. Perhaps the most archaeologically ‘visible’ aspect of Anglo-Saxon material culture is the evidence of early burials accompanied by grave goods. Pottery accompanying early burials, including the urns used for cremations, is often of better quality with decoration which allows more precise typological classification and dating.

4.1.4 The low density of assets might also reflect a lower population or a lower level of activity within the Project Area, reflecting socio-economic changes.

4.1.5 The Resource Assessment shows that there is a rise in the density of assets within the area of non-aggregate geologies; such assets represent c 34% of the total of early medieval assets. Assets within the Sand/Gravel Study area still comprise the majority although there appears to be a more even distribution between those on river terrace and plateau gravels than in previous periods, approximately 30% for the former and 23% for the later. It should also be questioned whether this is a true representation of settlement patterns or the result of geology. The river terrace gravels are overlain by alluvium and are likely to contain assets from this period as has been seen in other river valleys such as the Thames (Steve Ford *pers. comm*.). Saxon settlements were also located on gravel ‘dry islands’ within the river floor. The lack of archaeologically proven assets for this period hinders such investigations but it is probable that this is also the result of a lack of recognition of such assets.

4.1 Medieval (*c* 1066–1539)

4.1.1 Documentary evidence, later, post-medieval, historic maps and extant buildings, such as churches, provide a reasonably good picture of the likely medieval settlement pattern in West Berkshire. The period is one of gradual of population growth, although there are episodes of contraction, from disease and famine. A rise in sheep farming followed a decline of small rural communities, and there is the development and intensification of a range of industries.

4.1.2 The Resource Assessment demonstrates quite clearly the increased usage of the landscape once society has been become settled and established (Munby 2008). Not only does the range of asset type present increase but the numbers identified rises markedly. The change to more solid types of building construction results in an increase in the number surviving. Increased ground preparation techniques also results in more obvious markers of where buildings once stood, such as the earthwork remains of level 'house platforms'. Better agricultural techniques and new implements, e.g. better ploughs, have increased the survivability of evidence of such practices - more obvious and increased areas of ridge and furrow and some areas of flood meadows.

4.1.3 The concomitant growth in population resulted in the need for more building materials and thus we identify a growth in the range of these assets. Kilns and water mills form the largest element of Industrial assets. Water mills are naturally tied to the river valleys and therefore are at greatest risk of removal from gravel extraction activity, but kilns are also at risk as many of these have been located not far from sources of transport, ie the rivers. Wharves and quays appear to be lacking from the Project Area but it is possible that many of these were sited within the main areas of settlement and have therefore fallen outside the scope of the Resource Assessment. A number are also attached to existing buildings which are protected by national listing and again have been scoped out of the Assessment. Transport assets rise in comparison to the early medieval period which is as expected with the rise in population and general stability of society. It is interesting to note, however, that these bear no relation to the Roman road Transport assets, suggesting that these were no longer in the 'memory' of local medieval communities.

4.1.4 Despite the increase in range of assets, and the widening of distribution of assets across the Project area, the Sand/Gravel Study area remains the focus of activity.

4.1 Post-medieval period (AD1540–1900)

4.1.1 The post-medieval covers the period between the Dissolution of the Monasteries, when the monarch became both the ultimate temporal and spiritual power in England, and the end of the 19th century. England developed from a largely rural agrarian economy to mainly industrial economy through to increasing invention, industrialisation and imperial power. The 18th and 19th centuries saw settlement growth and the development of a road, rail, and canal network linking urban and rural areas. Along with improvements to the transport network, industrialisation was also responsible for much of the development of the district.

4.1.2 The post-medieval period across the District is reasonably well understood through its documentary and cartographic sources. This understanding is enhanced by a number of broad characterisation studies that have been undertaken in West Berkshire such as Historic Landscape Characterisation (www.westberks.gov.uk/HLC) and the Newbury Historic Character Study (www.westberks.gov.uk/NHCS), research undertaken for the Historical Atlas of Berkshire (Dils 1998) and a wide range of publications from local interest groups which specialise in particular topics. The quantity of information about this period that exists in the public domain can give the impression that archaeological study and investigation has little new to offer. Archaeological evidence can however provide a valuable contribution to the understanding of this period alongside the documentary and cartographic record.

4.1.3 The Resource Assessment shows that despite an increase in number and range of Industrial assets, agriculture remains the primary focus of activity in Project area, Agriculture and Subsistence assets forming over a third of all assets. They also show the continuity of this period with the previous period as a number of the agricultural assets have precedents in the Medieval period, e.g. ridge and furrow or field boundaries. Activity remains focussed on the fertile soils, the alluvial silts overlying the gravels of the valley floor which naturally increases their risk of loss to extraction activity.

4.1.4 Although the number of Industrial assets has increased it still remains a relatively low proportion of all assets for the Post-medieval period. It still remains focussed on the Kennet River; the number of watermills has increased, although this does not necessarily show in the figures as many of the original mill buildings have changed use or have become protected through listing and thus have been scoped out of the assessment. A noticeable development within this group is that of extraction sites. It is likely that the increased of such materials is a result of the development of new materials that would aid the development of certain types of Transport assets.

4.1.5 Transport assets become an important group during this period, particularly with the development of the canals in the 18th century and railways in the late 19th century. The canal runs alongside the Kennet River providing a more stable water access route for transport vessels of the time. The river level was not as stable as required and there were a number of locations where it was not deep enough for the transportation of goods. However, while this feature overlies areas of gravel, it is still in use, primarily for pleasure vessels, and thus is unlikely to be at threat of destruction due to gravel extraction. It is not the same for the railways – excluding the existing running lines. A number of lines were opened, initially for the transportation of goods but later also for the transportation of people, across the Project Area. However, as businesses closed and motor vehicle transport became more popular, unprofitable lines were closed and the evidence of the former paths, ie banks over which the lines were laid, now become less secure where they overlie areas of economically viable sand/gravel. Archaeological evidence of wharves and docks is limited but, like the Medieval, it is probable that many of these assets are located within the town centres or at warehouse areas just on the outskirts of the towns which have been now been absorbed in the much larger late post-medieval/modern townships that exist today. Understanding of what survives within the aggregate bearing geologies is more dependent upon historical documents, map evidence, standing buildings and objects found by chance or recovered by metal detecting. Further archaeological evidence will be required to enhance understanding of the use of the agricultural landscape and its relationship to urban centres.

4.1 Modern (1901–2010AD)

4.1.1 For the purposes of this project the modern period covers the span of time from 1901 until the present day. This period encompassed enormous social, political and industrial change including universal suffrage, the Welfare State and two World Wars.

4.1.2 Modern occupation patterns are evident in 20th century Ordnance Survey mapping and a large amount of material is available on changing patterns of land use and activity. Consequently this period is very well understood. The HER provides a record of those modern assets considered to be of particular historic interest (e.g. wartime batteries and important buildings) and those which might otherwise be mistaken for earlier and more significant remains (e.g. earthworks associated with golf courses).

4.1.3 In West Berkshire, the period witnesses the rise in prominence of the aggregate extraction industry, which although placing many assets of the previous periods at risk also reveals many of them, allowing us to increase our knowledge and understanding of those very periods under threat. However, a decline in the number

of Industrial assets in general during this period is apparent. Ironically it is likely that this is the result of the rise of industrialisation and spread of faster transport through motor-vehicles and railways, causing industries to become centralised. A number of new examples of older industries, such as brick making, opened in the Project Area in the early 20th century but most of these had ceased by the end of the century. The Project Area witnesses the arrival of an entirely new form of industry, the production of energy with one asset noting the location of a set of buildings associated to the investigation and production nuclear energy. The buildings were demolished in the 1980s when they ceased production.

4.1.4 Agriculture remains the most important industry in the area, with aggregate extraction being the second most important. Smaller industries exist in the District but many are now within towns, although on their edges, and thus have been scoped out of the Resource Assessment. The most obvious difference between the Modern period and all others is the dramatic increase in Defence assets. Many of the Second World War assets are located upon river gravel aggregates as they utilise the canal, river and rail networks as part of the defence scheme, and could thus be at risk from extract activity. Most of the major surviving components of the defence line lie adjacent to the canal network it is unlikely that would be directly affected by future extraction. Of greater potential is the unrecorded associated defence features, anti-tank ditches, anti-glider trenches, foxholes, etc, which may survive in the wider landscape and may be located within gravel pits. Ultimately these assets have variable historic significance, but would probably require archaeological investigation and recording prior to removal and some (particularly where groups of associated defence assets are present).

4.1.5 Military heritage assets from the Cold War relate to the presence, until very recently, of an active United States Air force base at Greenham Common, and the Atomic Weapons Establishment at Aldermaston and Burghfield. The airbase was itself the target of high profile political protest and a rise in Civil assets for this period can be attributed to the number of peace camps located at certain key positions around the airfield. The missile shelter complex at Greenham Common has become a Scheduled Monument, whilst many of the buildings that housed the personnel have been reused.

5 Asset Density overview

5.1 Introduction

5.1.1 This section provides an overview of the density of assets per km^2 for the Project Area and the various Study Areas, compiled from the enhanced West Berkshire HER data. General trends are discussed in this section and the individual periods reviewed in Section 6.

5.1.2 The assets include 'monuments' (comprising archaeological sites as well as other features of interest), findspots of individual objects, natural features and buildings (see para 1.1.5). Of these record types, standing buildings typically date from the medieval period onwards and are a more commonly occurring type in the post-medieval and modern periods. As noted in para 2.3.9, listed buildings have not been included as assets.

5.1.3 As the HER records the current state of archaeological work and knowledge, a single database entry may encompass several assets if there is currently insufficient information to distinguish between different asset types or limited evidence for different phases of activity. Similarly, a single site can be represented by multiple HER entries if there is very detailed information available for some phases or elements. Occasionally there is insufficient evidence to indicate that the separate elements of the site form a coherent whole, and they have therefore been entered individually. Where there is generally less information available (as in earlier archaeological periods), there is therefore likely to be an overall underestimation of the number of assets; and where there is more information available (as in later periods) there is likely to be an overall overestimation of the number of assets. Where the finds description states several flints or a flint scatter, these were counted as a single asset.

5.1.4 Records in the HER may have been given a broad date range, e.g. 'Late Prehistoric to Roman' when there is little evidence for a more specific period attribution. During the enhancement, these records were split into the chronological periods, creating multiple records.

5.1.5 The asset density for all periods across the entire aggregates resource within the Project Area (ie, all three Study Areas) for assets of known date was 11.20 assets per km^2. This rises to 11.84 assets per km^2 when including assets of unknown date. Table 4 notes the asset densities (number per km^2) across the Project Area by asset date and asset type.

5.2 Unenhanced HER Data

5.2.1 The original unenhanced HER dataset comprises 4762 monument records for the whole of the West Berkshire District. This contrasts with the enhanced dataset of 4373 revised monument records within the Project Area alone. The increase in number of records is primarily due to the splitting of single multi-period records into a number of records by period (5.1.4 above).

5.2.2 Whilst it has been possible to query the HER database by period, because the data has not been enhanced with a consistent chronological period it has not therefore been possible to provide any meaningful comparative analysis between the Project Area and District as a whole. Similarly it is not possible to provide such a comparison when considering asset type. The assessment demonstrates that enhancement of all the HER records for West Berkshire would provide the opportunity for fine-toothed comparative studies of impacts on assets per period.

Table 4 Total number of assets per km2 within the Project Area by asset date and asset type

PRE - prehistoric (undated)
EPRE - early prehistoric
MESO – Mesolithic
NEO – Neolithic
BA- Bronze Age
LPRE – late prehistoric
PAL – Palaeolithic
IA – Iron Age
RO- Roman
EMED – Early medieval (Saxon)
MED – Medieval
PMED – post-medieval
MOD – Modern; UN – Unknown

Asset Type	Chronological period														Total asset density by type, per km^2
	PRE	EPRE	LPRE	PAL	MESO	NEO	BA	IA	RO	SAX	MED	PMED	MOD	UN	
AGRICULTURE AND SUBSISTENCE			0.030		0.003		0.013	0.025	0.038	0.033	0.172	1.177		0.0375	**1.527**
CIVIL										0.005	0.005	0.018	0.020		**0.048**
COMMEMORATIVE												0.003	0.008		**0.010**
COMMERCIAL											0.003	0.013	0.003		**0.018**
COMMUNICATIONS													0.008		**0.008**
DEFENCE							0.005	0.025		0.003	0.010	0.018	0.408		**0.468**
DOMESTIC	0.003		0.033	0.003	0.084	0.008	0.053	0.030	0.137	0.068	0.233	0.208	0.020	0.025	**0.904**
EDUCATION												0.051	0.008		**0.058**
FINDSPOT	0.966	0.008	0.020	0.084	0.104	0.129	0.175	0.096	0.547	0.071	0.699	0.494	0.185	0.071	**3.597**
GARDENS PARKS AND URBAN SPACES											0.071	0.137	0.005	0.005	**0.218**
HEALTH AND WELFARE												0.010			**0.010**
HOARD							0.003		0.010			0.003			**0.015**
INDUSTRIAL	0.003		0.003		0.013		0.010	0.003	0.051	0.003	0.048	0.182	0.033	0.015	**0.362**
MARITIME															**0.000**
PALAEOENVIRONMENTAL			0.003						0.003		0.003	0.003			**0.010**
RECREATIONAL									0.005			0.008	0.005		**0.018**
RELIGIOUS RITUAL AND FUNERARY	0.005		0.030			0.051	0.162	0.020	0.025	0.020	0.061	0.101	0.013	0.005	**0.494**
TRANSPORT	0.03		0.018			0.000	0.005	0.008	0.144		0.035	0.329	0.020	0.038	**0.630**
UNASSIGNED	0.076		0.266	0.003	0.058	0.033	0.461	0.208	0.347	0.111	0.223	0.170	0.035	0.403	**2.392**
WATER SUPPLY AND DRAINAGE	0.008		0.005			0.003	0.020	0.005	0.033	0.003	0.084	0.066	0.001	0.035	**0.268**
Total asset density by period (per km^2, rounded)	**1.0**	**0.0**	**0.4**	**0.1**	**0.3**	**0.2**	**0.9**	**0.4**	**1.3**	**0.3**	**1.6**	**3.0**	**0.8**	**0.6**	**11.1**

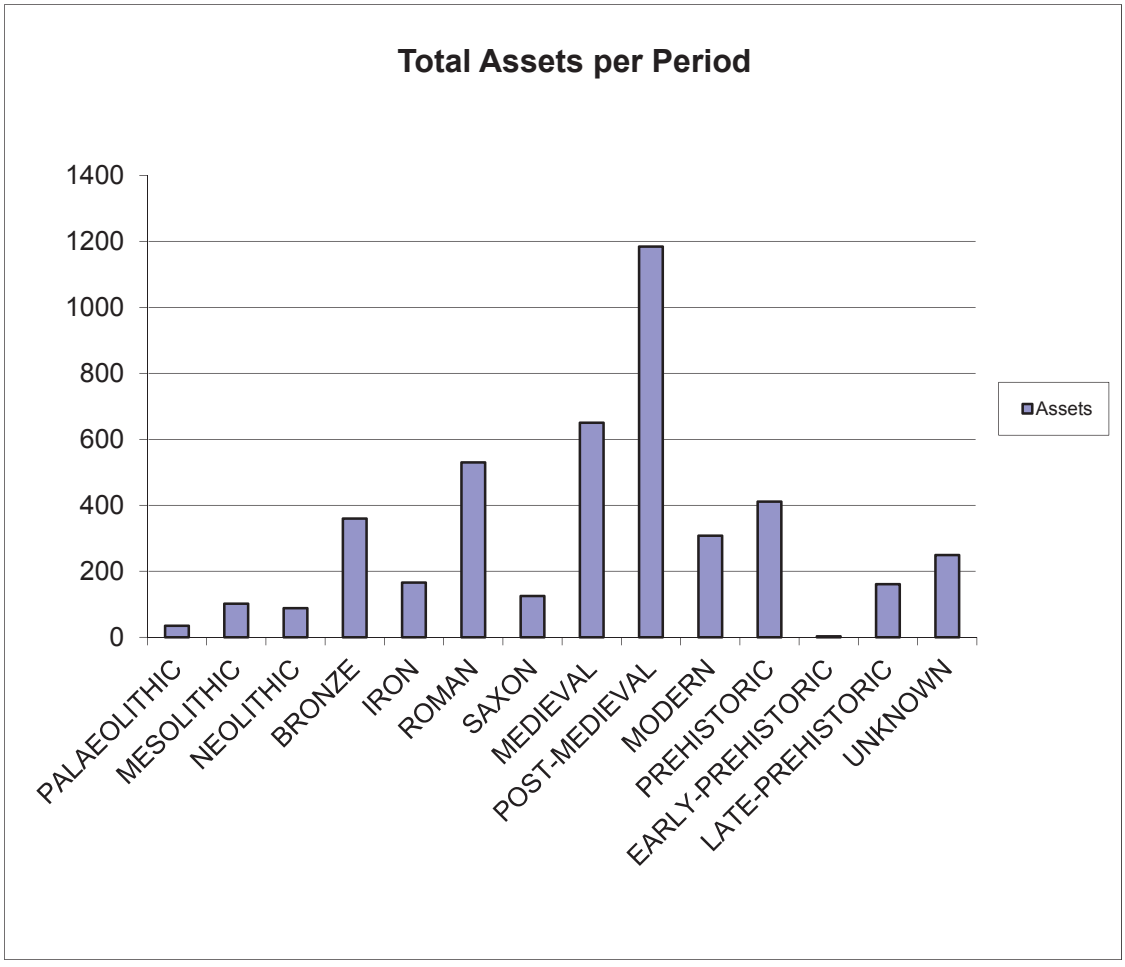
5.3 Chronological period and asset density

5.3.1 Graph 1 shows the total number of assets per period within the Project Area. As would be expected of the earliest and most remote period, the Palaeolithic, has the lowest asset density (0.1 assets per km^2). The density of assets remains low at around 0.2 assets per km^2 until the Bronze Age, whereby it rises sharply to 0.9 assets per km^2, but then falls again to 0.4km^2 during the Iron Age.

5.3.2 The asset density rises again to 1.3 assets per km^2 in the Roman period, before dropping again to reach 0.3 assets per km^2 for the early medieval (Saxon) period. Asset densities then rise in the Medieval period (1.6 assets per km^2 for all assets), with the highest density of all during the post-medieval period (3.0 assets per km^2). Asset density dramatically drops again in the modern period to 0.8 assets per km^2.

5.3.3 This pattern has been seen in other aggregates assessments (e.g., Bath and North East Somerset, the Isle of Wight). It might reflect the nature and distribution of human activity, but also the nature of the material remains (friable remains or deeply buried and thus precluding discovery) and the extent of the evidence (historic remains may have been identified from documentary or cartographic sources).

Graph 1 Total number of assets per period within the Project Area



5.3.4 There are some anomalies in the general trend of increasing asset density to the present day, for example peaks during the Bronze Age and Roman periods and a trough in the early medieval period and for modern assets. This may be a reflection of archaeological investigation or genuine aspects of past occupation and activity

- **High Bronze Age asset density** – The density (0.9 assets per km^2) is very high in comparison to other late prehistoric Neolithic and Iron Age periods (0.2–0.4 assets per km^2). This is due to the large number of Bronze Age

barrows (burial mounds) within the HER, which have probably been included due to their visibility and the general interest in this asset type from antiquarian observations and later. Like remains of the Neolithic and Iron Age periods, other Bronze Age assets are likely to be underrepresented because they are buried and intangible without site specific field investigation.

- **High density of Roman assets** –The Roman period exhibits a higher asset density (1.4 per km^2) than all previous periods. However, this is probably not just a reflection of local antiquarian interest in the Roman period and the amount of archaeological investigation in the 19th and 20th-centuries, but also because features and artefacts are more easily identifiable and attributable to this period. For example, the distinctive nature of Roman artefacts makes them likely to be recorded as chance finds and during metal detection and fieldwalking surveys, whilst remains of Roman roads are often identified and recorded out of local interest.
- **Low asset densities for the early medieval period** – The low asset density of the early Medieval (0.4 assets per km^2) reflects the limited understanding of the archaeology of this period. It should be noted that the Lower Kennet Valley fieldwalking project did recover some early medieval artefacts but due to the initial recording methodology, their dating was only made clear in the later analysis and publication of the project. It is likely therefore that this figure should be slightly higher. Furthermore, early medieval features are often ephemeral and can be difficult to identify. The pottery is friable and can be damaged by ploughing and other activity. Saxon pottery comprises very similar inclusions to prehistoric pottery and can be misidentified as such. Early Saxon settlement is typically dispersed and thus more difficult to identify using standard archaeological evaluation techniques such as trial trenching.
- **Low modern asset density** – There is a notable decline in asset density from the post-medieval period to 0.8 assets per km2 in the modern period. Although this period is very well understood from documentary and cartographic sources, this probably reflects current and past perceptions of the role and purpose of the HER and whether such assets have heritage significance/interest.

5.4 Asset date and geology

5.4.1 Table 5, below, shows the number and density of assets per chronological period within the three main geology type study areas of the Project Area - the Sands and Gravels, the Chalk and Other (which combines all geologies not included in either of the other two). Alluvium is not included as it overlies the Sands and Gravels. Table 6 shows the percentage of assets of each period on each of these three geology types in the Project Area.

5.4.2 The figures clearly show that the Sands and Gravels - the economically viable aggregate - is a prime area for past human activity from the earliest times onwards. Until the Roman period over 70% of the assets are located on this geology type, in particular there is a notably higher level of Mesolithic activity. There is a decline from the Roman period onwards and an increase in assets on the non-aggregate geologies, possibly reflecting an increase in population pressure and the utilisation of marginal land, as Clay soils included within this area are normally not a first choice for farming. This pattern may be because the river valleys were a focus of resources and activity, or that archaeological remains survive better within this environment (e.g. with and beneath overlying alluvial deposits).

5.4.3 The level of past human activity on Chalk remains a similar over the time, with around 13% of all known assets within each period being located on Chalk, with a slight rise to 15% in the medieval and a decline to 8.7% in the modern period.

Table 5 Number and density of assets within the Project Area by chronological period and geology

Aggregate	**Plateau Sand/Gravel (Area = 103km)**		**River Sand/Gravel (Area 135.8)**		**Chalk (Area = 83.9km)**		**Other (non aggregate) (Area = 72.4km)**	
Period	**Total Number of assets**	**Density per km^2**	**Total Number of assets**	**Density per km^2**	**Total Number of assets**	**Density per km^2**	**Total Number of assets**	**Density per km^2**
Undated prehistoric	124	1.20	178	1.31	25	0.3	84	1.16
'Early prehistoric'			2	0.01			1	0.01
'Later prehistoric'	9	0.09	122	0.90	22	0.26	8	0.11
Palaeolithic	9	0.09	13	0.10	8	0.10	2	0.03
Mesolithic	2	0.02	90	0.66	5	0.06	5	0.07
Neolithic	16	0.17	57	0.42	13	0.15	1	0.01
Bronze	70	0.68	226	1.66	54	0.64	11	0.15
Iron	60	0.58	75	0.55	15	0.18	16	0.22
Roman	139	1.35	233	1.72	73	0.87	86	1.19
Early Medieval	40	0.39	49	0.36	13	0.15	23	0.32
Medieval	142	1.38	258	1.90	87	1.04	163	2.25
Post-Medieval	284	2.76	504	3.71	125	1.49	269	3.72
Modern	66	0.64	178	1.31	25	0.304	39	0.54
Undated	44	0.43	145	1.07	37	0.44	28	0.39
Total assets = 4372	1004	9.7	2130	15.7	502	6.0	736	10.2
Project Area 395km^2		2.5		5.4		1.30		1.90

Table 6 Percentage of assets within the Project Area by chronological period and geology

Period	Total number of Assets	Plateau Sand/Gravel	River Sand/Gravel	Chalk	Other (Non aggregate)	Total %
Undated prehistoric	411	30%	43%	6%	20%	100.0
'Early prehistoric'	3		67%		33%	100.0
'Later prehistoric'	161	6%	76%	14%	5%	100.0
Palaeolithic	32	28%	41%	25%	6%	100.0
Mesolithic	102	2%	88%	5%	5.8%	100.0
Neolithic	87	18%	66%	15%	1%	100.0
Bronze	360	19%	63%	15%	3%	100.0
Iron	165	36%	45%	9%	10%	100.0
Roman	531	26%	44%	14%	16%	100.0
Early Medieval	125	32%	392%	10%	18%	100.0
Medieval	650	22%	40%	13%	25%	100.0
Post-Medieval	1182	24%	43%	11%	22%	100.0
Modern	308	21%	58%	8%	13%	100.0
Undated	254	17%	57%	15%	11%	100.0
Total	4372	23%	49%	11%	17%	100.0

5.5 Asset type and geology

5.5.1 Table 7 compares asset type and geology. This shows that Findspots were in general the most common asset type, although highest in the non aggregate area. Unassigned assets were then next most common asset type, although only within the Study Areas and are highest on the River Sand/Gravels. The Unassigned asset type is possibly unrepresentative as it may comprise a number of separate assets that actually form part of a single asset. The number of Findspots assets may simply reflect the location of fieldwalking surveys; while Findspots represent on average *c* 27% of all assets across the Project Area, they represent *c* 41% of assets recorded within areas of non-aggregate geology ('other').

5.5.2 Within the Sands/Gravel Study Areas, both Agricultural and Subsistence and Domestic assets have the highest density although primarily in the Plateau Sands/Gravels. This possible reflects the suitability of the typically well-drained and fertile Plateau Gravels for settlement and farming over the River Gravels, which while fertile, would be prone to flooding.

Table 7 Percentage of assets within the Project Area by asset type and geology

Asset type	Plateau Sand/Gravel	River Sand/Gravel	Chalk	Other (non-aggregate)
Agriculture and Subsistence	13%	10%	17%	23%
Civil	1%	0.2%		0.4%
Commemorative	0.2%	0.05%		0.1%
Commercial	0.3%	0.1%	0.2%	
Communications		0.1%		
Defence	4%	6%	2%	2%
Domestic	8%	6%	9%	8%
Education	1%	0.3%	0.2%	1%
Findspot	33%	30%	32%	41%
Gardens, Parks and Urban Spaces	3%	1%	2%	3%
Health and Welfare	0.3%			0.1%
Hoard	0.1%	0.05%	0.2%	0.1%
Industrial	2%	3%	4%	5%
Palaeoenvironmental		0.2%		
Recreational	0.3%	0.1%	0.2%	0.1%
Religious, Ritual and Funerary	6%	3%	6%	3%
Transport	3%	9%	4%	2%
Unassigned	23%	28%	21%	10%
Water Supply and Drainage	3%	3%	2%	1%
Total Percentage	100.00%	100%	100.00 %	100.00%
Total Number of Assets	1004	2130	502	736

5.6 Asset density and period of extraction

5.6.1 Table 8 shows the number and percentage of assets in the Study Areas by asset type, in relation to past, present and preferred proposed aggregate extraction. As one would expect, most of the known assets are in areas that have seen aggregate extraction in the past or which are currently being quarried, on the basis that associated archaeological investigation has been undertaken in advance and/or during extraction.

- Assets identified from Sand/Gravel aggregate extraction (both Active and Past Historic/Recently Historic) represents *c* 16% of the total of all assets in the Project Area
- Assets recovered from active and recently historic Sand/Gravel (both Plateau River) extraction sites (ie extraction sites active up to thirty years ago) account for *c* 82% of the assets recovered from all extraction sites within the Project Area. However, Active extraction sites have a density of 1.5 assets per km^2 across both Sand/Gravel Study Areas, whereas Past extraction areas (both Recent and Historic) have an asset density of 1.4 assets per km^2. The higher density of assets recovered from Active extraction sites demonstrates the importance of the Sand/Gravel area to communities of past periods.
- The Resource Assessment has identified that based on present information preferred proposed extraction sites would have a potential impact on a possible 1% of assets within the Sand/Gravel Study Areas with a density of 0.14 assets per km^2.

Table 8 Number and percentage of assets by type in relation to past, present and proposed aggregate extraction

Asset type	Past extraction								Active Extraction				Preferred Proposed Extraction	Total
	Pre-late 20th century				Late 20th century									
	Plateau Sand/ Gravel	River Sand/ Gravel	Chalk	Other	Plateau Sand/ Gravel	River Sand/ Gravel	Chalk (No assets recorded)	Other	Plateau Sand/ Gravel	River Sand/ Gravel	Chalk (No assets recorded)	Other	River Sand/ Gravel	
Agriculture and Subsistence	1	1				9			5	9			7	29
Civil														
Commemorative														
Commercial						1								1
Communications														
Defence		3		1		2				7			2	14
Domestic		3				12			15	14			3	53
Education														
Findspot	7	42	1		4	22			10	78		1	8	225
Gardens, Parks and Urban Spaces					1									2
Health and Welfare														
Hoard														1
Industrial	2				10	3			1	4				22
Palaeoenvironmental		2								2				4
Recreational														
Religious, Ritual and Funerary	1	1			2	13			12	6			2	36
Transport		3			2	12			4	8			3	33
Unassigned	2	24			5	133		4	82	92			3	376
Water Supply and Drainage		4		1		10			1	11			3	27
Total number of assets	**13**	**83**		**1**	**24**	**217**		**4**	**130**	**231**		**1**	**33**	**739**
Total % of assets within Study Areas	**1% (1004 assets)**	**4% (2130 assets)**	**0.2% (501 assets)**	**0.1% (736 assets)**	**2% (1004 assets)**	**10% (2130 assets)**		**1% (732 assets)**	**13% (1004 assets)**	**11% (2130 assets)**		**0.1% (736 assets)**	**2% (2130 assets)**	
Total % of all assets across Project Area	**0.3%**	**2%**	**0.02%**	**0.02%**	**0.5%**	**5%**		**0.1%**	**3%**	**5%**		**0.02%**	**0.8%**	**17%**

6 Resource assessment

6.1 Introduction

6.1.1 The period based summaries describe the state of archaeological understanding of the aggregates resource within West Berkshire by period in order to provide a basis for the research agenda and strategy and future resource management. The data has been analysed using the asset distribution maps created in GIS and the accompanying database in order to identify distribution patterns of human activity through time and to determine whether this can be used as a predictive tool for identifying areas of archaeological potential in aggregate areas, which may assist in future asset management.

6.1.2 The discussion focusses primarily on those assets which have been precisely dated to the relevant periods, and the key sites for each period. There is also an overview of additional assets which may date to the period, but for which there is inconclusive dating evidence. A total of 250 assets are recorded as Unknown representing only 6% of the total assets from the Project Area.

6.1.3 In the HER and project database most assets have been assigned to a particular chronological period, and the following period summaries are similarly divided. Because of the strict chronological divisions in the database (see Section 2), the Resource Assessment does not always follow the period divisions of the regional research framework, the *Solent Thames Archaeological Resource Assessment*, which links periods thematically to reflect continuity of material culture and separates periods in relation to cultural change.

6.1.4 Fig 6–Fig 20 show the distribution of assets within the Project Area and across each of the Study Areas. For each period, every asset has a RA (Resource Assessment) identifier number, which is referred to in the text, the gazetteer (bound separately) and shown on the figures where feasible.

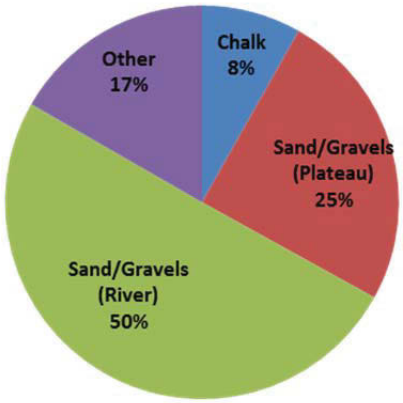
6.2 Undated prehistoric (*c* 700,000BC–AD42)

6.2.1 This group represents those assets which are known to be of prehistoric provenance, cannot be reliably attributed to a particular prehistoric period, for example artefact and flint scatters whose HER description only indicates a ‘late prehistoric’ dating. The group includes 411 undated prehistoric assets, three undated ‘early’ prehistoric assets, (700,000–4001BC) and 161 undated ‘late’ prehistoric assets (4,000–AD42).

Asset density

6.2.2 There are 575 known assets on the HER of prehistoric origin but for which a date has not been established in the HER entry. This group comprises 13.2% of the total number of assets in the Project Area, an asset density of 1.5 per km^2. Their distribution is shown on Fig 6. The proportion of assets within each of the Study Areas is shown in the diagram below.

Proportions of Prehistoric assets within each Study Area



6.2.3 The majority of this category (475 assets) comprises assets that have been either identified from aerial photography or recovered as artefact scatters, particularly during the LKVFS. In both cases more work is required to: a) confirm the existence of features identified from the air, and b) more fully integrate the extensive amount of data now available through the digitisation of the fieldwalking surveys (see the LKVFS report lodged with EH and West Berkshire HER).

6.2.4 Undated prehistoric assets comprise:

- Domestic – 1 assets;
- Findspots – 362 assets;
- Industrial – 1 asset;
- Religious, ritual and funerary – 2 assets;
- Transport – 12 assets;
- Unassigned – 30 assets ;
- Water supply and drainage – 3 assets

6.2.5 The ‘early prehistoric’ assets comprise:

- Three assets representing three find spots.

6.2.6 The ‘later prehistoric’ assets comprise:

- Agriculture and subsistence – 12 assets :
- Domestic – 13 assets;
- Findspots – 8 assets;
- Industrial – 1 asset;
- Palaeoenvironmental – 1 asset;
- Religious, ritual and funerary – 12 assets;
- Transport – 7 assets;
- Unassigned – 105 assets ;
- Water supply and drainage – 2 assets

6.2.7 Most undated prehistoric assets (64.7%) within the Project Area are Findspots. Artefact scatters form the largest element; their identification being the result of several non-intrusive archaeological surveys across West Berkshire including the LKVFS (77% of the undated prehistoric Findspots) and parts of the Berkshire Downs Survey (Richards 1978). The finds comprise a wide range of flint types, prehistoric pottery and large concentrations of burnt flint, potentially indicating areas of habitation, rather than isolated activity.

6.2.8 Asset distribution suggests that early human activity was concentrated on the fertile

and easily worked Gravel soils at the bottom of the river valleys, close to the resources of the rivers, rather than on the heavy Clay geology and higher plateau areas, although this perception may be skewed by the distribution of archaeological investigations in these areas associated with past aggregate extraction.

6.3 Palaeolithic

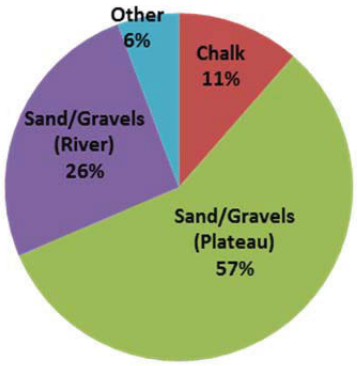
Asset density

6.3.1 There are 35 known assets dating to the Palaeolithic. The asset density within the Project Area is 0.09 per km^2. They are distributed across the Study Areas as follows:

- River Sand/Gravel: nine assets at density of 0.07 assets per km^2
- Plateau Sand/Gravel: 20 assets at a density of 0.19 assets per km^2
- Chalk: four assets at density of 0.05 assets per km^2
- Non-aggregate geologies of the Project Area: two assets at a density of 0.03 assets per km^2.

6.3.2 Two assets have been firmly dated to the Upper Palaeolithic period (40,000–10,001BC); 18 have been firmly dated to the Lower Palaeolithic (150,000–100,001BC). The remainder have not been securely dated within this period. Their distribution is shown on Fig 7. The proportion of assets within each of the Study Areas is shown in the diagram below.

Proportion of Palaeolithic assets within each Study Area



6.3.3 The asset types comprise:

- Findspots – 33 assets;
- Unassigned – 2 assets

6.3.4 The inclusion of the three undated early prehistoric and the possible 411 prehistoric assets would raise this density to a possible 1.1 assets per km^2. Naturally it is unlikely to be this high as it is probable that only a small number of these assets would actually date to this period. A further 250 assets of entirely unknown date could be of Palaeolithic origin, making a total of 699 assets or a maximum asset density of 1.8 assets per km^2, although, again it is likely that only a small number of these, if any at all, actually date to this period.

Findspots

6.3.5 Single flint artefacts, e.g. axe heads, comprise the majority of Findspots (Fig 7 RAs 1–4, 7, 8, 9–28, 30–3 and 35) with two finds spots (Fig 7; RAs 9 and 29) representing groups of two flint artefacts.

6.3.6 A Lower Palaeolithic handaxe was recovered around Hamstead Marshall (Fig 7; RA

19) providing evidence of an Anglian (or potentially a pre-Anglian) occupation of the area (Wymer 1999, 52). Isolated Lower Palaeolithic finds discovered in the 19th-century around Greenham Common (Fig 7; RA 2) provide further evidence of activity in this period.

Unassigned

6.3.7 Two Unassigned Upper Palaeolithic assets have been identified within the River Sand/Gravel Study Area, both of enormous significance for our understanding of the Upper Palaeolithic period in Britain.

6.3.8 The first, west of Kintbury (Fig 7; RA 34) and known as 'Avington VI (6)', is characterised by a prolific and undisturbed knapping floor. Although characteristic of a kill and butchery site, it could also represent industry or an area of domestic habitation. The homogeneity and completeness of the assemblage suggests that the site was short lived. The remains were first identified by chance in 1964 and were archaeologically excavated in 1972 by St Barts School Archaeological Society, with further open area investigation (35m^2) between 1978 and 1981 as a research project. The excavations revealed two major Palaeolithic flint concentrations, mainly of blade cores and long blades, and total of about 6000 artefacts. It also revealed Mesolithic activity (see below).

6.3.9 The other Upper Palaeolithic asset lies at Crown Acres, just south of Thatcham (Fig 7; RA 5). This site has a mix of flint flake types suggesting a range of activities. Wymer classified the 18 cores, 292 unretouched blades/flakes, 2 scrapers, 1 graver and 1 burin as Palaeolithic. Postgraduate research in 1986 indicated that the assemblage derived from within a cream-white sandy-marl beneath peat, which probably accumulated prior to the earliest Mesolithic occupations at Thatcham. The total Crown Acres assemblage studied included nearly 700 artefacts from the private collection of the late John Turner, a former member of the Newbury Museum Archaeology group. However, there is some debate as to whether the site is actually of early Mesolithic date rather than Palaeolithic (C Barnett *pers. comm*.; HER).

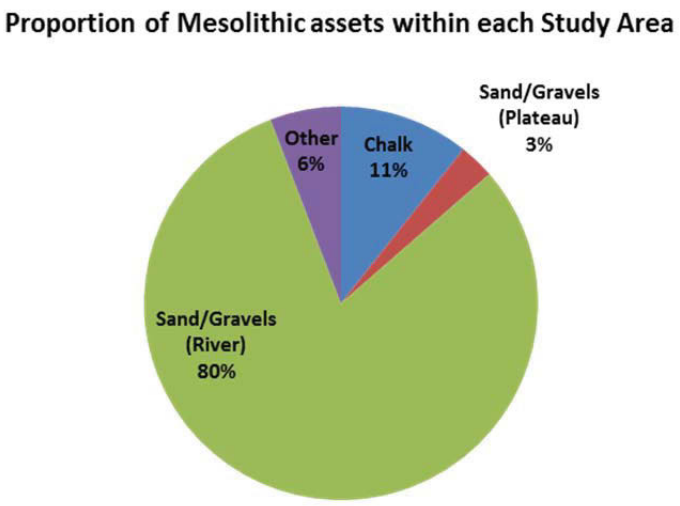
6.4 Mesolithic (*c* 10,000–4,001 BC)

Asset density

6.4.1 There are 103 known assets dating to the Mesolithic. The asset density within the Project Area is 0.26 per km^2 and they are distributed across the Study Areas as follows:

- River Sand/Gravel: 83 assets at a density of 0.61 assets per km^2
- Plateau Sand/Gravel: three assets at a density of 0.03 assets per km^2
- Chalk: 11 assets at a density of 0.13 assets per km^2
- Non-aggregate geologies of the Project Area: six assets at a density of 0.08 assets per km^2.

6.4.2 Their distribution is shown on Fig 8. The proportion of assets within each of the Study Areas is shown in the diagram below.



6.4.3 The asset types are primarily Findspots but the total group is comprised as follows:

- Agriculture and subsistence – 1 asset
- Domestic – 34 assets;
- Findspots – 54 assets;
- Industrial – 5 assets
- Unassigned – 9 assets

6.4.4 The inclusion of the three early prehistoric and the possible 411 undated prehistoric assets would raise this density to a possible 1.31 assets per km^2, although it is unlikely that all undated prehistoric assets date to this period. Any number of the 250 assets of entirely unknown date could potentially be of Mesolithic origin, which although unlikely would result in a possible total of 767 Mesolithic assets, or an asset density of 1.94 assets per km^2.

6.4.4.1. The distribution of assets suggests that river valleys were of primary importance to Mesolithic inhabitants. Of the known Mesolithic assets, around 83% were identified within the Sand and Gravel geologies. Of those, 85 were identified within the River gravels and only one asset (Fig 8; RA 52) was been identified on the Plateau gravels. Of the remaining 13 assets, 11 were recorded on the Chalk and six were record on the Other. Fig 8 would also indicate that nearly all the assets (Fig 8; RAs 1-9) were recorded at the interface between the Clay and Gravels (Plateau or River).

6.4.5 Although the majority of Mesolithic assets are isolated chance finds, a small number have been recovered during archaeological investigation undertaken as part of aggregate extraction (Fig 8), at Newbury Outfall Works (Thatcham Reedbed; Backlog Site no 3), Anslow Cottages (Backlog Site no 13), Kennetholme Farm (Backlog Site no 15), Chamberhouse Farm (Backlog Site no 18), Copyhold Quarry (Backlog Site no 27); Newbury Sewage Treatment Works (Backlog Site no 31), and Haywards Farm (Backlog Site no 59).

Agriculture and subsistence

6.4.6 Only one asset has been ascribed to this class (Fig 8; RA 11) and it represents a possible fishtrap. It was identified by Froom during his prospection work around Kintbury, to west of Newbury, although he was not able to be certain whether this was a fish trap or some sort of large pit.

Domestic

6.4.7 It is clear from the assessment of the importance of the river to Mesolithic inhabitants in this area, and that exposed gravel and thin soils of the river floor were

preferred. Seasonal camps might be identified on the basis of vertical rather than horizontal distribution of artefacts, representing a build-up of layers year after year as people returned to the same spot (Carter 2001).

6.4.8 Newbury and Thatcham in the western part of the Project Area appear to have been a focus of activity during the Mesolithic. At Crown Acres (Fig 8; RA 12) there was evidence to suggest continuation of occupation from an Upper Palaeolithic phase. Wymer makes no direct reference to this site in his article on Excavations at Thatcham (1958), but it is noted in the Archaeological Notes in the Berkshire Archaeological Journal. The Journal states: 'a series of long blades, double platformed flint cores and a small pointed backed blade have been found on the surface at Crown Acres…by members of the Newbury Museum Archaeology group'. As noted in 6.3.9, although Wymer suggested that the 313 flint artefacts of this assemblage are of Palaeolithic date, research in the 1980s indicates that the layer from which they were recovered was beneath peat, which probably accumulated at the interface of the two periods.

6.4.9 The most recent analysis of Crown Acres was by Froom, who drew parallels between this site and his site, Wawcott XII. However, Froom did not have any involvement with the 10–15 year period of surface collecting at Crown Acres, or the trial trenching carried out on more than one occasion (Froom 1971).

6.4.10 At Newbury sewage treatment plant (Backlog site 31) in the 1980s (Healy *et al.* 1992) two concentrations of flint artefacts were recorded, which although appear connected could possibly represent two separate domestic activity events (Fig 8; RA 103).

6.4.11 Archaeological interventions during the 1950s for an earlier phase of work at the Newbury Outfall works (Backlog Site 3) (now known as Thatcham Reedbed site) identified five major Early Mesolithic lithic concentrations (Sites I-V) associated with hearths and substantial animal bone assemblages (Wymer 1958, 1962, 1963; Churchill 1962) (Fig 8; RA nos 71 and 73). Approximately 16,000 flakes and spalls, 1,200 blade-like flakes, 280 cores, 285 microliths, 17 adzes, 130 scrapers, 15 awls, 6 hammerstones two of sarsen, and a variety of other flint implements were found (18,402 in total). Of these 3.5% were finished forms of Early Mesolithic type, and the rest was probably waste (Wymer 1963, 44). The activity is thought to represent temporary occupation sites visited time after time. Most of the finds were from the edge of the Kennet floodplain beneath a peat sequence.

Findspots

6.4.12 This group comprises 29 individual findspots, 12 occupation sites, seven flint scatters, five artefact scatters (Fig 8; RAs 41, 42, 43, 45-66, 68 and 72). The artefact and flint scatters were largely identified during fieldwalking exercises and are widespread and indicative of generally activity rather than a particular activity. Three flint scatters (Fig 8; RAs 63, 64 and 65) were identified by amateur archaeologist F.R. Froom during this investigations north of Kintbury to the west of Newbury in the 1990s. He did not consider there was enough evidence to suggest that they represented domestic sites.

6.4.13 Eleven of the Findspot assets identified by Froom lie on the river gravels just to the north of Kintbury (Fig 8; RAs 82, 83, 84, 87–94). These were primarily identified by surface inspection, with some limited trial trenching (Chisham 2006). The total assemblage from these sites was over 10,000 flints (Chisham 2006).

6.4.14 Within the prehistoric assets are a number of findspots recovered during the LKVFS, possibly of Mesolithic date, off the river floodplain and up the valley sides on sediments overlying plateau gravels, for example around Beenham, within Beenham parish, which might suggest activity beyond the bottom of the valleys.

Industrial

6.4.15 Six industrial assets have been identified within the Project Area and all lie within the

River Sands/Gravels rather than Plateau Sand/Gravels.

6.4.16 A group of three Industrial assets were identified in a 2km stretch between Newbury Outfall works (Backlog site 3) and Chamberhouse Farm (Backlog site 18) (Wymer 1977), south of Thatcham and east of Newbury toward the centre of the Project Area. At one (Fig 8; RA 69) flint and animal bones were recovered from 15 trenches and test pits on the side of a palaeochannel, the course of which is reflected in present ground levels. At another (Fig 8; 44), in a location known as Thatcham reed beds, on the outskirts of Thatcham, a range of flint flakes and an axe head were found during a range of trial pits and fieldwalking. The third site (Fig 8; RA 71) represented another area of extensive temporary Mesolithic occupation along the edge of what was once an old lake. Wymer's excavations here in the late 1950s/early 1960s revealed Maglemosian flint industry 8400 BC to 7500 BC and a bone industry technique broadly contemporary with Star Carr.

6.4.17 Two sites have been identified by Froom (Fig 8, RAs 70 and 80) to the north of Kintbury during his season of fieldwalking and small evaluations and a single site was identified in the east of the Project Area approximately 3km to the south-west of Theale (Fig 8; RA 71). The latter was initially identified by fieldwalking, which recorded a concentration of flints. A shallow excavation of the area greatest concentration revealed several layers of flints stratified between sand and silt. In total some 270 flints were recovered and the character of the flints indicated a Mesolithic flint knapping area.

Unassigned

6.4.18 Nine assets have been assigned to this category. Four of which are noted as occupation sites on the HER (Fig 8; RAs 74, 75, 77 and 86) although there is little supporting information for this interpretation; they have little further detail thus it is not possible to provide a more in depth consideration of these assets and they have been classed as Unassigned. Similarly, two assets are noted as hearths (Fig 8; RAs 75 and 85) but with no supporting information in the HER. The other three represent pits for which no function can be ascribed (Fig 8; RAs 76, 79 and 95)

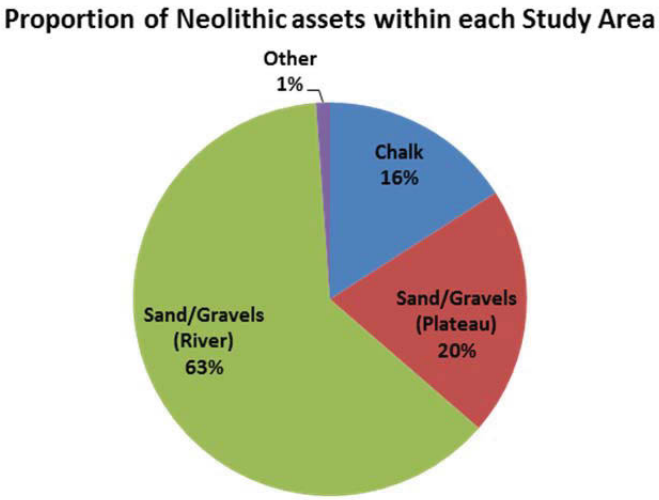
6.5 Neolithic (*c* 4000–2351 BC)

Asset density

6.5.1 There are 88 known assets dating to the Neolithic. The asset density within the Project Area is 0.22 per km^2 and they are distributed across the Study Areas as follows:

- River Sand/Gravel: 55 assets at a density of 0.40 assets per km^2
- Plateau Sand/Gravel: 18 assets at density of 0.17 assets per km^2
- Chalk: 14 assets at a density of 0.17 assets per km^2
- Non-aggregate geologies of the Project Area: one asset at a density of 0.01 assets per km^2.

6.5.2 Their distribution is shown on Fig 9. The proportion of assets within each of the Study Areas is shown in the diagram below.



6.5.3 The assets are primarily Findspots but the total group is comprised as follows:

- Domestic – 3 asset
- Findspots – 50 assets
- Religious, ritual or funerary – 19 assets
- Water supply and drainage – 1 asset
- Unassigned – 15 assets

6.5.4 The inclusion of the 161 late prehistoric and the possible 411 undated prehistoric assets would raise this density to a possible 1.67 assets per km^2, although it is unlikely that all of these assets date to this period. A further 250 assets of entirely unknown date could potentially be of Neolithic origin, which would result in a possible total of 910 Neolithic assets, or an asset density of 2.30 assets per km^2.

6.5.5 The Resource Assessment indicates that there is a slight decline in asset density from the Mesolithic period, which on initial examination could be taken to suggest a decline in activity. A comparison of the densities over the various study areas also indicate a rise in density over the Chalk but a decline in density within both the Plateau and River Sand/Gravel Study Areas. Asset density remains similar in the non-aggregate geology areas. However, the two periods cover quite different timespans; the Mesolithic represents a period of some 6000 years and the Neolithic some 1649 years. Therefore, the 103 known Mesolithic assets actually only represents only 0.02 deposited assets per year, whereas the Neolithic represents 0.05 assets deposited per year, indicating a possible rise in activity. If the figures are altered for the Neolithic to represent a similar time period as the Mesolithic, then a different picture is presented, asset density has increased to 0.86 assets per kilometre.

6.5.6 Although the majority of dated Neolithic assets are isolated chance finds, a number have been recovered during archaeological investigations associated with aggregate extraction, at Searle's Farm/Hyde Gravel Pit (Backlog Site no 4), Marley Tile Pit (Backlog Site no 5), Anslow Cottages (Backlog Site no 13), Copyhold Quarry (Backlog Site no 27), Moore's Farm (Backlog Site no 51), Lower Farm (Backlog Site no 55), and Haywards Farm (Backlog Site no 59).

Domestic

6.5.7 Only three domestic assets have been identified for the Neolithic (Fig 9; RA 1, 84 and 85). One lies south of Reading in the Pingewwod area close to the confluence of the Thames and Kennet (Fig 9; RA 1). An archaeological watching brief carried out in 1979 during topsoil stripping ahead of development in the Pingewood area identified a range of features that although primarily of Bronze Age date included a

number that were dated to the late Neolithic. The other two domestic sites (Fig 9; RA 84 and 85) are located *c* 300m apart but out of the Kennet River valley and up one of the its tributaries, and may represent parts of the same settlement area. The sites were identified during geophysical and fieldwalking survey undertaken ahead of the Newbury Reinforcement Pipeline.

6.5.8 The lack of evidence of settlement for the Neolithic period in the Lower Kennet Valley may be due to a number of reasons. To date few examples of Neolithic settlements have been recorded across southern Britain at least, making recognition of such settlements problematic. Naturally this could be a result of where Neolithic activity would appear to be focussed - on the fertile soils within the sand/gravel areas. These areas are of course prone to flooding and thus it is possible that such sites are present but deeply buried beneath layers of alluvium, making them less obvious. Moreover, much of the relevant material across the Solent-Thames area may have been deposited in pits when a living site was abandoned, making it particularly difficult to locate from surface finds. Such pits can be found in isolation or as clearly-defined clusters. They may also be scattered over an extensive area of land. Determining patterns which presumably reflect differences in the duration and intensity of occupation is therefore difficult to do. However, it is clear from radiocarbon dating that certain preferred locations were returned to several times. Structural evidence is also meagre, with the only clear evidence in Berkshire being that of the Neolithic structure identified at Horton quarry in the far east of East Berkshire, near Windsor outside the Project area (Bradley 2010).

Findspots

6.5.9 Findspots represent 61% of Neolithic assets and largely comprise isolated chance finds. They are primarily located within River Sand/Gravel Study Area. The remainder are located on Chalk, often at its interface with Sand/Gravel. The finds are fairly evenly distributed across the Project Area.

6.5.10 The group does include six artefact scatters and two flint scatters which might indicate areas of potential settlement activity. (Fig 9 RAs 2–7). These have primarily been identified through fieldwalking and mainly by the LKVFS.

Religious, ritual or funerary

6.5.11 The majority of these assets represent barrows or ring ditches (ploughed out remains of a barrow, where the perimeter ditch survives) identified primarily from aerial photographs (Fig 9; RAs 58–6, 63, and 77–82). The Project area also contains the sites of a number of Neolithic round barrows. It is likely that similar monuments once existed across most of the Solent-Thames area, although they have seldom been recognised. That has happened for two reasons. Some examples have been wrongly identified as ‘hengiform enclosures’: the sites of circular earthwork allied to the henge monuments of the later Neolithic period. The other reason is that they may have been incorrectly ascribed to the Bronze Age. It is possible that some of the ring barrows recorded within the undated Prehistoric could date to the later part of this period, in particular a round barrow in the Lambourn Valley outside the Project Area, which is argued to be a good example of a Neolithic round barrow (Bradley 2010).

6.5.12 A possible cursus (Fig 9; RA 55) has been recorded within the Project area. A cursus is an elongated rectilinear earthwork enclosure over 250m long, defined by parallel banks and ditches; the function is not known, although they are presumed to be ritual/ceremonial monuments. The cursus was identified through the Thames Valley NMP and the National Monuments Register website gives the following description of it: 'A potential Neolithic cursus is visible as cropmarks on aerial photographs. A partially visible, ditched rectangular enclosure, measuring 140m by 55m, is aligned on a north-east south-west axis. The south-west end is not visible. The north west corner is overlain by a possible prehistoric or Roman field system.'

6.5.13 This feature had apparently not been identified in an earlier survey (Gates 1975), and was removed by quarrying in the 1970s and 1980s. Like other cursus in the Solent-Thames area, it runs parallel to a watercourse, in this case the Kennet river (Bradley 2010)

6.5.14 Two mortuary enclosures have been identified within the north-east of the Project Area, within the Pangbourne valley (Fig 9; RAs 56 and 57). Although noted as two separate assets, they have been separated by a railway line and thus it is likely that they are part of one larger important prehistoric funerary complex. The NMP cropmark transcriptions show two oval enclosures, both with ring ditches nearby.

6.5.15 In the south-east of the Project Area *c* 800m to the west of Burghfield, is a group of three round barrows (Fig 9; RAs 53, 62 and 63). One ('Poors Allotment') is scheduled and survives up to 25m in diameter and a metre in height (RA 54). Close to this barrow is the remains of ring ditch identified by topsoil stripping in advance of the gravel extraction (RA 62). The third was identified in 1963 by the Aldermaston Archaeological Society (RA 63).

6.5.16 Two assets (Fig 9; RA 56 and 57) represent the discovery of human remains. One (RA 56) was found in 1869 *c* 5km to the west of Newbury in the centre of the Project Area. Notes of the observation refer to a human skull which was broken after discovery. However, enough remained for it to be identified as coming from a young male. Some red deer antlers were nearby, and another skull had apparently been dug out some time earlier. The other asset (RA 57) also represents the discovery of human remains found in association with deer antlers. These were found near Benham Park House *c* 1.5km to the west of Newbury.

Water supply and drainage

6.5.17 In the west of the Project Area, within the Sand/Gravel (River) Study Area, excavations at Moore's Farm extraction site (Backlog Site 51) identified a Neolithic gully (Fig 9; RA 88). It was described as a linear gully with a U-Shape, 0.4m wide and 0.24m deep. It contained a double-ended Neolithic scraper and burnt flint.

Unassigned

6.5.18 Unassigned assets represent assets that have primarily been identified through archaeological investigation but cannot be assigned a particular function. The majority of this group are pits or pit groups identified during archaeological investigations (Fig 9; RAs 67–74). Two post holes have been recorded (Fig 11; RAs 75 and 76). All but one lie in the River Sand/Gravel Study Area and in the east of the Project Area to the south-east of Reading in areas that have been subject to heavy gravel extraction. A single pit lies on the Chalk (Fig 9; RA 68) towards the centre of the Project Area on the edge of the Pangbourne River valley. Given the grouping it is possible that they represent a habitation area to the south-east of Reading (Bradley 2010).

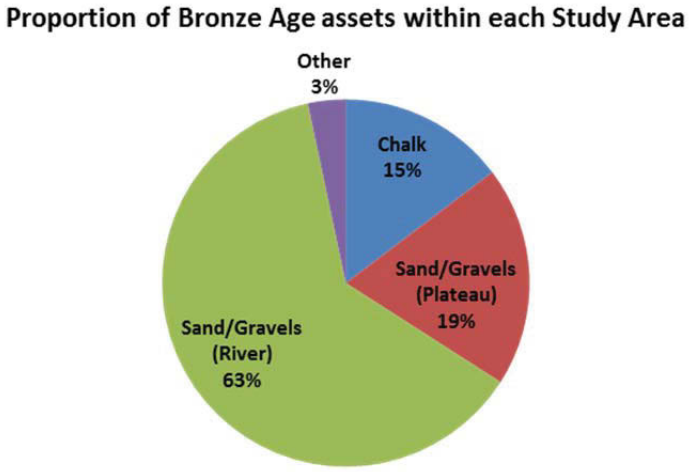
6.6 Bronze Age (*c* 2350–751 BC)

Asset density

6.6.1 There are 360 known assets dating to the Bronze Age. The asset density within the Project Area is 0.1 per km^2 and they are distributed across the Study Areas as follows:

- River Sand/Gravel: 226 assets at a density of 1.66 assets per km^2
- Plateau Sand/Gravel: 70 assets at a density of 0.68 assets per km^2
- Chalk: 53 assets at a density of 0.63 assets per km^2
- Non-aggregate geologies of the Project Area: 11 assets at a density of 0.15 assets per km^2.

6.6.2 Their distribution is shown on Fig 10. The proportion of assets within each of the Study Areas is shown in the diagram below.



6.6.3 The asset types comprise:

- Agriculture and subsistence – 5 assets
- Defence – 2 assets
- Domestic – 20 assets
- Findspots – 69 assets
- Hoards – 1 assets
- Industrial asset – 4 asset
- Religious, ritual or funerary – 55 assets
- Transport – 2 asset
- Unassigned – 194 assets
- Water supply and drainage – 8 assets

6.6.4 The inclusion of the 109 late prehistoric and the possible 411 prehistoric assets would raise this density to a possible 2.36 assets per km^2, although it is unlikely to that all of these assets date to this period. A further 250 assets of entirely unknown date could date to this period, making a total of 1183 assets or a maximum asset density of 2.99 assets per km^2.

6.6.5 Assets from this period were the second most common asset to be identified in archaeological investigations associated with quarrying (Fig 10). Bronze Age remains were uncovered at Cunning Man site (Backlog Site 2), Searle's Farm/Hyde Gravel Pit (Backlog Site 4), Blake's Gravel Pit (Backlog Site 6), Aldermaston Wharf (Backlog Site 7), Bradley's Pit (Backlog Site8), Field Farm (Backlog Site 10), The Ballast Hole (Backlog Site 11), Hartshill Copse (Backlog Site 12), Anslow Cottages (13), Chamberhouse Farm (Backlog Site 18), Knight's Farm (Backlog Site 19), Raghill (Backlog Site 21), Copse Area, Theale Pit (Backlog Site 24), Bath Road (Backlog Site 25), Copyhold Quarry (Backlog Site 27), Pingewood (Backlog Site 32, 33), George's Farm (Backlog Site 35), Moore's Farm (Backlog Site 51), Mill Road North (Backlog Site 53), Lower Farm (Backlog Site 55), Gravel Pit Farm (Backlog Site 61), Little Common Sandpit (Backlog Site 66), and Padworth Mill Gravel Pit (Backlog Site 67).

Agriculture and subsistence

6.6.6 Agricultural and Subsistence assets (Fig 10; 54–58) represent only 1.4% of Bronze Age assets and have a density of 0.01 per km^2 within the Project Area and a similar density in the Plateau Sand/Gravel Study Area.

6.6.7 The asset group comprises a field system and a number of linear ditches, mostly of mid/late Bronze Age. Their relative paucity suggests that there was limited exploitation or alternatively lack of evidence. Data for the whole region suggests a greater number of more extensive field systems on the Chalk uplands, which may have been utilised for grazing and pasture requiring more boundaries to coralle cattle. The general low density all of extensive late Bronze Age field systems within West Berkshire, and the Project Area compared with other counties in the South East of England is unusual and requires further research.

Defence

6.6.8 Two Defence assets have been recorded in the Project Area (Fig 10; 59 and 60), both on Plateau Sands/Gravels. Both are scheduled earthworks. One is part of an Iron Age hillfort (RA 59) and undoubtedly represents a very early phase. The other (RA 60) appears to be a single bank and ditch running across the neck of a promontory creating a promontory hillfort.

Domestic

6.6.9 Understanding of Bronze Age settlement patterns is marginally better than for the earlier periods, although in general evidence of early Bronze Age settlement is relatively scarce (Bradley 2010). On the other hand there is an increase of in the number of permanent dwelling structures, which could either indicate a change in settlement patterns or that the style of structure has changed to more durable materials.

6.6.10 Domestic Assets represent only 4.7% of Bronze Age assets and have a density of 0.05 per km^2 within the Project Area. All lie within the Sand/Gravel Study Area with an asset density of 1.75 per km^2 but 16 are within the River Gravel areas and 5 on the Plateau Gravels. The majority of these assets are dated to the late Bronze Age, with one asset being of middle Bronze Age date, one being early Bronze Age and three dating to the whole period.

6.6.11 The asset group includes: a group of ditches and possible structures discovered during an archaeological investigation (Fig 10; RA 61); a burnt mound (a small mound of burnt stones heated to heat water; Fig 10; RA 62); a ditched enclosure (Fig 10; RA 63); three hut circles (Fig 10; RA 64–66); a hut circle settlement (Fig 10; RA 67); a possible round house or other structure (Fig 10; 69 and 70); a rubbish pit (Fig 10; RA 71), and 10 areas of features that indicate areas of settlement (Fig 10; 68, 72, 73–80).

Findspots

6.6.12 Findspot assets represent the second largest group of assets (69 assets) (Fig 10; RAs 1-10, 83–126 and 348–356) representing 19.3% of Bronze Age assets and have a density of 0.17 per km^2 within the Project Area. The distribution indicates greater activity towards the bottom of river valleys.

6.6.13 A significant number of these (49 assets), are isolated chance finds made during the late 19th and early 20th centuries, primarily by interested amateurs. Eighteen of the 70 are artefact scatters, with only seven being the result of the LKVFS. The rest either relate to fieldwalking surveys at the edge of the chalk uplands as part of the Berkshire Downs Survey undertaken in the 1970s or to artefact scatters found during smaller surveys as part of an archaeological evaluations. The apparently small number of artefact scatters identified by the LKVFS suggests that activity focussed on the south side of the Kennet, at edge of the river gravels. However, the complete dataset of the LKVFS has yet to be fully integrated into the HER and it is likely that once this is done, the number of artefact scatters dating to this period will increase and may show a wider distribution of Bronze Age activity across the Project Area. For example, the LKVFS data highlights an area of possible prehistoric activity on an area of plateau gravels around Beenham, on the north side of the Kennet.

Hoards

6.6.14 One hoard (Fig 10; RAs 357) has been recorded in the north-east of the Project Area. It was discovered when a new housing estate was being developed on the top of a hill in Yattendon Park in the late 1870s. The hoard has been detailed and included 28 spearheads and sockets, as well as socketed and flat axes, palstaves, knives, chisels, gouges, sword fragments, 3 pieces of flat bronze sheet and other pieces.

Industrial asset

6.6.15 Four Industrial assets have been identified within the Project Area. Two lie within the Chalk Study Area in the north (Fig 10; RA 13 and 14) and comprise a dene hole (an underground structure consisting of a number of small chalk caves entered by a vertical shaft; RA 13) near North Heath, along with a series of chalk quarry pits 1.5km to the west of Chieverly (RA 14).

6.6.16 A lithic working was site was identified in Mosshall Wood in the north-east of the Project area (Fig 10; RA 132) during fieldwalking. Archaeological investigations in 2003 at the Hartshill Copse quarry (Fig 10; Backlog Site **12**) identified an area of possible early ironworking (Collard et al, 2006, pp 367–421). It comprised a late Bronze Age (10th century BC) settlement with slag, iron staining, iron-smithing residues and hammerscale. Almost all the hammerscale came from features associated with two 10th century BC round-houses. One round house produced over 50% of the residues.

Religious, ritual or funerary

6.6.17 Sixty-four Religious Ritual and Funerary assets have been recorded within the Project Area. These are mostly single features located on the Sand and Gravel geology. Barrows represent the largest element (30 assets). The majority are focussed close to the Lower Kennet Valley floor on the Plateau gravels south of the Kennet River, with two main groups near Mortimer (the Holdern Fir's group of barrows; Fig 10; RAs 130–34 and 136–42) *c* 6.5km to the southwest of Reading, and Brimpton Common (Poor's Allotment Fig 12; RAs 135, 174 and 175) near Burghfield *c* 5km to the southwest of Reading. Only three barrows have been identified within the Chalk Study Area (Fig 10; RAs 15, 16 and 23).

6.6.18 Ring ditches form the second largest group. The majority lie within on the River Sands and Gravels just south of Reading (Fig 10; RAs 313, 317, 318, 321, 322, 324 and 325) and on the Plateau Sands and Gravels around Mortimer and Burghfield (11 of the 17) (Fig 10, RAs 160 and 326). One such feature is located in the north-east of the Project Area adjacent to Pangbourne (Fig 10; RA 161) and the other lies at the interface between the River gravel and Chalk in the north-west of the Project Area on the eastern slope of the Lambourn River Valley (Fig 10; RA 162). Five ring ditches lie on the Chalk (Fig 10; RAs 18-20, 22 and 53) and are focussed to the west of the Project Area, west of Newbury. One lies on the northern boundary of the Project Area towards the centre (Fig 10; RA 21). A large group of ring ditches (53) have been recorded within Unassigned because these have been identified from aerial photography but have not yet been investigated on the ground to determine their nature and date. A significant number are close to the barrows and ring ditches already confirmed, and suggest that areas around Mortimer, Reading and Theale were of ritual importance. A number of these features have continued from the Neolithic period.

6.6.19 Burials, spread more generally through the Project Area, comprise the rest of the assets and represent a great increase in this asset type from previous periods. The group is comprised of nine cremations (Fig 10; RAs 145-153), three cremation cemeteries (Fig 10; RAs 154, 155 and 156), one inhumation burial (Fig 10; RA 159), one burial (Fig 10; RA 17) and two cemeteries (Fig 10; RAs 143 and 144) which are groups of barrows identified in the 1930s and might be the same as barrows

accidently recorded in later decades.

6.6.20 The Neolithic cursus (Fig 9; RA 55) is also noted in this period (Fig 10; RA 157) as it was probably still a feature of the landscape and connected Bronze Age monumental structures within a 'ritual landscape'.

Transport

6.6.21 Two Transport assets have been identified within the River Sand/Gravel Study Area. One being some form of wharf/dock structure and the other is a trackway leading to it (Fig 12; RA 179 and 180). They lie just south of Reading on the Kennet River, their purpose is uncertain but provides access to the river and would aid in transportation of goods up and down the rivers and activities such as fishing.

Unassigned

6.6.22 This group includes features for which a particular purpose has not been attributed in the HER, such as pits, post holes, post alignments, hearths, ovens, middens, which might be domestic or industrial in nature of with other purposes.

6.6.23 Unassigned represent the largest types of Bronze Age assets. They are mostly on the Sand and Gravel geologies and the majority have been identified by intrusive archaeological investigation on the valley floor primarily as a result of increased aggregate extraction from the 1970s and also urban and transport development, in particular to the south of Reading in the Pingewood area and around Aldermaston Wharf, and on Plateau in the south of the Project Area, i.e. near Brimpton, Harts Hill near Upper Bucklebury and Crookham. It is likely that many of these features are related to the Domestic assets above and provide evidence to support a shift to less transitory settlement over the Bronze Age.

6.6.24 As noted in Religious Ritual and Funerary, this group also contains a large number of ring ditches that have been identified by aerial photography. A large group of ring ditches have been identified on the Chalk to the west of Kintbury in the west of the Project Area (Fig 10; RAs 31–44). A large group of ring ditches have also been identified on the river gravels to the south of Reading (Fig 102; RAs 292–312, 314, 315, 316, 319, 320 and 323) amongst the barrows and ring ditches noted in 6.6.18 above.

Water supply and drainage

6.6.25 Eight Water Supply and Drainage assets of Bronze Age date have been identified in the Project Area. Within this group five are recorded as gullies and three as ponds. The gullies are distributed within the Sand/Gravel Study area with four located within the Kennet River Valley south of Reading and one on plateau gravels just north of Thatcham. These have been have been identified during excavation and possibly represent slots rather than gullies (Fig 10; RAs 346–350). The ponds (Fig 10; RAs 351–353) are all also within the Sands and Gravel geologies and located just south of Reading and were identified during the same excavations that recorded the gullies. The ponds represent either water storage areas/watering holes for stock or drainage pits (HER).

6.7 Iron Age (*c* 750BC–AD 43)

Asset density

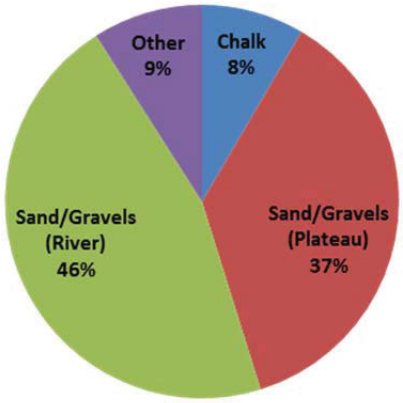
6.7.1 There are 166 known assets dating to the Iron Age. The asset density within the Project Area is 0.42 per km^2 and they are distributed across the Study Areas as follows:

- River Sand/Gravel: 76 assets at a density of 0.56 assets per km^2
- Plateau Sand/Gravel: 61 assets at a density of 0.59 assets per km^2

- Chalk: 14 assets at a density of 0.17 assets per km^2
- Non-aggregate geologies of the Project Area: 15 assets at a 0.21 assets per km^2.

6.7.2 Their distribution is shown on Fig 11. The proportion of assets within each of the Study Areas is shown in the diagram below

Proportion of Iron Age assets within each Study Area



6.7.3 The asset types comprise:

- Agriculture and subsistence– 10 assets
- Defence – 10 assets
- Domestic – 12 assets
- Findspots – 38 assets
- Industrial – 1 asset
- Religious, ritual or funerary – 8 assets
- Transport – 3 assets
- Unassigned – 82 assets
- Water supply and drainage – 2 assets

6.7.4 The inclusion of the 161 late prehistoric and the possible 411 undated prehistoric assets would raise this density to a possible 1.87 assets per km^2, although it is unlikely that all of these assets date to this period. A further 250 assets of entirely unknown date could be of Iron Age origin, making a total of 988 assets or a maximum asset density of 2.5 assets per km^2.

6.7.5 In contrast to the Bronze Age our understanding of Iron Age settlement patterns within the Project Area is more limited, with a significant decline in the number of known Iron Age assets. The intensification of use of the landscape through sub-division and field systems is also less clear.

6.7.6 The reasons for a drop in the number of assets are not known. It may be associated with the overlap between the Bronze Age and the Roman periods, with Iron Age assets assigned to these other periods in the HER. Iron Age and early medieval pottery can be quite similar and it is possible that there has been some misdating. Alternatively there may have been a general decline in activity as is suggested by the data.

6.7.7 The number of Iron Age assets identified through archaeological investigations related to aggregate extraction is less than the Bronze Age, but still considerable. Remains of this period have been found at Aldermaston Wharf (Fig 12; Backlog Site 7), Bradley's Pit (Backlog Site 8), The Ballast Hole (Backlog Site 11), Hartshill Copse (Backlog Site 12), Anslow Cottages (Backlog Site 13), Chamberhouse Farm

(Backlog Site 18), Field Farm Barn (Backlog Site 20), Raghill (Backlog Site 21), Copyhold Quarry (Backlog Site 27), Lower Farm Quarry (Backlog Site 28), George's Farm (Backlog Site 35), Preferred Area 5 (Backlog Site 37), Mill Road North (Backlog Site 53), Gravel Pit farm (Backlog Site 61), Little Common Sandpit (Backlog Site 66), Lane End Gravel Pit (Backlog Site 68), Curtis Gravel Pit (Backlog Site 71), and Boxford Hill Camp (Backlog Site 72).

Agriculture and subsistence

6.7.8 Iron Age agricultural and subsistence assets, form a proportionally larger group within the Project Area than they did for the Bronze Age, *c* 6.0% as opposed to 1.4%. Their density has naturally increased 0.03 per km as opposed to 0.01 per km. However, their distribution mirrors that of the Bronze Age with almost all within the River Sand/Gravel Study Area, on the fertile river floodplain gravels.

6.7.9 Current understanding of the extent of agriculture in this period is hampered by our lack of knowledge as to how much land was still wooded. Large areas of woodland would naturally restrict the area readily available for agricultural exploitation or habitation as they would in the Bronze Age and while some clearance would have been undertaken its extent is presently little understood.

6.7.10 Included within this group are four field systems, groups of bank ditches forming fields either for arable or husbandry, (Fig 11; RAs 7–10), a 'Celtic' field system (an antiquarian term of reference for Iron Age field system) (Fig 11; RA 3), two Banjo enclosures, so named because they have a banjo shape (Fig 11; RAs 1 and 2), two ditches, which are very wide and represent boundary ditches of some sort (Fig 11; RAs 4 and 5) and a lynchet, i.e. a bank and ditch indicating were ploughing had taken place (Fig 11; RA 11).

Defence

6.7.11 Ten Defence assets have been identified within the Project Area, primarily on the Plateau Sand/Gravel; none are within the river valleys. They either lie on the Plateau on higher ground away from the valley floor (RAs 13 and 20) or further up towards the Chalk uplands but on watersheds between valleys (RAs 16–19, 21, 22 and 24). This suggests that these have been constructed in controlling or very visible positions, possibly reflecting change control of the landscape.

6.7.12 The asset group comprises five ditched features that are generally accepted as hillforts (one scheduled monument, two multivallate hillforts and two single bank and ditch hillforts) (Fig 11; RAs 17–24) and two ditched features that are possibly hillforts (Fig 11; RA 13 and 16). One is a bank and ditch (Fig 11; RA 13) that cuts across a promontory and possibly dates from the Bronze Age (Fig 11; RA 60). The other is a circular bank and ditch which appears to have an inner bank and ditch (Fig 11; RA 16). It is noted in the HER reference that it is possible that this feature could be Medieval. The number of defence assets has increased markedly from the Bronze Age. Unfortunately, not enough excavation has been undertaken to give a more accurate dating and understand their role within the Project Area or West Berkshire as a whole.

Domestic

6.7.13 Domestic assets represent 7.2% of the total of Iron Age assets and indicate a continued rise in the level of established settlement within the Project Area. Although the number of Domestic assets has declined slightly from the Bronze Age, ie 12 down from 21, they represent a higher proportion because the total number of assets has declined 166 down from 360. A number of Unassigned assets may indicate other settlement as yet unrecognised. Domestic assets are primarily on the Sand and Gravels geologies.

6.7.14 The group comprises five settlement sites of early and middle Iron Age date (Fig 11; RA 27, 29, 30, 31 and 32), although all are described as unenclosed only one is

registered in the HER as an 'unenclosed settlement', a settlement site of late Iron Age date (Fig 11; RA 28), rubbish pit of late Bronze/early Iron date (Fig 11; RA 26) representing a low level occupation site, and two enclosed settlements, a round house, a farmstead and an occupation site of late Iron Age date (Fig 11; RAs 6, 12, 14, 15 and 25).

6.7.15 The distribution of the Domestic assets indicates that during the Iron Age there was a movement out of the valleys and up to the plateaus, possibly within the protection range of the Hillforts. The majority of evidence comes from cut features identified during archaeological excavations undertaken in the latter half of the 20th century.

Findspots

6.7.16 Findspots represent the second most common asset type, comprising 23% of the total of assets for the Iron Age. Of this number approximately 68% are isolated chance finds made by interested amateurs during the late 19th and early 20th centuries. The remaining 32% are artefact scatters; the majority of these represent finds identified during archaeological excavation but without associated features, whilst six assets are artefact scatters identified during fieldwalking survey, and intrusive investigation may reveal associated remains. This figure may increase once the LKVFS data has been fully integrated into the HER. Findspots have a density within the Project Area of 0.10 per km^2 and are distributed across the Project Area but primarily on the Sand and Gravel geologies.

Industrial

6.7.17 Only one Industrial asset (Fig 11; RA 70) has been identified in the Chalk Study Area in the north. It represents a dene hole (an underground structure consisting of a number of small chalk caves entered by a vertical shaft) that may also have been in use during the Bronze Age (Fig 10; RA 12). The iron working site identified in the late Bronze Age appears to have ceased as it is not recorded for this period. It should be noted that although there are other iron working sites but they fall outside the Project Area.

Religious, ritual or funerary

6.7.18 Eight Religious Ritual and Funerary assets have been identified within the Project Area. Other than one asset in the non-aggregate geology, the others were all on Sand/Gravel geology. There is a significant drop in number of this asset type from the Bronze Age, indicating a clear change between the Iron Age and Bronze Age in terms of ritual activity associated with the disposal of the dead.

6.7.19 The assets are all cremation burials; no monumental structures such as burial mounds, are recorded in the Project Area for this period. The majority are single cremations, although they may include several vessels (Fig 11; RAs 72–76 and 78). Two represent multiple cremation burials although one comprises two burials (Fig 11; RA 71) and one contains three cremations (Fig 11; RA 77). The cremation burials are not necessarily associated with settlement sites as is witnessed in many other Iron Age sites across the country. Only two assets are located close to a settlement site; one within the Kennet Valley (Fig 11; RA 73) near to a potential settlement located during excavations near Aldermaston Wharf (Fig 11; RA 28) and the other (Fig 11; RA 71) close to settlement on the plateau gravels west of Mortimer found during excavations at Raghill.

Transport

6.7.20 Three Transport assets (Fig 11; RA 79–81) have been identified within the Project Area, on the Kennet River Sands and Gravels in the east between Woolhampton and Reading. All three appear to be different sections of the same Iron Age trackway which is either a section of or a connection to the Silchester to Dorchester trackway. One section (RA 79) passes through a settlement (RA 28) lying within the

Kennet River valley. They appear to have been reused during the Roman period.

Unassigned

6.7.21 Unassigned assets form the largest group for the Iron Age, 82 have been identified within the Project Area for this period (49% of all Iron Age assets) and have an asset density of 0.21 per km^2; primarily on the River Sands and Gravels. Unassigned assets represent features such as pits, post holes, post alignments, hearths, ovens, middens and ditches which have been identified through archaeological investigation, often in response to gravel aggregate extraction within the Project Area in the late 20th century. A small number are related to small scale archaeological investigation in response to smaller extraction in the first half of the 20th century. It is likely that they relate to settlement sites recorded in the vicinity.

Water supply and drainage

6.7.22 Two Water Supply and Drainage Assets (Fig 11 RAs 164 and 165) have been identified within the River Sand and Gravel Study Area. They were identified during archaeological investigations in the Aldermaston Wharf area between Woolhampton and Theale prior to gravel extraction in the Beenham area (Backlog Site 7). One (RA 166) is described as a pond *c* 7.2m long and 2.4 m wide with almost vertical sides, a fairly flat bottom and *c* 0.5m deep. The other was recorded as a gully (RA 165) although it is not recorded if it fed into the pond.

6.8 Roman (*c* 43–410AD)

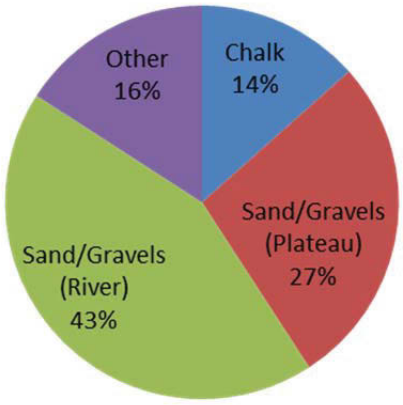
Asset density

6.8.1 There are 529 known assets dating to the Roman period. The asset density within the Project Area is 1.34 per km^2 and they are distributed across the Study Areas as follows:

- River Sand/Gravel: 229 assets at a density of 1.69 assets per km^2
- Plateau Sand/Gravel: 145 assets at a density of 1.41 assets per km^2
- Chalk: 71 assets at a density of 0.85 assets per km^2
- Non-aggregate geologies of the Project Area: 84 assets at a density of 1.16 assets per km^2.

6.8.2 Their distribution is shown on Fig 12. The proportion of assets within each of the Study Areas is shown in the diagram below.

Proportions of Roman assets within each Study Area



6.8.3 The asset types comprise:

- Agriculture and subsistence – 15 assets
- Domestic – 54 assets
- Findspots – 216 assets
- Hoard – 4 assets
- Industrial – 20 assets
- Palaeoenvironmental – 1 asset
- Recreational – 2 assets
- Religious, ritual or funerary – 10 assets
- Transport – 57 assets
- Unassigned – 137 assets
- Water supply and drainage – 13 assets

6.8.4 A further 250 assets of entirely unknown date could conceivably be of Roman origin, making a total of 779 assets or a maximum asset density of 2.0 assets per km^2, although it is unlikely that all date to this period.

6.8.5 Archaeological investigations associated with aggregate extraction in the Project Area have often revealed evidence of Roman activity. Remains of this date have been recorded at the following quarries:

- Ivy House Pit (Fig 12; Backlog Site 1)
- Cunning Man site (Backlog Site 2)
- Newbury Outfall Works (Backlog Site 3)
- Searle's Farm/Hyde Gravel Pit (Backlog Site 4)
- Marley Tile Pit (Backlog Site 5)
- Aldermaston Wharf (Backlog Site 7)
- Bradley's Pit (Backlog Site 8)
- Meale's Farm (Backlog Site 9)
- The Ballast Hole (Backlog Site 11)
- Hartshill Copse (Backlog Site 12)
- Anslow Cottages (Backlog Site 13)
- Kennetholme Farm (Backlog Site 15)
- Wasing Estate (Backlog Site 17)
- Chamberhouse Farm(Backlog Site 18)
- Field Farm Barn (Backlog Site 20)
- Raghill (Backlog Site 21)
- Lower Farm Quarry (Backlog Site 28)
- Pingewood (Backlog Site 32)
- Pingewood (Backlog Site 33)
- George's Farm (Backlog Site 35)
- Hartshill Copse (Backlog Site 36)
- Preferred Area 5 (Backlog Site 37)
- Bellwood, Newbury (Backlog Site 42)
- Moores Farm (Backlog Site 51)
- Midgham Quarry, Bath Road (Backlog Site 52)
- Oareborough Hill, Hermitage (Backlog Site 54)
- Lower Farm (Backlog Site 55)
- Morewood (Backlog Site 56)

- Kennetholme Farm (Backlog Site 60)
- Speen Hill (Backlog Site 65)
- Kirton Farm Gravel Pit (Backlog Site 69)
- Pyle Gravel Pit (Backlog Site 70)
- Curtis Gravel Pit (Backlog Site 71)
- And Cheynes Meadow (Backlog Site 73)

Agriculture and subsistence

6.8.6 Fifteen Agriculture and Subsistence assets have been identified within the Project Area. Six assets are on the Chalk; nine are on the Sand and Gravel geologies.

6.8.7 The assets comprise a 'Celtic' field system (Fig 12; RA 1), a ditch (RA 2), an enclosure (RA 3), 10 field systems (RAs 4–13) and two lynchets (RA 14 and 15). Five assets (RAs 2, 4, 5, 10 and 13) have been identified through archaeological investigations as a result of extraction activity to the south of Newbury and Thatcham, although one asset is south of Reading. Nine assets (RAs 1, 6–9, 11, 12, 14 and 15) have been identified through the examination of aerial photography; five of these are within the Chalk Study Area. One asset was archaeological investigated in the late 1800s and then examined by aerial photography (RA 3).

6.8.8 The relative paucity of Agriculture and Subsistence assets suggests a decline in such activity. Villa estates could cover large areas of land encompassing several geology types and a more detailed examination of the assets and their associations would provide a better picture of how the landscape was being used.

Domestic

6.8.9 Fifty-four Domestic assets have been identified within the Project Area and have an asset density of 0.14 per km^2. There are 14 assets within the Chalk Study Area and 31 assets are on the Sand and Gravel geology. A further nine assets are on non-aggregate geology. The assets can be divided into three basic groups, Buildings, which includes bath houses (3), buildings (2), villas (18) houses (1); Settlements, which comprises enclosed settlements (2), enclosures (1), farmsteads (4), occupations sites (2), settlements (16); and various domestic types, which represents single elements of probably larger features and comprises artefacts scatters (1), middens (2), rubbish pits (1) and threshing floors (1).

6.8.10 Villas represent the largest group. They located on all geologies and the pattern of dispersal suggests that they were primarily located close to transport routes. Only one villa asset lies out of a river valley, although it appears to lie on the watershed between two valleys (RA 69). The three bath houses (Fig 12; 17, 18 and 19) identified in the Project Area all correspond to villa sites (Fig 12; 53–56, 58 and 63 and 64). The other building/house assets (RAs 20, 21 and 29) represent single structures that are separated from could relate to a villa, such as RA 21 which relates to the villa at Wellhouse Farm (RA 66) first identified in 1839 and lies on the western side of the River Pang on the Chalk.

6.8.11 The settlement group includes areas that comprise evidence for a number of associated buildings, generally smaller than villas, that have either been identified through excavations (RAs 22–26, 28, 32, 33, 35, 37, 40–42, 44 and 47–49), or from landscape studies including aerial photography (RAs 27, 36, 38, 39, 43, 45, 46 and 51).

6.8.12 The increase in the number of settlement assets suggests a rise in population in the Project Area. Domestic assets represent the 7.3% of the total of Roman assets, which is a higher proportion than earlier periods. The increase is further emphasised by the fact that the Roman period covers a much smaller time span. There is also a noticeable change in location of habitation. While there is a continuity of habitation on the Gravels, during the Roman period there is a rise in the number of Domestic

assets recorded on the Chalk. In the Bronze Age none are recorded on the Chalk, one in the Iron Age but 14 in the Roman.

Findspots

6.8.13 Findspots form the largest asset type for the Roman period comprising 216 assets from a total of 529 assets (41%) and was the second largest group of assets from all chronological periods. and have an asset density of 0.55 per km^2 across the project Area. They are distributed primarily on the Sands and Gravels (152 assets) with some on the Chalk (16 assets). There is a notable increase on the non-aggregate geologies with 48 assets with an asset density of 0.66 per km^2.

6.8.14 The group is mostly comprised of isolated individual findspots with some artefact scatters. Finds include pottery, coins or other items recovered either by individuals as chance finds or through archaeological excavation as a result of quarrying during the late 19th and 20th centuries. Artefact scatters have been recorded through fieldwalking. A very small number represent scatters of finds identified during excavations that were not within specific features.

6.8.15 Findspots cover a range of locations throughout the Project Area. Scatters and groups of finds may represent potential occupation sites, such as settlement or industry. Artefact scatters identified by the LKVFS suggested small settlements on the valley sides with possibly more extensive, larger settlements on the valley floor.

Hoard

6.8.16 Four Hoards have been recorded within the Project Area, on the Chalk (one asset) (Fig 12; RA 286) and the Sand/Gravels (one asset) (Fig 12; RA 287). Two were found on the non-aggregate geologies (Fig 12; RA 288 and 289). These represent discoveries of coin accumulations found generally either during excavation or by metal-detecting, although one hoard (Fig 12; RA 287) was reputedly found by American soldiers during manoeuvres in the Second World War. It was said to 'contain over 1000 coins and that these were dispersed amongst the soldiers and villagers' (HER MWB10738).

Industrial

6.8.17 Twenty Industrial assets have been identified within the Project Area and have an asset density of 0.05 per km^2. They are mostly located on the Sand/Gravel geologies (Fig 12; RAs 291–6, 300–6, 308 and 309) with four assets within the Chalk Study Area (Fig 12; RAs 290 and 297–99), with one asset from the non-aggregate geologies (Fig 12; RAs 307).

6.8.18 The 20 assets represent a substantial rise in industrial sites within the Project Area from all the previous periods, there being only 12 Industrial assets identified for the whole prehistoric period. Fourteen of these are associated with pottery production and for the most part are situated off the valley floor but still primarily within the Sand/Gravel Study area. Three have been identified within the Chalk Study area. However, closer examination shows that they actually lie at the interface of the Chalk and Sand/Gravels. It is likely though that this positioning is not crucial to such kilns, rather proximity to wood would be more important. A group of individual industrial assets (RAs 293, 300–6), located *c* 850m north of Hamstead Marshall (Backlog Site 56), may form part of a single kiln complex, which would reduce the total number. On present data it is not possible to link them to a single complex however, and it is possible that some kilns were not for pottery production but were corn drying ovens.

6.8.19 The assets include four corn drying sites (RAs 290–3) and one 'food processing' site (RA 294), which may have been used for food items other than corn. Three of the corn driers are located at the Hamstead Marshall site discussed above (Backlog Site 56), suggesting a large multi-use complex.

6.8.20 One asset recorded on the HER within the Project Area is a possible Roman 'peat cutting' site (RA 295) with associated Roman finds, located close to Newbury (Backlog Site 46). Documentary evidence shows that at this location the river once had a different course and was later altered artificially. Peat cutting was carried out in this area during the medieval period. Peat was generally used for the heating of homes but it may have supplied the pottery kilns within the Project area.

6.8.21 In general the Industrial assets are located away from areas of settlement, except for a corn drying oven (RA 290) and a pottery kiln (RA 298) which are located in a villa complex (RA 44 and 62) where a threshing floor was also identified (RA 51). It is also noticeable that they have been located away from trackways although it is possible that they are yet to be identified or that the river was man source of transport.

Palaeoenvironmental

6.8.22 One Palaeoenvironmental asset has been identified within the River Sand/Gravel Study Area (Fig 12; RA 310). It represents a geoarchaeological investigation carried out ahead of the construction of the M4 motorway. It identified three soil horizons, early prehistoric, later prehistoric (Bronze Age to Iron Age) and the Roman and later.

Recreational

6.8.23 Two Recreational assets have been identified within the Chalk Study Area (Fig 12; RA 311) and nearby on the non-aggregate geology (Fig 12; RA 312). Both represent potential theatres. The area was survey in 1997 as part of an examination of a potential religious landscape. Two mounds were examined and their morphology, ie sub-circular, evenly graded banks surrounding depressed areas, and size suggested theatres However, neither has been excavated so their function has not yet been proved conclusively.

Religious, ritual or funerary

6.8.24 Ten Religious Ritual and Funerary asset have been identified within the Project Area: five assets within the Chalk Study Area (Fig 12; RAs 313, 314, 316, 320 and 321), three assets within the River Sand/Gravel (Fig 12; RAs 317, 318 and 319) and two assets within the non-aggregate geologies (Fig 12; RAs 315 and 322). The group contains four cremation burials, one cremation cemetery, one embanked avenue and two shrines and two buildings probably also shrines.

6.8.25 The majority lie within the Pang River Valley and some distance from known settlement sites. Three assets (RA 317, 318 and 319) represent cremations burials. Two were uncovered in the late nineteenth century - one being found close to a spring and thus likely to have had a shrine - and the other was uncovered in the late 20th century during an archaeological excavation. The rest are centred on the Pang between Frilsham and Little Hungerford in the north of the Project Area *c* 5km north of Thatcham. This group appears to represent a monumental landscape as it includes at least five mortuary structures (including two shrines) and an embanked avenue leading to the shrines/mortuary structures. The group contains one funerary site of a vaulted tomb which included a cremation burial (cremation RA 315) which lies to the north of the shrine sites and the site of a pit which contained the cremated remains of a young person (RA 316).

Transport

6.8.26 Fifty-seven Transport assets have been identified within the Project Area with an asset density of 0.14 per km^2. Five assets are within the Chalk Study Area and 43 assets are on the Sand and Gravel geology. A further nine assets are on non-aggregate geology. The group comprises one bridge, one cobbled road, 47 road assets and eight trackway assets.

6.8.27 One of the clearest differences between the Roman and the two previous periods is the rise in transport assets, confirming the establishment of provincial government administration and order allowing the introduction of extensive transport infrastructure across the district. Transport assets represent 10.8% of the total of Roman assets, 2.5% of Iron Age assets and 0.3% of Bronze Age. Other assets (RAs 354, 326, 327, 329, 340, 342–8, 351–3, 355, 356 and 358) represent elements of two sections of a major Roman road which runs north-west/south-east through Newbury in the west of the Project Area (road 41a; Margary pp130–2). The Region is clearly influenced by the development of the Roman town of *Calleva Atrebatum* (modern Silchester), just to the south of the Project Area (see Fig 14). Another two assets (Fig 12; RAs 368 and 369) represent elements of another major Roman Road running north-east/south-west cutting the eastern corner of the Project Area 4km to the east of the Mortimer (possibly road 160c; Margary pp165–6). Other transport assets represent minor roads linking the smaller estates to these main roads. Several Road assets are noted within the Kennet River Valley leading north-east towards Theale (Fig 12 RAs 359, 361, 363 and 367), which suggests another road running up the valley past Reading.

6.8.28 The bridge asset lies just south-east of Thatcham and represents a river crossing for the Margary Road 41a. The rest of the assets represent trackways, three (Fig 12; RAs 372, 373, and 374) of which are lesser access roads and probably continuations of older trackways. Three (Fig 12; RAs 363, 376 and 378) appear to be sections of the road running north-east along the Kennet River Valley, heading north-east past Reading and two appear to indicate the presence of another trackway leading east from Theale, which possibly connects to Margary Road 160c (Margary pp165–6). These assets appear to be the re-use of older trackways. It is likely that the River Kennet and its tributaries were also used to transport goods but no assets reflecting such use have been recorded for the Roman period in the Project Area.

Unassigned

6.8.29 Unassigned assets form the second largest group for the Roman; 137 have been identified within the Project Area for this period (26% of all Iron Age assets) and have an asset density of 0.35 per km^2. There are 19 assets are within the Chalk Study Area and 107 assets are on the Sand and Gravel geology. A further 11 assets are on non-aggregate geology. Unassigned assets primarily represent features such as pits, post holes, post alignments, hearths, ovens, middens and ditches which have been identified through archaeological investigation, often in response to gravel aggregate extraction within the Project Area in the late 20th century. Whilst their presence has been recorded archaeologically, their nature/function is undetermined, although for the majority of the assets identified within the Sand/Gravel, particularly those on the Kennet River gravels, it is likely that they relate to settlement sites recorded in the vicinity. Whether this is due to insufficient information or reluctance on the part of the excavators to express opinion when reporting the discoveries is not known.

Water supply and drainage

6.8.30 Thirteen Water supply and drainage assets have been identified within the Project Area and almost all are within the River Sand/Gravel Study Area (Fig 12; RAs 517–28). One lies within the non-aggregate geology (Fig 12; RA 529). They represent one water disposal site (cess-pit) and three gullies and nine wells. All features have been identified during archaeological excavations and all wells are associated to settlements. The water disposal site, which actually represents a cess-pit was located 10m to the south of the bath house (Fig 12; RA 18) associated with Aldermaston villa (Fig 12; RA 18, 29, 40 and 58, Backlog Site 5 and 7) 3km north-east of Woolhampton.

6.9 Early Medieval period (*c* AD 411–1065)

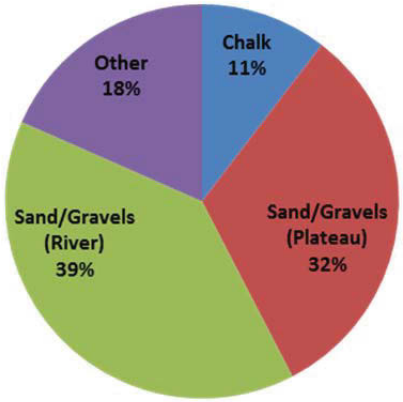
Asset density

6.9.1 There are 125 known assets dating to the early Medieval Period. The asset density within the Project Area is 0.32 per km^2 and they are distributed across the Study Areas as follows:

- River Sand/Gravel: 49 assets at a density of 0.36 assets per km^2
- Plateau Sand/Gravel: 40 assets at a density of 0.39 assets per km^2
- Chalk: 13 assets at a density of 0.16 assets per km^2
- Non-aggregate geologies of the Project Area: 23 assets at a density of 0.32 assets per km^2.

6.9.2 Their distribution is shown on Fig 13. The proportions of the assets within each Study Area are shown in the diagram below.

Proportions of early Medieval assets within each Study Area



6.9.3 The asset types comprise:

- Agriculture and subsistence – 15 assets
- Civil – 2 assets
- Defence – 1 asset
- Domestic – 25 asset
- Findspots – 30 assets
- Industrial – 3 assets
- Religious ritual or funerary – 20 assets
- Transport – 1 asset
- Unassigned – 38 assets
- Water supply and drainage – 1 asset

6.9.4 Any number of the 250 assets of entirely unknown date could be of early medieval origin. If they were all of this period, which is highly unlikely, a 'best case' density would be 375 assets or a maximum asset density of 0.95 assets per km^2.

6.9.5 Early Medieval assets represent only 3% of the total number of known assets, lower than either Bronze Age, Iron Age or Roman assets but greater than the Palaeolithic, Mesolithic and Neolithic periods.

6.9.6 The shortfall in archaeological data is partly made up by the availability for the first time of documentary records, in particular Domesday Book (AD1086), which records manorial estates and their ownership and by inclusion in the survey and other evidence such as later medieval settlement centres, the likely location of settlement.

The majority of the assets within the Project Area from the HER are derived from documentary sources and relate to the possible site of an asset rather than a known location.

6.9.7 A limited number of archaeological investigations associated with aggregate extraction in West Berkshire have revealed assets of this period. Of the 137 Early Medieval assets only 31 were identified by intrusive archaeological intervention. Early medieval remains have been uncovered at Ivy House Pit (Fig 13; Backlog site 1), Bradley's Pit (Backlog site 8), The Ballast Hole (Backlog site 11), Anslow Cottages (Backlog site 13), Field Farm Barn (Backlog site 20), and Kintbury Chalk Pit (Backlog site 63 and 64).

Agriculture and subsistence

6.9.8 Thirteen Agriculture and Subsistence assets have been identified within the Project Area with an asset density of 0.03 per km^2. These are located on the Sand/Gravel geologies, with and five assets within the non-aggregate geologies. The group comprises one cultivation mark, one field system, 10 areas of ridge and furrow and one wood.

6.9.9 Evidence of agricultural activity is limited. Although ridge and furrow (the archaeological pattern of ridges and troughs created by the use of non-reversible ploughs for ploughing) forms the greatest element of this group (10 assets of 13), it is likely that this dates primarily to the later part of this period, ie the 10th and 11th centuries. Just over half have been identified from aerial photography and lie on the Clay soils to the south-west of Newbury, between Enborne and Hamstead Marshall (Fig 13; RAs 3–8) and form a large area of field systems. A small area of ridge and furrow has been identified on the valley floor *c* 3km south-west of Theale in the west of the Project Area. These have been identified through archaeological investigation (Fig 13; RA 2) and by field survey (Fig 13; RAs 9–13). However, it is likely that such landscapes are as common on the alluvial plains of the Kennet but that they have been obscured by flooding or removed by gravel extraction. The single wood recorded refers to Hawkridge wood noted in a charter of AD 956. According to that document the wood was given by King Eadwig to Abbot Aethelwold, in order to provide building material for the church of St Mary at Abingdon. There is, however, little evidence to identify the actual bounds of the late Saxon wood.

Civil

6.9.10 Two Civil assets (Fig 13; RA 14 and 15) have been recorded on the River Study Area. Civil assets appear for the first time in this period and comprise two Hundred boundaries referred to in documentary sources. Hundreds were major civil administrative and units for approximately 100 households. Their boundary may have been defined by a stone marker or such.

6.9.11 The inclusion of just two such assets is misleading as there would have been numerous other such civil boundaries which are not currently on the HER. As Hundreds are areas rather than discrete territorial units they are perhaps not suitable for inclusion on the HER (Steve Clark *pers. comm*.).

Defence

6.9.12 Only one Defence asset has been identified in the on Plateau Sands/Gravels Study Area (Fig 13; RA 16). This is the site of a battle between Danes and Saxons AD 871, as noted on large scale Ordnance Survey maps 1.5km to the west of the Theale, near Reading. The Victoria County History references the Anglo-Saxon Chronicles as the source of this information, but there is no description as to why the location given on the map is correct location.

6.9.13 Although Grim's Bank (also known as Grim's Ditch or Grim's Dyke) runs north-east/south-west through the south-east corner of the Project Area along a plateau gravel ridge south of the Kennet River *c* 2.5km west of Mortimer, its purpose is

unknown and therefore it is included in Unassigned assets. The earthwork could be of earlier origin.

Domestic

6.9.14 Twenty-seven Domestic assets have been identified the Project Area with an asset density of 0.07 per km^2. Four assets are within the Chalk Study Area and 15 assets within the Sand/Gravel geologies. Eight assets are located within non-aggregate areas. The group comprises a deserted settlement, one grubenhaus, two hamlets, four manors, three settlements, one site, six vills and nine villages.

6.9.15 They represent 21.6% of the Early Medieval assets and are the second most common Domestic group within any periods. It should be noted that 22 of the 27 assets are the results of documentary research rather than from archaeological investigation, and many are taken from Domesday Book and therefore have no accurate locational data. Of the remaining five, two assets (Fig 13; RAs 27 and 28) refer to archaeological work undertaken around Meales Farm in the east of the Project Area *c* 1.2km to the north-west of Burghfield in the 1970s and 1980s ahead of gravel extraction on Plateau Sands/Gravels, which is more likely to be 10th/11th date than earlier. Two assets refer to an excavation in the east of the Project Area as a result of extraction ahead of the construction of the Ufton Nevret/Bath Road (Fig 13; RAs 18 and 26), which identified a Grubenhaus (more commonly known within archaeology as a Sunken Feature Building). The fifth asset (Fig 13; RA 17) refers to a series of earthworks identified from aerial photography by the Berkshire Archaeological Unit describes L-shaped ditches and enclosures which are possibly a deserted settlement. As no archaeological work has been undertaken on the site, its dating is uncertain and is more likely to date from the later centuries from the Early Medieval period than the earlier.

Findspots

6.9.16 Twenty-eight Findspot assets have been identified the Project Area with an asset density of 0.07 per km^2. Seven assets within the Chalk Study area and 18 assets are on Sand/Gravel geologies. Three assets are on the non-aggregate geology.

6.9.17 This group comprises nine artefact scatters and 19 isolated chance finds of artefacts. Only a small number were identified during the LKVFS, although once the data has been fully integrated into the HER, the number of early medieval findspots will increase. A large proportion are isolated chance finds recorded during the 19th century, which would benefit from reassessment.

Industrial

6.9.18 Only one Industrial asset has been identified in the Kennet River Sands/Gravels (Fig 13; RA 73). This is the potential site of a Saxon watermill 1.5km to the west of Padworth between Woolhampton and Burghfield. The HER entry is based entirely on a Saxon charter dating AD 956 which refers to ‘mill place at Padworth’ and also on Domesday Book which refers to three mills at Padworth. Thus this location can only be indicative.

Religious, ritual or funerary

6.9.19 Eight Religious, Ritual and Funerary assets have been identified the Project Area. Other than one asset within the Chalk Study area (Fig 13; RA 74) all others are on the Sand/Gravel geologies (Fig 13; RAs 75–81). The group is comprised of a cemetery, a church, a cremation, a grave slab, an inhumation, an inhumation cemetery, a minster and a monastery.

6.9.20 A major cemetery site of *c* 50 inhumations was uncovered during gravel extraction either side of the M4 motorway extension at Field Farm just to the south of Reading (Fig 13; RA 79; Backlog site 16). A 6th century AD cemetery site, within the

Lambourn Valley, has been identified through metal detectoring (Fig 13; RA 74). Finds include a fragment of a silver radiate-headed Frankish brooch, along with other base metal brooches including disc, saucer, small-long and button. Nearly all the brooches were fragmentary, probably broken as a result of ploughing (HER).

6.9.21 In the 1980s a skull was discovered during development of the Aldermaston Court site for Blue Circle Cement (Fig 13; RA 78). A near complete jaw and partial upper jaw were revealed in a trench, and the presence of an adjacent decayed iron nail suggested that there might have been a coffin. It was suggested that the skull was of Saxon or earlier date and its location next to but outside the churchyard implied either a contraction of the extent of the present churchyard, or the existence of a pre-Christian burial ground nearby (HER). At an archaeological excavation ahead of gravel extraction near Field Barn Farm near Beenham (Fig 13; Backlog Site 20) a Saxon cremation urn cut into a large boundary ditch was uncovered(Fig 13; RA 76).

6.9.22 Of the other four Religious Ritual and Funerary assets, one is an 11th century Saxon grave cover (Fig 13; RA 77) found in an old church but now affixed to the Chancel Wall. It refers to Aegelwardus, who died in 1017. It was found in two pieces under the tower of the old church when it was pulled down in 1866. The grave-cover is comprehensively described and photographed in a Corpus of Anglo-Saxon sculpture. The second (Fig 13; RA 75) refers to elements of an 11th century church surviving in St Mary's Bucklebury which is recorded in Domesday Book as being pre-invasion.

6.9.23 The last two assets (Fig 13; RAs 80 and 81) refer to the possible location of Bradfield monastery and the subsequent minster. Berkshire had three minsters prior to AD 800, one each at Abingdon (now in Oxfordshire), Cookham and Bradfield. Reading is first recorded as having a minster in the late 9th or 10th century. The presence of the minster established Reading as a town of some importance, which continued to gain status and develop, influencing development of the hinterland. The Victoria County History is sceptical about the documentary reference to the monastery. However, reinterpretation of the early charters transcribed in the Abingdon Chronicles suggests that a minster was founded at Bradfield *c* 670 by Eadfrith son of Iddi (Blair 1994).

Transport

6.9.24 Only one Transport asset has been identified in the Project Area (Fig 13; RA 782). This is the documentary evidence for the existence of a Roman bridge used by the Saxons. The bridge was apparently incorporated into the bounds of Brimpton parish and was noted in the Saxon charter.

Unassigned

6.9.25 Forty-four Unassigned assets have been identified the Project Area with an asset density of 0.11 per km^2, representing just over one third of the assets of this period. The majority are on the Plateau Sands/Gravels, with a smaller number of the River Sands/Gravels and only one on Chalk. Several are on the non-aggregate area. The group comprises four banks, nine ditches, 14 earthworks, one feature, two field boundaries, one gravel pit, one house platform, two ovens, four pits, two post hole, one site, one structure and one wall.

6.9.26 This group primarily represents features which have been identified through archaeological investigation, often in response to gravel aggregate extraction within the Project Area in the late 20th century.

6.9.27 Within this group are eight sections of the Grim's Ditch (Fig 13; 87, 88 and 96–101), which is a bank and ditch feature that runs from Harrow, through the Chilterns, Oxfordshire, Berkshire and into Hampshire. It has been considered to form a defensive feature established by the Saxons to help provide a barrier to Danish Viking incursions, but could be a territorial boundary feature. It is now thought that this feature possibly dates to the Bronze Age or Iron Age and it received its name by

the Saxons who felt that it impressive size could only indicate a military usage.

6.10 Medieval (*c* 1066–1539)

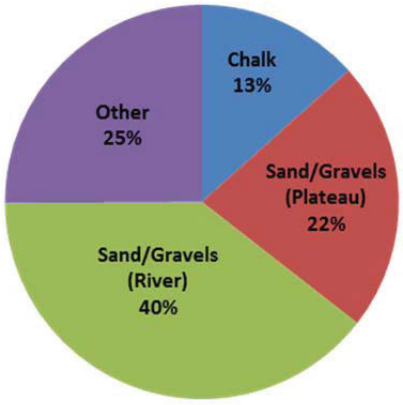
Asset density

6.10.1 There are 650 known assets dating to the medieval period. The asset density within the Project Area is 1.65 per km^2 and they are distributed across the Study Areas as follows:

- River Sand/Gravel: 256 assets at a density of 1.88 assets per km^2
- Plateau Sand/Gravel: 144 assets at a density of 1.40 assets per km^2
- Chalk: 87 assets at a density of 1.04 assets per km^2
- Non-aggregate geologies of the Project Area: 163 assets at a density of 2.25 assets per km^2.

6.10.2 Their distribution is shown on Fig 14 and Fig 15. The proportion of the assets across each of the Study Areas is shown in the diagram below.

Proportions of Medieval assets within each Study Area



6.10.3 The asset types comprise:

- Agriculture and Subsistence– 68 assets
- Civil – 2 assets
- Commercial – 1 asset
- Defence – 4 assets
- Domestic – 92 assets
- Findspot – 276 assets
- Gardens and parks – 28 assets
- Industrial – 19 assets
- Palaeoenvironmental – 1 asset
- Religious, ritual or funerary – 24 assets
- Transport – 14 assets
- Unassigned – 88 assets
- Water and drainage – 33 assets

6.10.4 The inclusion of a further possible 250 assets of unknown date into the assets of Medieval date would bring this to a total of 900 assets, equivalent to 2.28 assets per km^2. It is unlikely that all of these date to this period.

6.10.5 Within the Project Area, the Medieval period is relatively well understood through its

documentary sources and above ground remains but less so by its buried archaeological remains. Archaeological interventions have provided new information, particularly from development within the major towns, but rural archaeology is still fragmentary. New construction methods and types of structure are evident. There is an increase in the range of asset types reflecting socio-economic and cultural development. Two new types of assets include commercial, and garden and parks.

6.10.6 Only a relatively small number of archaeological interventions resulting from aggregate extraction have returned features or artefacts dating to this period, with discoveries at Meale's Farm (Backlog Site 9), Hartshill Copse (Backlog Site 12), Raghill (Backlog Site 21), Village Farm (Backlog Site 29), Pingewood (Backlog Site 32), Pingewood (Backlog Site 33), Woolhampton Extension (Backlog Site 39), Bellwood, Newbury (Backlog Site 42), Moores Farm (Backlog Site 51), Oareborough Hill, Hermitage (Backlog Site 54), Kennetholme Farm (Backlog Site 60), and Irish Hill (Backlog Site 74).

Agriculture and Subsistence

6.10.7 Sixty-eight Agriculture and Subsistence assets have been identified within the Project Area with an asset density of 0.17 per km^2. The majority are on the non-aggregate areas (38 assets) with 29 assets within the Sand/Gravel geologies and seven assets in the Chalk Study Area. A large portion of the group (59% or 40 assets of 68) is ridge and furrow.

6.10.8 There is a clear rise in number of Agricultural and Subsistence assets in comparison to previous periods (ie 68 for the Medieval and 43 for all previous periods combined), although with only a very small increase from the Early Medieval. After ridge and furrow, the next most common asset are lynchets (a bank of earth that builds up on the downslope of a field ploughed over a long period of time), the majority of which have been identified from aerial photographs.

6.10.9 The group contains a range of Agricultural and Subsistence assets common to the period. This includes pillow mounds (the artificial, enclosed establishment of animal husbandry dedicated to the raising of rabbits; noticeably all on Plateau Sands/Gravels; Fig 14; RAs 19–22) and water meadows (areas of land at the edge of rivers that were flooded to maintain fertility or to provide earlier crops of grass Fig 14; RA 65s and 66) located on the River Sands/Gravels the west of the Project Area between Kintbury and Newbury. Documentary sources refer to a tithe barn (Fig 14; RA 64), a croft (Fig 14; RA 2), a medieval fishery (Fig 14; RA 10) and woodland and common land (Fig 14; RAs 1, 67 and 68). The HER notes a farm identified by an archaeological evaluation which uncovered a number of ditches indicating field boundaries (Fig 14; RA 5).

Civil

6.10.10 Two Civil assets (Fig 14; RA 69 and 70) have been recorded. One is a documentary reference and Ordnance Survey 1st edition map location of a set of stocks just to the east of Beenham. The other Civil asset is a parish boundary (RA 69).

Commercial

6.10.11 The medieval period sees the first reference to a commercial asset (Fig 14; RA 71). This refers to the documentary evidence of the first charter of a market and fair at which lies just outside the excluded urban area of Thatcham but within the River Sand/Gravel Study Area.

Defence

6.10.12 Four Defence assets have been identified within the Project Area. Two assets are on the Chalk (Fig 14; RAs 72 and 73) and one asset (Fig 14; RA 74) on the Sand

and Gravel geology. One asset (Fig 14; RA 75) is on non-aggregate. The group comprises three motte and bailey castles, and one possible defensive feature (RA 75), within Oare Common, just north of Hermitage, is less clear as the earthworks are shallow.

6.10.13 The three motte and baileys (Fig 14; RAs 72, 73 and 74) are unusual in that they are located within close proximity to each other. The HER suggests that these may have been misidentified and are seigeworks or the displacement over time (HER MWB1542).

Domestic

6.10.14 Ninety-two Domestic assets have been identified within the Project Area with an asset density of 0.23 per km^2. There are 16 assets within the Chalk Study Area and 59 assets on the Sand and Gravel geologies. On the non-aggregate there are 17 assets. The group comprises the sites of 36 villages, 10 deserted settlements, 13 manors, and the sites of various manorial and medieval buildings.

6.10.15 The distribution of settlement in the Project Area is better understood than for earlier periods due to the large amount of documentary evidence along with the later development and growth throughout later periods, and evidence in the built record (e.g. listed medieval churches). The successful medieval settlements have grown and evolved into the current urban landscape and for this reason are unlikely to be included within the Study Areas. The majority of the viable aggregates are located within what would have been a predominantly rural landscape during this period, with smaller, secondary settlements of isolated homesteads/farmsteads and much smaller villages. The references to the locations of buildings that once existed and are known through historical documentary sources and until recently had existed.

Findspot

6.10.16 Two hundred and seventy six Findspot assets have been identified within the Project Area with an asset density of 0.70 per km^2. The majority (169 assets) are located on the Sand and Gravel geologies although a significant number (76 assets) are on non-aggregate areas. The group comprises artefact scatters and findspots and despite the increase in the range of asset types in this period, Findspot assets still represents the dominant type with over one-third of the total. The majority of finds can be attributed to the fieldwalking surveys and the LKVFS in particular.

6.10.17 In many cases the artefact scatters recorded by the fieldwalking may either only be the result of agricultural activities such as manuring or have been scattered more widely by ploughing in later periods. A concentration within the Kennet River valley in an area between Newbury and Reading is the direct result of this initial inclusion of the LKVFS.

Gardens Parks and Urban Spaces

6.10.18 The medieval period sees the first reference to parks. Twenty-eight Gardens, Parks and Urban Spaces assets have been identified within the Project Area with an asset density of 0.07 per km^2. Seven assets (Fig 14; RAs 464–70) are within the Chalk Study Area and 16 assets (Fig 14; RAs 444–9, 451, 453, 455, 457, 458, 460–3 and 471) are on the Sand/Gravel geologies. A further five (Fig 14; RAs 450, 451, 454, 456 and 459) are on non-aggregate geologies. The group comprises 18 deer parks, one park, eight park pales and one prospect mound.

6.10.19 Domesday Book shows that a significant amount of royal property existed within the old county of Berkshire, which is later reflected in the predominance of royal parks. The 28 assets identified within this category include the site of deer parks or associated landscape features including the park boundaries (park pale), which can often reflect the estate boundaries. A number of the principal houses associated to these parks have survived although greatly altered beyond their original structure, for example at Wokefield Park in the south-east corner of the Project Area *c* 2km

from both Mortimer and Burghfield (Fig 14; RA 454) but many have not and now simply exist either as literary references with no accompanying evidence for their location (e.g. Crookham Deer Park in the south of the Project Area towards the centre, Fig 14; RA 448) or as earthworks (e.g. Fig 14; RA 444).

Industrial

6.10.20 Nineteen Industrial assets have been identified within the Project Area with an asset density of 0.05 per km^2. Two assets (Fig 14; RAs 476 and 490) are within the Chalk Study Area and 10 assets (Fig 14; RAs 475, 477, 478, 479, 482 and 484–88) are on the Sand and Gravel geologies. A further seven assets (Fig 14; RAs 472–4, 480, 481, 483 and 489) are on non-aggregate. The group comprises various kilns and mills, along with a possible beacon, saw pit, wheelwrights works and windmill mound.

6.10.21 Kilns and water mills form the majority. The actual number may originally have been higher as there are a number of kiln and mill buildings that exist today but are no longer used as such. These buildings are listed buildings and therefore fall outside the remit of this assessment. The inclusion of medieval assets in the HER, like watermills, has not been systematic and many more mills noted in Domesday Book are not mentioned. The beacon (Fig 14; RA 472) that has been included represents a structure of oak timbers which were discovered during the building of Yattendon Court in late 19th century. They were interpreted then as a beacon, but more recent analysis suggests that they more likely represent the base of a windmill. Apart from the watermills, which all lie towards the bottom of the river valleys (four within the Kennet, RAs 479, 485–8, and one within the Pang, RA 484), the rest of the Industrial assets are relatively well distributed across the Project Area suggesting that there was no particular area of industry.

Palaeoenvironmental

6.10.22 One asset was identified within River Sand and Gravels (Fig 15; RA 491) *c* 700m to the west of Woolhampton. It represents a former channel used to feed a water meadow system identified during investigations ahead of gravel extraction.

Religious, ritual or funerary

6.10.23 Twenty-four Religious, ritual and funerary assets have been identified within the Project Area with an asset density of 0.06 per km^2. Six assets (Fig 15; RAs 492, 495, 496, 501, 510 and 514) are within the Chalk Study Area and nine assets (Fig 15; RAs 493, 497, 498, 505, 507–9, 512 and 515) are on the Sand and Gravel geology. A further nine assets (Fig 15; RAs 494,499, 500, 502–4, 506, 511 and 513) are on non-aggregate areas. The group includes the site of various ecclesiastical buildings including chapels and churches and also cemeteries.

6.10.24 Although there is a rise in the asset density from 0.02 for the early medieval period to 0.06 per km^2 for the medieval period, their relative percentage has dropped from 6.4% for the early Medieval to 3.7% for Medieval assets. It is likely that this is the result of continuance of certain types of structures, e.g. churches, and the expansion of villages into towns to include some assets that previously would not have been scoped out. The group primarily comprises documentary references to religious buildings that have been demolished (Fig 15; RAs 492–5, 497–508, 510–12 and 515), for example there is a reference to the building at Shalford Farm, in the centre of the Project Area towards the south once being a Hospitaller's Preceptory (Fig 14b; RA 512). Only four assets actually relate to burials of which three relate to discoveries made during archaeological investigations during pipe laying (Fig 15; RAs 496, 506 and 514). The other burial reference relates to the burial ground originally for the Sandleford monastery (Fig 15; RAs 494, 500 and 513), which apparently was in use up to the late 17th century (HER).

Transport

6.10.25 Fourteen Transport assets have been identified within the Project Area with an asset density of 0.04 per km^2. Three assets (Fig 15; RAs 517, 521 and 524) are within the Chalk Study Area and 10 assets (Fig 15; RAs 516, 519, 520, 522, 523 and 525–9) are on the Sand and Gravel geology. One asset (Fig 15; RAs 518) is on non-aggregate area. The group comprises one bridge, six hollow ways, two roads and five trackways.

6.10.26 The trackways and hollow ways have been identified from aerial photography and do not necessarily relate to areas of known historic settlement. It is more likely that trackways or hollow ways within those areas have been removed by later development. The road (Fig 15; RA 523) also refers to a cropmark feature identified by aerial photography and possibly represents the course of former road and the bridge (Fig 15; RA 516) is part of the Ufton Nervet manor Scheduled Monument. Wharves and quays, which were not restricted to urban centres and which could potentially be found anywhere along rivers at suitable locations, are noticeably absent from the Project Area.

Unassigned

6.10.27 Eighty-eight Domestic assets have been identified within the Project Area with an asset density of 0.22 per km^2. Nine assets are within the Chalk Study Area and 69 assets are on the Sand and Gravel geology (mostly River gravels). Ten assets are on non-aggregate areas. The group comprises various miscellaneous archaeological features of unknown nature. Many have been identified through archaeological investigation in response to gravel aggregate extraction. The relative decline in this asset type may reflect greater confidence in interpretation of remains recorded archaeologically, possibly because of associated documentary evidence. Earthworks and enclosures identified by aerial photography and appear to represent medieval settlements but for which not enough is surviving to be more precise.

Water supply and drainage

6.10.28 Thirty-three Water supply and drainage assets have been identified within the Project Area with an asset density of 0.08 per km^2. Three assets are within the Chalk Study Area and 25 assets are on the Sand and Gravel geology. Five assets are on non-aggregate areas. The group comprises 18 fishponds, a decoy pond, various drainage systems, one gully, four moats (where defence is unlikely to have been a primary function), two ponds, a watercourse and three wells.

6.10.29 Water supply and drainage assets represent 5.1% of assets dated to the medieval period and although small is a dramatic increase from all previous periods. The greatest element of change shown by the rise in fishponds (Fig 15; RAs 622–39). Rivers and their produce were often under private ownership or the crown. All the fishponds noted here related to manorial estates or monastic estates. All but five of lie on the plateau gravels away from the Kennet River. Eleven are associated with scheduled monuments.

6.11 Post-medieval period (AD1540–1900)

Asset density

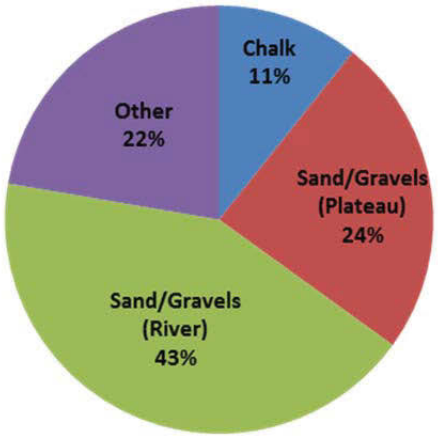
6.11.1 There are 1184 known assets dating to the post-medieval period. The asset density within the Project Area is 3.00 per km^2 and they are distributed across the Study Areas as follows:

- River Sand/Gravel: 506 assets at a density of 3.73 assets per km^2
- Plateau Sand/Gravel: 287 assets at a density of 2.79 assets per km^2
- Chalk: 127 assets at a density of 1.52 assets per km^2

- Non-aggregate geologies of the Project Area: 264 assets at a density of 3.65 assets per km^2.

6.11.2 Their distribution is shown on Fig 16–Fig 18. Their proportions across each Study Area are shown in diagram below.

Proportions of Post-medieval assets within each Study Area



6.11.3 The asset types comprise:

- Agriculture and subsistence – 464 assets
- Civil assets – 7 assets
- Commemorative – 1 assets
- Commercial – 5 assets
- Defence – 7 assets
- Domestic – 82 assets
- Education – 20 assets
- Findspot – 195 assets
- Gardens and parks – 55 assets
- Health and welfare – 4 assets
- Hoard – 1 asset
- Industrial – 72 assets
- Palaeoenvironmental – 1 asset
- Recreation – 3 assets
- Religious, ritual or funerary – 40 assets
- Transport – 130 assets
- Unassigned – 67 assets
- Water supply and drainage – 30 assets

6.11.4 The inclusion of a further possible 250 assets of unknown date would conceivably increase the total to 1434 assets, equivalent to a density of 3.64 assets per km^2.

6.11.5 The substantial rise in the number of assets suggests an intensification of the use landscape during the post-medieval period, through rapid population growth, industrialisation and change in agricultural practices. A large proportion of assets on the HER within the Project Area represent assets attested through documentary or cartographic sources. As with the Medieval period, most settlement centres of this period have grown and form the current urban areas, and for this reason are excluded from the study. The majority of the viable aggregates are located within

what would have been a predominantly rural landscape. Urban locations do contain higher densities post-medieval assets and higher levels of archaeological investigation. The range of assets, e.g. commemorative and civil, has increased along with the number of extant features, for example canals and roads. Within the Project Area significant post-medieval assets including buildings and infrastructure such as canals and related structures etc, have formed barriers to aggregate extraction. Canal and rail lines form the boundaries for a number of more recent extraction operations.

6.11.6 The historical understanding of the national context is well established for this period, but interest in terms of archaeological study is still developing. Traditionally, later post-medieval remains, particularly 19th century, were not adequately recorded during archaeological excavation but in the last quarter of 20th century such remains have gained greater significance and have contributed much to our understanding, supplementing historical studies. For example, whilst the nature and growth of an early post medieval pottery trade, scale, distribution and employment practices may be documented, processes of production and the nature of the product from particular kilns may rely on the results of archaeological investigation.

6.11.7 This period is much less dependent upon the level and distribution of archaeological investigations. Only a small number of archaeological interventions resulting from aggregate extraction have returned features or artefacts dating to this period, with remains identified at Newbury Outfall works (Fig 16; Backlog Site3), Raghill (Backlog Site 21), Village Farm (Backlog Site 29), Wasing (Backlog Site 30), Butts Lake (Backlog Site 34), Silver Land, Padworth Common (Backlog Site 38), Woolhampton Extension (Backlog Site 39), Woolhampton Quarry (Backlog Site 40), Bellwood, Newbury (Backlog Site 42), Field Farm (Backlog Site 43), Moore's Farm (Backlog Site 51), Oareborough Hill, Hermitage (Backlog Site 54), and Lower Farm (Backlog Site 55). While a greater percentage of post-medieval assets lie on gravel aggregate than any other period, many of these are standing structures, such as mill houses, or cut features, like canals, which on the whole are still in use and thus are barriers to extraction and generally avoided. Assets recorded during archaeological interventions ahead of any extraction are likely to be those which relate to the agricultural use of the landscape such boundary ditches or drainage features, or small scale localised industrial activity such as brick kilns.

Agriculture and subsistence

6.11.8 Agriculture and subsistence assets form the largest element of this period, 464 assets forming 39.4% of all post-medieval assets, with an asset density of 1.18 per km^2. There are 64 assets across the Chalk and 276 assets across the Sand and Gravel geology. Non-aggregate areas have 127 assets. The group includes field systems and boundaries, water meadows, three pillow mounds, and the sites of various types of farm buildings, largely identified through documentary and cartographic sources. The high percentage demonstrates the continuing agricultural nature of the Project Area. In fact, such assets form the majority of all Agricultural and Subsistence assets for the Project Area (10% of 13.06%, the other 3.06% is formed from the total of all other periods).

6.11.9 A significant new agricultural feature in this period is the watermeadow (Fig 18; RAs 437 to 467). These are in the Kennet Valley and to a lesser extent along the Pang and Lambourn rivers. The dramatic increase in number of water meadows over the medieval period shows the rising need to maintain and increase the fertility of the soil to match the need for increasing food production from rising population. Along with the water meadows there is also the record of a watercress bed (Fig 17a; RA 468). This became an economically farmed material form the 17th century onwards. The site is located on the Kennet River *c* 500m to the north-west of Kintbury in the west of the Project Area.

Civil

6.11.10 Seven Civil assets have been recorded in the Project Area. Almost all are on the Sands and Gravels. The group comprises one boundary marker, one boundary stone, three parish boundary and two stocks.

Commemorative

6.11.11 There is a single asset in the form of a monument erected to commemorate Queen Victoria's 60th year on the throne through the opening of Beech Hill parish reservoir in 1897 in the far south-east corner of the Project area (Fig 17; RA 477).

Commercial

6.11.12 Five Commercial assets have been recorded; one asset (Fig 17; RA 478) within the Chalk and four assets (Fig 17; RA 479–82) across the Sands and Gravels. The group comprise a beer house, two inns, one laundry and one public house. All except for an inn, the Red Lion (Fig 17; RA 478), in the north-east corner of the Project Area, which is still in use as a public house, have been demolished. Although the Red Lion has been dated to the 18th century, it has not been listed. The small number may reflect the gravitation of such activity towards the main centres of population and town centres and therefore has been scoped out of the assessment, or is otherwise a listed building. Furthermore, much is probably carried out in buildings that have become listed and again have been scoped out.

Defence

6.11.13 Seven Defence assets have been identified in the Project Area: one asset (Fig 17; RA 490) within the Chalk and four assets (Fig 17; RA 484, 485, 488 and 489) across the Sand and Gravel geologies. Two assets (Fig 17; RAs 486 and 487) are on non-aggregate areas. The group comprises one battlefield, one set of butts, one castle, one fortification, one military camp and two seigeworks.

6.11.14 The set of butts noted from the Ordnance Survey 1st edition map (Fig 17; RA 485) lie within Greenham Common. Although the area has been subject to extraction in the past, it was for much of the 20th century part of an airbase and is now common land. Excluding the references to Donnington Castle (Fig 17; RAs 486 and 487), *c* 250m to the north-west of Newbury, which was used during the Civil War but was built in earlier centuries, the rest of the Defence assets (Fig 17; RAs 484, 488, 489 and 490) relate to activity during the Civil War and the battle of Newbury.

Domestic

6.11.15 Eighty-two Domestic assets have been identified within the Project Area with an asset density of 0.21 per km^2. Twelve assets are within the Chalk Study Area and 50 assets are on the Sands and Gravels (spread evenly between the Plateau and River Study Areas). A further 17 assets are on non-aggregate geology. The group comprises various (non-listed) buildings and settlement areas. Domestic assets have declined as a proportion of assets for this period in comparison to previous periods, although still represent 6.9%.

6.11.16 The majority of asset in this group are actually references to the buildings, 52 assets of the total 82 and the majority are no longer extant whilst some are buildings that have changed use in the Modern period. The remaining 30 assets refer to settlements of some sort, the majority of which exist today but have expanded, although not large enough to have been scoped out of the assessment. A small number of this sub-group are represent settlements that either shrunk or were deserted in the early decades of this period. Although not necessarily within areas proposed for gravel extraction, they lie close to them and could be at risk from associated development. The distribution of the settlements further demonstrates the predominantly rural nature of the Project Area.

Education

6.11.17 Twenty Education assets have been identified within the Project Area with an asset density of 0.05 per km^2. One asset (Fig 16; RAs 579) is within the Chalk and 13 assets are on the Sands and Gravels. A further six are on non-aggregate geology. The group comprises one church school, one dormitory, one house, one national school, 15 schools and one teacher's house. This type of asset appears for the first time but only represents 1.7% of post-medieval assets. The assets tend to be on the edge of or within the smaller towns/villages areas and thus are unlikely to be under threat of extraction activity. Many ceased operation as schools in the late Victorian period and have subsequently become private residences.

Findspot

6.11.18 Findspot assets form the next largest group within this period, 195 assets representing 16.5% of all post-medieval assets, with a density of 0.49 per km^2. The Chalk has 17 assets, with 126 assets across the Sands and Gravels. A further 52 are on non-aggregate.

6.11.19 The group comprises 155 artefact scatters and 40 findspots and the majority are derived from the LKVFS, which recorded scatters of post-medieval ceramic building material and pottery across a large number of fields within the river valley. While it is probable that a large number of scatters represent areas of manuring, concentrations may indicate areas of past activity and highlight the potential that the gravel aggregate areas have to add to our understanding of this period.

Gardens Parks and Urban Spaces

6.11.20 Fifty-five Gardens Parks and Urban Spaces assets have been identified within the Project Area with an asset density of 0.10 per km^2. Three assets are on the Chalk and 38 assets are on the Sand and Gravels (primarily the Plateau). A further 14 are on non-aggregate. The group comprises ten deer parks, two follies, one formal garden, one garden terrace, the sites of four gate lodges, two Ha Ha, eight icehouses 13 landscaped parks, two parks, two park pales, one prospect mount, prospect tower, one summer house, three tree enclosure rings, one tree ring and one walled garden. The location out of the River valleys suggests the need for views and land not prone to flooding.

6.11.21 The number of this type of asset has doubled from the previous period, however, the actual percentage they represent in the post-medieval period has remained very similar, 28 assets for the medieval period representing 4.3% as opposed to 55 assets representing 4.6%. Features may have had roots within the previous period but which have been extended or altered, e.g. some of the deer parks, and very new features such as the icehouses, Ha Has and prospect mounds. Icehouses represent a garden design development of the 18th century; these were small structure built to house ice and snow collected during the winter to keep drinks cool during the summer. Built away from the house, they became design features in their own right. Another notable development was the creation of tree rings, enclosure features used for decorative purposes.

Health and welfare

6.11.22 Five Health and Welfare assets (Fig 16; RAs 845 to 849) have been identified within the Sand and Gravel geology. The group comprises two alms-houses, one bath, one children's home and one convalescent hospital. These all represent buildings that either started as private residences, converted to homes of some sort in the Victorian period, e.g. the convalescent home (Fig 16; RA 849) and have been converted back of private residences in early 20th century or started life as care institutions, e.g. the alms-houses (Fig 16; RAs 845 and 846), but which were converted to private residences. One asset relates to the site of a possible 18th century cold bath (Fig 17b; RA 847).

Hoard

6.11.23 One hoard (Fig 18; RA 850) has been recorded in the Project area within the Sand and Gravel geology. This is a late 17th and early 18th century coin hoard found on Snelsmore Common in 1984, and classified as Treasure Trove at an inquest in 1985. The 24 gold and silver coins were in a cylindrical container made of sheet lead. About half of the coins were purchased by Newbury Museum (HER).

Industrial

6.11.24 Seventy-two Industrial assets have been identified within the Project Area with an asset density of 0.18 per km^2. Seven assets are within the Chalk Study Area and 45 assets are on the Sand and Gravel geology. A further 20 assets are on non-aggregate geology. The group includes various mills and kilns, and also workshops, peat cutting and quarries.

6.11.25 Industrial assets have increased in comparison to previous periods but only represent 6.1% of the total for this period. Industrial assets of this period are the most common of Industrial assets from any period, including the Modern (they decline to represent only 4.2% of Modern Assets) and probably represent the peak of industrial activity in the District. The majority are either derived from documentary records or are surviving (non-listed) structures converted to modern dwellings. Half lie on River Sands/Gravels Study Area are include industries that require a water supply. Those on the Plateau gravels represent industries for which water is not a primary source, e.g. brick and tile making kilns. All but two of the assets within the Chalk Study Area are related to chalk mining.

Palaeoenvironmental

6.11.26 One Palaeoenvironmental Asset (Fig 16; RA 922) lies within the River Sand/Gravel Study Area *c* 700m to the west of Woolhampton. It represents a palaeochannel used during the post-medieval period to feed a water meadow system identified during an archaeological investigation carried out ahead of gravel extraction.

Recreational

6.11.27 Three Recreational assets (Fig 16; RAs 923, 924 and 925) have been identified on the Sands and Gravels. The group comprises a golf course, a teahouse and a working men's club. The golf course asset (Fig 16; RA 923) is the Crookham Golf Club which was established 1873 and is the third oldest 18 hole course in England. The teahouse (Fig 16; RA 924) known as the 'Ark', was a wooden building erected in a meadow in 1886 and dragged up Pyle Hill to Greenham Common by several horses and volunteers. It was used for refreshments for walkers and ramblers on the common (HER). The third asset (Fig 16; RA 925) represents an early 19th century building used initially as a school but towards the end of the 19th century was converted into a Working Man's Club (HER).

Religious, ritual or funerary

6.11.28 Forty Religious ritual or funerary assets have been identified within the Project Area with an asset density of 0.10 per km^2. Six assets are within the Chalk Study Area and 25 assets are on the Sands and Gravels. A further eight assets are on non-aggregate geology. The group includes various chapels and churches and cemeteries.

6.11.29 The number of this asset type has increased from previous periods. Churches, which form the bulk of the assets have, for the most part, remained in use and tend to form the focus of a community and as they are within existing settlements it is unlikely that they will be affected by extraction activity. Smaller features such as the locations of abandoned chapels (Fig 18; RA 933) which lie on the gravels may be at risk of being affected by extraction activity. The references to inhumations, including

vaults and mausoleums, relate to private burials or burials uncovered in disused churches being redeveloped rather than large burial grounds which would generally be protected or attached to a church still in use.

Transport

6.11.30 One hundred and thirty Transport assets have been identified in the Project Area with an asset density of 0.33 per km^2. Six assets are within the Chalk Study Area and 122 assets are on the Sands and Gravels. A further two assets are on non-aggregate geology. The group includes canal and railway infrastructure, bridges, roads, toll roads and wharves.

6.11.31 Transport assets represent the third most common group of post-medieval assets at 11%. Over half of all Transport assets (73 assets, 56%) relate to the Kennet Navigation built in the early 18th century (RAs 968–1025, 1029–31, 1063, 1064, 1079–87, 1095 and 1096) to help regulate and increase the amount of material that could be transported to, through and from the Project Area. The canal survives as a feature today and much of it is still use although generally for pleasure rather than industry. Therefore it is unlikely that extraction activity would have a direct impact upon this asset but related features, such as previously unrecorded dwellings or lock features could be affected.

6.11.32 The rest of the assets can be divided into two groups, those relating to the development of the railways (RAs 1037–62 and 1094) and the those associated with the development roads and toll roads (RAs 1026–28, 1032–36, 1065–78 and 1088–93). The majority of the railway assets relate to a main east-west rail link which overlies the gravel bearing aggregates on the valley floor and is still in use. The rest are older disused railway infrastructure some of which is no longer extant.

Unassigned

6.11.33 Sixty-seven Unassigned assets have been identified within the Project Area with an asset density of 0.17 per km^2. Four assets are within the Chalk Study Area and 55 assets are on the Sands and Gravels. A further eight assets are on non-aggregate geology. The group comprises a variety of ditches, banks, and pits and other features of uncertain function. For the post-medieval period, Unassigned assets represent only 5.7% of the total for this period.

Water supply and drainage

6.11.34 Twenty-six Water Supply and drainage assets have been identified within the Project Area with an asset density of 0.07 per km^2. Three assets are within the Chalk Study Area and 22 assets are on the Sands and Gravels (primarily on the River Sands/Gravels Study Area). One asset is on non-aggregate geology. The group comprises water management features including a decoy pond, a dew pond, drainage ditches, a fishery and fishponds.

6.11.35 The majority of these assets lie within the Kennet River Valley with two in the Pang River valley and one within the Lambourn valley. The three assets on the Chalk relate to documentary or map evidence of the presence of a dew pond (RA 1166), reservoir (RA 1177) and a fishpond (RA 1182), although there is no definitive evidence of their use.

6.12 Modern (1901–2010AD)

Asset density

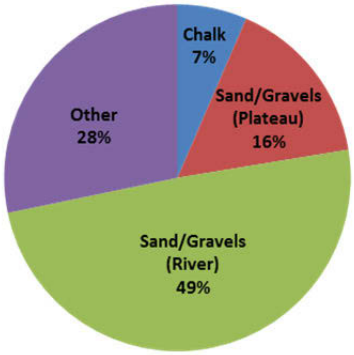
6.12.1 There are 308 assets dating to the Modern period. The asset density within the Project Area is 0.78 per km^2 and they are distributed across the Study Areas as follows:

- River Sand/Gravel: 152 assets at a density of 1.12 assets per km^2

- Plateau Sand/Gravel: 49 assets at a density of 0.48 assets per km^2
- Chalk: 20 assets at a density 0.24 assets per km^2
- Non-aggregate geologies of the Project Area: 87 assets at a density of 1.2 assets per km^2.

6.12.2 Their distribution is shown on Fig 19 and Fig 20. Their proportions across each Study Area are shown in diagram below

Proportions of Modern assets within each Study Area



6.12.3 The asset types comprise:

- Civil – 8 assets
- Commemorative – 3 assets
- Commercial – 1 assets
- Communication – 3 assets
- Defence – 161 assets
- Domestic – 8 assets
- Education – 3 assets
- Findspot – 73 assets
- Gardens and parks – 2 assets
- Industrial – 13 assets
- Recreation – 2 assets
- Religious, ritual or funerary – 5 assets
- Transport – 8 assets
- Unassigned – 14 assets
- Water and drainage – 4 assets

6.12.4 The inclusion of a further possible 250 assets of unknown date would bring this to a total of 558 assets, equivalent to a density of 1.41 assets per km^2.

6.12.5 The resource assessment shows that there has been a decline in the asset density in this period, 2.1 assets per km^2. The Modern period has seen limited archaeological investigation, which is partially due to the limited significance that has until recently been attributed to it by the archaeological sector. The increased range of surviving documentary sources has generally been the reason given for the limited recording of this period. This attitude has changed in the last thirty years and so archaeological features of modern date are being more consistently recorded and studied.

6.12.6 Seven archaeological interventions were noted in the Backlogs report as having identified assets from the Modern period, this represents only approximately 9.5% of the total interventions resulting from aggregate extraction. Modern remains were identified at Field Farm (Fig 19; Backlog site 16), Copse Area, Theale Pit (Backlog

site 24), Bath Road (Backlog site 25), Village Farm (Backlog site 29), Silver Land, Padworth Common (Backlog site 38), Kennetholme Farm, Site A (Backlog site 50), and Kennetholme Farm (Backlog site 60). The small number of excavations with assets dated to the Modern period is likely to be the result of the lack of acknowledgement that features of this period are of archaeological interest. Although the majority of assets are located on the Sand and Gravel geologies, they are mostly situated either within settlements or in areas of gravel that would be considered uneconomic to extract.

Civil

6.12.7 Eight civil assets (Fig 20) have been identified within the Project Area, all of which are peace camps set up in the 1980s in opposition to the storing of Cruise missiles by the United States Air Force at their airbases. The camps were inhabited until the early 1990s when negotiations between the USA and the USSR resulted in the limitation of intermediate ranged nuclear weapons and removal of cruise missiles from USAF bases within the UK. Seven assets (Fig 196a RAs 22–28) lie with the Sand and Gravel geologies. One lies on the non-aggregate geology.

Commemorative

6.12.8 Three commemorative assets have been identified within the project area; one monument which is a memorial to the peace camps that were active during the 1980s (Fig 20; RA 28) and two war memorials (Fig 20; RAs 29 and 30)

Commercial

6.12.9 One Modern commercial asset has been identified within the Project area, an early 20th century roadside café (Fig 20; RA 31), which lies alongside the A4, Bath Road, and close to two derelict railway carriages that have been incorporated into another café (Fig 20; RA 211). The asset overlies Sand/Gravel aggregates in the Kennet River Valley approximately halfway between Theale, to the southwest of Reading and Woolhampton to the east of Newbury.

Communication

6.12.10 Three Modern communications assets have been recorded within the River Sand/Gravel of the Kennet Valley (Fig 20 RAs 32, 33 and 34). They represent three early 20th century telephone boxes along the valley, one just east of Hungerford in the west of the Project Area, one *c* 2.5km east of Woolhampton towards the centre of the Project Area and one just west of Theale in the west of the Project Area.

Defence

6.12.11 The most obvious difference between the Modern period and all others is the dramatic increase in defence assets. Over all, defence assets represent 4.1% of the total number of assets for all periods and those attributes to the Modern period comprise 84% of this total, i.e. 161 out of 193, with a density of 0.41 per km^2 over the Project Area. Nine assets lie within the Chalk Study Area (Fig 20; RAs 1 to 9) and 134 are on the Sand and Gravel geologies (Fig 20; RAs 35–169). A further 18 (Fig 20; RAs 236-243) are on the non-aggregate areas.

6.12.12 The group is comprised of assets primarily from the Second World War and the Cold War. Such assets are significant for our understanding of the physical aspects of those periods of conflict and complement the large number of primary documentary sources and synthetic secondary histories regarding these events. Assets from the Second World War relate mainly to the defensive lines established through the country designed to impede the advance of an expected invasion. It is interesting to note that despite such probable significance, this topic was lacking in the Historical Atlas of Berkshire (Dils 1998).

6.12.13 The assets comprise two air raid shelters, four aircraft hangers, one aircraft maintenance unit, one antiaircraft battery, two anti-tank emplacements, two armament depots, one battle headquarters, two bomb stores, one bombing decoy, one cold store, one control tower, four gun emplacements, three military airfields, three military buildings, two military camps, two military depots, three military headquarters, one military installation, one military training site, two munitions factories, one ordnance store, 101 pillboxes, two POW camps, one radio station, one storehouse, one supermarket, 13 tank traps, one water tank and one workshop.

Domestic

6.12.14 There are eight Domestic assets, which is much lower than the previous periods but this is likely the result of many of the post-medieval domestic assets still being in use into and through this period. Five assets are on the Sands and Gravels. The other three assets are on non-aggregate geology. The group contains three country houses (Fig 19; RAs 173, 175 and 251), four houses (Fig 19; RAs 174, 176, 250 and 252) and one estate village which contains much early 20th century housing (Fig 19; 172).

6.12.15 Modern occupation patterns are largely visible in current and recent maps and a large amount of written material is available on changing patterns of land use and activity. Consequently this period is well understood. In general, instead of a record of known occupation, the HER provides a record of those modern assets considered to be of particular archaeological, historic, architectural or artistic interest and those which might otherwise be mistaken for earlier and more significant remains (e.g. earthworks associated with golf courses).

Education

6.12.16 There are three Education assets. One represents a boarding school which was established in 1922 on the grounds of a house built during the First World War (Fig 19, RA 177), a second represents a Catholic primary school which was established in a house built *c* 1911/12 (Fig 19; RA 253) and the third represents the location of the Naval shore training establishment, HMS Dauntless, which was a training and drafting centre for the WRNS (Women's Royal Naval Service) from 1946 to the 1980s when it was demolished (Fig 19; RA 254).

Findspot

6.12.17 Seventy-three Findspots have been recorded in the Project area, with a density of 0.18 per km^2. Seven assets are within the Chalk Study Area and 23 assets are on the Sands and Gravels. A further 43 assets are on non-aggregate geology. The majority of this group are artefact scatters and represent finds recovered during the LKVFS.

Garden Parks and Urban Spaces

6.12.18 Two assets have been recorded in the Project Area. These are a feature in the form of a ring of trees first identified on a 1948 aerial photograph (Fig 19; RA 292) and a pavilion designed in 1956 by G E Child-Beale in memory of his parents and was placed in the Child Beale Wildlife Trust Park (Fig 19; RA 199).

Industrial

6.12.19 Three assets lie within the Chalk Study Area (Fig 20; RAs 17, 18 and 19) and two lie within the Sands and Gravels geologies (Fig 20; RA 200 and 201). The later comprise the site of an early 20th century brick kiln north of Newbury, and the site of a weir constructed in the early 20th century just to the north of Kintbury in the west of the Project Area (Fig 20; RA 201). Eight industrial assets lie on the non-aggregate geologies, in the form of five brick and tile making sites (Fig 20; RAs 295, 297–300),

two chalk pits (close to edge of the Chalk Study Area) (Fig 20; RA 294 and 296), and the nuclear power station mentioned above (Fig 20; RA 293).

6.12.20 Modern Industrial assets decline quite markedly in comparison to the Post-medieval period, i.e. 13 Modern to 80 post-medieval Industrial assets (0.03 to 0.20 per km^2 across the Project Area). However, while the densities are very different, the percentages that these groups represent within their respective periods are similar. Although the majority represent new processing sites for old established industries, for example brickworks developed in the early 20th century, one represents a purely 20th century development, a Nuclear Reactor site built to generate power and for research. The reactor was demolished in the 1980s.

Recreation

6.12.21 Two assets have been recorded on the Sand and Gravel geologies; a golf course (Fig 19; RA 202) and a racecourse (Fig 19; RA 203). Like other Modern assets, this group has declined in number in comparison to the post-medieval but is unlikely to represent an actual decline but rather the result of the continued use of earlier assets and the lack of recording of Modern assets within the HER.

Religious, ritual or funerary

6.12.22 Religious, ritual and funerary assets decline from the post-medieval to five assets. The assets comprise a Benedictine monastery established in 1903 at Woolhampton to west of Newbury (Fig 19; RA 301); a convent (Fig 19, RA 302) established in the early 20th which included Downe House School (Fig 19, RA 253); a Methodist chapel (Fig 19, RA 20) built near Chieveley in the north of the Project Area and two Churches (Fig 19; RA 204 and 205). One lies in the north-west corner of the Project Area and the other just of north of Thatcham in the centre of the Project Area.

Transport

6.12.23 Transport assets for the modern period represent a relatively small group within the Modern period (2.6% of all Modern assets). This group has declined markedly in comparison to the post-medieval. The group includes a range of early 20th century features; a new swing bridge built over the canal (Fig 20; RA 210) and a set of weight restriction signs concerning vehicles passing over the canal (Fig 20; RA 21). A section dual carriageway known as the Newbury Bypass has been included due to the controversy that surrounded its construction (Fig 20; RA 206). These assets are generally still extant, albeit not in use for their original purpose and in some cases those form ‘natural’ barriers to aggregate extraction. The group also includes a footbridge, one moveable bridges, a pair of derelict railway carriages, two railway stations, road features and a runway.

Unassigned

6.12.24 Unassigned assets are primarily assets that been identified through archaeological investigation but are unassigned because there is not enough other information to determine their actual use. Fourteen Modern Unassigned assets have been identified 11 of which were identified during modern archaeological interventions and include boundary and ditch features and a ditched enclosure.

Water and drainage

6.12.25 Four Modern Water Supply and Drainage assets have been identified within the Project Area, one drainage ditch, one field drain and two reservoirs (Fig 20; RA 307, 222, 223 and 308 respectively).

7 Research Strategy and Agenda

7.1 Introduction

7.1.1 The following research strategy and agenda has been developed following the assessment of the archaeological resource within the Project Area and in association with *Solent Thames Archaeological Research Framework Research Agenda*. The Agenda has been under development for a number of years.

7.2 General research priorities

7.2.1 Based on the results of the present project, the following general research priorities have been identified. These would have a positive impact upon the understanding of multiple periods across the Project Area as well as West Berkshire as a whole.

Refine understanding of the location, nature and extent of aggregates geology

7.2.2 Current understanding of the aggregates geologies could be enhanced through geoarchaeological investigation. Although there is a generally good understanding of the location and extent of aggregates within the Project Area, minor variations in ancient river courses may affect the depth of gravel aggregate and the location of archaeological remains. Geoarchaeological/geomorphological investigations and the monitoring of non-archaeological geotechnical investigations would help to provide a better understanding of the River Terrace Deposits which often contain early prehistoric (Palaeolithic and Mesolithic) remains and later (Neolithic to early medieval) settlement because of their well-drained soils. More widespread use of these techniques would help to lower any risks by allowing better predictive models to be developed.

7.2.3 Such data would be enhanced by the increased inclusion of geoarchaeological/geomorphological and non-archaeological geotechnical data within the HER, even where the archaeology is absent or unknown (this take in a range of academic work not specifically tied to commercially led archaeological interventions).

National Mapping Programme

7.2.4 The aim of this English Heritage's programme (NMP) is to enhance the understanding of past human settlement, by providing primary information and synthesis for all archaeological sites and landscapes visible on aerial photographs or other airborne remote sensed data. NMP is a key component of English Heritage's capacity to investigate and understand the historic environment at the landscape scale, and underpins other priority projects and programmes. NMP projects that have already been completed have transformed our knowledge of past land-use by mapping whole archaeological landscapes for the first time, with more than 50% of the sites not having been previously recorded.

7.2.5 Three NMP surveys have been undertaken across West Berkshire, comprising a total of 463.62km^2. The surveys cover 161.5km^2 or *c* 42.4% of the Project Area (quartersheets SU46NW, SU46SW, SU46NE and SU67SE). NMP should be undertaken across the rest of the Project Area.

Integration of non-intrusive archaeological survey

7.2.6 The integration of the now digitised LKVFS has added to the HER's ability to visually display the possibly location of activity from different periods. The continued use of fieldwalking within archaeology as an evaluation tool and the continued integration of such data into the Digitisation project would continue to improve the HER and the understanding of activity across the whole region. The creation of fieldwalking map

of area, continually enhanced by all fieldwalking projects, both from professional and amateur work, linked to the NMP and excavation site plans would connect all these sources and greatly enhance the HERs ability to understand and predict locations of historical significance and thus reduce the risks from future development.

7.3 Specific research priorities

7.3.1 The general research priorities would have a positive effect on understanding of the archaeology of all periods across the aggregates resource. However, all the periods have particular research needs and these have been addressed in much detail in the *Solent Thames Archaeological Research Framework Research Agenda* (see http://thehumanjourney.net). The following period discussions will briefly summarise the present situation identified by the resource assessment and only refer to the Agenda proposals where relevant.

Lower and Middle Palaeolithic

7.3.2 Understanding of the Palaeolithic in the Project Area is limited by the very low density of assets across the Project Area. The Backlogs project identified only one site of Palaeolithic date as a result of aggregate extraction, Marley Tile Pit. Two other sites have been identified within the Project Area, Avington VI near Hamstead Marshall and Crown Acres, near Thatcham.

7.3.3 The *Solent Thames Research Framework* splits the Palaeolithic period into two separate periods; the Lower/Middle as one period and includes the Upper with the Mesolithic period and thus it is treated in the same way in this section. The Solent Thames Research Framework Research Agenda argues that all research aims for the Lower/Middle Palaeolithic period should relate to the national Lower/Middle Palaeolithic research themes, which are set out in the Framework Agenda. It sets out a number of more general research aims that apply to all the areas covered by the Framework and sets out the criteria established by English Heritage by which it can be determined if a Palaeolithic site is of national significance. It also includes a number of more specific aims for Berkshire as a whole.

General Research questions

- Does the artefactual material from Berkshire provide evidence relevant to the debate concerning the status of British handaxe and core and flake assemblages?
- What are the absolute geochronological ages of the fluvial terraces of the Thames and its tributaries?

Specific projects

- Independent geochronological testing of terrace chronology models, including use of AAR (amino-acid ratio) and OSL (optically stimulated luminescence) techniques, either through specific re-investigations of remnant deposits or PPS5-funded work in light of development activity.
- Direct, multi-disciplinary, investigation of primary context deposits (if and when such deposits are newly identified and/or re-located).
- The re-examination of the Hamstead Marshall assemblage alongside one from a site near Knowle Farm, which is outside the Project Area but both are key sites to understanding this period.

Upper Palaeolithic and Mesolithic

7.3.4 Understanding of these periods is also limited. Current asset densities suggest that Mesolithic assets are concentrated around the river valleys, but this is may be due to the greater level of archaeological investigation within the gravel aggregate areas

on the valley floor, although this has possibly been partially balanced by extensive fieldwalking that was undertaken on the shallower soils and beds on the valley sides (Ford 1987b).

7.3.5 The *Solent Thames Archaeological Research Framework Research Agenda* sets out a series of detailed research aims that need to be addressed for the whole Solent-Thames area (Hey 2010). However, a number of these do apply specifically to the Project Area:

- A re-examination of artefacts and associated archive (if possible) should be carried out where uncertainty remains as to their date.
- There is a need to improve chronological understanding of Late Upper Palaeolithic and Mesolithic flint scatters using a range of scientific dating including OSL, TL (Thermoluminescence) and AMS (Accelerator Mass Spectrometry) radiocarbon dating. The latter is particularly suitable to the assemblages from the valley floodplain as these are within the waterlogged organic sequences overlying the gravels.
- Excavation should be targeted in river valley situations to provide much better information about riverine settlement and the use of and impact upon the surrounding landscape.
- More work needs to be done to identify sites away from river valley areas, particularly open sites.
- Ways to shed light on mobility/group range and group size need to be investigated. In addition more work is needed on seasonality in the use of sites, for example using faunal remains and other proxy indicators.
- Differences between Late Upper Palaeolithic society and settlement and that of the early Mesolithic should be identified.
- More micro wear analysis would help us understand activities on site, for example, food resources and food preparation methods.
- Use of detailed analysis of a full range of palaeoenvironmental material found in association with Mesolithic remains should be undertaken and, where necessary, linking these sites to deeper off-site sedimentary sequences by targeted coring programmes.

7.3.6 A more general research aim could also include

- A review of Mesolithic entries within the HER to revise the dates of those which, by virtue of their nature, associations or physical position, cannot be Mesolithic.

Neolithic, Bronze and Iron Ages

7.3.7 The *Solent Thames Archaeological Research Framework Research Agenda* splits these three periods into two, the Neolithic and Early Bronze Age as one period and the later Bronze Age and Iron Age as the other. Therefore, for the purposes of continuity these divisions will be replicated here. Furthermore, as the discussions for these periods are quite detailed they have been included as Appendices 6 and 7. This section includes more specific questions identified by period specialists on review of the this report

Neolithic and Early Bronze Age

7.3.8 There is a low density of Neolithic assets whereas there is a relatively high density of Bronze Age assets within the Project Area. Religious, Ritual and Funerary assets form only 13.6% of the total of Bronze Age assets, with unassigned assets forming the majority at 56%. Over the course of the Neolithic and early Bronze Age, a dramatic change occurred in the landscape of the region which, for the first time, was achieved by human rather than natural means. The speed of change, the relative and changing importance of animals and cereals and the impact of their

introduction on human populations remains hotly contested.

7.3.9 The *Solent Thames Archaeological Research Framework Research Agenda* (Bradley 2008) sets out a series of detailed research aims that need to be addressed for the whole Solent-Thames area and the assessment provides visual images of some of the gaps in our knowledge that can be address by the Research Agenda.

Later Bronze Age and Iron Age

7.3.10 Understanding of this period is better than for earlier periods but the assessment has highlighted areas that need reassessment or further investigation. The *Solent Thames Archaeological Research Framework Research Agenda* sets out a series of research aims of particular relevance to the Project Area but several specific research aims have been by this assessment (Lambrick 2008).

- Does the course of the river and the way that the valley is used (along it and across it) make the Kennet distinctive?
- Why have so few Bronze Age field systems been found in the Kennet Valley when they are so common in the Thames Valley?
- Why, compared to the River Thames, is there so little evidence for votive deposition in watery places in the Kennet Valley? (re. palaeochannels in extraction sites)
- Why are there apparently so few burnt mounds in the Kennet Valley when they are relatively frequent finds to the east?
- What is the significance of the nationally important early iron working sites within the Kennet River Valley, such as for example the one at Hartshill Copse.
- What variation is there in the location of settlements on the valley floor and how was the local micro-topography used (in comparison with the widespread use of gravel islands in the Upper Thames and occasional use of seasonally occupied settlements)?
- What effect did the 'catchment' of the *oppidum* at Silchester have on the communities of the Kennet Valley?.

Roman

7.3.11 The Roman period is generally well understood in the Project Area. The Roman period contains the highest asset density of all the early periods, including the early Medieval period. A range of Roman sites have been identified and excavated since the 19th century and there is generally a good understanding of the chronological framework and artefact typologies. The *Solent Thames Archaeological Research Framework Research Agenda* sets out a series of detailed research aims that need to be addressed for the whole Solent-Thames area (Fulford 2008; Fulford and Allen 2010; Greenaway 2008). The agenda makes it clear that, like the previous period, PPG16/PPS5 driven archaeological investigation has inadvertently caused a bias towards particular geologies, primarily those areas subject to extraction. The thrust of the agenda, therefore, is to try and redress this imbalance and it is argued that there should be more emphasis on the clay lands within the Framework area. The present assessment moves some way towards addressing this as it deals with assets across the whole Project Area, which contains clay areas as well as aggregate areas. However, more specific research aims apply to the Project Area.

7.3.12 From Environmental evidence:

- Environmental evidence should be collected and analysed to help identify how field systems operated.
- Evidence for variation in resources from different scales of farm needs to be investigated.

- Attempts should be made to find evidence for changes in farming methods from field, farm to valley.
- Evidence for a Roman cultivation signature in the alluvial sequences in for instance the Thames Valley should be sought.

7.3.13 From Communication and Trade:

- The evidence for the use of the Thames and its major tributaries, in this instance the Kennet River, for the movement of goods and people requires further investigation.
- Evidence for river crossing points should be sought.
- The evidence for Roman-period deposition in the river needs more study.
- The influence of the Thames on the development of riverine settlements should be explored and the evidence for change over time should be identified.
- The influence of the major roads on the development of roadside settlement should be investigated.
- The evidence for changes in the relative importance of the east-west and other major roads through the region over time need to be explored.
- The relationship between transport routes and the London hinterland should be better understood.

Early Medieval

7.3.14 Understanding of the early medieval periods within the Project Area is very limited and has one of the lowest asset densities at 0.36 per km^2. The primarily asset types are findspots and unassigned, with the majority of assets in these groups being identified through archaeological investigations, both intrusive and non-intrusive. Despite this, within the rest of the asset types, references from documentary sources provide the bulk of the references, such as place name evidence. The majority of Religious, Ritual and Funerary assets are surviving structural elements within existing churches, although a nationally important cemetery has been recorded in the study on the edge of Kintbury in 1867 during the expansion of a chalk quarry. It was rediscovered in 1979-80 during archaeological investigation ahead of housing development. Nevertheless, the assessment has the potential to contribute to the research agenda established for the Solent–Thames area.

7.3.15 The *Solent Thames Archaeological Research Framework Research Agenda* sets out a series of detailed research aims that need to be addressed for the whole Solent-Thames area. The data from this project can be used to contribute to all of the aims but particularly to the following specific aims (Crawford 2008: Crawford and Allen 2010)

- A review of rural field systems
- A review of settlement patterns and land use, particularly the apparent concentration of settlement on gravel terraces in the Thames Valley
- Understanding the fate of the Roman roads during this period.

7.3.16 More general aims could include:

- Targeted, systematic field survey (including metal detecting and fieldwalking) in order to identify possible early medieval sites.
- Wider use of geoarchaeological survey to identify early medieval landscapes adding to our understanding or likely locations for settlement.
- Targeted investigation (including field survey and excavation as appropriate) of possible early medieval assets. This should include assets identified from NMP, from documentary and place-name evidence and from artefact scatters and metal detecting.

Medieval

7.3.17 The medieval period is better understood than the previous periods. A greater range of documentary sources and structural elements survive which are complimented in some cases by archaeological evidence. Urban development and an increased level of aggregate extraction have led to increasing levels of archaeological data. Nevertheless, unassigned assets, which included archaeological features, represent only 12.4% of the total of Medieval assets; findspots represents 38%, the majority of which are the result of non-intrusive archaeological investigation. The distribution of settlement and land use is relatively well understood and the Historic Landscape Characterisation has been carried out across the region. However, it is argued in the *Solent Thames Archaeological Research Framework Research Agenda* that a study of the local *pays* (an area whose inhabitants share common geographical, economic, cultural, or social interests) would be more beneficial to the understanding of the period (Munby 2008). The Agenda also provides two main aims for the Solent-Thames area that:

- Evidence from documentary sources needs to be integrated with the physical evidence, and each allowed to challenge the other
- Consideration of art and art-historical studies should be included.

7.3.18 It also sets out a series of detailed research aims that need to be addressed for the whole Solent-Thames area into which this project can contribute.

7.3.19 Several specific new aims have been identified for the Project Area;

- Churches and chapels are often peripheral, so the assets may not be showing the medieval settlements.
- The river gravels were important in that they might not just be areas of open field but contain dispersed settlements.
- There is a poor knowledge of several site types, especially water exploitation – where were the wharves and quays (likely to be not just in urban areas), and where are the Domesday mill sites (probably on palaeochannels not the current river)?
- We need to understand how the Kennet Valley links with the Thames.
- A lot of remains are ephemeral but might have had a major impact, such as the pottery kilns on the Newbury Bypass which were just clamp kilns but produced pottery which was widely distributed.
- There is a need for environmental and geological input, e.g. identifying palaeochannels and the extent of medieval colluvium and alluviation.

Post-medieval and Modern

7.3.20 The *Solent Thames Archaeological Research Framework Research Agenda* considers the two periods as one for the purposes of research therefore for the sake of continuity this report will consider them as one as has been done with earlier periods (Doggett 2008; Hind 2010). Both periods are well understood, but despite the good understanding of the history and buildings of the period, there has been limited archaeological excavation of post-medieval remains. Many buildings survive from this period and documentary and map evidence provides considerable information on settlement patterns and land use. The rural settlement pattern of the medieval period continued into the post-medieval period and a number of large houses developed fashionable landscaped parks. Towards of the post-medieval period two important communication networks link the area more closely to the rest of Britain, the system of canals that run beside the Kennet River and railway network.

7.3.21 The Modern period is very well understood, but the asset density declines because of questions of which modern remains should be considered heritage assets. For earlier periods heritage assets are typically ‘those which have survived’ but

assigning heritage assets for the modern period requires identifying those 'which should be preserved' and is therefore a more complex issue. Those assets which have been include a large number of defence assets, many of which relate to World War II and the Cold War. Other assets include commemorative assets, such as war memorials.

7.3.22 The *Solent Thames Archaeological Research Framework Research* provides two main aims for the Solent–Thames area, that:

- Areas where the physical and documentary evidence is contradictory need to be identified for further investigation
- The strengths and weakness of the various types of evidence across the regions should be assessed.

7.3.23 The present project should provide a starting point for these aims within the Project Area.

7.3.24 The Agenda also sets out a series of detailed research aims that need to be addressed for the whole Solent-Thames area. The data from this project can be used to contribute to all of the aims particularly those relating to Warfare, defences and military installations, Crafts trade and industries and Transport and Communication.

8 Mitigation

8.1 Introduction

8.1.1 Aggregates extraction typically results in the entire removal of any archaeological (i.e. buried), built heritage (i.e. standing buildings or structures) or historic landscape (i.e. woodland, earthworks, hedgerows and field systems). This impact derives from two main phases:

- Preliminary topsoil strip and enabling works – archaeological remains are potentially located immediately beneath the topsoil. Removal of the topsoil as part of the preliminary site strip, and for temporary and permanent works, including access roads, work compounds and topsoil storage areas, exposes any archaeological remains that may be present immediately beneath the topsoil. Exposed remains may then be truncated by subsequent movement of vehicles and plant involved in construction activities (i.e. through rutting and compaction) and the construction of new ground surfaces and site amenities (e.g. offices, rest areas, processing plants etc). In addition, it is possible that topsoil removal without archaeological supervision may result in overstripping, which would have a direct impact upon archaeological remains located beneath the topsoil, or understripping, where archaeological features are concealed beneath a thin layer of topsoil but are then exposed and unprotected from subsequent activities.
- Aggregate extraction – which entirely removes any surviving assets, (including archaeological remains, built heritage and historic landscape features, where these were not removed by the preliminary topsoil strip).

8.2 Planning Policy and guidance

8.2.1 The status of archaeological remains in the planning system is outlined in national, and local planning and minerals policy and guidance and minerals planning policy:

- Planning Policy Statement 5 (PPS5): *Planning for the Historic Environment*
- Planning Policy Statement 1 (PPS1): *Delivering Sustainable Development*
- Minerals Policy Statement 1 (MPS1): *Planning and Minerals*
- Berkshire Replacement Minerals Local Plan (RMLP) (adopted 2001)

8.2.2 These documents establish that development and minerals extraction should take place in accord with principles of sustainable development. They emphasise that heritage assets of national (very high) significance, including statutorily protected sites and those of equivalent merit, should be preserved *in situ,* while sites of lesser significance should be subject to archaeological excavation and recording (*preservation by recording and advancing understanding of asset significance),* where the needs of the development outweigh the need to conserve archaeological remains *in situ.*

8.2.3 The process of archaeological investigation can use a range of techniques, both intrusive and non-intrusive, and require a number of successive stages designed to define the nature, date, extent, survival and ultimately the significance of any archaeological assets which may be affected by development/aggregate extraction. This is carried out in order to determine whether any remains are of national significance and allow an informed decision regarding an appropriate mitigation strategy.

8.2.4 Guidance on the application of planning policy to minerals and the historic environment is provided in *Mineral Extraction and Archaeology: A Practice Guide* (MHEF 2008) and *Mineral Extraction and the Historic Environment* (English Heritage 2007a). Any archaeological investigation, whether invasive or non-invasive, should take consideration of the research priorities discussed in the Research Strategy and

Agenda (section 7) of this project report and other relevant documents (e.g. *Solent Thames Archaeological Research Framework*). All archaeological work should be undertaken by an approved archaeological contractor, to the standards prescribed by the Institute for Archaeologists (IfA 2001a; 2001b; 2001c).

8.3 Desk-based assessment

Introduction

8.3.1 The initial stage of archaeological investigation is a desk-based historic environment assessment (HEA) and is sometimes included in an Environmental Impact Assessment (EIA) where one is required by the Town and Country Planning (England and Wales) Environmental Impact Assessment Regulations (2011).

8.3.2 Under the terms of PPS5 an HEA forms an initial stage of investigation of the area of proposed extraction and may be required as part of a planning submission in order for the local planning authority (LPA) to formulate an appropriate response in the light of the impact upon any known or likely heritage assets. These are parts of the historic environment which are considered to be significant because of their historic, archaeological, architectural or artistic interest. These might comprise below and above ground archaeological remains, buildings, monuments or heritage landscape within or immediately around the site (DCLG 2010, 1, 13).

8.3.3 The HEA will set the site into its full archaeological and historical context in order to determine the likely nature, extent, preservation and significance of any heritage assets that may be present within the site or its immediate vicinity. It will assess the likely impacts from the proposed extraction upon any known or likely heritage assets and make recommendations as to the next stage of investigation. Where understanding of the archaeological remains on the site is very good and can be determined to a high degree of certainty, it may be possible to undertake archaeological mitigation immediately without further initial investigation. More usually the HEA will recommend further site-based investigation into the nature of the remains because the existing information is insufficient to determine precisely what is present on the site. This investigation may take the form of invasive or non-invasive procedures. The HEA may also include or recommend a survey of the buildings and historic research to identify relevant physical and historical aspects of the building in order to make an assessment of the importance of the building, whether it should be retained and whether further recording would be appropriate.

Predicting archaeological remains

8.3.4 The current level of understanding across the aggregates resource in the Project Area will have a direct impact on the accuracy of any prediction in an HEA as to the nature, date and significance of any archaeological remains within that area. In general the greater the understanding, the greater the probability of predicting at the desk-based stage the nature and significance of the remains which are likely to be present. The following factors improve understanding of the archaeological resource within a given area and so enhance the probability of predicting the nature and significance of any anticipated remains at the desk-based stage:

- High asset density – the greater the number of assets around a site, the more evidence there is as to what might be present on it.
- High number of past archaeological investigations – the greater the number of archaeological investigations around the site, the more evidence there is as to what might be present within it. If archaeological investigations found no remains, this provides an indication that the absence of evidence reflects a genuine aspect of past occupation patterns and rather than an absence of investigation. Systematic fieldwalking and metal detecting surveys can provide a useful indication of areas with archaeological potential and areas without. Even the results of less systematic metal detecting can reveal

possible archaeological sites where very high concentrations of assets have been recovered,

- NMP coverage – NMP identifies any archaeological remains of either earthwork or masonry type which are sufficiently large and shallow enough and to have had a visible impact upon the patterns of grass and crop growth. This will include most large and complex sites of most periods as well as diffuse assets such as field systems, enclosures and boundaries. Although NMP identifies all such sites visible in air photographs, further investigation is often required to confirm their date, nature and significance. NMP cannot normally identify deeply buried sites beneath alluvium or remains of the earliest prehistoric periods (Palaeolithic and Mesolithic) and particular types of sites (e.g. cemeteries without earthwork boundaries) may also be invisible. A qualified archaeological contractor would normally be able to view, interpret and plot aerial photographs, even if NMP had not been completed, but may not be able to access as wide a range of photographs as the NMP.

8.3.5 It would therefore be easier to predict accurately the nature and significance of archaeological remains within areas of high asset density. Where a very high density Study Area has been subject to NMP mapping and has had a history of intensive investigation, desk-based predictions of the nature and significance of predicted archaeological remains are likely to have a greater accuracy still. However, this may not obviate the need for non-invasive investigation or evaluation which may still be required at the discretion of West Berkshire's Archaeological Officer.

8.3.6 In areas where understanding is low due to a low asset density, limited past investigation and an absence of NMP survey, initial non-invasive investigation and evaluation are more likely to be required because the nature and significance of the remains are less predictable at the desk-based stage.

8.4 Evaluation

Non-invasive

8.4.1 Non-invasive techniques may be undertaken at the same time as desk-based assessment, subsequent to it or as part of an invasive field evaluation of the potential of the site. Non-invasive archaeological techniques require minimal ground disturbance and may be an appropriate initial stage of site based investigation, particularly if a site is very large in area or if understanding of the archaeology of the area is very limited.

Walkover survey

8.4.2 Walkover survey is often undertaken as part of an initial phase of desk-based assessment but may also be incorporated into later investigations. It can be used to identify and monitor any up-standing buildings or historic landscape features (e.g. Scheduled Monuments, historic field boundaries, barrows etc), identify likely areas of archaeological interest and record features that may be periodically obscured (e.g. by tidal movement, growth of vegetation etc). Depending on the purpose of the walkover survey, the location of significant features can be documented using GPS equipment and surveyed to a standard commensurate with their significance as described in RCHME (1999b) and English Heritage (2007b) guidance.

Topographical survey

8.4.3 Topographical survey can be undertaken to record and analyse earthworks, field boundaries and other up-standing components of the historic landscape. Topographical surveys should only be undertaken following detailed historic map regression, so that the survey is informed by a clear understanding of the key

landscape components.

8.4.4 The level of detail recorded should be judged according to the nature of the remains. Recording levels appropriate for specific types of assets are defined by RCHME guidance (1999b). English Heritage guidance (English Heritage 2007b) on recording archaeological landscape may also be appropriate. Survey will normally be undertaken using GPS equipment and drawings will be generated in CAD, such that the results can be incorporated directly into a digital scheme mapping.

Aerial photographic survey

8.4.5 A survey of aerial photographs might be undertaken as part of a desk-based assessment or an initial stage of a subsequent evaluation. If the site has been included in existing NMP survey, it might only be necessary to examine aerial photographs taken after the NMP was completed (if any). Aerial photographs show two different kinds of feature:

- Cropmarks – buried features are visible as cropmarks or grassmarks because the different material within them causes differential growth of the crop or grass above.
- Earthworks – The upstanding remains (either positive or negative) are visible from the air.

8.4.6 The following types of assets are unlikely to be identified from aerial photographs:

- Deeply buried remains – As the remains have to be sufficiently shallow to have an impact on surface growth deeply buried remains are typically invisible. Typical deeply buried remains include:
    - Palaeolithic (and sometimes Mesolithic) remains which may be within River Terrace Gravels.
    - prehistoric and some historic remains within or beneath alluvium.
    - Remains beneath landfill or made ground.
- Small remains – Even if relatively shallow, small features and artefact assemblages are unlikely to be seen because they are not normally large earthwork features and do not affect the water retention of a large area of plants.
- Burials – Graves are normally refilled with the material dug out of them relatively soon after the initial grave digging. Consequently the grave fill is very similar in water holding properties to the surrounding area and little differential may be visible between the plants above the burial and the surrounding land.

Field artefact collection survey (Fieldwalking)

8.4.7 Surface artefact collection survey (fieldwalking) may be undertaken in fields under arable cultivation. Artefacts within the ground are disturbed by agricultural practices periodically brought to the surface by ploughing. Buried archaeological sites are detected by collecting artefacts from the ploughed field surface and plotting the distribution of different artefact types by period.

8.4.8 Fieldwalking is particularly effective for the following types of site:

- Sites with very ephemeral or non-existent sub-soil features
- Sites rich in durable artefacts such as worked flint or Roman and medieval pottery

8.4.9 Unlike geophysical survey, fieldwalking can determine the period of the site's use. Fieldwalking and geophysical survey may therefore be undertaken together in order to identify the main activity areas in a very extensive development area, but it is rarely cost-effective to use both methods purely for evaluation purposes.

8.4.10 Surveys are normally carried out using linear transects 10–20m apart. Fieldwalkers

walk along each line, systematically collecting artefacts within a 2m wide sample transect. More intensive coverage can be applied over relatively small areas. Artefacts are then separated into categories and periods and artefact distribution plotted against the linear transects so that areas of artefact concentration are seen as 'hotspots'.

8.4.11 If geophysical survey (including metal-detecting) is to be carried out, it may be cost-effective to do such surveys at the same time as the fieldwalking, using the same survey transects.

Geophysical survey

8.4.12 Available methods of geophysical survey include:

- Magnetometer Survey
- Electromagnetic survey (including soil conductivity, magnetic susceptibility, magnetic viscosity, metal detecting and ground penetrating radar)
- Resistivity survey

8.4.13 The choice of method depends on the type of archaeology expected, the environment, ground conditions (including, drift and solid geology, depth of overburden above archaeological remains), survey objectives and cost. Detailed guidance on the selection of methods and sampling strategies can be found in the English Heritage (2008c) guidance. The advice of a specialist is normally required before determining any geophysical survey strategy.

8.4.14 For extensive surveys in rural areas, magnetometer survey is the most commonly used and effective method, usually using a fluxgate gradiometer. Extensive magnetometer survey is capable of revealing the layout of a site in remarkable detail under suitable (magnetically enhanced) soil conditions. Resistivity survey is more effective at detecting certain types of feature, including masonry and brick foundations and is also quite commonly used. Geophysical survey of any sort is rarely an option in urban environments, or for detecting sites covered with thick deposits of hillwash or alluvial deposits, although Ground Penetrating Radar has some applications.

Metal detector survey

8.4.15 Metal-detector survey can be very effectively used in conjunction with surface artefact collection survey (or in place of it where the land is under permanent pasture) and in the course of archaeological excavation. Concentrations of metal artefacts in the ploughsoil are often the first indication for the presence of complex archaeological sites (Roman and medieval settlements and industrial sites, for example). Some important Anglo-Saxon sites consist entirely of scatters of metal artefacts in the ploughsoil.

8.4.16 It may desirable to employ amateur metal-detector users, as a contribution to community access and involvement. However, surveys must always be carried out under the supervision of a suitably experienced professional archaeological contractor, who will record the location of the artefacts and undertake specialist artefact identification, conservation and reporting.

Invasive techniques of evaluation

Geoarchaeological techniques

8.4.17 Geoarchaeological boreholes and sampling techniques may be used as part of an evaluation or mitigation strategy to investigate geological deposits of archaeological interest, establish the geological sequence on the site, identify any geological deposits with potential to contain archaeological remains and collect palaeoenvironmental and geoarchaeological samples. Where extraction of sub-alluvial River Terrace Deposits is required, geoarchaeological investigation of the

alluvial sequence is likely to be required because of the archaeological and palaeoenvironmental potential of these deposits.

8.4.18 The identification and dating of geological deposits with archaeological potential and understanding of geological sequences is particularly important for aggregates extraction sites. Geoarchaeological techniques may be used to identify the potential for such deposits to be of archaeological significance (either through the remains they contain or the potential to improve understanding and dating of the geoarchaeological sequence within the Study Area) and to mitigate the impacts of aggregate extraction.

8.4.19 Where geoarchaeological techniques are used as part of a mitigation strategy the aim is to develop an understanding of the geological sequence (including the date of significant deposits) and to excavate, record and analyse any archaeological remains within the geological sequence in order to improve understanding of the periods concerned.

8.4.20 The strategy for geoarchaeological investigation is likely to involve a combination of some or all of the following:

- Investigation and extraction of deposits (most frequently through the use of boreholes and test pits),
- The extraction of samples (from boreholes, bulk sampling and monoliths)
- Laboratory analysis and testing (including analysis of stratigraphic deposits, micro-artefact sieving, Optically Stimulated Luminescence dating, palaeoenvironmental analysis of pollen, insects and other environmental indicators) where appropriate.
- Topographical modelling of the surface and subsurface deposits to inform understanding of past landscapes.

8.4.21 Stratigraphic information from individual logs can be entered into a specialist geological modelling program in order to allow borehole cross-sections through the site to be generated and topographical projections of identified surfaces to be constructed (e.g. Pleistocene gravel surface topography). Information from individual boreholes and test pits is examined and the major stratigraphic units identified. Interpretation of the geological sequence at each stage will be informed by palaeoenvironmental data, as it becomes available.

Field Evaluation

8.4.22 Following a HEA or initial non-invasive investigation, archaeological evaluation may be requested to confirm the results of the earlier work. Evaluation usually comprises a series of trial trenches or test pits across the site and archaeological boreholes. Archaeological monitoring of geotechnical investigations may be included to provide information on the stratigraphic sequence and the potential for geoarchaeological and palaeoenvironmental information. The proportion of the site and distribution of the pits would need to be agreed with West Berkshire's Archaeological Officer. The location and distribution of the test pits and trenches would normally be expected to investigate any anomalies identified in earlier work and provide good coverage of the site to give the best opportunity for the identification of previously unidentified archaeological remains.

8.4.23 Field evaluation on proposed aggregate extraction sites is most likely to comprise large open test trenches. Made ground and topsoil is normally removed by machine. Further deposits may then be removed by machine until archaeological remains are identified. All machining is undertaken under archaeological supervision. Any archaeological remains are cleaned and recorded and may be sampled to obtain evidence for their date and significance. The size and distribution of the evaluation trenches would need to be agreed with West Berkshire's Archaeological Officer and would be expected to investigate any anomalies identified during earlier non-invasive investigations.

8.4.24 The depth of the required evaluation trenches will depend upon the likely depth of any archaeological remains and the geology type. Across most aggregate geologies, archaeological remains are likely to be relatively shallow. Remains of the later prehistoric to modern periods are typically present above or cut into the top of the highest natural deposits whether these are the aggregate bearing geologies (e.g. River Terrace Deposits, Angular Flint Gravel, Chalk etc) or superficial non-aggregate geologies overlying them.

8.4.25 Certain geology types have the potential to contain archaeological remains at deeper levels. If the following geologies are present on a proposed extraction site, deeper evaluation trenches or test pits may be required:

- River Terrace Deposits, Angular Flint Gravels, Raised Marine Deposits and Blown Sand have the potential to contain Palaeolithic remains. Geoarchaeological investigation of these strata may be required to confirm the extent and date of these deposits and if any archaeological remains are present.
- Alluvium (present above sub-alluvial River Terrace Deposits in river valleys, on floodplains, marshes or semi-inundated land) has potential for palaeoenvironmental remains and deeply buried *in situ* assets, potentially including well preserved waterlogged material. Investigation (through boreholes, test pits or deep trenches) of the archaeological and palaeoenvironmental potential of the alluvium would be required prior to any aggregate extraction

8.5 Mitigation

8.5.1 Following the completion of the evaluation phase, a historic environment mitigation strategy would be developed and agreed with West Berkshire's Archaeological Officer. Mitigation may include any of all of the following:

- Re-design or modification of the proposals to allow for the *preservation in situ* of any nationally significant remains (whether these have been statutorily protected or have been recently identified). Nationally significant remains could potentially include elements of the historic landscape (such as Ancient Woodland or protected Hedgerows).
- Archaeological excavation to comprise *preservation by recording and advancing understanding of asset significance* of assets not considered to be of national significance. Different excavation techniques may be suitable for different environments and types of remains and these are detailed in 8.4.22 to 8.4.24.
- Geoarchaeological investigation to develop an understanding of the geological sequence (including the date of significant deposits) and to excavate, record and analyse any archaeological remains within the geological sequence. Geoarchaeological investigation may include any or all of the techniques described in 8.4.17.
- Watching brief – comprising intermittent attendance by an archaeologist to ensure no archaeological remains are removed without record during non-archaeological works that are unlikely to have an impact on archaeological remains.
- Standing building recording – should any standing structures of historic interest be identified, but not considered appropriate for *preservation in situ,* standing building recording is likely to be requested. This would comprise a survey of the structure undertaken before demolition, with accompanying historical research and visits during demolition (if appropriate) to identify any features not visible during the initial survey. The levels of standing building recording have been set out by English

Heritage (2006b) and the IfA (2001c) and vary depending on the importance of the structure.

Excavation techniques

8.5.2 The precise form of mitigation will depend upon the significance, preservation, underlying geology and depth of the archaeological remains present on site. Sites on River Terrace Deposits may require geoarchaeological investigation as in 4) below to determine the date and extent of the River Terrace Deposits. Deeper trenches might also be required to excavate any *in situ* Palaeolithic remains within the River Terrace Deposits.

8.5.3 Sites within the alluvium may require geoarchaeological and palaeoenvironmental investigation to provide answers to research questions about the past environment. Deeper trenches (as described in 4) below) may be required to excavate *in situ* prehistoric deposits if present within the alluvium:

1) Where diffuse or dispersed archaeological remains (e.g. field systems with localised settlement or ritual landscapes) are likely to be located at shallow depth (i.e. most extraction sites and particularly on River Terrace Deposits), 'general excavation' is likely to be most appropriate.
2) Where understanding of archaeological potential and significance is very good, 'targeted excavation' may be most appropriate. Normally a thorough HEA, followed by non-invasive investigation and/or field evaluation would be required to confirm that the targeted areas are of sufficient archaeological significance and whether other areas require 'general excavation' or 'watching brief'.
3) A watching brief may be appropriate if proposed works (e.g. geotechnical works, preparatory excavation works, site preparation, preliminary topsoil/subsoil strip and other enabling works etc) are only anticipated to have a limited and localised impact on archaeological remains and/or in areas where preceding HEA and non-invasive investigation and/or field evaluation have identified a low archaeological potential where no significant archaeological remains are anticipated.
4) Where archaeological potential has been identified within geological deposits (i.e. River Terrace Deposits, Angular Flint Gravel, Raised Marine Deposits or Blown Sand) or alluvium; deeper excavations, geoarchaeological tests pits and boreholes may be required to mitigate the impacts upon deeper remains. These could include localised areas of deeper excavation where higher archaeological potential has been identified. On alluvium, battered or stepped trenches up to 4m below ground level (mbgl), with further machine dug (and not manually accessible) test pits in the base may be required to reach deep remains.

8.5.4 *General excavation* (also known as 'strip, map and sample') is particularly appropriate for large scale extraction sites with relatively shallow rural sequences. It is particularly advantageous in recording large areas and diffuse features. It should be undertaken according to a Method Statement agreed with West Berkshire's Archaeological Officer and in accordance with the IfA guidelines (IfA 2001):

- Strip – The topsoil or made ground is removed by machine under archaeological supervision until the subsoil or first archaeological layer is reached.
- Map – Archaeological deposits are hand cleaned to define the edges of discrete features and a measured plan, photographic and written record is made of the visible features.
- Sample – Visible artefacts are collected to assist in dating of features and deposits. Sections (of circular or linear features) and quadrants (of large circular or sub-circular features) of large or significant features are

excavated to recover artefacts and record internal stratigraphy. Certain types of features (burials, hearths, stratified remains or significant features) are hand excavated in their entirety by the archaeologist and recorded. Palaeoenvironmental sampling of buried soil horizons and bulk sampling of certain deposits will be undertaken to retrieve additional evidence.

8.5.5 *Targeted excavation* is most suitable where the archaeological potential of the site is well understood and localised areas of interest with significant archaeological remains have been identified. Under these conditions, archaeological investigation can focus on a particular area of archaeological remains rather than stripping a large area, including areas of no archaeological potential. Should areas of complex and deeply stratified archaeological deposits be identified, 'single context excavation' may be appropriate. Such complex and stratified deposits are unlikely to occur outside an urban environment. Single context excavation excavates each feature in its entirety and records them individually in plan. This enables the stratigraphic sequence to be reconstructed at the post-excavation stage. A written record provides additional information on the nature of contexts.

Watching Brief

8.5.6 During a watching brief an archaeologist may be required to visit the site during or prior to specific works to ensure no previously unknown or unexpected remains are removed without *preservation by recording and advancing understanding of asset significance*.

8.5.7 There are two forms of watching brief:

- General watching brief – an archaeologist visits the site at predetermined intervals to monitor archaeologically sensitive areas where no specific remains have been identified but where there is a risk that works may have an impact on previously unknown remains.
- Targeted watching brief – an archaeologist observes certain specific locations or processes which have been identified as posing a potential risk to specific archaeological remains.

8.5.8 There may also be provision for the client to contact the archaeologist should archaeological remains be located. Should remains be identified provision would normally be required for the excavation and recording of such remains by the attending archaeologist and/or others.

8.5.9 The watching brief would need to be undertaken in accordance with IfA guidance (IfA 2001e) and the requirements of West Berkshire's Archaeological Officer.

Standing building recording

8.5.10 Standing building recording may be applied to significant buildings and structures prior to demolition and clearance. The level of recording will be commensurate with the significance of the remains, and will be carried out in accordance with English Heritage (2006a; 2006b; 2007; 2008b and 2008d) and IfA (2001b; 2001c) guidelines. The 19th and 20th century development of the site is as important as earlier phases. As minimum, digital records of buildings and other structures will be included in the Project digital mapping in layers illustrating the historic development of the site. Much of this information can be obtained from digital overlays of historic map information. However, particularly important standing structures may require more detailed recording.

8.5.11 In general, baseline recording of significant structures will be undertaken to RCHME Level 2. In summary, this is a descriptive record in which both the exterior and interior of the building is seen, described and photographed. The examination of the building will produce an analysis of its development and use and the record will include the conclusions reached, but will not discuss the evidence on which the analysis is based. A plan will be made and elevations may be appropriate in some

circumstances.

8.5.12 Building survey will not be undertaken until existing documentary sources have been consulted, as adequate survey records may already exist in some cases, particularly for modern oil refinery structures.

8.6 Analysis and dissemination

8.6.1 Following completion of the fieldwork the data and artefacts recovered from the site would require post-excavation assessment and analysis to determine the potential of the data, appropriate analytical techniques and type of publication. The results of the assessment would need to be presented to West Berkshire's Archaeological Officer and the type of analysis and publication agreed with them. On completion of the project, the publication or client report would need to be lodged with the West Berkshire Council Archaeological Service and included in the HER.

8.7 Specific Mitigation Strategies

8.7.1 The above sections will all generally apply but will depend on the proposed development and its location. However, it is recommended here that with regard to extraction proposals, particularly those on gravel geologies (river or plateau), a more consistent use of fieldwalking as part of an evaluation is undertaken. Such work should be recorded in a manner and form compatible to the database established in the Lower Kennet Valley Fieldwalking Digitisation project (Featherby 2011), which would enable the results of all such survey work undertaken anywhere within the West Berkshire to be incorporated into the project. The benefit of such action would be to create a publicly accessible fieldwalking map of West Berkshire within the HER which is continually updated, enabling more precise prediction of areas of asset significance. Linking such work to NMP data and excavation data would provide comparisons and aid in predicting significance. Such a map would also be extremely useful as a research tool in the comparisons of regional patterns of change in the human landscape over time.

8.7.2 It is recommended that geoarchaeological investigations include geomorphological assessment. Present understanding of the gravel terraces shows that there are many different phases of deposition, which may have resulted in many different periods of human activity. While geoarchaeological investigations will identify areas of gravel aggregate, and thus areas of potential human activity, they do not necessarily identify all the phases of gravel deposits. Geomorphological investigations would help develop this understanding and allow us to better understand which types of gravel deposits would have the highest potential for human activity. Ultimately our ability to predict potential areas of significance would be enhanced and help minimise the risks to future extraction operations.

8.7.3 It is recommended that alongside the above geoarchaeological surveys, palaeo/environmental survey be undertaken. As many of the prehistoric resources lie within the floodplain, buried within the alluvial sediments overlying the sand/gravel deposits, much evidence from the earlier periods would comprise waterlogged environmental material. Such surveys would add to and refine our understandings of the environments that existed during these periods and enhance our ability to identify likely locations of prehistoric activity. This would ultimately lead to better decisions regarding mitigation.

8.7.4 On the terrace edges, sites of these earlier periods often lie close to the surface and could be lost during the initial surface strip. Thus early intervention through some form of archaeological survey, primarily fieldwalking, may recover evidence of domestic activity. Within the floodplain, early prehistoric sites often lie under several metres of alluvium and peat areas and so intensive geo-archaeological investigation might identify those areas that contain gravels likely to have been targeted for Mesolithic inhabitants and thus limit the need for expensive strip, map and sample excavations. Where it is carried out, dewatering would also potentially have an

impact upon waterlogged remains within the alluvium.

9 Conclusions

9.1.1 The project was primarily GIS-based, and entailed manipulating spatial data from a number of sources, including the West Berkshire HER database, in order to show the distribution of past human activity on the aggregates resource of West Berkshire, by chronological period and by asset type. Through a series of asset density maps, this has provided an invaluable overview of the nature of activity over time, which has not previously been possible. The report entailed summarising and analysing the asset density and asset distribution for each chronological period, and attempted to identify any patterns in past activity, which could be used for future heritage asset resource management.

9.1.2 The project identified areas of past, present and potential future extraction from BGS mapping, historic maps, British Pits database and current minerals permissions. The overlaying of the various data sources within the ARCGIS framework indicated that the BGS mapping was relatively accurate. An enhanced and updated HER project database was used to generate asset density figures for an archaeological resource assessment. This considered the density of types of assets (e.g. domestic, ritual, agricultural, etc) across the aggregates resource, divided by period and Study Area, and how this reflects past occupation and activity and the history of archaeological investigation.

9.1.3 This revealed some clear patterns in the asset densities of different chronological periods:

- The asset density in the early prehistoric (known dating) remains low (around 0.6 assets per km^2) until the Bronze Age (0.9 assets per km^2).
- The low Iron Age asset density (0.4 assets per km^2) may reflect wide regional changes in habitation patterns but could also reflect difficulties in identifying assets of this period, for example certain Iron Age pottery fabrics are very similar to certain Saxon pottery fabrics.
- The low density of early medieval assets (0.3 assets per km^2) reflects current limited understanding of this period generally across the South East.
- The most significant rise in asset density on the aggregate areas occurs during the post-medieval period (3 assets per km^2). This reflects the range of changes in building fabrics, styles etc, which affects the survivability of many assets. For example parts of the Kennet River canal, known as the West Kennet Navigation, constructed in the 1700s, i.e. the locks and bridges are made of brick and thus survive and become a defining landscape feature much like the canal itself although this is not made of brick. Another example is domestic structures: a greater range of building types have survived through consistent reuse because of the more durable building materials used.
- The number of Modern assets (0.8 assets per km^2) is lower than that of the medieval period (1.6 assets per km^2). This is probably explained by the present ongoing debate as to what represents an asset and thus what should recorded. At present, the HER provides a record of those modern assets considered to be of particular archaeological, historic, architectural or artistic interest (e.g. military features and important buildings) and those which might otherwise be mistaken for earlier and more significant remains (e.g. earthworks associated with golf courses).
- Of the different geologies (Chalk, Sand/Gravel, and Other), asset density is highest on the Sand/Gravel throughout the prehistoric and Roman periods. By the medieval period, this geology type appears less significant in influencing patterns of activity.

9.1.4 This revealed some clear patterns in the asset densities of different asset types which include:

- For the early Prehistoric findspots have higher densities, although for the Mesolithic, the unassigned category has the highest density. This figure is higher due to a number of flint scatter of national importance, identified from archaeological work carried out on the Kennet River floodplain but unrelated to gravel extraction.
- The majority of Palaeolithic findspots relate to isolated chance finds of single flint artefacts. For the Mesolithic these represents groups of flints or flint scatters
- There is a higher density of assets Palaeolithic assets on the plateau gravels than the floodplain gravels whereas for the Mesolithic and the Neolithic a much greater proportion lie on the floodplain.
- Religious, Ritual and Funerary assets would appear to be more common in the Bronze Age than the Neolithic, it is clear that this that this may not be truly representative but the result of the recording within the HER database.
- There is a lack of evidence of the extensive landscape organisation within the Bronze and Iron Ages as witnessed in other regions. Although unassigned assets are generally high compared to other periods, many assets within this type are pits, pit clusters or postholes which don't necessarily reflect landscape division.
- Although Iron Age defence assets have a higher density compared to all periods except the Modern, their distribution would suggest territorial concerns rather than defence.
- The majority of Iron Age assets lie in the south-east of the Project Area and overlie the floodplain gravels away from the main concentration of the defence assets which lie to the north-west of the Project Area on chalk.
- There is a marked rise in the range of asset types from the Roman period which reflects increasingly more complex social and economic structures. Furthermore, the Roman and post-medieval periods have the highest densities of transport assets. It should be remembered that this is partly the result of recording every transport element for particular features such as the two Roman roads and the Kennet Navigation.
- There is a decline in the range of asset types in the early medieval period.
- The number of assets resulting from documentary sources peaks in the early medieval period.
- The dominance of agricultural and subsistence over industrial assets, particularly for the post-medieval period, demonstrate the continuing agricultural nature of the region. This would need to be compared against industrial assets within the excluded urban areas to see how much of a change their inclusion would have.

9.1.5 The archaeological Resource Assessment and its accompanying asset densities can input into general and period-specific research topics set out in the emerging *Solent Thames Research Strategy and Agenda*. These research priorities would be appropriate to any investigation into the archaeology or heritage of the aggregates resource (whether associated with proposed aggregates extraction or not) and other research agendas should also be considered.

9.1.6 Given the potential impact on the historic environment that normally results from extraction, it is likely that any proposals for aggregate extraction would require archaeological investigation of the area of impact. Confirmation of the precise procedures required for particular sites would need to be agreed with the West Berkshire Archaeological Officer. This would normally follow a staged process of initial historic environment (desk-based) assessment, evaluation (either invasive or non-invasive) and mitigation of any impacts as outlined in the report. In general it was noted that the identification of possible assets and impacts through historic environment assessment is likely to be most effective in areas of high asset density,

while site-based invasive or non-invasive field investigation would almost certainly be required in areas of lower asset density.

9.1.7 Although a large proportion of the district has been subject to NMP and this data has been integrated into the HER, just over half of the Project Area has not been subject to the NMP. It is recommended that this be carried out so that such results can be integrated completing the HER aerial database of the district.

9.1.8 Fieldwalking is an important technique as it can identify sites that now only exist in the topsoil. However, fieldwalking is both labour- and time-intensive if robust and meaningful research results are to be returned. Thus, for it to be more widely applicable and efficient, the period of time between the initial Historic Environment Assessment and the start of the aggregate extraction needs to be considerably longer than is generally the case, to allow for the development and undertaking of an effective fieldwalking project. The more consistent use of fieldwalking and reporting in a more standardised form as suggested in this assessment would result in constantly undated picture of potential locations of significance across all geologies within the district let alone the Project Area.

9.1.9 Geoarchaeological investigation might be required for the evaluation and mitigation of extraction impacts on River Terrace Deposits and other superficial aggregate producing geologies with potential for *in situ* Palaeolithic remains. Similarly, where alluvium is present over aggregate deposits, geoarchaeological and palaeoenvironmental investigation is likely to be required to evaluate and mitigate any impacts on archaeological remains within the alluvium and this might require large or deep trenches to access deep alluvial deposits.

9.1.10 Early intervention is always beneficial, and would be particularly useful at the prospection stage to allow better archaeological interpretation of geotechnical results. More work is needed to identify lower Palaeolithic sites, ideally based on information obtained from geotechnical data.

9.1.11 Trial trenching need to be done at a relevant sample rate in order to better identify the presence of significant remains. Observation of topsoil stripping during the normal working of a quarry is likely to remain a significant strand in the strategy for the mitigation of extraction during the normal working of a quarry. But archaeological features can be much harder to identify, particularly in the context of a working quarry, and when it is identified there can be a time pressure which may reduce the quality of the information obtained. Known sites can also be lost due to misunderstandings.

9.1.12 Open area excavations can miss significant elements of a site. The advantage of the observation of topsoil removal on quarry sites is that the entire area to be destroyed can be observed, and often important satellite features can be found which would be missed in defined excavation areas. Also, the extent and alignments of features are often lost in defined excavation areas but can be traced across the whole of the extraction area.

9.1.13 The results of the project, including this project report and possible changes to the HER, will be used to facilitate management of the impacts of aggregate extraction on archaeological remains. It also sets out how it can feed into the *Solent Thames Research Framework Agenda and Strategy* for any further archaeological work associated with aggregates extraction and in general. It also gives an indication of the position of archaeology within the planning process and the possible investigation and mitigation strategies which may be employed to determine and mitigate the impacts of extraction on archaeological remains. The report will be circulated widely to those employed in archaeology and minerals planning in West Berkshire, to English Heritage, the minerals industry and interested local parties.

9.1.14 A significant component of the project included an assessment of the levels of dissemination of the results of past investigations carried out as part of aggregate extraction (‘Backlogs Project’). This identified 27 assets from 15 archaeological investigations prompted by past aggregate extraction which are not present on the

HER. These changes to the project database resulting from the addition of the archaeological investigations represented only a 0.5% increase in assets. The results of this study are fully detailed in the associated report.

10 Bibliography

Alexander, M, 2008, *Archaeological Resource Assessment of the Aggregate Producing Areas of Warwickshire and Solihull*, Warwickshire Museum Field Services

Baker, S. and Rowan, M, 2007, *Identification and Quantification of projects Arising From Aggregates Extraction: Pilot Study*, ARCUS

Bewley, R, 2001 'Understanding England's Historic Landscapes: An Aerial Perspective.' *Landscapes*, **2,** 74-84.

Blackwell, R, 2010, *Archaeological Resources assessment of the Aggregate Producing Areas of South Gloucestershire*, Cotswold Archaeology

Blair, J, 1994, *Anglo-Saxon Oxfordshire*

Bradley, R, 1978, *The Prehistoric Settlement of Britain*. London

2008, *Solent Thames Research Framework Research Agenda: The Neolithic and Early Bronze Age.* STFAA Consultation. www.thehumanjourney.net

2010, with Allen, M. and Hey, G, *Solent Thames Research Framework Research Agenda: The Neolithic and Early Bronze Age*, www.thehumanjourney.net

Brightman, J. and Waddington, C. 2010, *Aggregates and Archaeology in Derbyshire and the Peak District*, Bakewell, Archaeological Research Services Ltd

British Geological Survey, 2008. *Directory of Mines and Quarries*

Campbell, J B, 1977, *The Upper Palaeolithic of Britain. A Study of Man and Nature*, in The Late Ice Age, Vol I & II, Oxford

Carter, H H, 1976, *Fauna of an Area of Mesolithic Occupation in the Kennet Valley, Considered in Relation to Contemporary Eating Habits*. Berkshire Archaeological Journal 68, pp1-3

Carter, R J, 2001, *New Evidence for Seasonal Human Presence at the Early Mesolithic Site of Thatcham, Berkshire, England* in Journal of Archaeological Science 28 pp1055-1060

Chartres, C J, 1981, The mineralogy of Quaternary deposits in the Kennet Valley, Berkshire. *Proc.Geol.Ass.*,92 (2) 93-103.

Chartres, C J, 1975, *Soil development on the terraces of the River Kennet*. Unpublished PhD thesis. Reading.

Cheetham, G H, 1976, *Late Quaternary palaeohydrology with reference to the Kennet Valley*. Unpublished PhD thesis. Reading.

Chisham, C, 2006. *The Upper Palaeolithic and Mesolithic of Berkshire* Solent Thames Research Framework Agenda Consultation

Churchill, D, M, 1962, *The Stratigraphy of the Mesolithic Sites III and V at Thatcham, Berkshire, England*, Proceedings of the Prehistoric Society, 28, pp 362-370

Collard, M, Darvill, T, and Martin, W, 2006, *Ironworking in the Bronze Age? Evidence from a 10th century BC settlement at Hartshill Copse, Upper Bucklebury, West Barkshire* in Proceedings of the Prehistoric Society, Salisbury

Crawford, S, 2008. *Solent Thames Early Medieval Research Agenda.* Solent Thames Research Framework.

Crawford, S. and Allen, M. 2010. *Solent Thames Research Framework Research Agenda: The Early Medieval Period.* April 2010. www.thehumanjourney.net

Dawson, H, and Featherby, R, 2010, *Assessment of archaeological resource in aggregate-producing areas of Bath and North–East Somerset*, Museum of London Archaeology (Draft)

Dils, J (ed.), 1998. *An Historical Atlas of Berkshire,* University of Reading

Doggett, N, 2008. *Solent Thames Research Framework Research Agenda Post-medieval and Modern.* Solent Thames Research Framework Agenda Consultation.

Dunlop, L, 2009, *Gravels of Berkshire: Origin, history, industry & recreation*. Berkshire Conservation Group.

English Heritage, 2005a. *English Heritage Research Agenda: an introduction to English Heritage's research themes and programmes*

English Heritage, 2005b. *Discovering the past shaping the future: research strategy 2005–10*
English Heritage 2006a. English Heritage *Management of Research Projects in the Historic Environment.* The MoRPHE Project Managers Guide.
English Heritage 2006b *Understanding Historic Buildings – A guide to good recording practice.*
English Heritage 2007. *Understanding the Archaeology of Landscapes – A guide to good recording practice.*
English Heritage 2008a. *Mineral Extraction and the Historic Environment*
English Heritage 2008b. *Project Planning Note 3: Archaeological Excavation.* Management of Research Projects in the Historic Environment.
English Heritage 2008c. *A Strategic Framework for Historic Environment Activities & Programmes in English Heritage – Guidance for external grant applicants.*
English Heritage 2008d. *Geophysical Survey in Archaeological Field Evaluation*

Eyers, J, 2003, *Geology of Berkshire*. Report commissioned by Berkshire RIGS.

Featherby, R, 2010, *Identification and quantification of archaeological projects arising from aggregates extraction in West Berkshire*, EH ALSF project 5898, Museum of London Archaeology
Featherby, R, 2011, *Methodology report of the ARCGIS digitisation of the Lower Kennet Valley Fieldwalking Survey, 1976 to 1989*, EH ALSF project 5898, Museum of London Archaeology
Ford, S 1987a, *East Berkshire Archaeological Survey (EBAS)*, Department of Highways and Planning, Berkshire County Council Occasional Paper no.1
Ford, S, 1987b. Flint scatters and prehistoric settlement patterns in south Oxfordshire and east Berkshire, in Lithic analysis in later British prehistory (eds A Brown and M Edmonds), Oxford
Ford, S, 2008. *Late Bronze Age and Iron Age Berkshire*, Solent Thames Research Framework
Froom, F, R, 1971, A Mesolithic site at Wawcott, Kintbury, *Berkshire Archaeol* J 66, 23–44
Fulford, M, 2008. *The Roman Period.* Solent Thames Research Framework Agenda Consultation.
Fulford, M. and Allen, M, 2010, *The Solent Thames Research Framework Research Agenda: The Roman Period*, www.thehumanjourney.net
Gaffney, V, and Tingle, M, 1989, *The Maddle Farm Project, an Integrated Survey of Prehistoric and Roman Landscapes on the Berkshire Downs*, BAR Brit Ser 200 Oxford
Gates, T, 1975. *The Middle Thames Valley, An archaeological survey of the river gravels*, Berk Arch Committee, 1
Good, C, Hegarty, C, Plouviez, J and Rolfe, J, 2007, *The Aggregate Landscape of Suffolk: the Archaeological Resource*, Suffolk County Council Archaeological Service
Greenaway, J, 2008 *Roman Berkshire*, Solent Thames Research Framework
Healy, F., Heaton, M. and Lobb, S, J, 1992, *Excavations of a Mesolithic Site at Thatcham, Berkshire,* Proceedings of the Prehistoric Society, 58, pp 41-76
Hey, G. 2010. *Late Upper Palaeolithic and Mesolithic Research Agenda.* Solent Thames Framework Research Agenda
Hey, G et al, 2011. The Mesolithic to Early Bronze Age in Morigi, Schreve et al. *The Thames through Time - The Archaeology of the Gravel Terraces of the Upper and Middle Thames. Early Prehistory to 1500 BC,* Thames Valley Landscapes Monograph 32
Hind, J, 2010, *The Solent Thames Research Framework Research Agenda: The Post-medieval and Modern Period,* www.thehumanjourney.net

Hosfield, R, 2007, Lower/Middle Palaeolithic (Berkshire). Part of the Solent Thames Archaeological Research Framework.

IfA, 2001a *Institute for Archaeologists, By-laws, standards and policy statements of the Institute of Field Archaeologists, standard and guidance: desk-based assessment, rev,* Reading

IfA, 2001b *Standard and Guidance for Archaeological Desk-based Assessment, Institute of Field Archaeologists*, compiled 1994, revised 2001

IfA, 2001c *Standard and Guidance for Archaeological Investigation and Recording of Standing Buildings and Structures, Institute of Field Archaeologists*, published 1996, revised 2001

IfA, 2001d *Standard and Guidance for Archaeological Excavation, Institute of Field Archaeologists,* compiled 1994, revised 2001

IfA, 2001e *Standard and Guidance for Archaeological Watching Brief, Institute of Field Archaeologists*, published 1994, revised 2001

Jackson, R, and Dalwood, H, 2007, *Archaeology and Aggregates in Worcestershire: A Resource Assessment and Research Agenda,* Worcestershire County Council and Cotswold Archaeology

Joint Strategic Planning Unit (Berkshire Unitary Authorities), *Minerals and Waste Core Strategy*, 2007

Lambrick, G, 2008. *The Later Bronze Age And Iron Age: Research Agenda.* Solent Thames Research Framework Agenda Consultation.

Lewis, L R, 1998. *An introduction to landscape in West Berkshire*, Berkshire

Lobb, S J, and Rose, P G, 1996. *Archaeological Survey of the Lower Kennet Valley, Berkshire,* Wessex Archaeology Report No. 9.

Lyne, M, 2008. *Roman Wight*. Period-based assessment report to support the Solent-Thames archaeological research framework. Isle of Wight Council.

Minerals and Historic Environment Forum 2008. *Mineral Extraction and Archaeology: A Practice Guide*. http://www.helm.org.uk/guidance-library/mineral-extraction-and-archaeology/

Munby, J T, 2008. *The Solent Thames Research Framework Research Agenda: The Medieval Period,* www.thehumanjourney.net

Parfitt, S. A., et al, 2010, *Early Pleistocene human occupation at the edge of the boreal zone in northwest Europe*, Nature, 466, 229–233:

Pethen, H, 2009, *Assessment of Archaeological Resource in Aggregate Areas of West Berkshire*, Project Design, Revision 2.0, Unpublished MOLA document

Pethen, H, 2011 *Assessment of archaeological resource in aggregates areas of the Isle of Wight*, Museum of London Archaeology

Rackham, J, and Sidell, J, 2000 *London's landscapes: the changing environment*, in The Archaeology of Greater London: an assessment of archaeological evidence for human presence in the area now covered by Greater London, Museum of London , 11–28

Richards, J, 1978. *The Archaeology of the Berkshire Downs: An Introductory Survey*. Berkshire Archaeological Committee Publications, 3, Reading.

Rodenbüsch, I, 2010, *Assessment of archaeological resource in aggregate areas in the London Borough of Havering*. English Heritage ALSF Project No. 5849. MOLA unpublished report.

Roe, D. A. 1981. *The Lower and Middle Palaeolithic Periods in Britain.* Routledge and Kegan Paul.

RCHME, 1999b *Recording Archaeological Field Monuments: A Descriptive Specification, Royal Commission on the Historical Monuments of England*,

Sherlock, R.L. 1960, British Regional Geology: London and Thames Valley, 3rd Edition, HMSO, London.

Solent Thames Research Framework on Oxford Archaeology's website: http://thehumanjourney.net/index.php?option=com_content&task=view&id=553&Itemid=277

Thomas, M.J., 1961, River terraces and drainage development in the Reading area. *Proc.Geol.Ass.*, 72, 415-436.

Tremlett, R, 2009, *Norfolk's Aggregate Landscape: An Archaeological Assessment*,Norfolk Landscape Archaeology

Underhill, F, 1946. *Notes on Recent Antiquarian Discoveries in Berkshire III* Berkshire Archaeological Journal, pp 49-61

Wenban-Smith, F, 2008. *Late Upper Palaeolithic and Mesolithic Research Questions for Agenda.* Solent Thames Research Framework Agenda Consultation.

Wenban-Smith, F. and Allen, M. 2010. *Solent Thames Research Framework Research Agenda: Lower and Middle Palaeolithic Period.* April 2010. www.thehumanjourney.net

West Berkshire Council, 2001 *Replacement Minerals Local Plan*

Wymer, J, J, 1958, *Excavations at the Mesolithic Site at Thatcham, Berkshire- 1958*, Transactions of the Newbury District Field Club, 10, pp 31-48

Wymer, J, J, 1962, *Excavations at the Maglemosian Sites at Thatcham, Berkshire, England*, Proceedings of the Prehistoric Society, 28, pp 329-361

Wymer J, J, 1963, *Excavations at Thatcham. Final report* Transactions of the Newbury District Field Club, 11, pp 41-52

Wymer, J, J, 1968, *Lower Palaeolithic Archaeology in Britain as Represented by the Thames Valley*, London

Glossary

ADS	Archaelogical Data Service
ALSF	Aggregates Levy Sustainability Fund
AONB	Area of Outstanding Natural Beauty
BGS	British Geological Survey
DCLG	Department for Communities and Local Government
DPD	Development Plan Document
EH	English Heritage
GIS	Geographical Information System
HEA	Historic Environment Assessment
HEEP	Historic Environment Enabling Programme
HER	Historic Environment Record
HLC	Historic Landscape Characterisation
IfA	Institute for Archaeologists
JSPU	Joint Strategic Planning Unit (Berkshire)
LDF	Local Development Framework
LKVFS	Lower Kennet Valley Fieldwalking Surveys
MOLA	Museum of London Archaeology
MoRPHE	Management of Research Programmes in the Historic Environment
NHPP	National Heritage Protection Plan
NMP	National Mapping Programme
NRHE	National Record of the Historic Environment
RMLP	Replacement Minerals Local Plan
SHAPE	Strategic Framework for Historic Environment Activities and Programmes
SMR	Sites and Monuments Record

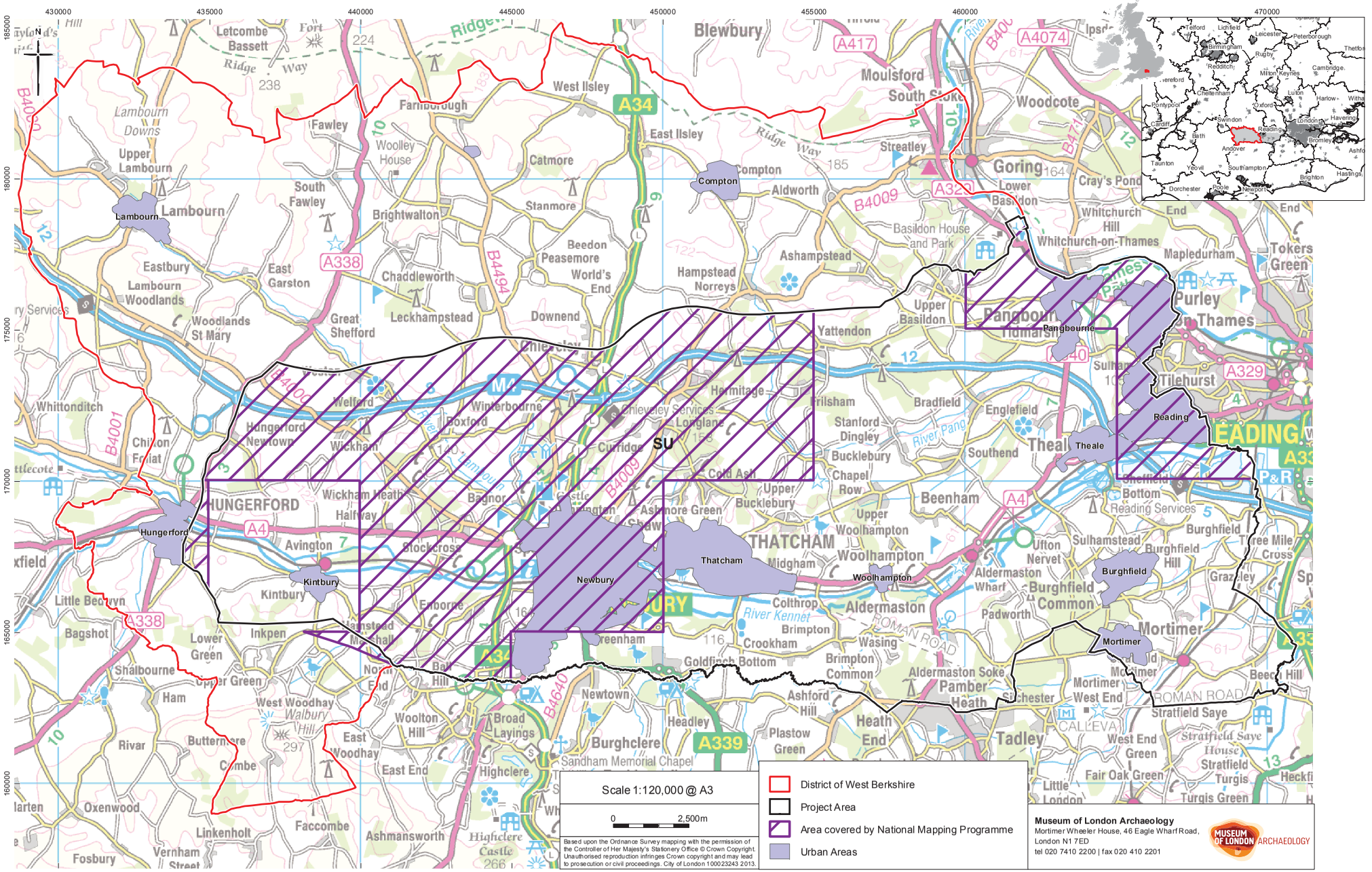


Fig 1 West Berkshire and the Project Area, showing areas covered by the National Mapping Programme

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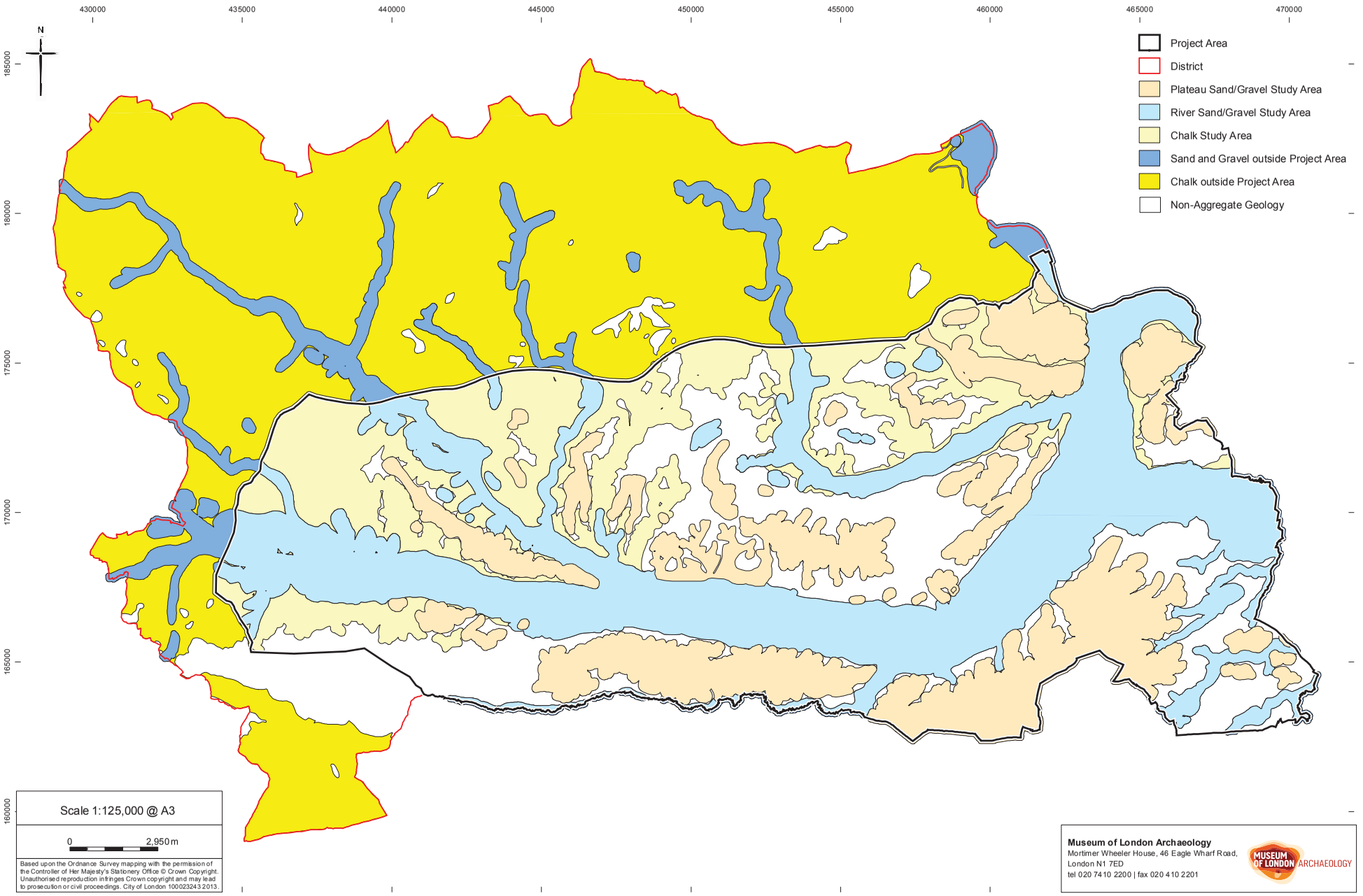

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Fig 2 Aggregate geologies of West Berkshire and the Project Area

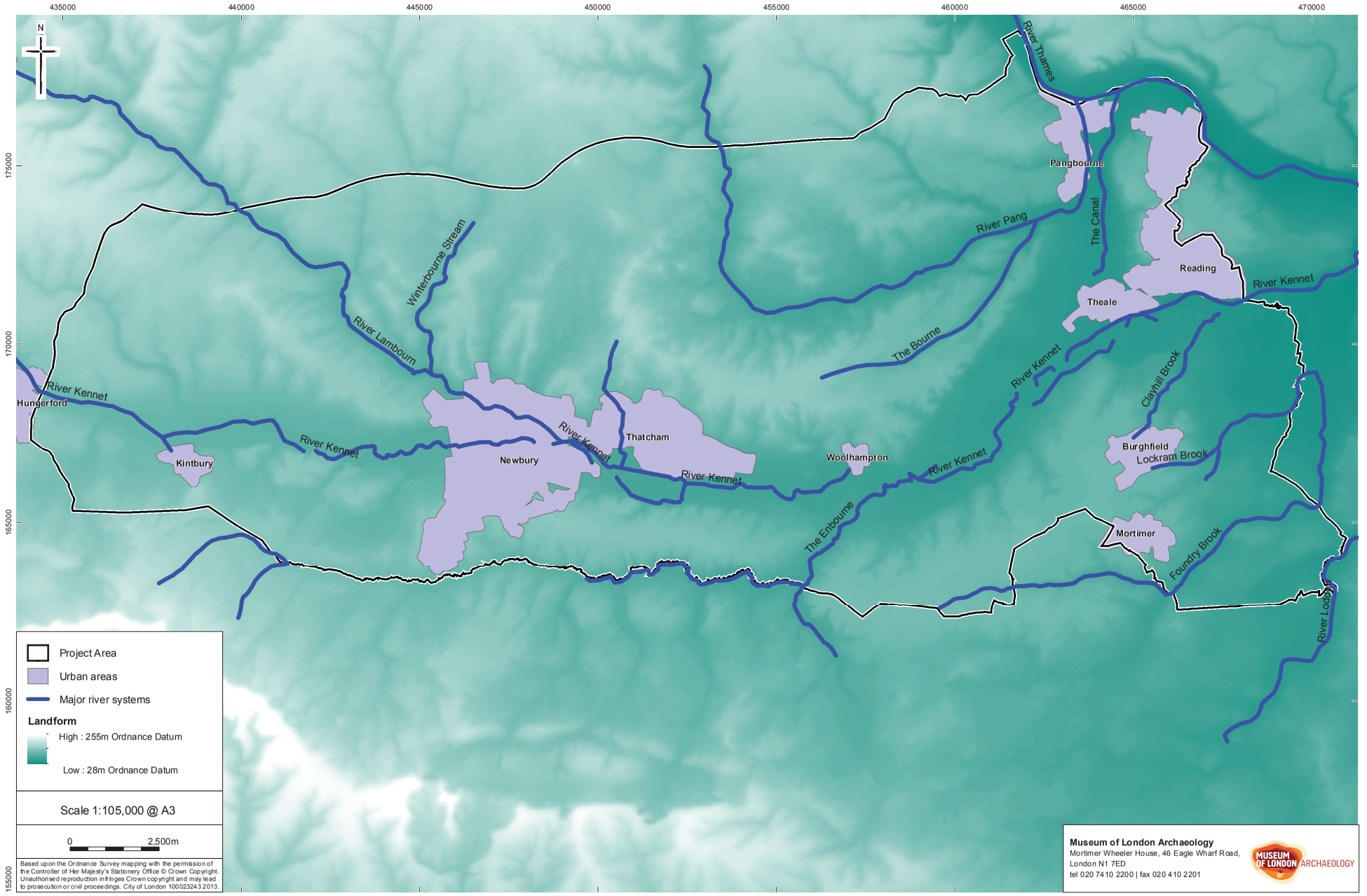

Fig 3 Landform topopraphy and river systems of the Project Area

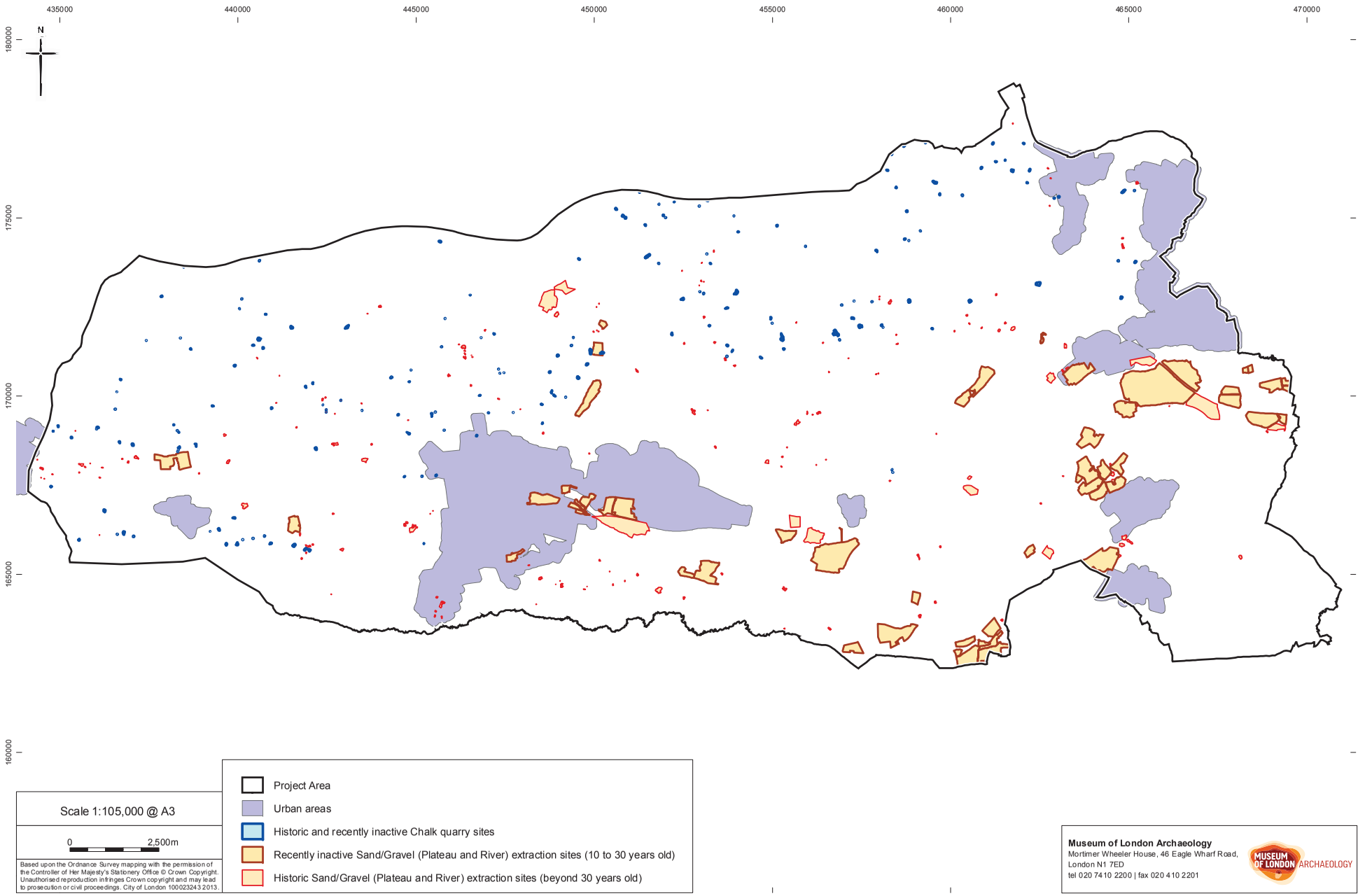

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Fig 4 Past aggregate extraction within the Project Area

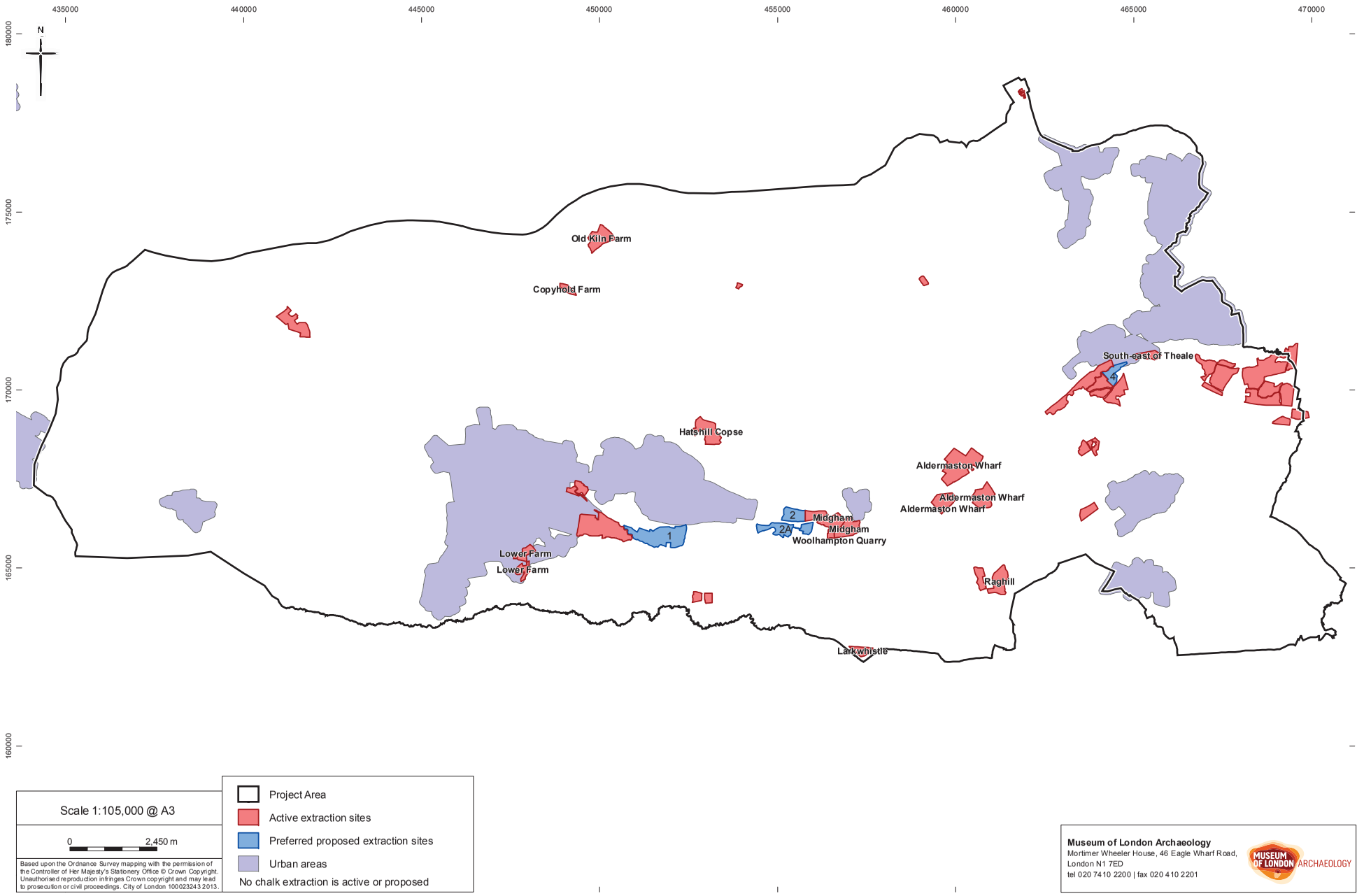

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Fig 5 Active and proposed Plateau and River Sand/Gravel aggregate extraction within the Project Area

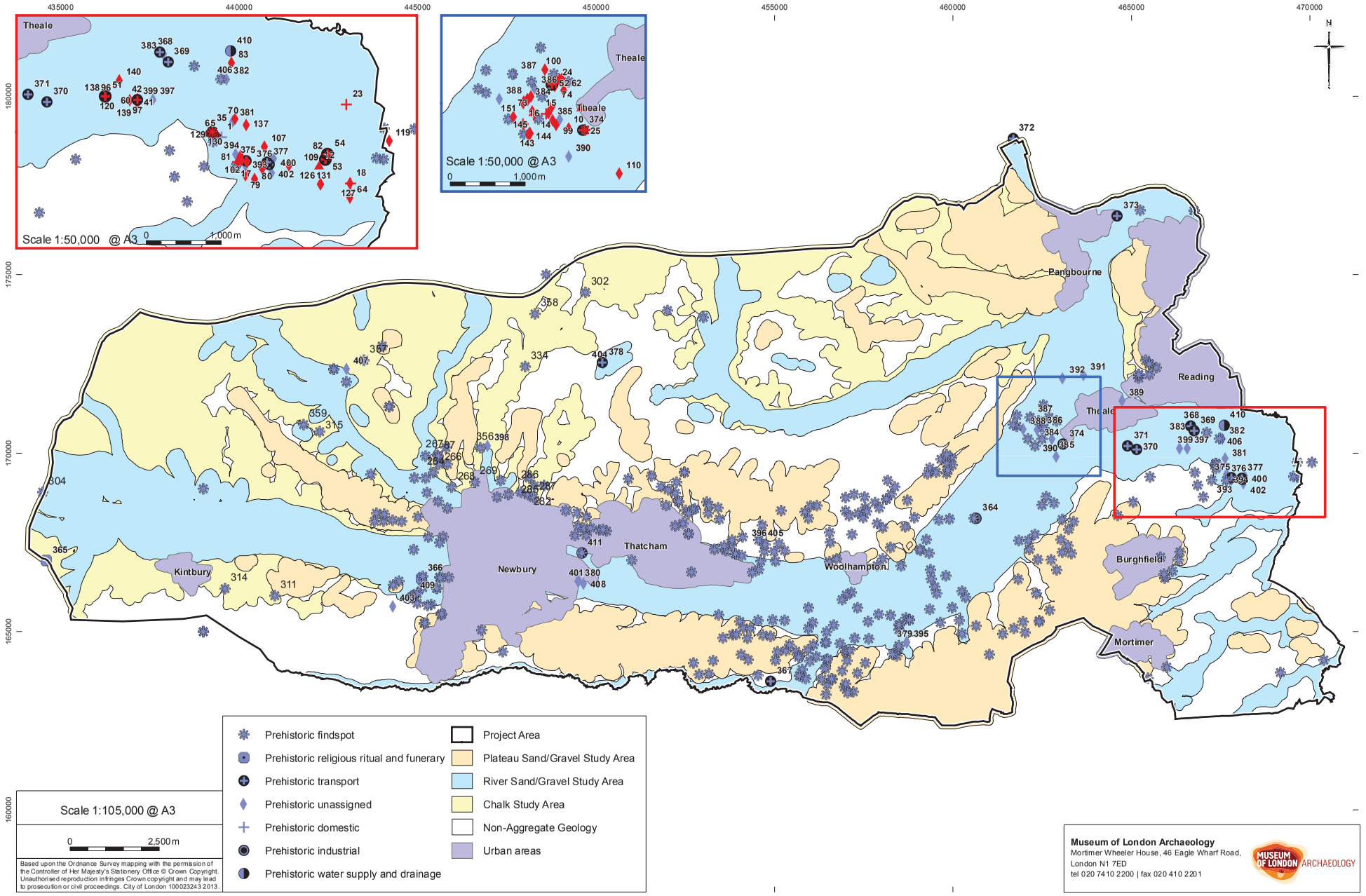

Fig 6a Undated Prehistoric assets

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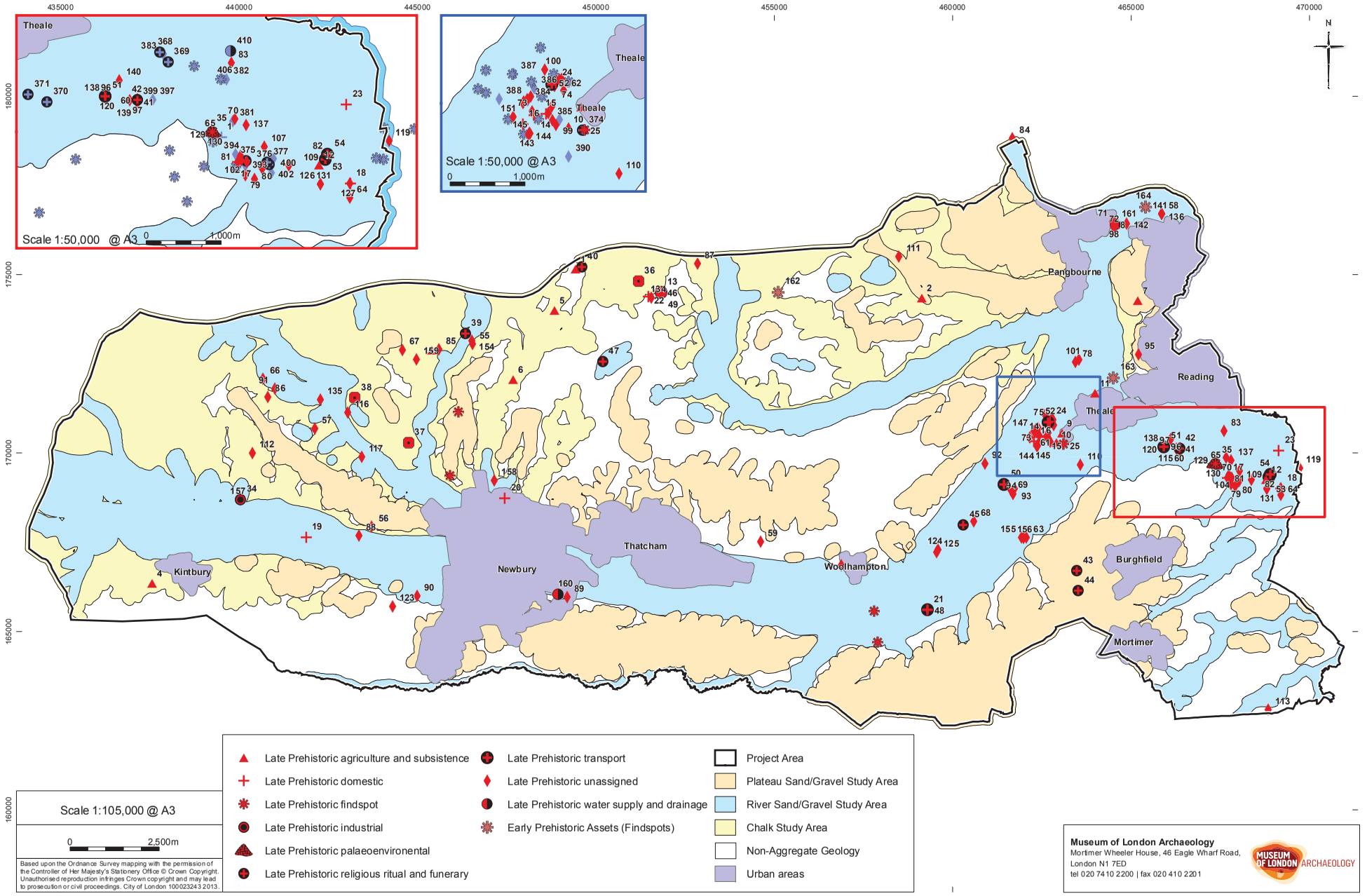

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Fig 6b Undated Early and late Prehistoric assets

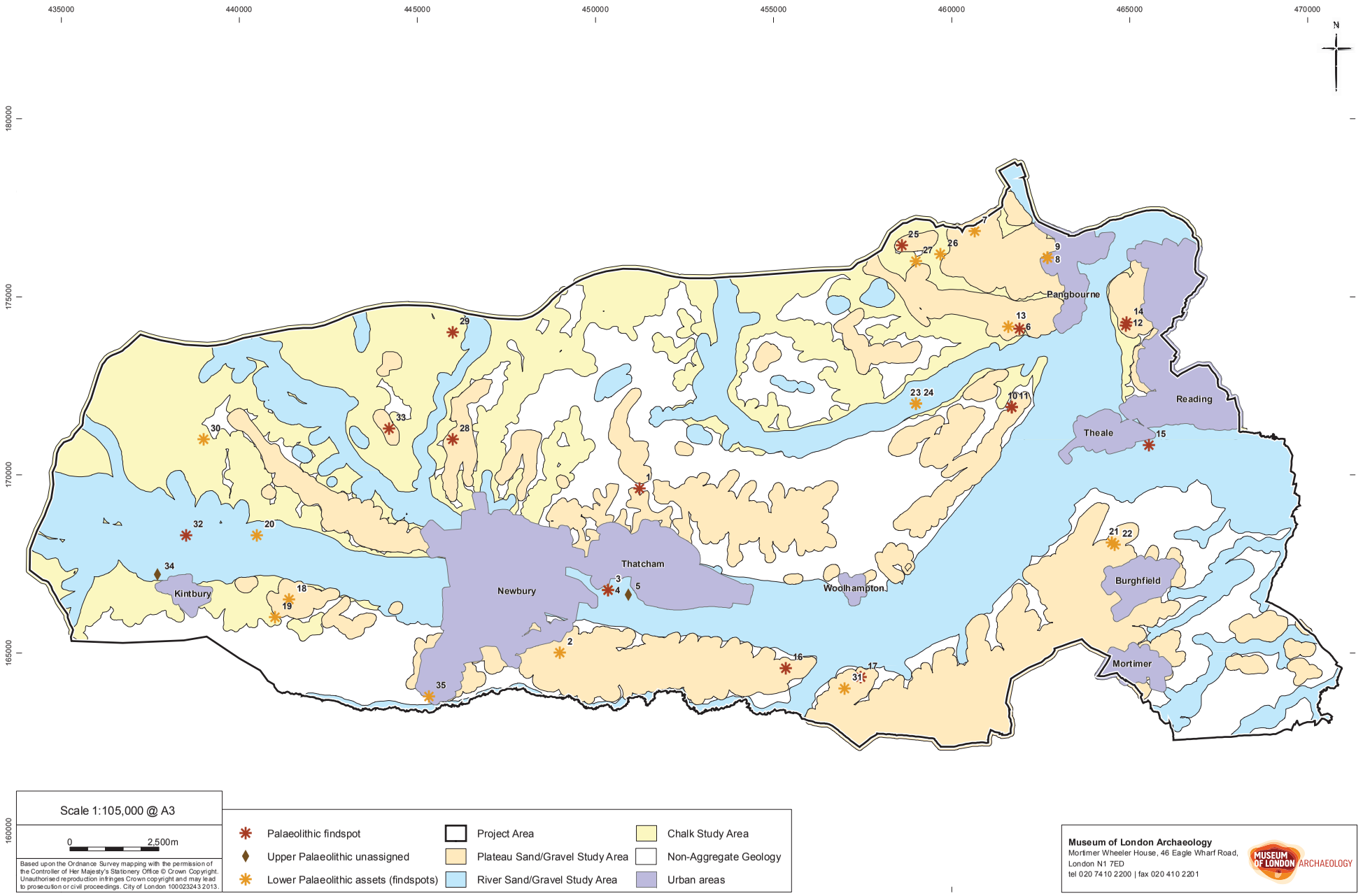

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Fig 7 Palaeolithic assets

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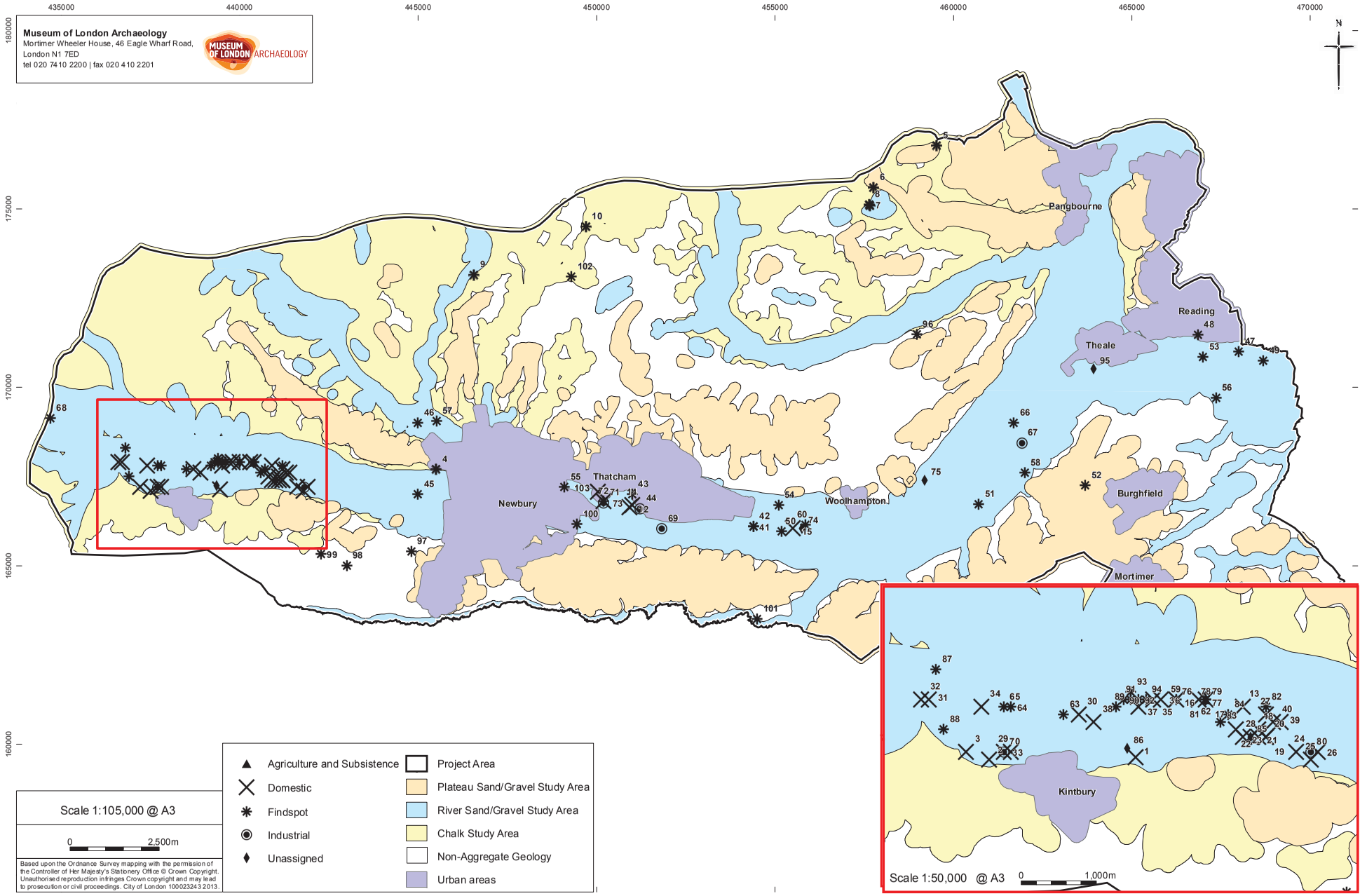

Fig 8 Mesolithic assets

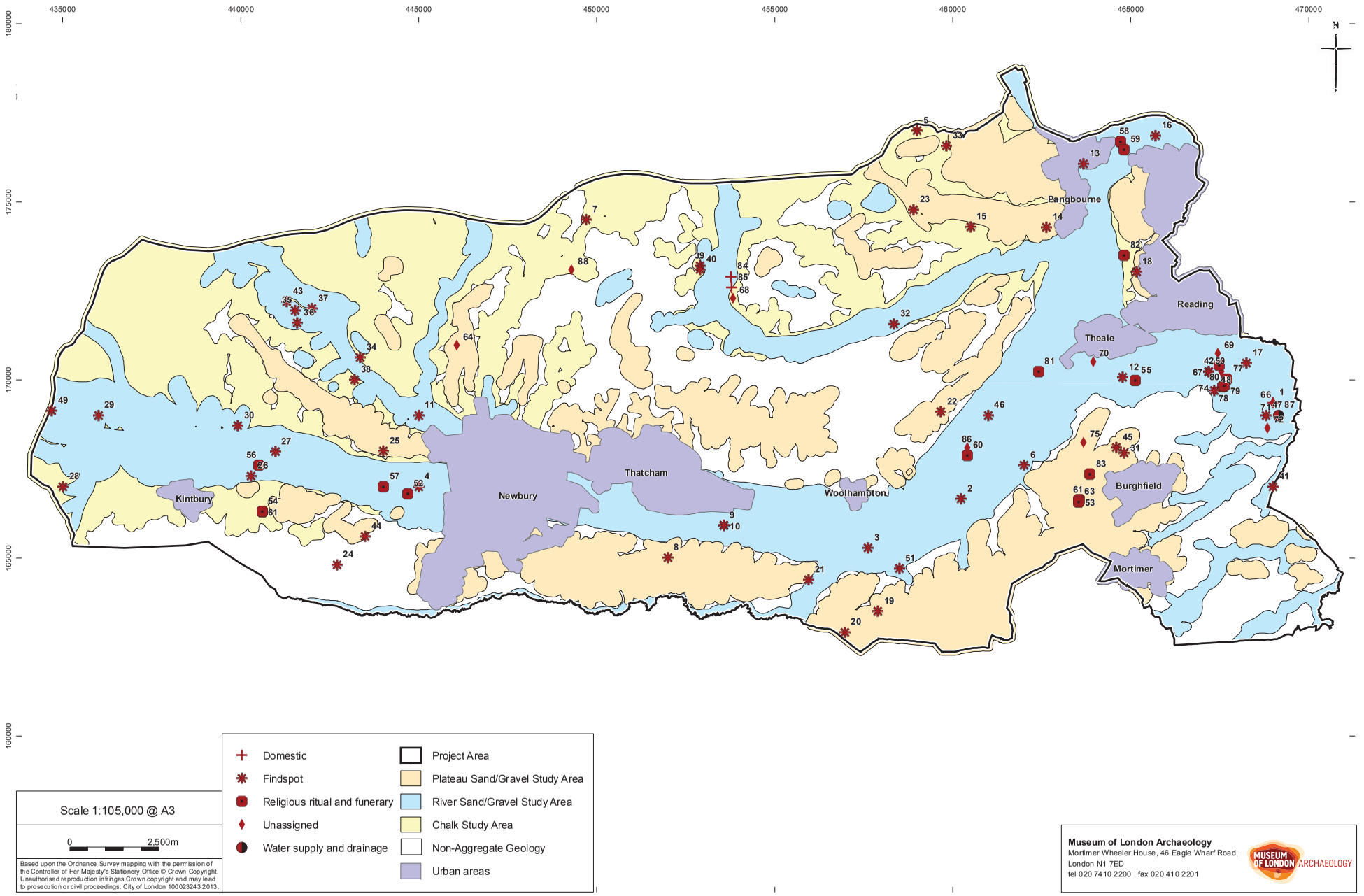

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Fig 9 Neolithic Assets

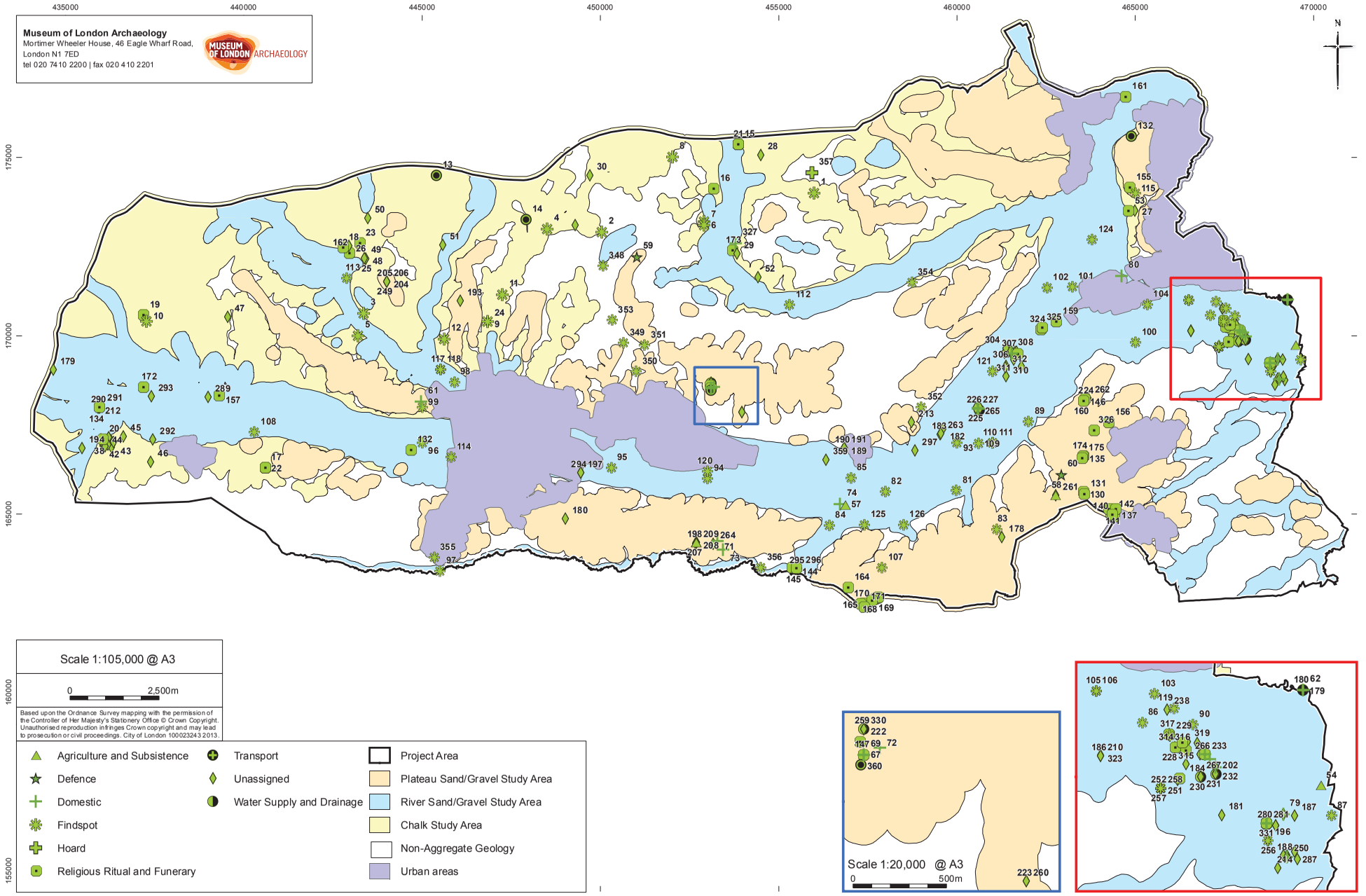

Fig 10 Bronze Age Assets

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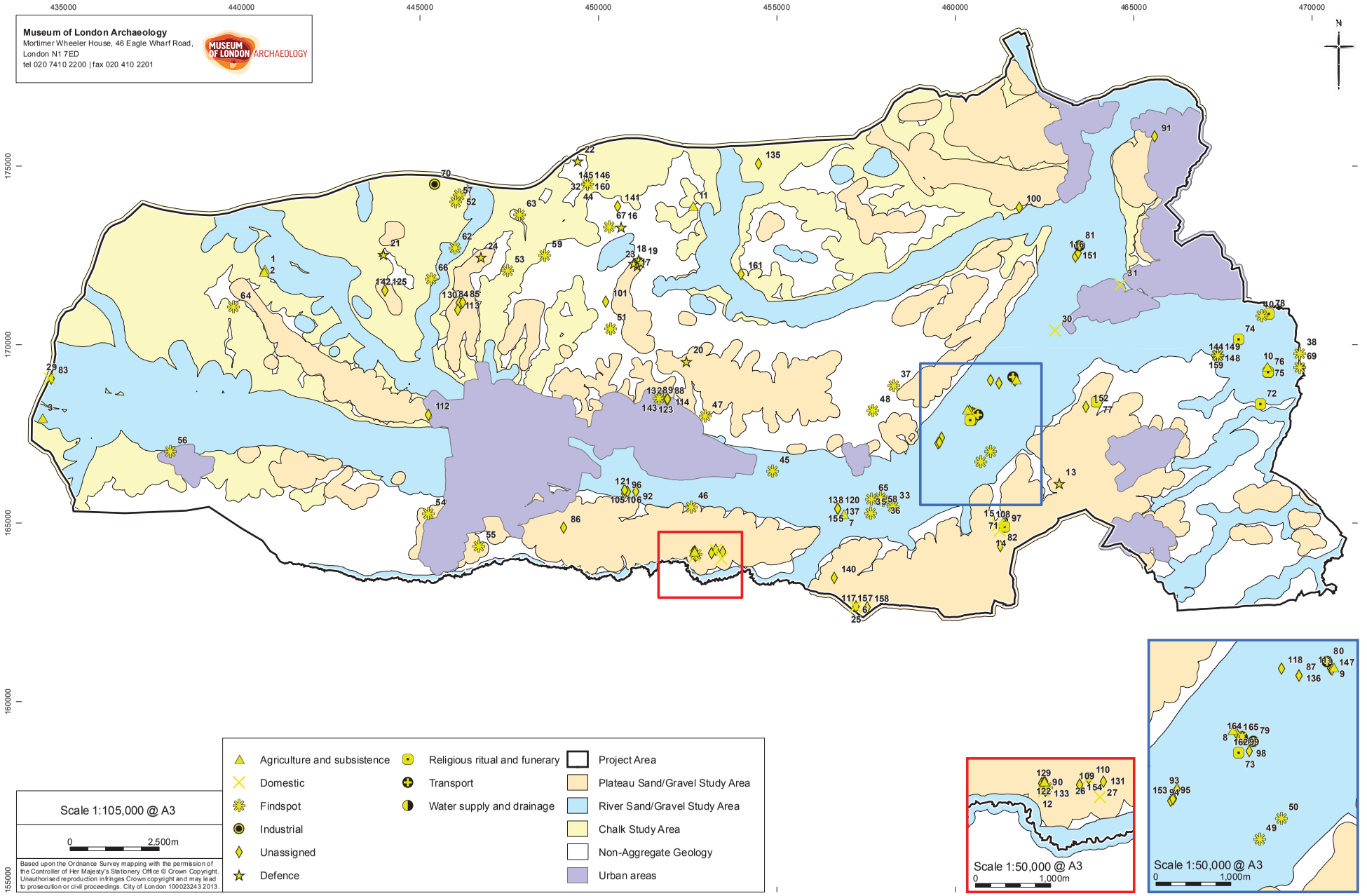

Fig 11 Iron Age Assets

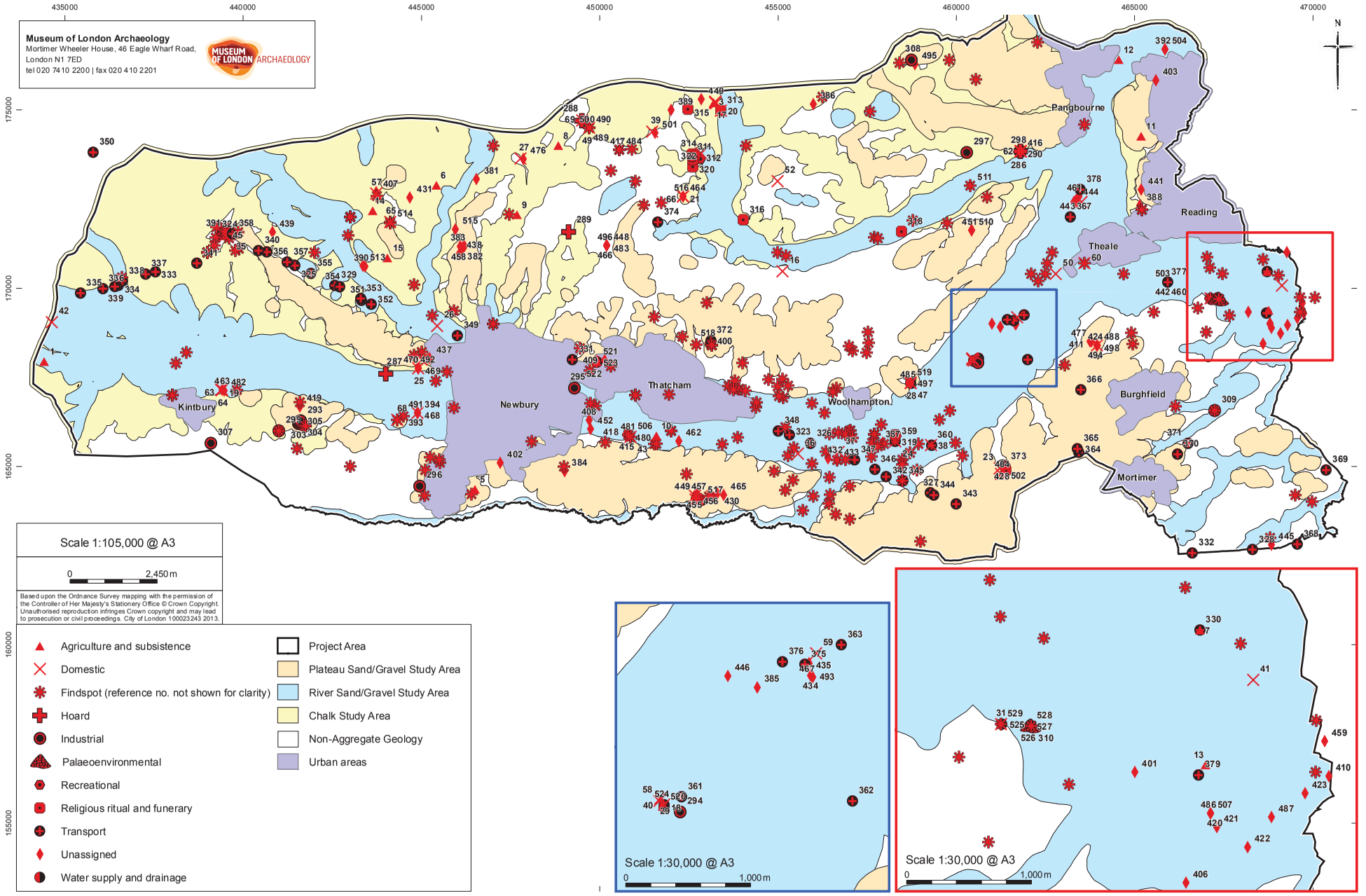

Fig 12 Roman Assets

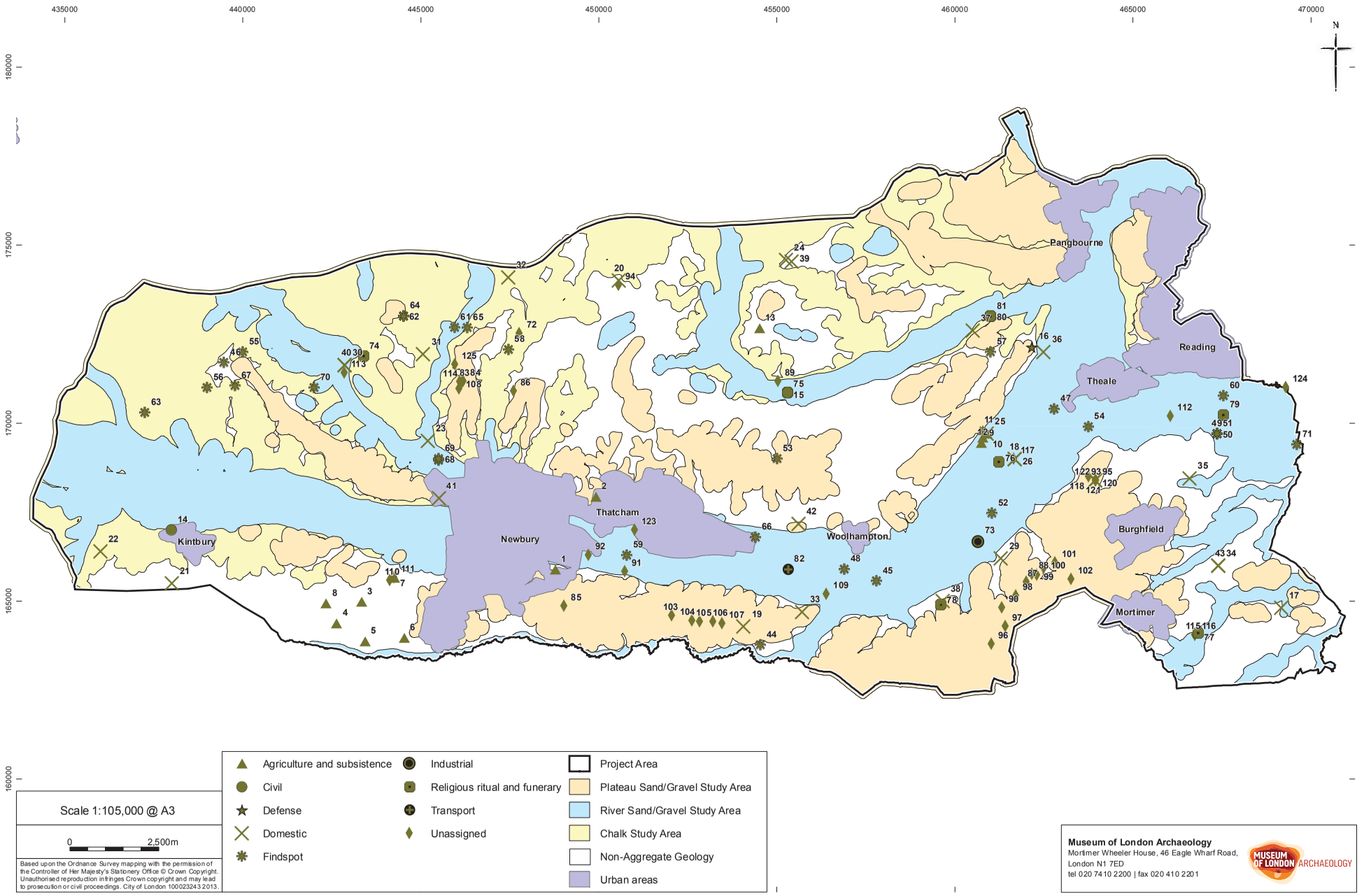

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Fig 13 Early Medieval Assets

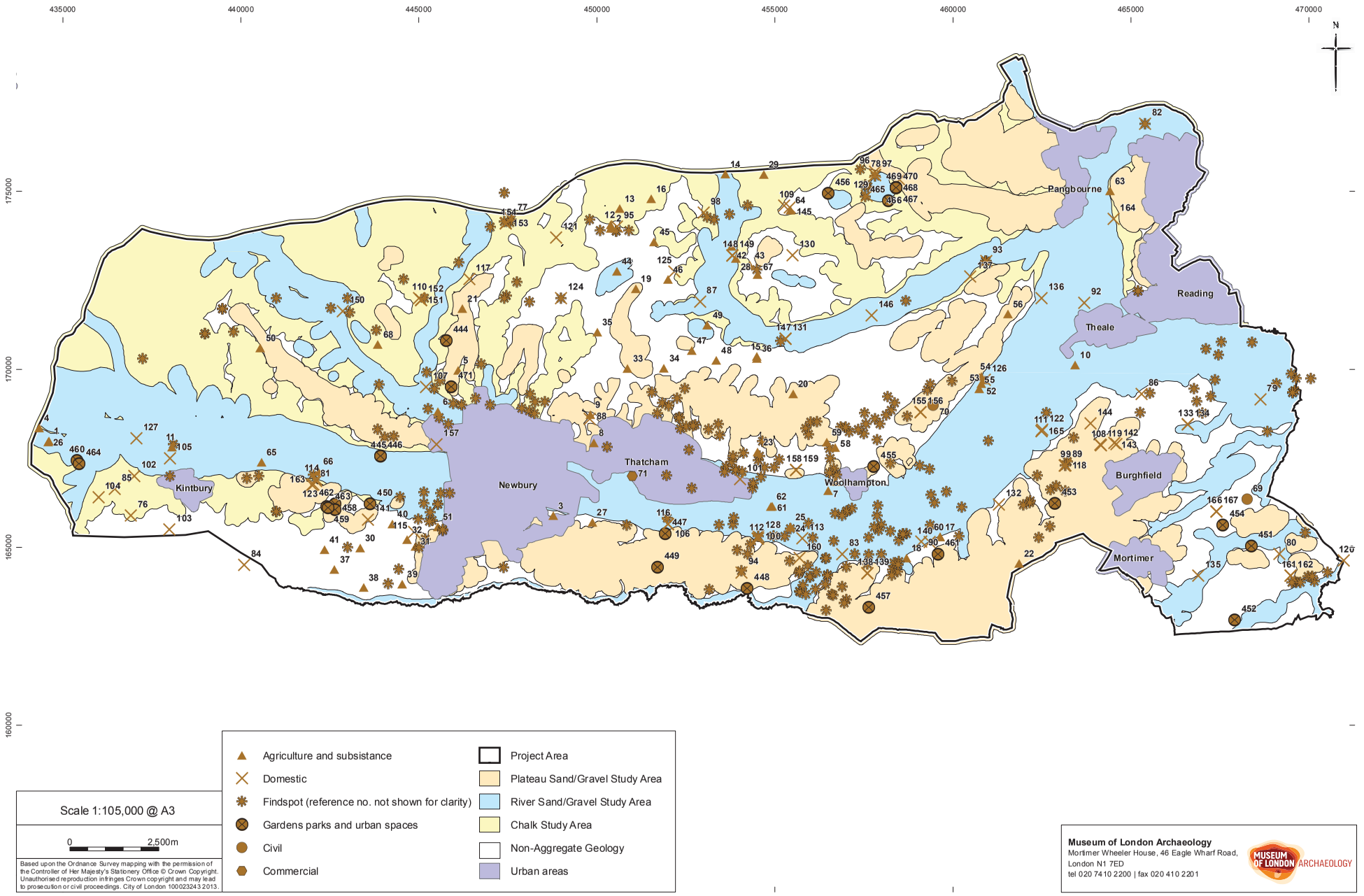

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Fig 14 Medieval Assets (Agriculture and Subsistence, Civil, Commercial, Communications, Defence, Domestic, Findspot, Industrial, Parks Gardens and Urban Spaces)

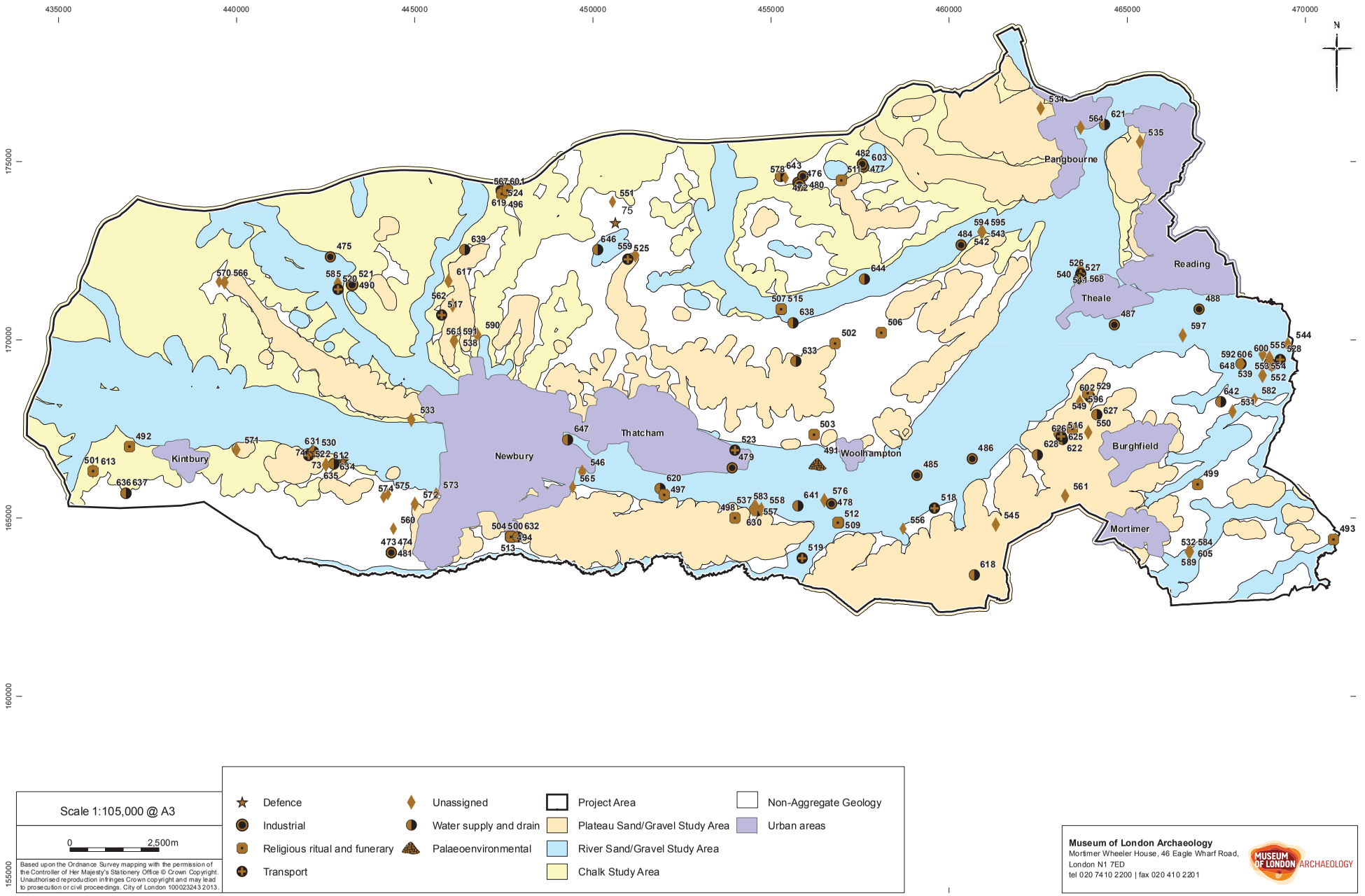

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Fig 15 Medieval Assets (Palaeoenvironmental, Recreational, Religious Ritual and Funerary, Transport, Unassigned, Water Supply and Drainage)

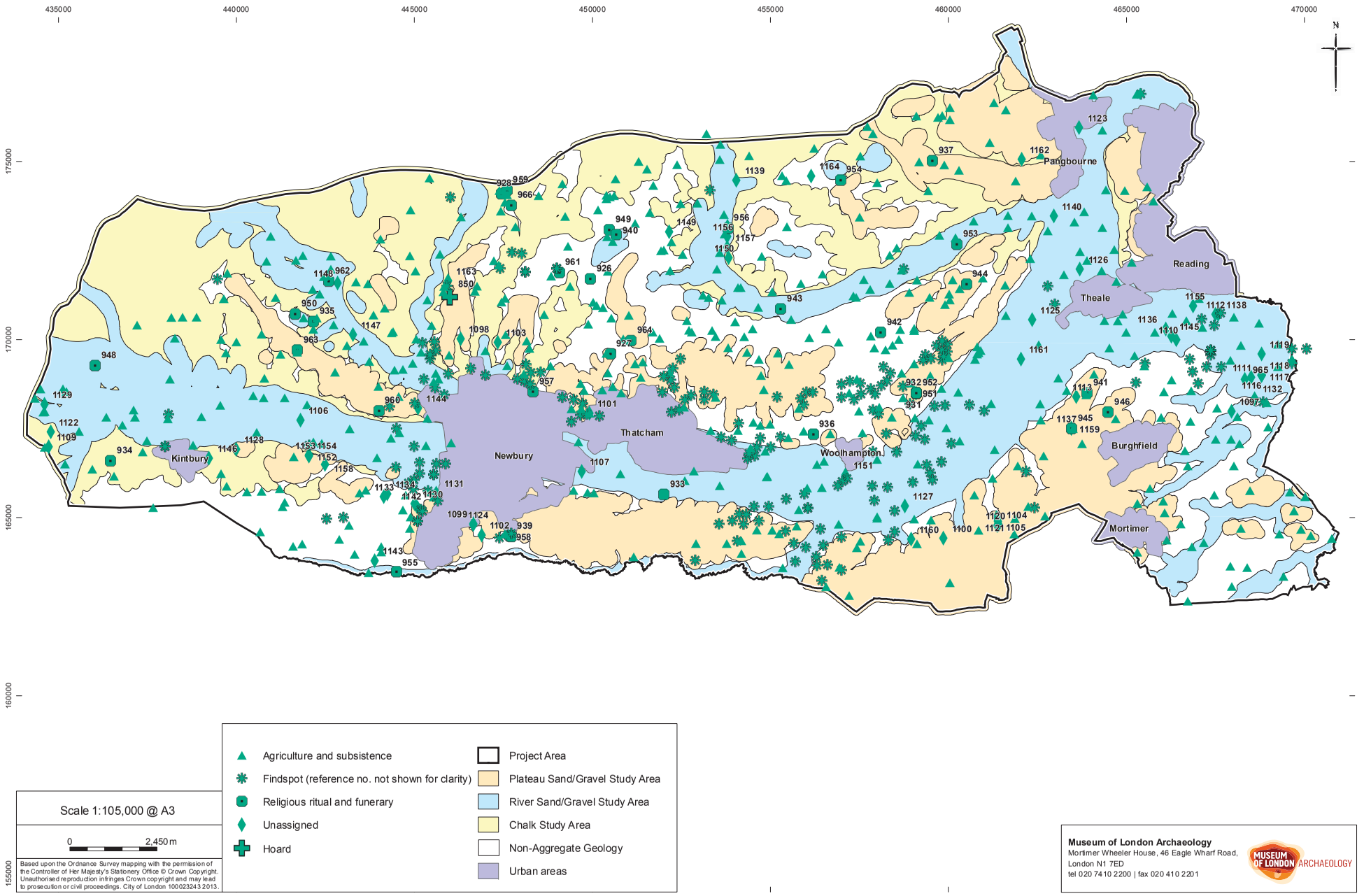

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Fig 16 Post-Medieval Assets (Domestic, Education, Parks Gardens Parks and Urban spaces, Health and Welfare, Palaeoenvironmental, Recreational)

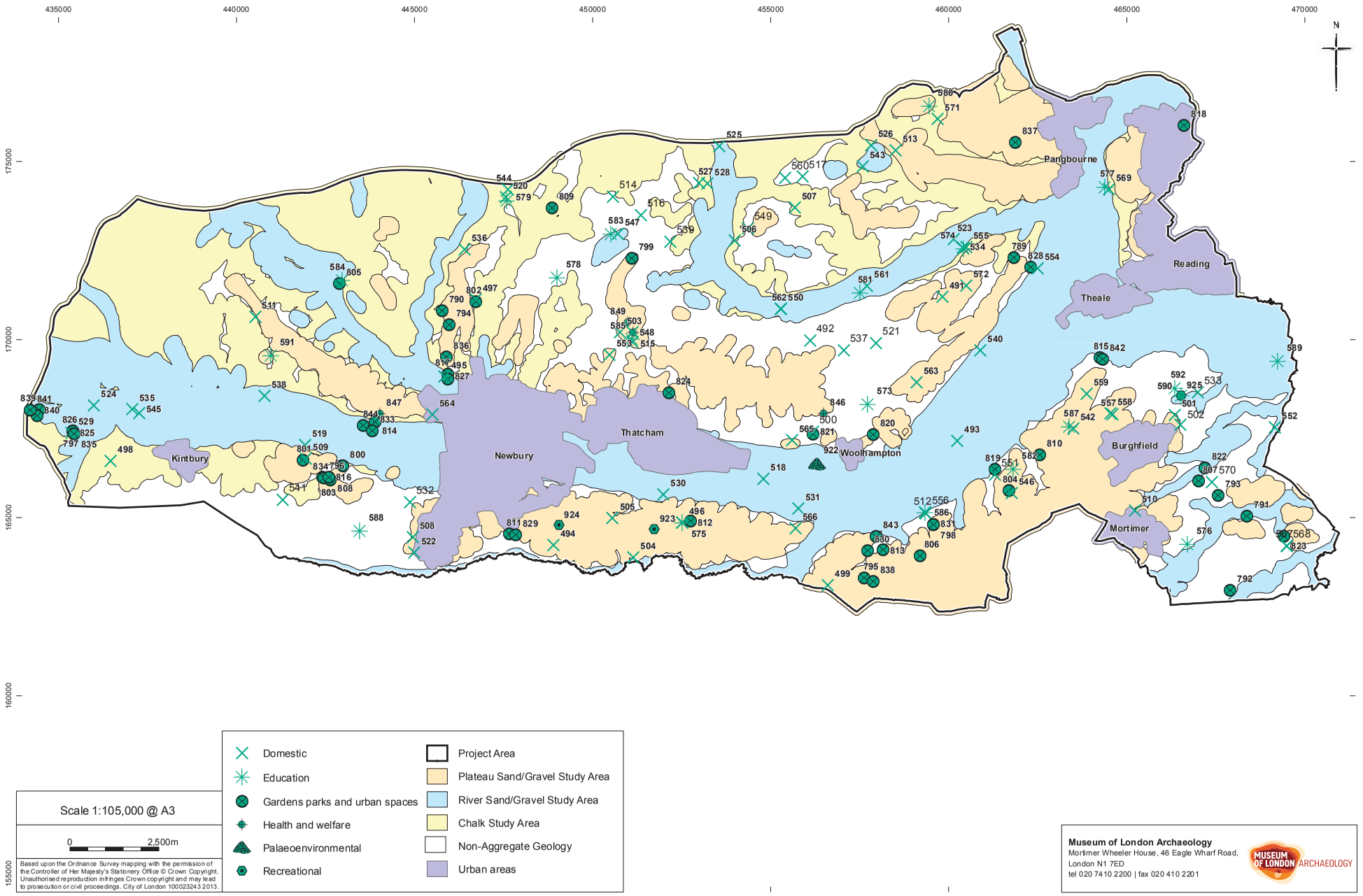

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Fig 17 Post-Medieval Assets (Civil, Commemorative, Commercial, Communications, Defence, Industrial, Transport, Water Supply and Drainage)

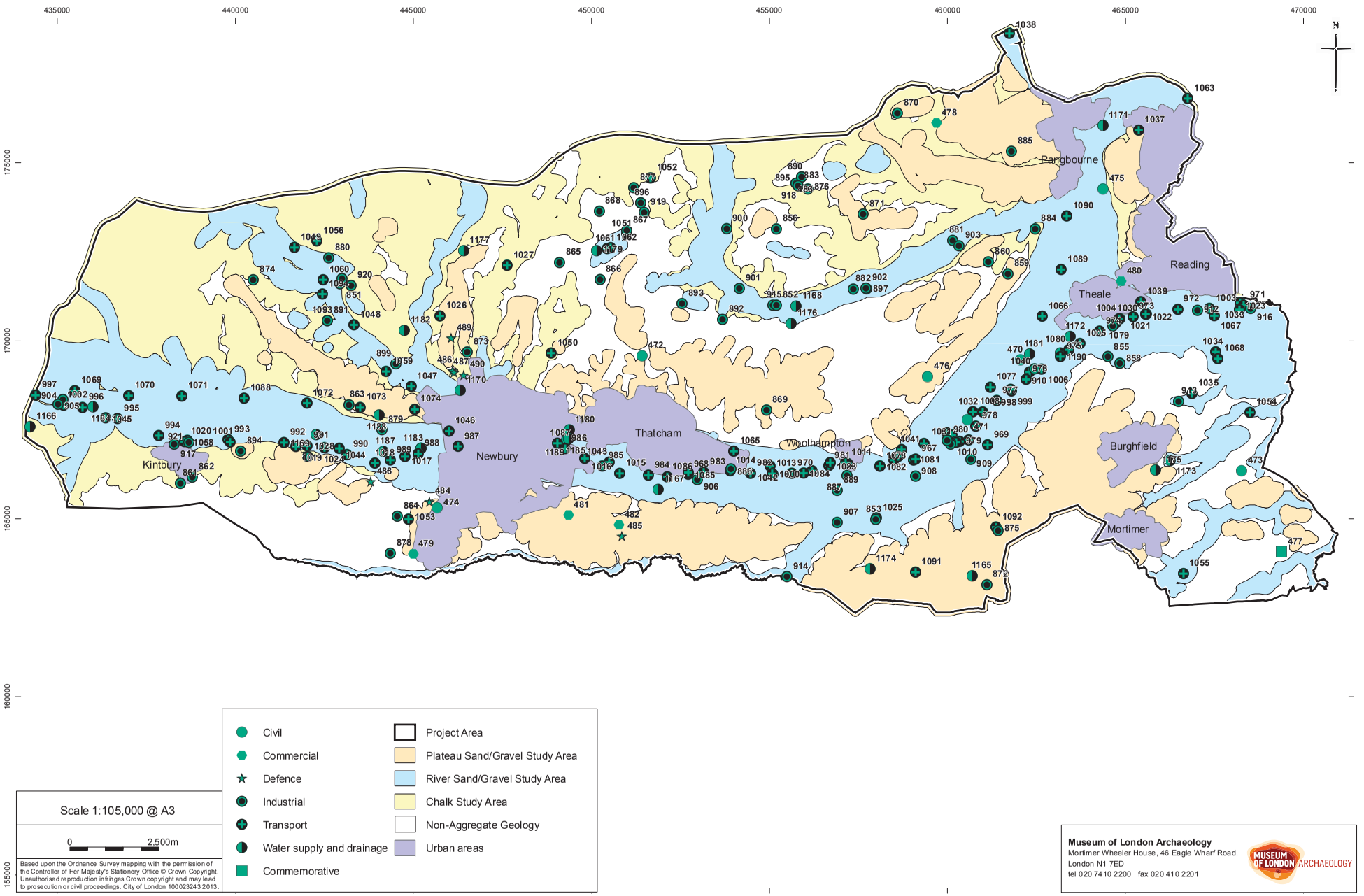

Fig 18 Post-Medieval Assets (Agriculture and Subsistence, Findspot, Hoard, Religious Ritual and Funerary, Unassigned)

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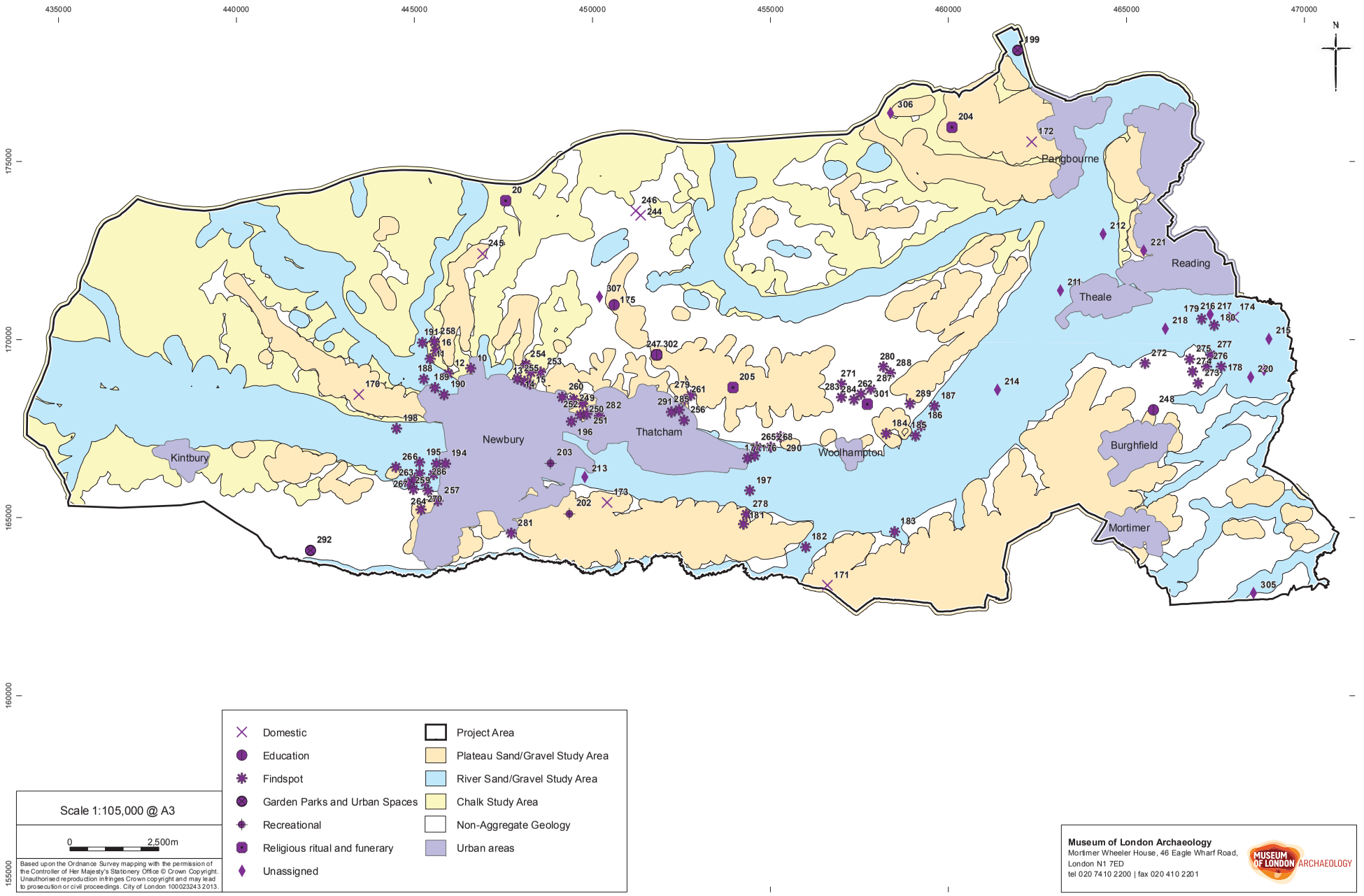

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Fig 19 Modern Assets (Domestic, Education, Findspot, Gardens Parks and Urban spaces, Health and Welfare, Recreational, Religious Ritual and Funerary and Unassigned)

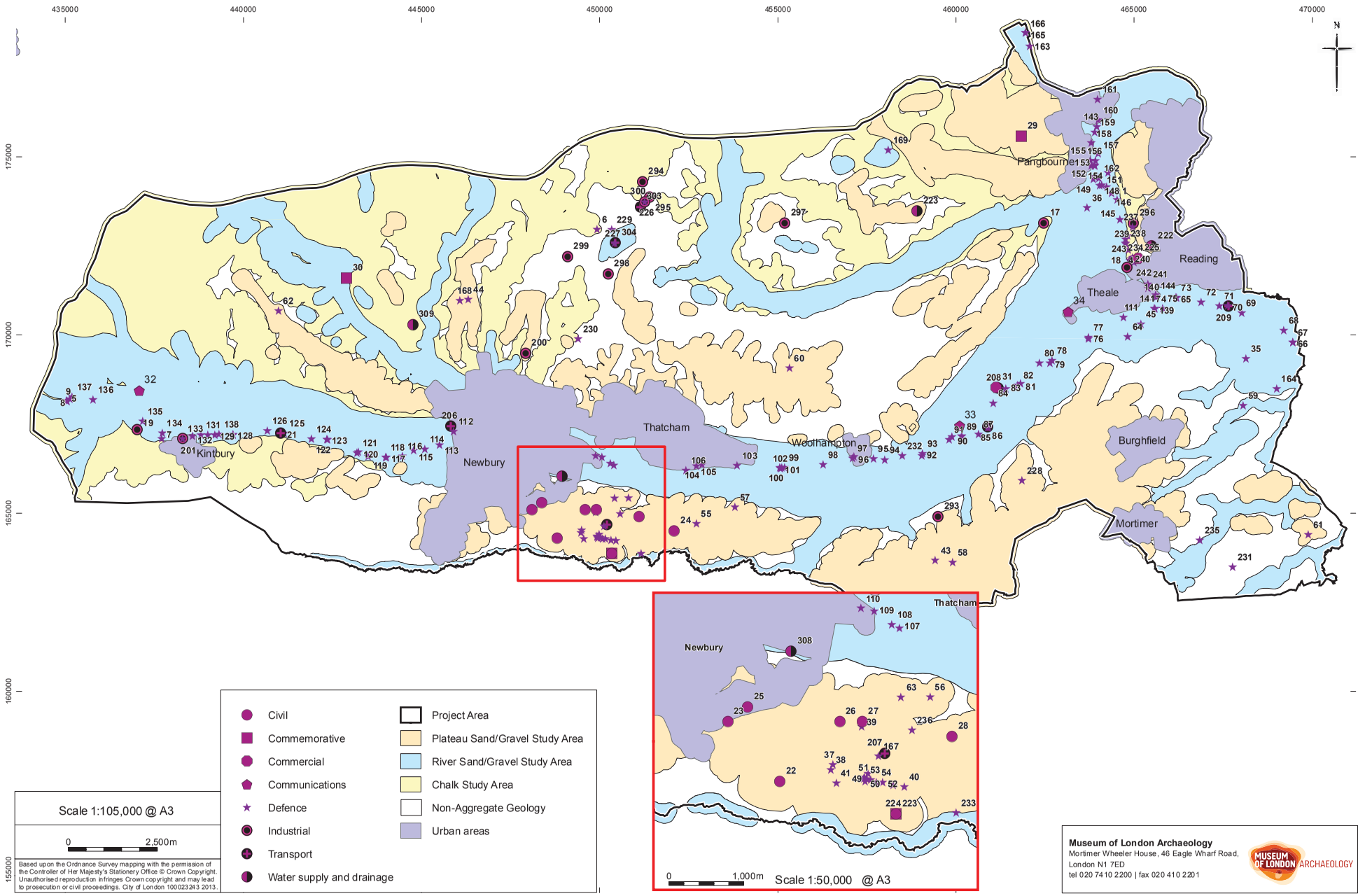

Fig 20 Modern Assets (Civil, Commemorative, Commercial, Communications, Defence, Industrial, Transport, Water Supply and Drainage)

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