

PLANNING DELIVERY ZONES 5 & 6 (PDZ 5 & 6)

CZ5&6 (Trenches PDZ 5.01, PDZ 5.02, PDZ 5.03, PDZ 6.07, PDZ 6.08, PDZ 6.09 and PDZ 6.48)

An Archaeological Evaluation Report

PDZ 5 NGR: TQ 37441 85460 to the north and TQ 37410 84610 to the south

PDZ 6 NGR: TQ 37430 85460 to the northwest, TQ 37610 84775 to the southwest, TQ 38070 85660 to the northeast

On behalf of the Olympic Delivery Authority

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SUMMARY (NON-TECHNICAL)

This report presents the results of an archaeological evaluation carried out by RPS Planning and Development and AOC Archaeology Group within Construction Zone 5 (CZ5), within the eastern portion of Planning Delivery Zone 5 (PDZ5), and Construction Zone 6 (CZ6), within the southwest corner of Planning Delivery Zone 6 (PDZ6), of the Olympic Park. PDZ5 is located in the London Borough of Hackney (NGR TQ 37441 85460 to the north and TQ 37410 84610 to the south) and PDZ6 is in Stratford, London Boroughs of Newham and Waltham Forest (NGR 537430 185460 to the north-west, 537610 184775 to the south-west and 538070 185660 to the north-east). The report was commissioned by the Olympic Delivery Authority.

Following the recommendations of the PDZ5 and PDZ6 Detailed Desk Based Assessments and PDZ6 Method Statement for Archaeological Evaluation, three evaluation trenches were excavated across PDZ5 and four evaluation trenches were excavated across PDZ6.

The stratigraphic sequence exposed within the evaluation has illustrated that a significant depth of alluvial clays, peat and gravels survive throughout CZ6 and within the north of CZ5.

No archaeological features or artefacts were recovered from the excavations within CZ5. Within CZ5, only Trench PDZ5.01, in the north of the site, contained peat and organic clay deposits, representing the same environmental changes shown within CZ6 (see below). AMS radiocarbon dating is currently taking place on samples from this trench in order to date the sequence. The results will be integrated into this report once available. Trenches PDZ5.02 and PDZ5.03, to the south of the site, contained clays and silts indicative of overbank deposits of the natural river system active on the floor of the Lea Valley in the period prior to large-scale programmes of land-raising in the late 19th and early 20th centuries.

The sedimentary sequence revealed within CZ6 was consistent throughout all four trenches, comprising natural sands and gravels, overlain by re-worked gravels and subsequent sands, silts and peat, which contained varied concentrations of detrital wood, plant remains and mollusc shells, representing the gradual silting of an initially free flowing, meandering river channel. These sediments were covered by silty clay deposits, identified as contemporary overbank silting residue. Within Trench PDZ6.09, sandy clays located above the natural gravels and below a peat layer, contained evidence of soil formation processes in the form of mottling and root penetration, which suggests that a terrestrial land surface formed during an erosional hiatus, preceding the formation of overlying peat. Radiocarbon dating is currently taking place on samples from this trench in order to date the sequence. The results will be integrated into this report once available.

The excavation of four trenches within CZ6 uncovered few archaeological remains. A Roman brick and possible coin were recovered from Trench PDZ6.48 suggesting Roman occupation within the wider area. Prehistoric activity is also suggested by two fine sand-tempered prehistoric slab fragments from Trench PDZ6.07 and a horse skeleton near the base of the sedimentary sequence within Trench PDZ6.09.

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SECTION 1: INTRODUCTION

- 1.1 This document is a report for an Archaeological Evaluation at Construction Zone 5 (CZ5) within the eastern portion of Planning Delivery Zone 5 (PDZ5A) and Construction Zone 6 (CZ6) in the southwest corner of Planning Delivery Zone 6 (PDZ6D) of the Olympic Park, East London (Figure 1).
- 1.2 Professional archaeological services were provided by AOC Archaeology Group (hereafter AOC) and RPS Planning and Development to the Olympic Delivery Authority (ODA) in respect of the Olympic, Paralympic and Legacy Transformation Planning Applications.
- 1.3 PDZ5A is located between National Grid Reference (NGR) TQ 37441 85460 to the north and TQ 37410 84610 to the south, situated within the London Borough of Hackney. The overall area is approximately 34 hectares. It is bounded to the east by the River Lea, to the west by the River Lea Navigation, to the north by Eastway (A102) and to the south by the North London Railway line (Figure 1).
- 1.4 PDZ6D is centred on NGR 537430 185460 to the northwest, 537610 184775 to the southwest and 538070 185660 to the northeast, within the London Boroughs of Newham and Waltham Forest. The zone covers approximately 331,170m². It is bounded to the west by the River Lea, to the east by the former Eastern Counties Railway line from Stratford to Cambridge, to the north by Temple Mills Road and to the south by Temple Mills Lane, in the south-western corner by the Clay Lane Estates and the channels of the Channelsea River. The former Eastway Cycle Circuit currently occupies the majority of the zone, apart from the western section of the Clays Lane Estate (Figure 1).
- 1.5 PDZ5 and PDZ6 are two of 15 zones within the Olympic, Paralympic and Legacy Transformation Planning Applications development area. Major structures to be constructed within the zones include a velodrome, BMX venue, fencing venue, the Handball Arena, the International Broadcast Centre, Multi-Storey Car Park and buildings associated with the athlete's village. Other works include drainage, roadways, bridges, cycle paths and an artificial wetlands area, as well as general ground reduction.

- 1.6 A Detailed Desk Based Assessment for both PDZ5 and PDZ6 (MoLAS-PCA 2007a, 2007b) assessed the archaeological potential for the zone and provided recommendations for archaeological fieldwork in advance of development. These recommendations included trial trenching across both zones.
- 1.7 The original method statements (MoLAS/PCA 2007c, 2007d) detailed how the Evaluations were to be undertaken. A later addendum (RPS/AOC 2008a, 2008b) followed the methodology set out in the original method statement, but specifically focused on the work carried out in the Bully Point Wetland Area (CZ5 & CZ6), in the east side of PDZ5, and in the southwest corner of PDZ 6. All works were undertaken by a team of professional archaeologists.
- 1.8 This report conforms to the requirements of Planning Policy Guidance: Archaeology and Planning (DoE, 1990) (PPG 16). It has been prepared in accordance with current best archaeological practice and local and national standards and guidelines:
 - English Heritage – Management of Archaeological Projects (EH 1991).
 - Institute of Field Archaeologists – Standards and Guidance for Archaeological Field Evaluations (IFA 1994)
 - Institute of Field Archaeologists – Code of Conduct (IFA 1997).

SECTION 2: GENERAL OBJECTIVES

- 2.1 The Institute of Field Archaeologists (IFA, 2001) states that the purpose of an Archaeological Evaluation is to:

Determine, as far as is reasonably possible, the nature of the archaeological resource within a specified area using appropriate methods and practices. These will satisfy the stated aims of the project, and comply with the Code of Conduct, Code of Approved Practice for the Regulation of Contractual Arrangements in Field Archaeology, and other relevant by-laws of the IFA.

- 2.2 Furthermore the purpose of the investigation is detailed as being:

To gain information about the archaeological resource within a given area or site (including presence or absence, character, extent, date, integrity, state of preservation and quality), in order to make an assessment of its merit in the appropriate context, leading to one or more of the following:

- the formulation of a strategy to ensure the recording, preservation or management of the resource;
- the formulation of a proposal for further archaeological investigation within a programme of research.

- 2.3 The protection of archaeological sites forms a significant planning consideration. English Heritage Greater London Archaeology Advisory Service noted (1998) that:

In the case of evaluation work the planning applicant should be aware that this is only the initial stage of investigation, carried out in support of a planning application to enable an informed decision. Evaluation will seek to define and characterise the archaeological remains on a site. Should significant archaeological remains be discovered and the proposed scheme has an impact on those remains, further archaeological work will be necessary, in the form of either a mitigation strategy for preservation in situ, full excavation or a combination of the two.

- 2.4 A field evaluation will thus augment any previous desk-based assessment, and provide all parties, particularly the LPA, with sufficient material information upon which to base informed decisions incorporating adequate heritage safeguards.

- 2.5 A field evaluation will result in a detailed archive of information that can be used to answer archaeological research questions concerning the buried archaeological heritage of the area or site being investigated, either in support of a planning application or to discharge the relevant archaeological planning condition.
- 2.6 The evaluation will provide an assessment of the damage already done to archaeological deposits by previous developments and will also provide an evaluation of the potential effect of the new proposals outlined in the planning application. The evaluation methodology will be in accordance with the advice set out in the Department of the Environment, *Planning Policy Guidance 16, Archaeology and Planning* (November, 1990) and will conform to the advice given in the English Heritage (London Region) *Archaeological Guidance Papers 1-5* (English Heritage, GLAAS, June 1998).
- 2.7 Finally, it should be noted that, as defined by English Heritage Greater London Archaeology Advisory Service (1998):

The objective [of field evaluations] is to define remains rather than totally remove them. Full excavation will therefore be confined to those deposits which have been agreed with the local Planning Authority archaeological advisor through a project design or site meeting. Within significant levels partial excavation, half-sectioning, the recovery of dating evidence, sampling and the cleaning and recording of structures will be preferable to full excavation.

- 2.8 Such excavation as takes place will not be at expense of any structures, features or finds which might reasonably be considered to merit preservation in situ.

SECTION 3: GEOLOGY AND TOPOGRAPHY

- 3.1 A full background description of the local geology and topography has been covered in the Desk Based assessments produced by MoLAS-PCA (MoLAS-PCA 2007a, 2007b). The main points are summarised below:
- 3.2 The British Geological Survey Sheet 256, of North London indicates that PDZ5 and PDZ6 lie on alluvium that represents a range of different wetland and dryland environments existing on the floodplain of the River Lea. The alluvium is underlain by the Lea Valley Gravels, deposited during the Palaeolithic period. Below this initial deposit of gravel, lie two further gravel horizons namely the Kempton Park Gravels and the Taplow gravels. Tertiary Bedrock in this area is London Clay and Woolwich and Reading Beds.
- 3.3 Considerable thicknesses of made ground have been encountered across the site. The modern ground surface varies greatly across the site due to the accumulation of made ground. In the area of the Eastway Cycle Circuit and the former allotments the land surface is at over 16m OD, whereas adjacent to the rivers, where little dumping has taken place, the modern land surface lies at around 5m OD.

SECTION 4: HISTORICAL & ARCHAEOLOGICAL BACKGROUND

4.1 The following summary of the historical and archaeological background to the site complements the findings of the fieldwork undertaken within PDZ5 and PDZ6. For a more detailed description of local and regional themes please see Section 4 of Desk Based Assessments (MoLAS-PCA 2007a, 2007b).

Prehistoric

4.2 The eastern side of PDZ6 and islands of higher ground throughout PDZ5 and PDZ6 would have provided dry, fertile land suitable for settlement throughout prehistory. The surrounding marshland would have provided food from hunting and fishing, clay for pottery manufacture, reeds for basketry and rough ground for animals to graze on.

4.3 The Lea Valley was well populated during the Bronze Age (1,800–600 BC) and Iron Age (600 BC–AD43). Well-preserved Prehistoric timber structures and trackways have been found within the valley and would have allowed inhabitants of the region access across the frequently marshy landscape. It is likely that similar structures were constructed across CZ5 and CZ6.

4.4 Within the Upper Lea Valley, to the north of zones 5 and 6, there is evidence that settlements existed in which the dwellings, named crannogs, were constructed upon stilts driven into the marshland.

4.5 The GLSMR documents a cluster of Palaeolithic and Neolithic finds discovered within the northwest border of PDZ6, although they are contextually indeterminable. Additionally spot finds have been recovered from throughout PDZ6, including two Palaeolithic hand axes found within low-lying gravels (c.6.1m OD) in the central part of the zone, a later, Neolithic stone axe discovered to the north of the zone during gravel extraction work, and Prehistoric worked bone recovered from low-lying gravels during gravel extraction works in 1913.

4.6 Few archaeological excavations have taken place within the vicinity of PDZ5 and PDZ6. A 1975 excavation on Temple Mills Lane, within the northern border of PDZ6, uncovered human remains and several undated timber structures, thought to possibly

be of prehistoric date. In 2000, an archaeological evaluation and excavation took place to the south of the zone. It revealed a number of palaeochannels, a layer of wood chips dated to the late Iron Age (380-160BC) and a number of Bronze Age features. The most recent archaeological investigation took place in 2005. It comprised an archaeological evaluation that formed part of the Olympics development at Carpenters Road, c 400m south of PDZ6. It revealed a peaty land surface of Neolithic date, containing butchered animal bone and worked wood.

Roman

- 4.7 The Roman town of *Londinium* (London) was well established by AD53, located within the area currently occupied by the modern City of London, c 6km to the south-west of PDZ5 and PDZ6. The settlement and land use within the Greater London region would have been strongly influenced by the development of the city as a major trading post, port and provincial capital by the 2nd century AD. Small, nucleated settlements and larger villa estates located along the major roads, acted both as markets and as producers supplying the city, particularly with agricultural produce (MoLAS 2000, 150). The fortunes of these nucleated settlements followed general trends, becoming highly prosperous during the early 2nd century, generally going into decline in the late 2nd and early 3rd centuries, and becoming briefly revived within the 4th century (*ibid.* 151).
- 4.8 The Lea is likely to have been used to supply the London area with agricultural produce and during the later Roman period pottery from Much Hadham, via the River Stort. Archaeological investigations have established that Roman settlement existed both at Old Ford and in the areas of Stratford and Leyton, representing established habitations on both sides of the Lea Valley.
- 4.9 The eastern side of PDZ6 and islands of higher ground found throughout PDZ5 and PDZ6 would have provided dry and fertile land suitable for settlement, as it had throughout the prehistoric period. Similarly the marshlands would have been exploited as an agricultural, hunting and material resource. Therefore the potential for Roman waterfront installations, channels and mills is significant.

- 4.10 A burial vault containing several urns was found during the removal of old foundations at Temple Mills. One of the urns contained Roman coins dating from Caesar to Constantine the Great, and several medals. The vault was reportedly on the edge of the River Lea. Similarly, a Roman stone sarcophagus containing a sword, fragment of a helmet crest, spur, padlock and three coins was found c 4–5 feet below the surface of the marsh according to newspaper reports in 1783. However, it is probable from the description of the find within the GLSMR that it was actually of a medieval date.
- 4.11 In 1830 a possible Roman leat was identified on the eastern side of Temple Mill Stream. However the dating of the structure is not certain and it may in fact have been constructed much later. It is described as ‘a trench running parallel with the Stream and banked up on either side with Roman bricks.’
- 4.12 The 2000 archaeological evaluation and subsequent excavation at Stratford Box, revealed a number of palaeochannels and Roman features.
- 4.13 A number of Roman crossing points over the river Lea have been identified to the north and south of the zones. A Roman road from Clapton to Great Dunmow (Essex) is thought to have crossed the Lea near Pond Lane Bridge (Margary 1955), c 1.5km to the north.
- 4.14 Ermine Street was a major Roman road that stretched from London to Colchester. Within the region of what is currently east London it is known to have linked the settlements at Old Ford and Stratford on either side of the Lea valley. It is thought that it may have crossed the Lea c 1km to the south, yet it is possible that there was a crossing point actually within PDZ6.
- 4.15 A minor Roman road was identified by an antiquarian observation in 1797, when a causeway was reportedly discovered along with Roman finds during works at Temple Mills. It is thought to have been located on the northern border of PDZ6, yet its alignment is not known. It has been assumed that it forms part of a road that extended along Ridley Road and Homerton High Street to the east, and which may have extended to a crossing point at Temple Mills. However the evidence has

previously been examined (Tyler 1998) and the conclusion made that the road's existence was unlikely. In 1722, the author Daniel Defoe mentions a great stone causeway that continued over by the present site of Temple Mills to Ruckholts. It is placed by the GLSMR approximately 750m to the north of PDZ6, although it's positioning is some distance from both Temple Mills (on the edge of the zone) and Ruckholt Manor, (c 400m to the north-east).

- 4.16 A pattern of Roman occupation has been identified from recent excavations within the Church Road/Grange Park area of Leyton, c 1.5km to the northeast of PDZ5 and 6. The occupation comprised a concentrated strip of Roman activity on a northeast - southwest alignment, suggesting activity along the course of a road. Archaeological investigations at Livingstone College Towers, Leyton (*ibid*) c 3km to the north of PDZ5 and PDZ6 have further suggested the presence of a road, illustrating that the axis of field patterns reflected the roads alignment. A recent archaeological site at Beaumont Road Estate in Leyton (Taylor 2004), situated c 2km to the north of PDZ5 and PDZ6, uncovered part of the road itself, consisting of a metalled surface c. 6m wide, with a north-south ditch on each side. However, no contemporary roadside activity was found.

Saxon

- 4.17 PDZ6 was located within the ancient parishes of West Ham and Leyton that were most probably formed from the manors referred to within the Domesday Book (AD 1086) as Ham (meaning 'low-lying pasture') and Leyton (meaning 'settlement on the Lea'). Throughout the Saxon period much of PDZ6 was marshland, suggesting that it was used as little more than pasture or meadow. Similarly PDZ5 was located within the ancient parish of Hackney, itself derived from Saxon words, which refer to the well-watered meadows by the River Lea marshes.
- 4.18 During the Saxon period the River Lea had several channels collectively known as the Stratford Back rivers constructed extending from its course. Tradition dictates that after Danish marauders sailed up the River Lea to Hertford, King Alfred cut a series of channels in this part of the Lea, which sufficiently lowered the water level, leaving the ships aground and preventing their escape. However, it is perhaps more likely that the channels were used as millstreams (Barber *et al* 2004). A number of mills

mentioned within the Domesday Book are situated along the Lea and its tributaries, although their precise locations are unknown. It is possible that the medieval Temple Mills was built on the site of a Domesday mill.

- 4.19 At Old Ford, c 1km to the southwest of the zones, and at Stratford, c 850m to the southeast, evidence of Saxon activity has been recorded. The place name Stratford means *fording place on the old street*, which may refer to the Roman road/causeway that crossed the marshes nearby. It is thought to have passed c 500m to the south of PDZ6. Although it is unlikely that the road was maintained, it would probably have continued to be used throughout the Saxon period (Vince 1990, 120).
- 4.20 Early medieval activity is represented within the area by a number of wooden structures, related to the use of the regions waterways. An early medieval revetment was uncovered at Gibbins Yard, located approximately 1km to the south-east of zone 6, and a log boat, dated to AD950–1000, at Springfield Park on the west bank of the Lea, c 3km to the north-west. During excavations in 2000 the remains of a bridge or jetty structure, dating to the Mid - Late Saxon period, was discovered on the bank of a palaeochannel in the southwest corner of the Stratford Box site.

Medieval

- 4.21 As within earlier periods the area of dry and fertile, higher ground only existed within the east of PDZ6, where any settlement is most likely to have been. This is away from the focus of the evaluation at the Bully Point Wetland Area, which would have been a marshland environment until the area was reclaimed in the later medieval period. The location would have been prone to regular flooding prior to this, making it of little use to the areas inhabitants. Reclamation would have taken place slowly throughout the medieval period, in the form of a series of river walls/embankments constructed successively further out from the edge of the higher ground (Rippon 2000, 1). Accordingly the wetland area would have been one of the last locations to have been drained within PDZ5 and PDZ6. The process of reclamation is likely to have caused the silting up of natural creeks and channels, revealed in the braided and sinuous nature of the channels of the River Lea, as shown on Rocque's map, an early cartographic source for the area, dating to 1746, which shows the reclaimed former marshland divided by drainage ditches into uniform parcels of land.

- 4.22 Documentary sources indicate the presence of a medieval mill named Temple Mill in the northwestern corner of the zone and a manorial residence, the manor of Chobham in the southeastern corner of PDZ6. The construction of which would probably have involved some attempt to drain the surrounding marshland. Track or drove ways ('manor ways'), often following the line of the river reclamation embankments, would have provided access across the marsh from the settlements on the higher ground. Temple Mill Lane, which forms the northern and eastern border of the zone, was probably originally such a trackway.
- 4.23 Between 1185 and 1278, the Knights Templar, using land granted to them by William of Hastings, steward to Henry II, built a water mill at Temple Mills. In 1308, a second mill was built on the opposite side of the mill stream, in the manor of Hackney, and the mills are described as being under the same roof. After the suppression of the Templars the mills passed to the Hospital of St. John of Jerusalem, Clerkenwell (the Knights Hospitaller) and following the Dissolution they passed back to the crown and were leased to Clement Goldsmith in 1593. The Knights also constructed a bridge near Temple Mills in the 14th century, possibly a precursor to that shown on Rocque's map of 1746.
- 4.24 The medieval manor house of Cobhams, later owned by Lord Henniker, which survived at least into the 1860s, was formed in 1329-31 by John de Preston. He sold it in 1335 to John de Sutton of Wivenhoe, who in 1343 sold it to Thomas de Chobham, who only owned the manor until 1356 when it was bought by Adam Fraunceys, a merchant who also bought Ruckholt to the north.
- 4.25 Within the area surrounding PDZ6 the main river crossing over the valley shifted further south between AD1110 – 1118, moving from the location of the old Roman road at Old Ford to the existing Stratford High Street, and in doing so linking the settlements at Bow and Stratford on either side of the valley (Vince 1990, 120).
- 4.26 The moated site of Ruckholt Manor was located approximately 400m northeast of PDZ6. Documentary evidence suggests that the Manor was in existence by 1066. It

was forfeited to the crown in 1345, after which it was variously inherited and sold. A later manor house was built on the same site in 1592.

Post-medieval

- 4.27 During the post medieval period the Lea Valley developed from a rural area, predominantly composed of common pasture and meadow into an industrial region, encompassing factories, warehouses and docks. The River and its channels were valuable due to their proximity to the increasingly industrial city of London, with waterpower and water transport initially exploited by industries including gunpowder and milling (Smith and Carr 2004, 4). Towns along the valley increasingly became the milling centres for London (Crossley 1990, 88) and the lower parts of the valley became the cradle of the British Chemical Industry (Smith and Carr 2004, 4).
- 4.28 The expansion of the milling industry within the Lea Valley was evident within PDZ6 by the 17th century, when a number of mills were constructed and through into the 18th century when the process industries rapidly changed. In 1627, Temple Mill was enlarged and modernised in order to grind corn and rape. Two new mills were built on or beside the site in the 1630s. In 1720, the mills were used to manufacture brass items and then lead in 1757. There is documentary evidence, within the GLSMR for a number of mills within the vicinity of Temple Mill, comprising a leather mill, which may have medieval origins, and subsequent logwood, gunpowder and a cutter's mills. Another mill is recorded here in the 1630s, used for working brass, tin and lead sheets, which may also have been an experimental foundry used by Prince Rupert for the production of toughened bronze.
- 4.29 The earliest map of the area, created by Rocque in 1746, shows the Lea Valley as extensive marshland divided by drainage ditches into fairly uniform parcels of land, while the River Lea is braided into several channels. However, modifications to the watercourses, the arrival of railway infrastructure in the mid 19th century and Victorian industrial developments have subsequently changed the topography of the area drastically.
- 4.30 A Plan of the Wike Meadow dated to 1763 (MoLAS/PCA 2007b) shows the site in an area of the marsh called *Wike Meadow*. The southern tip of the site falls within

separate fields owned by Mr Harris, Mr Pratt, Mr Salmon and Mr Brookes, indicating that private individuals had managed to acquire part of the common meadow shown in Roche previous map.

- 4.31 Chapman and Andre's map of the County of Essex dated to 1777 and Milne's map of 1800 shows that little changed during the 18th century within PDZ5 and 6, illustrating Temple Mill in the north-western part of PDZ6, whilst the remainder of the zones remained open and undeveloped. Within the later map a stipple along the west side of the Channelsea River in the western part of the zone indicates the presence of a river embankment, almost certainly constructed to prevent flooding. Within PDZ5 in 1768 the Hackney Cut canal was constructed (defining the western side of PDZ5) after the passing of the 1766 River Lee Act, which approved major alterations to eliminate loops in the natural river. This canal can be seen on the 1799 OS survey drawing.
- 4.32 Within Stanford's map of 1862 Temple Mills is shown as a number of separate small buildings, constructed after the original mills were pulled down in 1854. The map shows 'White Hart Inn' to the north of the mills at the edge of PDZ6. However, most of PDZ5 and PDZ6 is open field divided by artificial watercourses, with some amalgamation of smaller land parcels shown in 1800. Stanford's map shows a branch of the River Lea, marked as Lead Mill Stream (the Mill River on Rocque, and subsequently named Waterworks River) feeding the mills and continuing southwards in the western part of the zone beside a second more sinuous channel (the Channelsea). Stanford's map shows the Great Eastern Railway, which was built in the 1840s and forms the eastern boundary of the zone, along with considerable Victorian expansion across the higher ground on both sides of the valley and along the main crossing of Stratford High Street, c 1km to the south of PDZ6.
- 4.33 The 1st edition 25" Ordnance Survey (OS) map of 1882 shows little change within PDZ5 and PDZ6, other than the appearance of a large brickfield outside the southern boundary of PDZ6. The brickfield probably produced brick for local building programmes, as there is continued expansion of residential development on the eastern side of the valley. The 2nd edition 25" OS map of 1896 shows artificial manure works in the south of PDZ6 comprising buildings and sewage beds. There is

also the start of residential development in the northeast corner of PDZ6 with Temple Mills Crescent marked as well as Wycliffe Road leading to another artificial manure works.

- 4.34 In 1894 the first buildings were constructed within the southwest corner of PDZ5, alongside the Hackney Cut. These are labelled on Bacon's map of 1900 as Clarke, Nicholson & Coombs, confectionery and jam makers established in 1872, becoming registered as Clarnico in 1946. To the south of the site on White Post Lane was the Hope Chemical Works established in 1859 by Eugene Careless. The rest of the site in 1894/1900 was used as a recreation ground. The watercourses depicted previously appear to have been formalised and extended to the south to provide a flow of water into the former East London Waterworks reservoir in the adjacent PDZ4. The main north-south stream passes beneath the Eastern Counties Railway to feed into the Victoria Park Steam Bone Works.
- 4.35 The OS 25" map of 1914 shows small groups of what are probably industrial buildings alongside the ditches in the north half of the zones and allotment gardens are marked south of Temple Mills Lane. The manure works are still present and the clusters of buildings at Temple Mills remain unchanged. The later 1920 and 1938 OS maps show little change. An anti-aircraft battery is documented as being located in the western side of PDZ6 during World War II, representing an effort to protect the industries within the valley.
- 4.36 OS maps dating from the 1950s show considerable development including the construction of a cooperage and a piggery in the north-west, a Ministry of Supply storage depot (later a Civil Defence training ground) between the White Hart and the River Lea, the infilling of the Waterworks River, the demolition of Temple Mills Bridge and the construction of a small speedway track adjacent to the White Hart Inn, a furniture factory, meat extract works, a timber yard and allotment gardens. West of Waterden Road was Lea Mill for fabrics as well as Marsh View, a cloth works and a shoe works. There was a Cabinet Works and an Oxygen and Acetylene Gas Factory. Massive ground raising also took place within the northern and central parts of PDZ6 throughout the 1950-70s.

- 4.37 By the time the 1988 OS map was produced CZ5 comprised industrial and retail estates and CZ6 allotment gardens. This was how the sites remained until enabling works for the Olympic Park began in 2005.

SECTION 5: AIMS AND OBJECTIVES

5.1 In line with the ongoing archaeological work at the above sites, AOC adopted the already established aims and objectives, as documented within the Written Schemes of Investigation (MoLAS-PCA 2007c, 2007d). The relevant objectives for CZ5 and CZ6 are set out below:

- Do deposits pre-dating the Last Glacial Maximum, which might correspond with the Arctic Beds, exist within non-reworked gravels on the site? What is the potential for past environment reconstruction and/or Late Upper Palaeolithic activity in these deposits?
- Do Late Glacial Deposits exist within re-worked gravels? What is the potential for past environment reconstruction and/or Late Upper Palaeolithic activity from these deposits?
- Does evidence for Mesolithic activity (similar to that in the Colne Valley) exist in the clayey gravels recorded above Pleistocene gravel on the site?
- What are the characteristics of the gravel surface and overlying alluvium in the central and southern parts of the site, for which no data currently exists?
- Did the Hackney Brook and/or River Lea cross the site in the Holocene and is there evidence for human activity from the Mesolithic onwards associated with these rivers?
- What environmental evidence suitable for past landscape reconstruction exists within wetland deposits associated with ancient channels of the River Lea and Hackney Brook?
- Can episodes of channel activity and abandonment be dated?
- Is there evidence for areas of mud flats that are suggested to have covered much of the area in the later prehistoric eras?
- Is there evidence for an agricultural landscape in the post-prehistoric eras, and if so how does it present itself? Is it possible to determine field boundaries and if so can they be dated?
- Are there any in situ deposits of archaeological significance within the made ground or is it all of 19th/20th century dump and make-up deposits?

- Can any of the dumps be associated with the construction of the Hackney Cut, part of the Lea Navigation?
- Is there evidence of pre-20th century industrial features?

5.2 In addition the following questions have been considered:

- Do Late Glacial deposits exist within re-worked gravels in the southwest part of the zone? What is the potential for past environment reconstruction and/or Late Upper Palaeolithic activity in these deposits?
- Did the Leyton River cross the zone in the Pleistocene or Holocene and is there evidence for human activity associated with the river?
- Can channels of the River Lea be distinguished from its tributaries in the southwestern part of the zone? Does evidence for human activity, similar to that found in the Stratford Box, associated with the river, survive?
- What environmental evidence suitable for past landscape reconstruction exists within deposits associated with ancient channels of the River Lea and its tributaries?
- Can episodes of channel activity and abandonment and wetland expansion across previously dry land surfaces on the zone be dated?
- Is there any evidence of a Roman road and/or occupation activity within the area of the zone? If so, how does it relate to what is known of the settlement pattern further north in the Leyton area during the Roman period?
- Is there any evidence of medieval and post-medieval agricultural activity present on the zone?
- What was the pre-modern/pre-Victorian topography of the zone?
- How extensive is modern truncation across the zone? Do made ground deposits bury or truncate the post medieval/modern land surface?
- Is there evidence for past water management, i.e. drainage ditches, mill remains, sluices and revetments associated with earlier courses of the Channelsea River/Henniker's Ditch and River Lea?

5.3 The works followed the guidance set out in *Archaeological Guidance Paper 3 Standards and Practices in Archaeological Fieldwork in London*; *Archaeological*

Guidance Paper 4: Archaeological Reports; Archaeological Guidance Paper 5: Evaluations. (English Heritage, 1998)

SECTION 6: METHODOLOGY

- 6.1 The Evaluation was carried out at the artificial wetlands area comprising CZ5, on the eastern side of PDZ 5, and CZ6 in the south-western part of PDZ6 (Figures 2).
- 6.2 The trenches excavated within PDZ5 and PDZ6 form part of a larger scheme of archaeological investigation, representing the archaeological sampling of approximately 5% of the wider development area
- 6.3 Five trenches, each measuring 30m x 3m at base, were initially proposed for excavation within PDZ5 (MoLAS/PCA 2007c). However, on site constraints allowed only three trenches to be excavated (PDZ5.1, PDZ5.2 and PDZ5.3) at a reduced size of 6m x 2m at base (Figure 2 and 3).
- 6.4 Within PDZ6 the original method statement (MoLAS/PCA 2007d) specified that three trenches were to be excavated (PDZ 6.48, PDZ 6.49 and PDZ 6.50), each measuring 25m x 3m at base. However, due to the close proximity of a nearby power pylon, only one trench measuring 30m x 8m at base (PDZ6.48) was excavated within the area originally proposed for excavation. Three additional north-south oriented trenches measuring approximately 30m x 4m at base (PDZ6.7, PDZ6.8 and PDZ6.9), extending northwards from PDZ6.48, adjacent to the River Lea, were excavated. Due to the volume of water entering Trench PDZ6.48, and the probable collapse of sections, the excavated area was altered to 20m x 10m at base (Figure 3).
- 6.5 A mechanical excavator, initially using a breaker and toothed bucket, broke out the areas of trenching under archaeological supervision. Once intact archaeological and/or alluvial deposits were identified a toothless ditching bucket was used to excavate the trenches to the first archaeological horizon or natural sands and gravels.
- 6.6 Once the initial machine excavation of the trenches had taken place, all trench faces that required examination or recording were cleaned using appropriate hand tools. All investigation of archaeological levels was undertaken by hand, with cleaning, examination and recording in both plan and section. Within significant levels partial excavation, half-sectioning, the recovery of dating evidence, sampling and the

cleaning and recording of structures was undertaken, as agreed with English Heritage (GLAAS).

- 6.7 Investigation was not undertaken at the expense of any structures, features or finds which might reasonably have been considered to merit preservation *in situ*. Some features, such as pits and ditches were half sectioned, whilst modern concrete foundations found *in situ* were left unexcavated..
- 6.8 Specific guidance on the treatment of palaeo-environmental remains within the Olympic Park area has been issued by English Heritage. Prehistoric landscapes have survived within the Olympic Park area and this presence has been identified in the Detailed Desk Based Assessment (MoLAS-PCA 2007a, 2007b).
- 6.9 Alluvial and peat deposits were cleaned and recorded by the archaeological team, before being sampled and recorded in greater depth by a team of geoarchaeological specialists. The field team for the evaluation trench included a geoarchaeologist from Quaternary Scientific, University of Reading (formerly ArchaeoScape), who was available for the duration of the project to assess the potential of the natural deposits for reconstructing the past environment, which was of relevance to understanding the context of any archaeological levels (or the lack of them). The geoarchaeologist conformed to the methodology set out in the original method statement (MoLAS/PCA 2007c, 2007d).
- 6.10 All trenching conformed to current best practice and was undertaken according to the relevant guidelines set out in:
- Department of the Environment, 1990 Planning Policy Guidance 16, Archaeology and Planning (PPG 16).
- English Heritage, 1991 Management of Archaeological Projects (MAP2).
- English Heritage Greater London Archaeology Advisory Service, June 1998 Archaeological Guidance Papers 1-5.
- English Heritage Greater London Archaeology Advisory Service, May 1999 Archaeological Guidance Papers 6.

Institute of Field Archaeologists (IFA), rev. 2001 By-Laws, Standards and Policy Statements of the Institute of Field Archaeologists, Standard and guidance: Desk Based Assessment.

Museum of London, 1998 General Standards for the preparation of archaeological archives deposited with the Museum of London.

The Unitary Development Plans of the London Boroughs of Newham (2001), Hackney (1995), Waltham Forest (1996), and Tower Hamlets (1998).

- 6.11 Archaeological work was monitored by Atkins on behalf of the Olympic Delivery Authority. The English Heritage (GLAAS) Archaeological Advisor, David Divers, was responsible for monitoring progress and standards throughout the project on behalf of the Olympic Delivery Authority Planning Decisions Team (ODA PDT).

SECTION 7: RESULTS

7.1 Trench PDZ5.01 (Figure 4)

OD Height	Context	Description
5.00m OD	101	Mid – dark blackish brown, loose, gravelly, silty clay, containing frequent inclusions of late 19 th and early 20 th century domestic waste, pottery and CBM. Made Ground.
3.52m OD	102	Mid bluish grey, firm, silt.
2.60m OD	103	Mid – dark brown, highly organic peat clay, with frequent wood inclusions.
2.60m OD	108	Mid – dark greyish blue silt.
2.33m OD	109	Light yellowish brown, highly organic, peat clay.
2.24m OD	104	Mid – light greyish blue, firm clay, containing rooting and sand inclusions.
1.83m OD	105	Mid – dark brown, silty sand.
1.77m OD	106	Mid – light yellowish grey, friable, sand lens underlying peat..
1.65m OD	107	Mid – light greyish yellow, poorly sorted gravels, within a fine sand matrix. Natural.

7.1.1 Natural sands and gravels (107) were observed at a height of 1.65m OD, overlain throughout the trench by a 0.10m thick layer of mid – light yellowish grey, friable, sand and mid brown peat (106), which contained common plant remains. This layer was sealed by a deposit of mid – dark brown, firm, silty sand (105), which contained twigs, 0.13m thick.

7.1.2 These basal layers were overlain by 0.60m thick deposit of mid – light greyish blue, firm clay, containing rooting and sand inclusions (104). Above this was a layer of light yellowish brown, highly organic, peat clay (109) 0.10m thick, which was in turn found beneath a 0.22m thick deposit of darker, more organic peat clay, with frequent wood, detrital plant material and scattered mollusc remain inclusions, including opercula of *Bithynia tentaculata* inclusions (103). This was overlain by a mid – dark greyish blue silt (108), measuring 0.10m in thickness, which also contained mollusc inclusions.

- 7.1.3 The uppermost sedimentary deposit (102) was located above (108). It comprised mid bluish grey, firm, silt and measured 1.17m in thickness. The sedimentary deposits were overlain by a deposit of modern made ground (101), comprising 1.55m+ of mid – dark blackish brown, loose, gravelly, silty clay, which contained frequent inclusions of late 19th and early 20th century domestic waste, pottery and ceramic building material (CBM).
- 7.1.4 A set of four overlapping column samples was taken from the west-facing section between 3.42m and 1.39m OD (Figure 4), incorporating contexts (102), (103), (104), (105), (106), (107) and (109) (Appendix C). A single column sample was taken from east-facing section between 1.94 and 1.44m OD. Additionally, a set of 14 bulk samples were obtained between 2.59m and 1.59m OD. Preliminary assessment of the bulk samples indicates the presence of charred wood within all the sampled deposits except (103). Waterlogged wood was present in high quantities within (102) and (108) and waterlogged seeds were present in all the sampled deposits except (108),(103) and (104). Insects were recorded in low to moderate concentrations in (103) and (109).
- 7.1.5 Accelerator mass spectrometry (AMS) radiocarbon dating is being carried out on samples from Trench PDZ5.01 in order to obtain dates for the top (103) and base (105) of the sedimentary sequence.
- 7.1.6 No archaeological features or significant artefactual remains were recovered during the excavation of Trench PDZ5.01.

7.2 Trench PDZ5.02 (Figure 4)

OD Height	Context	Description
5.04m OD	201	Mid – dark blackish brown, loose, gravelly, silty clay, containing frequent inclusions of late 19 th and early 20 th century domestic waste, pottery and CBM. Made Ground.
3.43m OD	202	Mid – light greyish yellow, mottled mid bluish grey, firm, silt. Contained moderate organic inclusions and occasional sub rounded pebble inclusions.
2.60m OD	203	Mid grey, firm, gravelly silt.
2.11m OD	205	Mixed mid grey and dark blackish brown, friable, highly organic clayey gravels, with frequent rooting inclusions.
1.81m OD	206	Dark blackish brown, moderately compacted, poorly sorted gravelly, sand with frequent organic inclusions.
1.71m OD	204	Poorly sorted gravels within a mid orangey yellow, fine

		sand matrix. Natural.
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- 7.2.1 Natural sands and gravels (204) were observed at a height of 2.24m OD, overlain throughout the trench by a 0.10m thick layer of dark blackish brown, moderately compacted, poorly sorted gravely sand with frequent organic inclusions (206). This layer was sealed by a 0.32m thick mixed deposit of mid grey and dark blackish brown, friable, highly organic clayey gravels, with frequent rooting inclusions (205).
- 7.2.2 These deposits were overlain by a 0.67m thick mid grey, firm, gravely silt (203), which was in turn overlain by a 1.20m thick deposit of mid – light greyish yellow, mottled mid bluish grey, firm, silt (202). The uppermost deposit was modern made ground (201), comprising 1.56m+ of mid – dark blackish brown, loose, gravely, silty clay, which contained frequent inclusions of late 19th and early 20th century domestic waste, pottery and CBM.
- 7.2.3 A set of five overlapping column samples were taken from Trench PDZ5.02, from the west-facing section between 3.44m and 1.56m OD, incorporating contexts (201), (202), (203), (205) and (206) (Figure 4). A set of eight bulk samples were additionally obtained between 2.06m and 1.71m OD. The bulk samples produced little in the way of macro fossils. Pollen was only present in (201) and (203) where it was preserved in very low concentrations, whilst low to moderate concentrations of microscopic charcoal were recorded in contexts (201) and (202).
- 7.2.4 The natural sands and gravels (205 and 206) are interpreted as the undissected remnants of Late Devensian Late Glacial gravels (Appendix C). The channels of the Holocene river system cut into these deposits and the sediment sequence (203 and 202) that overlies the sand and gravels is considered here to represent the overbank deposits of these rivers (Appendix C).
- 7.2.5 No archaeological features or significant artefactual remains were recovered during the excavation.

7.3 Trench PDZ5.03 (Figure 4)

OD Height	Context	Description
5.00m OD	301	Mid – dark blackish brown, loose, gravelly, silty clay,

		containing frequent inclusions of late 19 th and early 20 th century domestic waste, pottery and CBM. Made Ground.
3.52m OD	302	Mid – dark bluish grey, firm, silt, with occasional sub angular pebble inclusions.
2.60m OD	303	Mid – light grey, sub angular and sub rounded pebbles, poorly sorted gravels within a slightly sandy silt matrix.
2.24m OD	304	Mid – light yellow, friable, gravel lens.
2.19m OD	305	Rounded – sub rounded gravels within a dark blackish brown clay matrix.
1.89m OD	306	Sub rounded gravels within a mid – light brownish yellow, fine sand matrix. Natural.

7.3.1 Natural sands and gravels (306) were observed at a height of 1.89m OD, overlain within the north of the trench by a thin (70mm) layer of rounded – sub rounded gravels within a dark blackish brown, organic clay matrix (305), which contained detrital plant remains and charcoal particles. It was overlain by a 0.18m thick lens of mid – light yellow, friable, gravel (304).

7.3.2 Overlying deposits (306), (305) and (304) was a 0.40m thick layer of mid – light grey poorly sorted gravels (sub angular and sub rounded pebbles) within a slightly sandy silt matrix (303). The uppermost sedimentary deposit was a 1.28m thick mid – dark bluish grey, firm, silt, with occasional sub angular pebble inclusions and charcoal (302).

7.3.3 The uppermost deposit was modern made ground (301), comprising 1.92m+ of mid – dark blackish brown, loose, gravelly, silty clay, which contained frequent inclusions of late 19th and early 20th century domestic waste, pottery and CBM.

7.3.4 Two sets of three overlapping column samples were taken from east-facing section between 3.24m and 1.80m OD, including (302), (303), (304), and (306), and the west-facing section between 3.29m and 2.05m OD (Appendix C). As in Trench PDZ5.02, these deposits are interpreted as overbank deposits of the prehistoric and historic rivers (Appendix C).

7.3.5 No archaeological features or significant artefactual remains were recovered during the excavation.

7.4 Trench PDZ6.07 (Figure 5)

OD Height	Context	Description
5.95m OD	701	Mid – dark blackish brown, loose, gravelly, silty clay, containing frequent inclusions of late 19 th and early 20 th century domestic waste, pottery and CBM. Made Ground.
2.70m OD	702	Mid bluish grey, soft, clay, containing occasional fragments of CBM.
2.34m OD	703	Mid brownish yellow, soft, silt.
2.24m OD	705	Mid - Dark brown, highly organic, peat.
2.08m OD	708	Light grey, soft – loose, silt containing sandy lenses, with frequent inclusions of sub rounded pebbles within the sandy lenses and occasional wood fragments within the silt.
1.60m OD	704	Mid bluish green, soft, silty sand. No inclusions.
1.39m OD	706	Light grey, loose, clayey sand, with occasional inclusions of wood fragments, rounded pebbles and very occasional angular and sub angular pebbles.
1.36m OD	709	Mid brown, soft, peat clay, containing frequent traces of decayed leaves, roots and reeds.
1.01m OD	707	Mid greyish brown, loose, slightly sandy gravels. Natural.

7.4.1 Natural gravels (707) were observed at a height of 1.01m OD, running relatively level throughout the trench. They were overlain across the site by a 0.30m thick deposit of light grey, loose, clayey sand, with occasional inclusions of wood fragments, rounded pebbles and very occasional angular and sub angular pebbles (706). This was located, within the eastern extent of the trench, beneath a 0.82m deep layer of light grey, soft – loose, silt (708) containing sandy lenses, with frequent inclusions of sub rounded pebbles within the sandy lenses and occasional wood fragments within the silt. A large mammal rib was recovered from context (708). Above this was 0.32m thick deposit of mid - dark brown, peat (705).

7.4.2 Within the southern end of the west facing section of the trench, palaeochannel [711] cut into sand (706). The channel was 0.80m wide and 0.30m deep and had rounded, moderately sloping sides, with a rounded base. The fill was a dark brown, firm, organic peat (712).

- 7.4.3 Within the western extent of the trench, a 0.62m thick mid brown, soft, peat clay (709), containing frequent traces of decayed leaves, roots and reeds, mollusc, insect and ostracod remains overlay sand (706). Overlying the peat was a 0.10m thick mid bluish green, soft, silty sand (704), containing scattered remains of plants, insects and ostracods. This was overlain by a 0.41m thick mid brownish yellow, soft, silt (703), which overlaid (705) within the eastern extent of the trench.
- 7.4.4 The uppermost sedimentary deposit found in Trench PDZ6.07 was a 0.74m thick layer of mid bluish grey, soft, clay, containing occasional CBM fragments (702). Artefacts recovered from the layer include two prehistoric fine sand-tempered, reduced slab fragments, a clay tobacco pipe fragment, 19th century pottery sherds, unfrogged post-medieval brick and pegtiles and pantiles typical of those used in London between the 16th and 18th centuries (Appendix E). This was sealed by a 3.06m+ thick made ground deposit (701) of mid –dark blackish brown, loose, gravelly, silty clay, containing frequent inclusions of late 19th and early 20th century domestic waste, pottery and CBM. A white earthenware funnel with a blue internal transfer-printed owner’s mark: ‘POPLAR AND STEPNEY SICK ASYLUM’ in a garter was recovered from (701). The Poplar and Stepney Sick Asylum opened in 1873 becoming renamed St Andrews Hospital in 1921 (Appendix E), this may suggest the deposition of the made ground around this time.
- 7.4.5 Column samples were taken from the east-facing and west-facing sections within Trench PDZ6.07, incorporating contexts (703) to (709) and (712) (Appendix C). The concentration and preservation of pollen generally ranged between moderate and high throughout the different contexts within the trench. Microscopic charcoal was recorded in generally low concentrations throughout. The sample taken from cut [711], context (712) also recorded high pollen concentration and preservation. Additionally, diatoms were recorded in moderate concentrations in contexts (704) and (708), and low concentrations in context (706).
- 7.4.6 These sediments are consistent with deposition in an active channel or channel backwaters of a meandering channel and are interpreted as an abandoned channel or floodplain surface (Appendix C). The overlying silty deposits are interpreted as overbank deposits of Mid to Late Holocene age (post-Neolithic) (Appendix C).

7.4.7 No archaeological features or significant artefactual remains were recovered during the excavation.

7.5 Trench PDZ6.08 (Figure 6)

OD Height	Context	Description
5.94m OD	801	Mid – dark blackish brown, loose, gravelly, silty clay, containing frequent inclusions of late 19 th and early 20 th century domestic waste, pottery and CBM. Made Ground.
3.14m OD	802	Mid – pale, brownish yellow, soft, clay, with orange areas of oxidization and mid bluish grey mottling. Contained occasional sub rounded pebbles and very occasional fragments of rolled, non-diagnostic CBM.
2.45m OD	803	Mid brownish yellow, soft, silt.
2.44m OD	804	Mid – light orange, soft, clayey sand.
2.25m OD	805	Mid – light bluish grey, firm, silt.
2.08m OD	808	Mid brown, firm, peat clay.
1.68m OD	807	Mid – dark brown, firm, heavily organic, peat clay, containing frequent decaying wood fragments and occasional shell inclusions.
1.60m OD	806	Mid – pale yellowish brown sand, containing frequent shell, peat and decaying wood inclusions.
1.47m OD	814	Mid – dark brown, heavily organic peat clay, containing frequent decaying wood and moderate sub rounded pebble inclusions.
1.24m OD	809	Poorly sorted gravels within a mid yellowish brown shelly sand matrix. Natural.
0.77m OD	813	Dark brown, soft, peat.

7.5.1 Natural shelly sands (809) were observed at a height of 1.24m OD, running relatively level throughout the trench. Within the south of the trench, the lowest observed deposit was a 0.12m thick dark brown, soft, peat (813). The gravels and peat were overlain by a 0.69m thick mid – pale yellowish brown sand (806), containing frequent rich mollusc fauna including *Theodoxus fluviatilis*, *Valvata piscinalis*, *Valvata crista*, *Bithynia tentaculata* and *Ancylus fluviatilis*., peat and decaying wood inclusions. Within the northwest corner of the trench, a 0.74m thick deposit of mid – light bluish grey, firm, silt (805), overlay (806). This petered out by the north-eastern corner of the trench, where an overlying deposit of mid – dark brown, firm, heavily organic, peaty clay, containing frequent decaying wood fragments and occasional shell inclusions (807) overlay (806).

- 7.5.2 Within the northwest corner of the trench, a deposit of mid – light orange, soft, clayey sand (804), which measured 0.32m thick, overlaying silt (805). The layer extended 5m to the east within the northern face of the trench. It was overlain by a 0.30m thick deposit of mid brownish yellow, soft, silt (803) which ran intermittently throughout the length of the trench..
- 7.5.3 Within the west facing section, 7.60m to the south of the northern extent of the trench, a palaeochannel [812] was found truncating the upper sedimentary sequence of deposits (807), (803) and (802) (Figure 6). It was also sealed by deposit (802) suggesting that the sediment was deposited over a period of time. The channel was 1.82m wide and 0.82m deep, had rounded, gradually sloping sides, that broke moderately to its rounded base and contained two distinct fills (810) and (811). The primary fill was 0.10m thick; it comprised dark greyish brown, moderately firm, sandy clay, which contained frequent mollusc remains, including *Planorbids*, *Bithynia tentaculata* and *Ancylus fluviatilis* (Appendix C) and occasional charcoal and organic inclusions. The secondary fill comprised a 0.72m thick, mid orangey brown, firm, silty clay deposit, with frequent ostracods and mollusc inclusions, including whole gastropods and small bivalves.
- 7.5.4 Deposit (802) comprised 0.96m of mid – pale, brownish yellow, soft, clay, with orange areas of oxidization and mid bluish grey mottling. The layer contained occasional sub rounded pebbles and very occasional fragments of rolled, non-diagnostic CBM. The sedimentary sequence was sealed by a 2.50m+ thick made ground deposit (801) of mid – dark blackish brown, loose, gravelly, silty clay, containing frequent inclusions of late 19th and early 20th century domestic waste, pottery and CBM.

7.5.5 Three sets of column samples were taken from the west-facing and a single column sample from the south-facing section within Trench PDZ6.08, incorporating deposits (802), (803), (806) (807), (808), (809), (810), (813) and (814). These were accompanied by a set of eleven bulk samples obtained between 2.24m and 1.69m OD. Pollen remains varied greatly in concentration throughout the alluvial sequence and Diatoms were absent from most remains (Appendix C). Preliminary assessment suggests that the tufa-rich sands within the lower alluvial sequence, which contained a rich mollusc fauna including several species characteristic of fairly large, well-oxygenated rivers, represent a deposit laid down in the channel of an initially active and probably meandering river, which gradually silted up (Appendix C). Further, the absence of anthropogenic material in this sequence of sands and silts suggests that it is of Early to Mid Holocene age (Appendix C). Channel [812] is likely to represent the silting of an active channel on the floor of the Lea Valley. It is sealed by silty clay overbank deposits probable of Mid to Late Holocene age (Appendix C).

7.5.6 Accelerator mass spectrometry (AMS) radiocarbon dating is being carried out on samples from Trench PDZ6.08 in order to obtain dates for the top (807) and base (813) of the sedimentary sequence.

7.5.7 No archaeological features or significant artefactual remains were recovered during the excavation.

7.6 Trench PDZ6.09 (Figures 7 and 8)

OD Height	Context	Description
5.94m OD	901	Mid – dark blackish brown, loose, gravelly, silty clay, containing frequent inclusions of late 19 th and early 20 th century domestic waste, pottery and CBM. Made Ground.
3.36m OD	902	Mid bluish grey, diffusing to orangey grey, soft, clay. Mottled orange in places due to oxidation.
2.45m OD	905	Mid – light yellowish brown, very slightly sandy clay, with occasional organic inclusions.
2.37m OD	903	Mid – dark greyish blue, with areas of dark brown and mid yellowish brown mottling, soft silt. Contained frequent inclusions of peat and organic material.
2.37m OD	908	Mid – dark reddish brown, firm, organic, peat clay with occasional gravel inclusions.
1.58m OD	909	Poorly sorted gravels within a mid grey sand matrix. Sand lens.
1.34m OD	904	Mid – dark brown, firm, peat, containing moderate inclusions of partially decayed wood and organic

		material.
1.25m OD	906	Mid greyish brown sandy clay with occasional gravel and organic inclusions.
1.24m OD	907	Mid brown, mottled light yellowish brown, firm clay, with frequent wood and gravel inclusions.
0.44m OD	910	Poorly sorted gravels. Natural.

- 7.6.1 Natural gravels (910) were observed at a height of 0.44m OD, within the northernmost 14m of the trench. The gravels were overlain throughout the trench by mid greyish brown sandy clay (906) with occasional gravel and organic inclusions (roots and detrital wood), which measured up to 0.90m, within the northern end of the trench. At the northern end of trench, the sandy clay (906) was overlain by a 1.00m thick layer of mid brown, mottled light yellowish brown, firm clay, with frequent wood and gravel inclusions (907). This was overlain by a 0.34m thick deposit of mid – dark brown, firm, peat (904), containing moderate inclusions of partially decayed wood and organic material and two rib fragments from a large mammal (Appendix F).
- 7.6.2 Within the southern half of the trench, overlying sandy clay (906), was a 0.13m thick lens of poorly sorted gravels within a mid grey sand matrix (909), which was located beneath a 0.40m thick mid – light yellowish brown, very slightly sandy clay, with occasional organic inclusions (905). A complete right metatarsal from an adult horse was recovered from this context (Appendix F)
- 7.6.3 A horse skeleton [911] (Figure 8) (Appendix F) was found in the centre of the trench at the base of (905). Assessment of the bones (Appendix F) has identified that the horse was male, aged between 9-10 years old and stood approximately 1.33-1.37m high. Geo-archaeological analysis of the deposit (905) has indicated that the sandy clayey silt sediment represents the beginning of terrestrial soil formation, suggesting that the skeleton may be found *in situ*. A broken wood fragment [912] was located to the west of horse skeleton (Figure 9) at a similar depth, also within (905). It was 700mm long and 230mm wide. The object was broken into two pieces and most probably comprised further missing fragments. Preliminary assessment has identified the wood as *Alnus glutinosa* (common Alder), a native species of tree that is commonly found within a riverside or swampy environment, suggesting that it was part of the local flora (Appendix D). The wood was extensively damaged from water erosion and by wood boring invertebrates and it did not show signs of woodworking.

- 7.6.4 Within the western side of the trench a 0.55m thick layer of mid – dark greyish blue, with areas of dark brown and mid yellowish brown mottling, soft, silt (903), overlaid peat deposit (904), clay (907) and sandy clay (906).
- 7.6.5 Overlying layer (905), throughout the eastern side of the trench, was a 0.30m thick layer of mid – dark reddish brown, firm, organic, peat clay with occasional gravel inclusions (908). Covering (908) in the east and (903) in the west was the uppermost sedimentary deposit of mid bluish grey, diffusing to orangey grey, soft, clay, (902) which measured 1.15m thick. Post-medieval brick and peg tile from (902) was identified as being similar to the materials typically used in London during the 17th and 18th century (Appendix E).
- 7.6.6 The sequence was sealed by a 2.25m+ thick deposit of made ground (901) of mid – dark blackish brown, loose, gravelly, silty clay, containing frequent inclusions of late 19th and early 20th century domestic waste, pottery and CBM.
- 7.6.7 Animal bone was recovered from throughout the alluvial sequence, within layers (905), (906) and (907). It comprised a complete right metatarsal III of an adult horse and two rib fragments from a large mammal, probably also a horse (Appendix F).
- 7.6.8 Two sets of column samples were taken from the east-facing section of Trench PDZ6.09, representing sediments (901) to (908). These were accompanied by a set of nine bulk samples taken between 1.58m and 1.13m OD. Preliminary assessment has shown that sandy clay deposits (905) and (906), at the base of the sequence, have evidence of soil forming processes in the form of mottling and root penetration, suggesting the development of a terrestrial surface (Appendix C). However, the immediately overlying deposit had a very sharp contact suggesting some sort of erosional hiatus preceding the accumulation of peat (904). The location appears to have been floodplain throughout most of its history with deposition of fine-grained predominantly silty sediments, phases of soil development and opportunities for peat accumulation (Appendix C).

7.7 Trench PDZ6.48 (Figure 9)

OD Height	Context	Description
6.16m OD	4801	Mid – dark blackish brown, loose, gravelly, silt, containing frequent inclusions of late 19 th and early 20 th century domestic waste, pottery and CBM. Made Ground.
2.94m OD	4802	Dark brownish black, loose, silty clay, with occasional root inclusions. Buried topsoil.
2.64m OD	4803	Pale yellowish grey, soft, silt.
2.24m OD	4804	Dark bluish grey, soft, sandy silt, containing occasional rooting and snail shell inclusions.
1.89m OD	4805	Mid brownish grey, soft, silty sand.
1.74m OD	4806	Dark brownish grey, heavy, silty sand.
1.39m OD	4807	Pale bluish grey, soft, sand, with occasional rooting inclusions.
1.19m OD	4808	Mid bluish grey, loose sandy silt.
1.09m OD	4809	Pale brownish grey, soft, loose, sand, containing occasional root and shell inclusions.
0.75m OD	4810	Bluish grey, loose, poorly sorted gravels. Natural.

7.7.1 Natural gravels (4810) were observed at a height of 0.75m OD, running roughly level throughout the trench. The gravels were overlain by 0.34m of pale brownish grey, soft, loose, sand, containing occasional root and shell inclusions (4809). This was overlaid by a 0.10m thick deposit of mid bluish grey, loose, sandy silt (4808) containing frequent mollusc remains, including small bivalves with valves conjoined, and occasional insect parts (Appendix C). A single large mammal long bone (Appendix F) and a Roman brick with imprints of a hob-nailed shoe or sandal, and on the base a thick layer of coarse *opus signinum* mortar (Appendix E) were recovered from (4808). Above this deposit was a 0.20m thick pale bluish grey, soft, sand with occasional rooting inclusions (4807)

7.7.2 Above (4807) was a 0.35m thick deposit of dark brownish grey, heavy, silty sand (4806). Overlying this was a 0.15m thick mid brownish grey, soft, silty sand (4805) which in turn, was overlaid by a 0.35m thick deposit of dark bluish grey, soft, sandy silt, containing occasional rooting and snail shell inclusions (4804). Above was a 0.40m thick layer of pale yellowish grey, soft, silt (4803).

7.7.3 The sedimentary sequence was covered by buried topsoil (4802), which measured 0.30m thick and comprised dark brownish black, loose, silty clay, with occasional root

inclusions and frequent mollusc remains, including *Limnaea truncatula*, *Succinea* spp., *Trichia hispida* and *Vallonia pulchella* (Appendix C). This was overlain by 3.20m of made ground (4801), which comprised mid – dark blackish brown, loose, gravelly, silty clay, containing frequent inclusions of late 19th and early 20th century domestic waste, pottery, CBM. In addition, an undiagnostic copper object, thought to be a badly worn Roman coin, was also recovered from this context. It has been inconclusively examined following x-radiography (Appendix G / H).

7.7.4 A set of column samples were taken from the north-facing section of Trench PDZ6.48, incorporating deposits (4802) to (4810). These were accompanied by a set of 16 bulk samples obtained between 2.01m and 1.21m OD. Assessment of the samples has suggested that the basal gravels probably represents the Lea Valley Gravel of Gibbard (1994), whilst the overlying gravelly sand (4809) represents Holocene reworking of the underlying sands and gravels and of pre-existing beds of organic silt (Appendix C). The overlying partly calcareous sands and silts, rich in organic and mollusc remains, represent the gradual silting of the river channel, whilst the uppermost deposits of silty clay are representative of Holocene terrestrial overbank soil forming processes (Appendix C).

7.7.5 The Roman finds from this trench suggest Roman activity in the locality.

7.8 Finds

7.8.1 No significant archaeological finds were recovered from the three trenches excavated within CZ5. However, within CZ6, a Roman brick and possible coin were recovered from Trench PDZ6.48 suggesting Roman occupation within the wider area. Prehistoric activity is also suggested by two fine sand-tempered prehistoric slab fragments from Trench PDZ6.07 and a horse skeleton near the base of the sedimentary sequence within Trench PDZ6.09. Post-medieval pottery, CBM and clay tobacco pipe were recovered from the silt and clay overbank material throughout CZ6

- 7.8.2 A partially articulated horse skeleton [911] was recovered from a lower sedimentary deposit (905) within Trench PDZ6.09. The remains comprised the skull, shoulder and leg bones with the majority of the torso, pelvis and femurs missing (Figure 8). Assessment of the bones (Appendix F) has identified the horse as male, aged between 9-10 years at death and stood between approximately 1.33-1.37m high. Disarticulated animal bone was also recovered from deposits (905), (906) and (907) within Trench PDZ6.09. The finds comprised two fragments of horse rib and a complete right metatarsal. Within Trench PDZ6.07 a horse's rib was recovered from sandy silt sediment (708) and within Trench 48 a long bone from a horse was recovered from silt sediment (4808).
- 7.8.3 A wooden, arched shaped object was found near to horse skeleton [911], at a similar height OD (Figure 8). It was initially thought to be part of a possible yoke or bridle, however, subsequent assessment identified it was a naturally bowed. The wood was an alder branch; either shed naturally or split from the tree and was not worked. The depth of tunnels produced by the wood boring invertebrates and the level of water damage suggests that the wood is significantly old and may therefore allow for an accurate date of the adjacent horse skeleton [911].
- 7.8.4 A Roman brick, with imprints of a hob-nailed shoe or sandal and *opus signinum* mortar attached to its base was recovered from a lower silt rich deposit (4808) within Trench PDZ6.48. A copper coin-like object was recovered from modern made ground (4801).
- 7.8.5 A brick and a peg tile were recovered from the clay overbank sediment (902) within Trench PDZ6.09. Assessment identified them as typical building materials used in London during the 17th and 18th centuries (Appendix E). Within similar clay overbank sediment (702) in Trench PDZ6.07 two fine sand-tempered, reduced slab fragments, including one corner fragment, were recovered along with CBM, pottery and clay pipe dating to the 16th, 17th and 18th century. The slab fragments appeared in character to be prehistoric, but did not show structural similarities to slabs commonly found on late Bronze Age sites (Appendix E).

7.8.6 A total of forty five 50cm long column samples and sixty eight bulk samples were collected by Quaternary Scientific, University of Reading from all trenches excavated within CZ5 and CZ6. From a rapid assessment of the samples (Appendix C) it has been noted that a consistent pattern of sedimentation was present within the areas investigated and that a good agreement existed in most cases with the stratigraphic and palaeogeographical models proposed in the detailed desk-based assessments (MoLAS-PCA, 2007c, 2007d) for the two areas. The column and bulk samples identified varying concentrations of diatoms, pollen, micro charcoal, mollusc shell and insect remains throughout the site (Appendix F).

SECTION 8: CONCLUSIONS AND RECOMMENDATIONS

8.1 PDZ5

- 8.1.1 No archaeological features or artefacts were recovered from the excavations within CZ5. From the stratigraphy uncovered during the excavations it is notable that only Trench PDZ5.01, in the north of the site, contained peat and organic clay deposits, representing the same environmental changes shown within CZ6 (see below). AMS radiocarbon dating is currently taking place on samples from peat clay deposit (103) and silty sand deposit (105), which will allow the dating of the alluvial sequence within Trench PDZ5.01 and will increase our understanding of sedimentary deposition within neighbouring zone PDZ6D. The results will be integrated into this report once available.
- 8.1.2 Trenches PDZ5.02 and PDZ5.03, to the south of the site, contained sedimentary clays, silts and gravels indicative of overbank deposits of the natural river system active on the floor of the Lea Valley in the period prior to large-scale programmes of land-raising in the late 19th and early 20th centuries.
- 8.1.3 Deep 19th/20th century made ground deposits covered the whole area within CZ5. No *in situ* deposits of archaeological significance were uncovered within the overburden and none of the dumping material could be directly associated with the construction of the Hackney Cut or Lea Navigation, as hoped prior to the evaluation.

8.2 PDZ6

8.2.1 The sedimentary sequence revealed within CZ6 was consistent throughout all four trenches, comprising natural sands and gravels, overlain by re-worked gravels and subsequent sands, silts and peat, which contained varied concentrations of detrital wood, plant remains and mollusc shells, representing the gradual silting of an initially free flowing, meandering river channel. These sediments were covered by silty clay deposits, identified as contemporary overbank silting residue. The full stratigraphic sequence has been identified by the geo-archaeological rapid assessment as dating to the mid – late Holocene. Within Trench PDZ6.09, sandy clays located above the natural gravels and below a peat layer, contained evidence of soil formation processes in the form of mottling and root penetration, which suggests that a terrestrial land surface formed during an erosional hiatus, preceding the formation of overlying peat (Appendix C). Radiocarbon dating is currently taking place on peat clay deposit (807) and peat deposit (813), which will facilitate the dating of the alluvial sequence within PDZ6. The results will be integrated into this report once available.

8.2.2 The excavation of four trenches within CZ6 uncovered few archaeological remains. A Roman brick, with *opus signinum*, and a copper possible Roman coin were recovered from Trench PDZ6.48 suggesting Roman occupation within the wider area. Two fine sand-tempered prehistoric slab fragments were recovered from Trench PDZ6.07. A horse skeleton was found near the base of the sedimentary sequence within Trench PDZ6.09, suggesting a prehistoric date, but was comparable in size to a modern horse rather than the smaller indigenous species, possibly representing the early importation of larger breeds. The silt sediment (905) from which the skeletal remains were recovered may have formed a terrestrial surface (Appendix C). It would be beneficial to undertake radiocarbon dating on the detrital wood remains found within (905), the bones themselves, or on wooden object [912] that was found close to the horse remains.

8.3 General

- 8.3.1 Following consultation with EH GLAAS, advisors to the ODA PDT, it is not intended to carry out any further archaeological fieldwork across CZ5 and CZ6. It is intended that the results and any further recommended work highlighted in the assessment of environmental remains is included in the site-wide geoarchaeological assessment, and the site-wide geoarchaeological/stratigraphical database and GIS model.
- 8.3.2 It is recommended that the results of the evaluation are included and assessed in the Site Wide Integrated Post-Excavation Assessment (SWIPEA), which will recommend any further analysis of archaeological data across the Olympic Park and in the eventual production of publication and dissemination of the results.

SECTION 9: ARCHIVE DEPOSITION

9.1 The documentary archive comprises of:

Context checklist	4 sheets
Trench record	11 sheets
Context sheets	32 sheets
Timber recording sheet	1 sheet
Levels register	5 sheets
Photo registers	10 sheets
Section registers	2 sheets
Section drawings	53 sheets
Plan registers	1 sheet
Plan drawings	18 sheets
Soil sample sheets	1 sheet

9.2 The physical archive comprises 1 large box containing a wood sample, 2 boxes of ceramic finds, 7 boxes of animal bone, 1 Stewart box containing a copper alloy object, 45° 50cm long column samples and 68 bulk samples,

9.3 The integrity of the site archive will be maintained. The finds and records will be available for public consultation. Appropriate guidance set out in the Museum and Galleries Commission's, *Standards in the Museum Care of Archaeological Collections' (1992) Towards an Accessible Archaeological Archive. The Transfer of Archaeological Archives to Museums: Guidelines for Use in England, Northern Ireland Scotland and Wales.* For deposition with the Museum of London the Guidelines for the Preparation of Archaeological Archives will be followed.

9.4 The results will be made publicly available via the ADS OASIS form (Appendix I).

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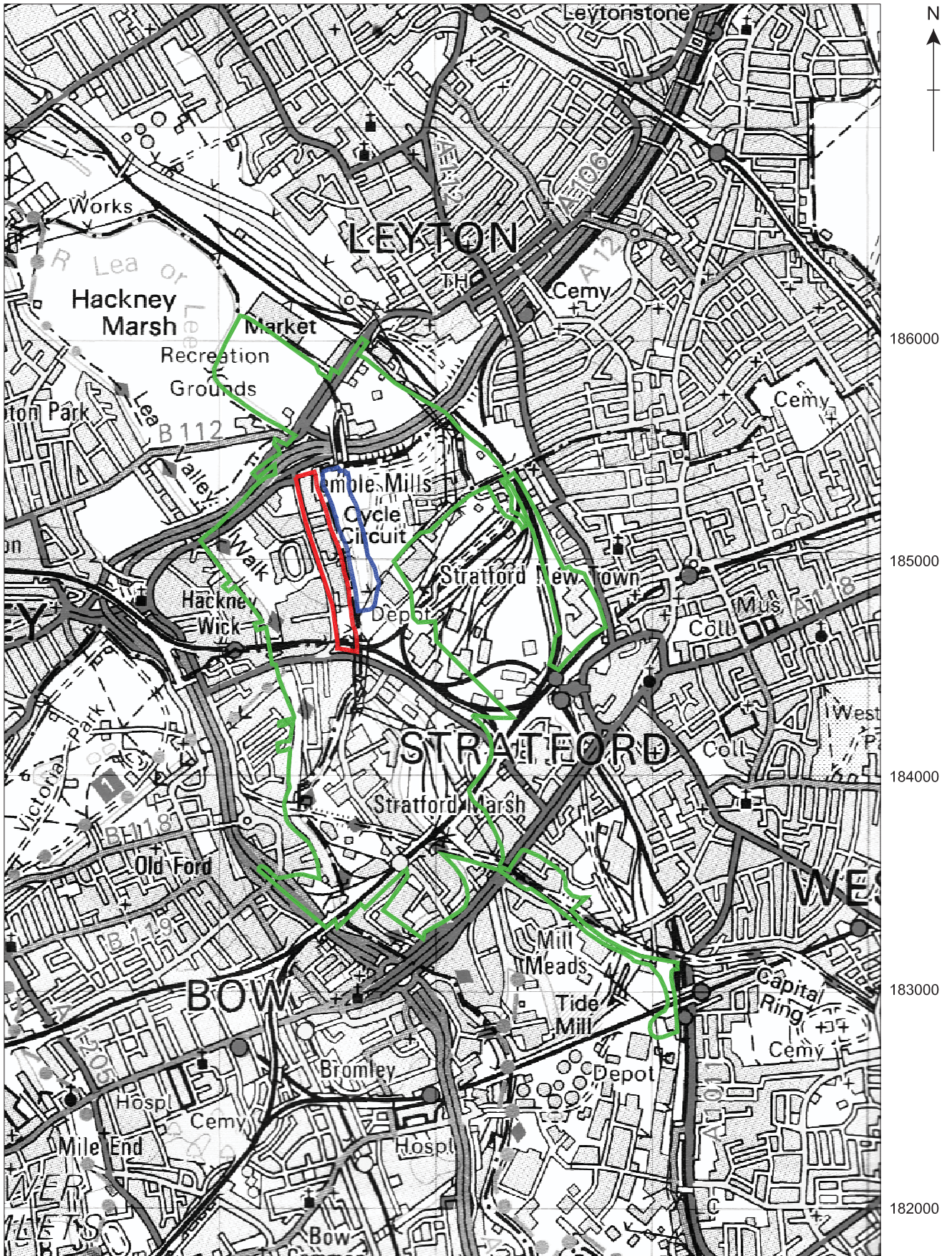
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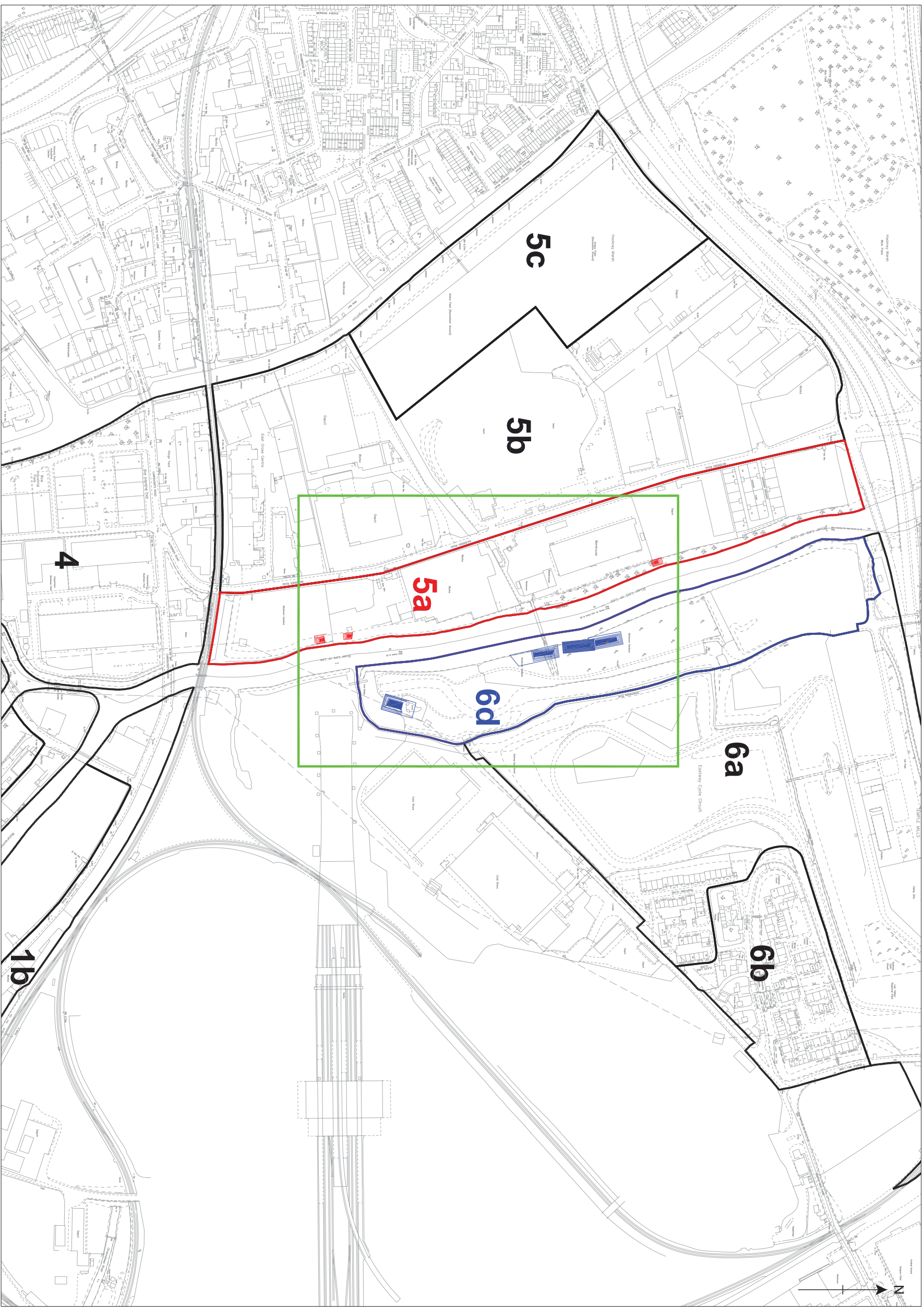
Based on the Ordnance Survey's 1:50,000 Landranger Map of 2004 with the permission of the Controller of Her Majesty's Stationary Office © Crown Copyright. Licence No. AL 100023757

□ Site Outline
 □ PD5 Outline
 □ PD6 Outline

0.5km 0 1km

1:25000

Figure 1: Site Location Plan



Based on the Ordnance Survey's 1:250 Superpan Digital Data of 2008
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Figure 2: Zone 5a & 6d Location Plan

- Fig 03 Location Plan
- Zone 5a Outline
- Zone 6d Outline
- ▬ Zone 5a Evaluation Trench
- ▬ Zone 6d Evaluation Trench



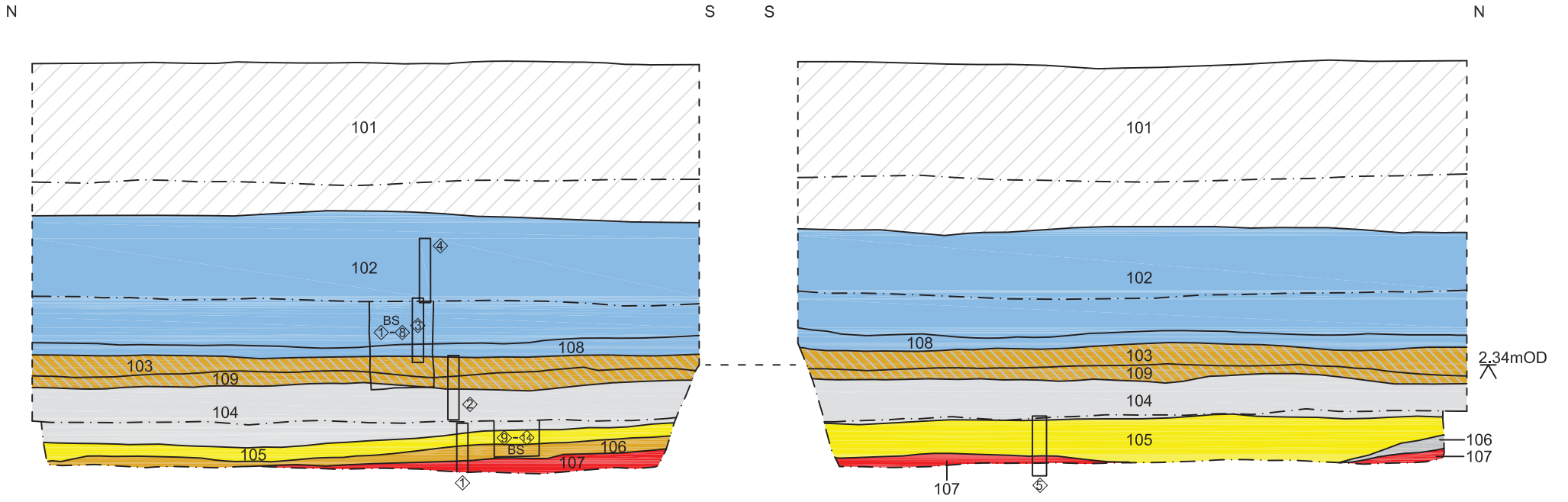
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Figure 3: Evaluation Trench Location Plan

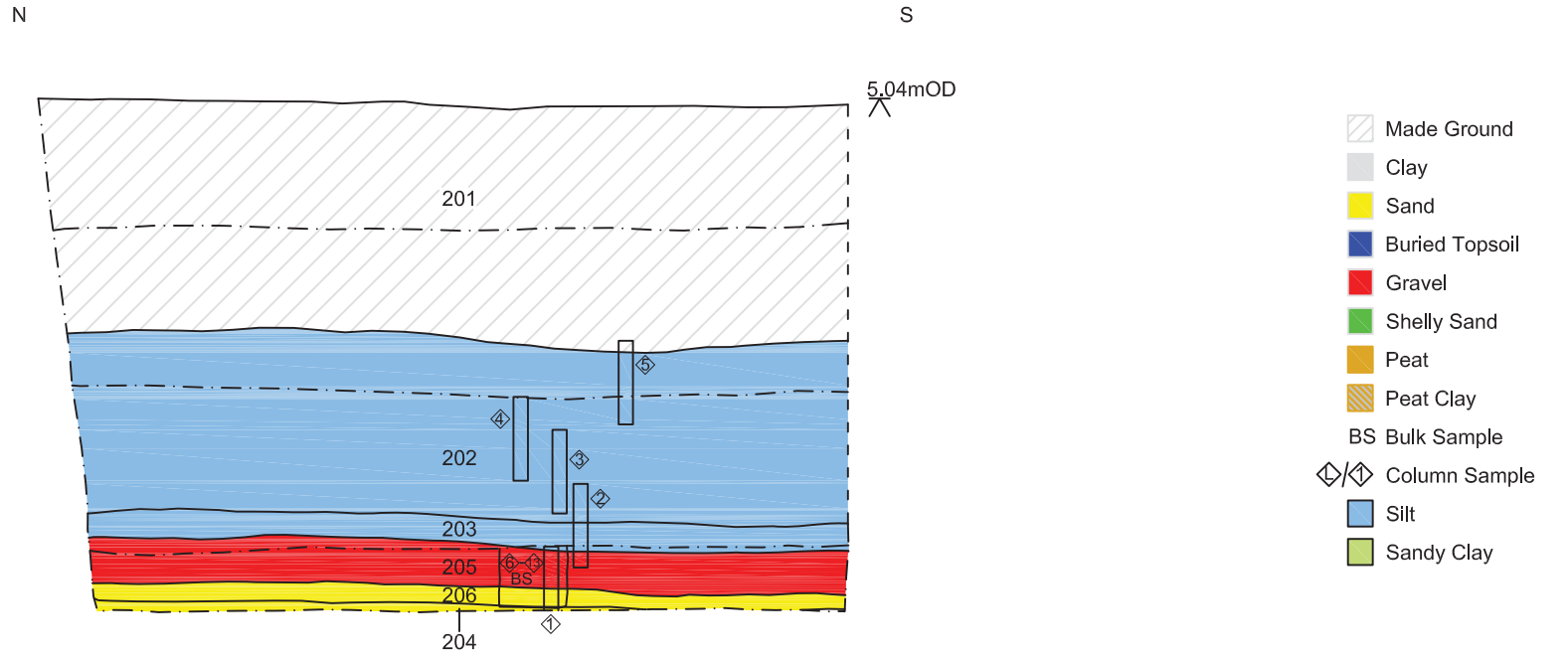


- Fig 03 Location Plan
- Zone 5a Outline
- Zone 6d Outline
- Base Step ▭ Zone 5a Evaluation Trench
- Base Step ▭ Zone 6d Evaluation Trench

PDZ5.01



PDZ5.02



PDZ5.03

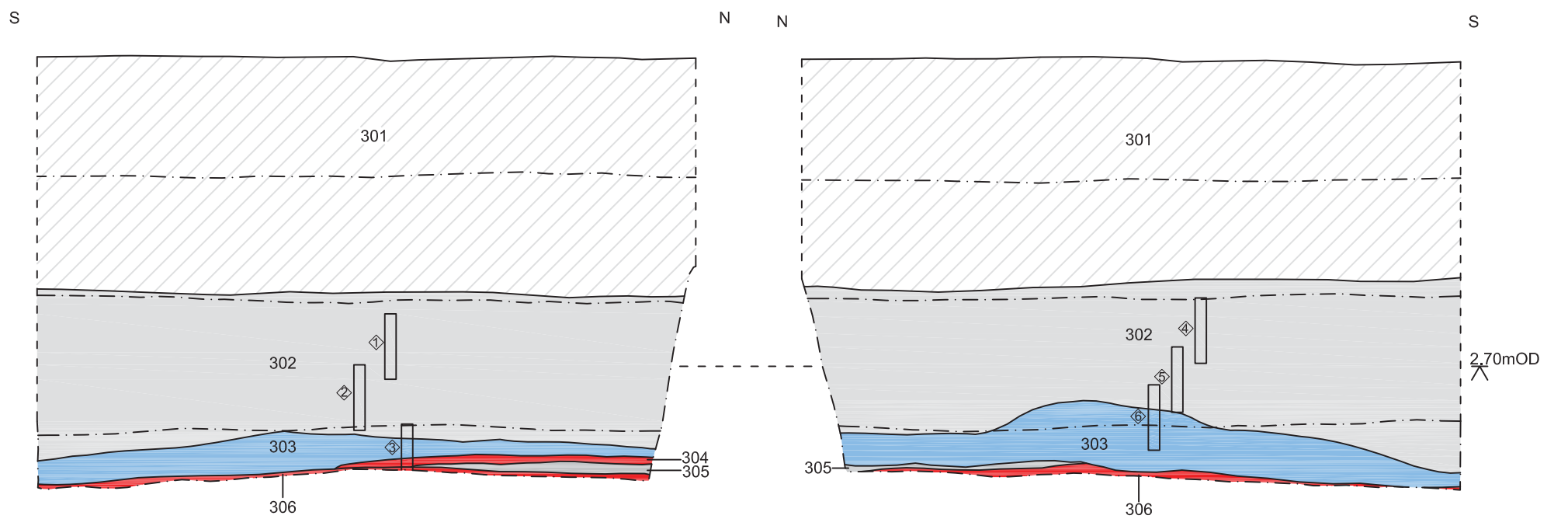


Figure 4: PDZ5.01, PDZ5.02 & PDZ5.03: East and West Facing Sections

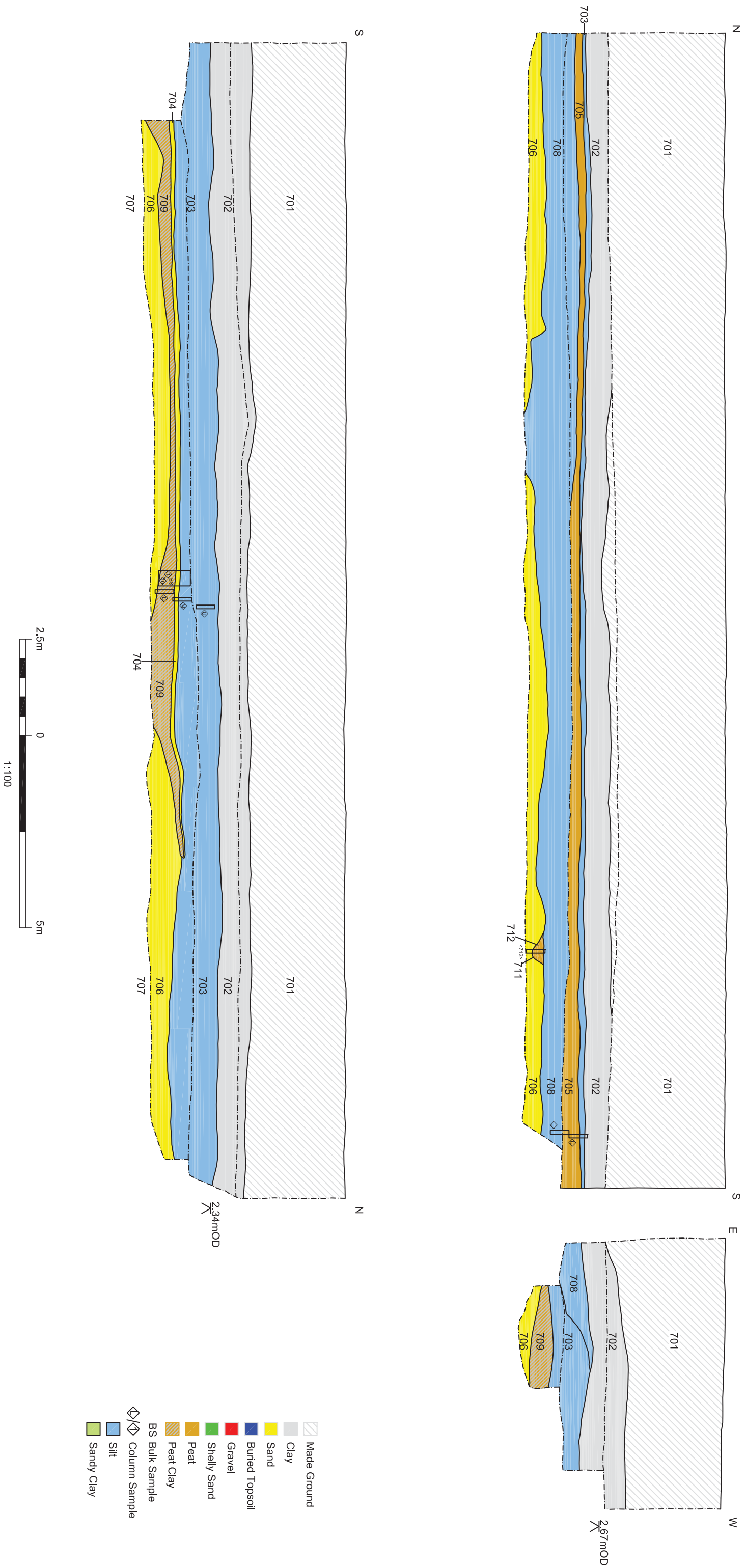


Figure 5: PDZ6.07: East, North and West Facing Sections

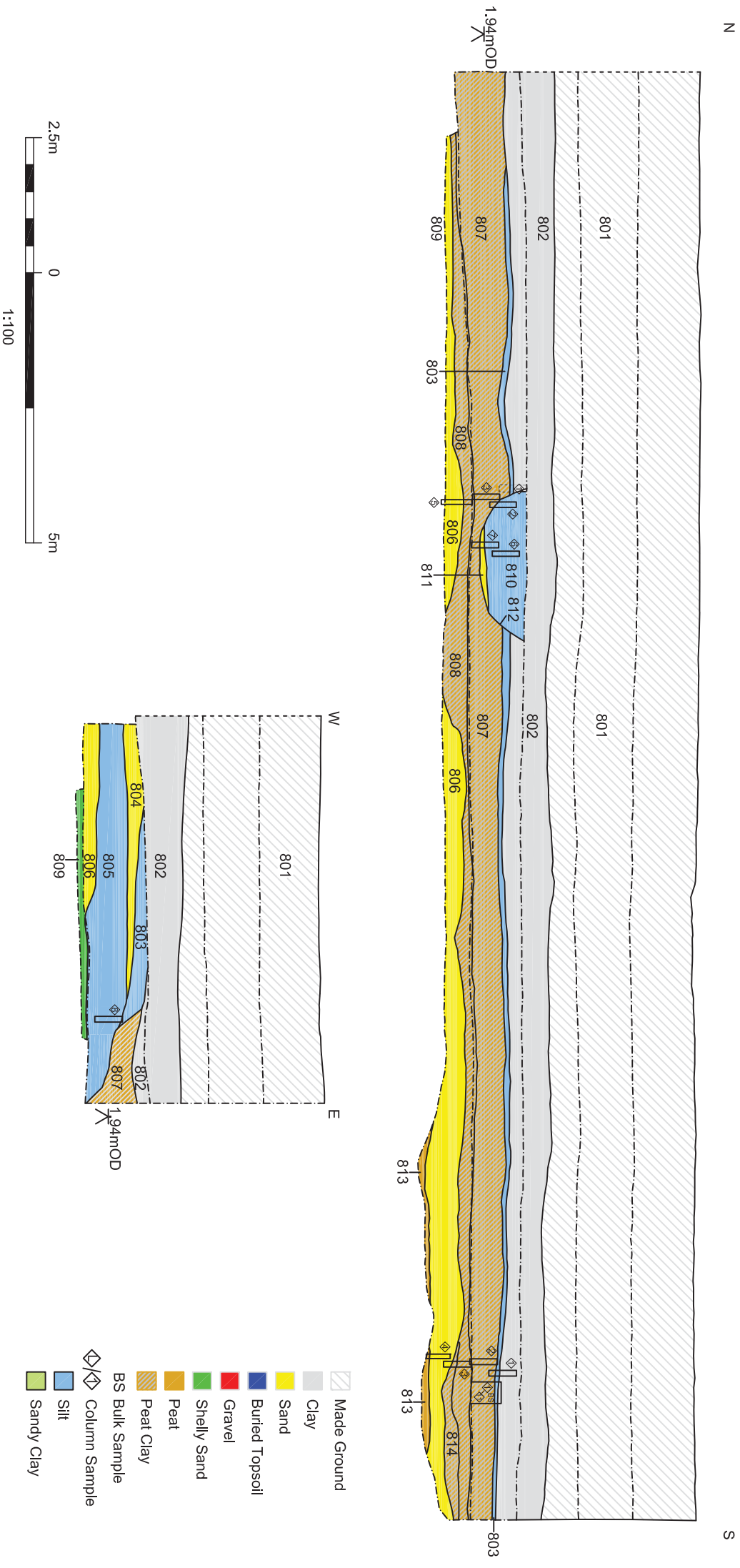


Figure 6: PDZ6.08: South and West Facing Sections

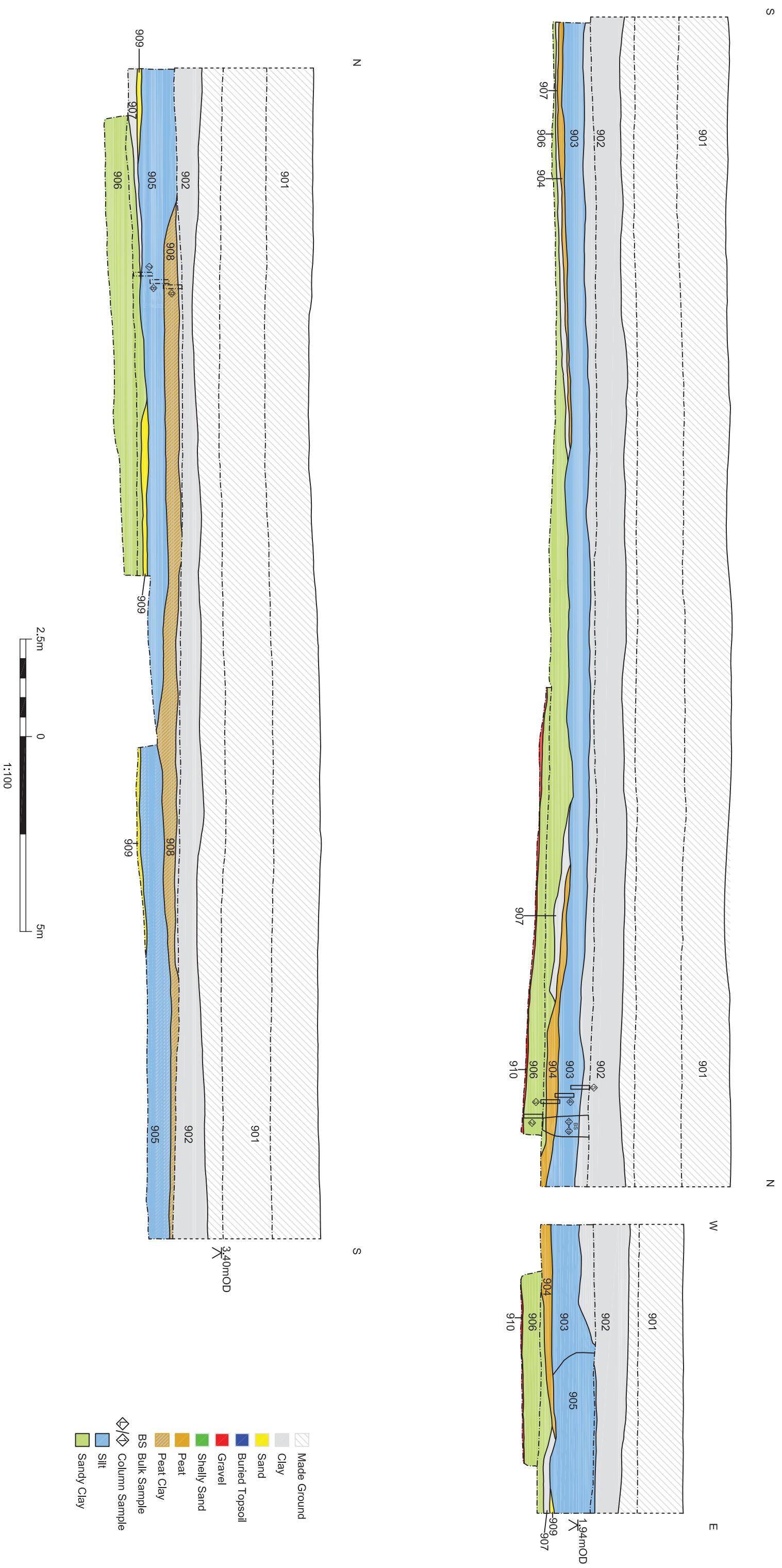


Figure 7: PDZ6.09: East, South and West Facing Sections

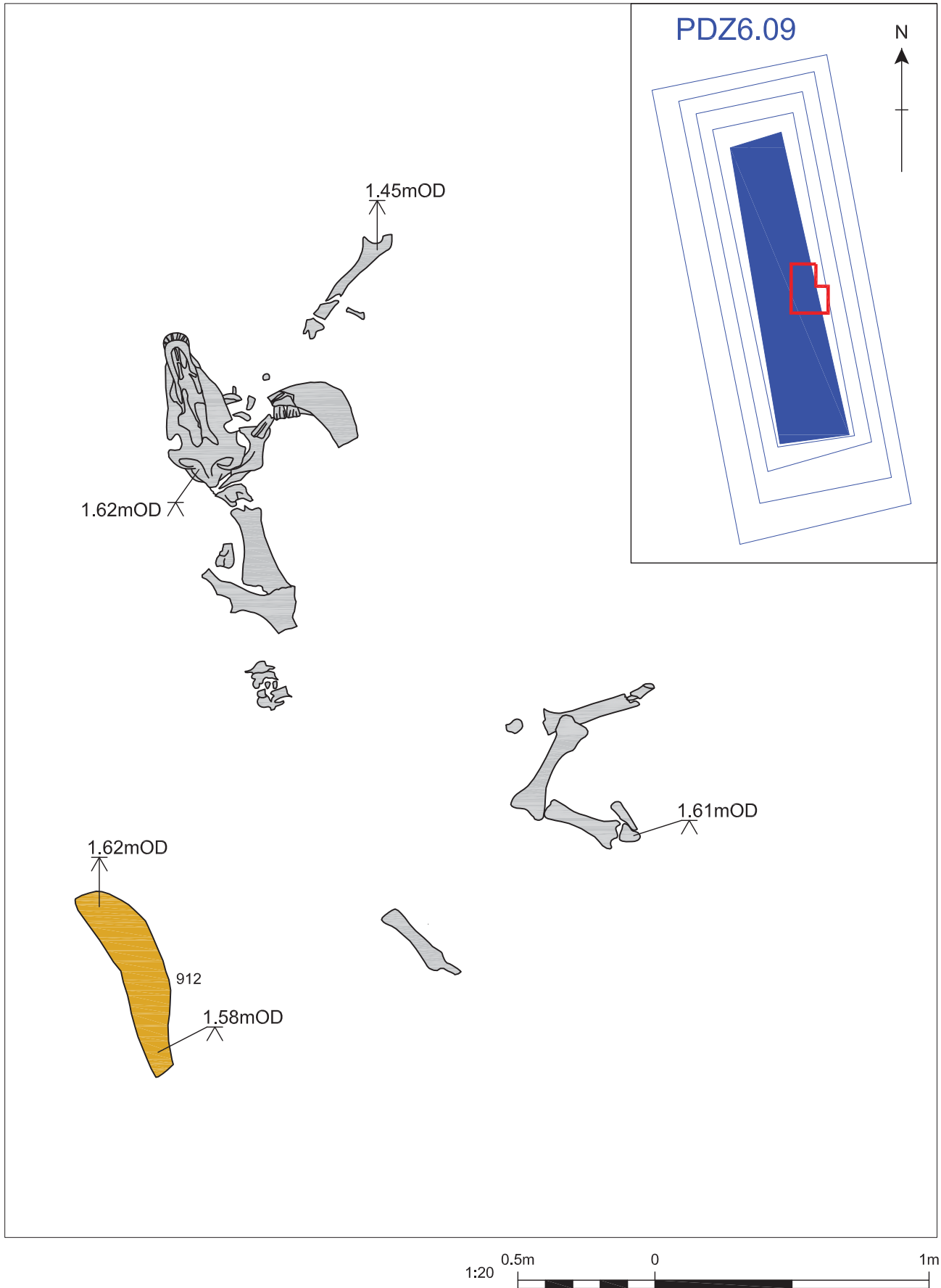


Figure 8: Trench PDZ6.09: Plan of Horse Skeleton

-  Base of Evaluation Trench
-  Evaluation Trench Steps
-  Outline of Fig 7
-  Wood
-  Bone

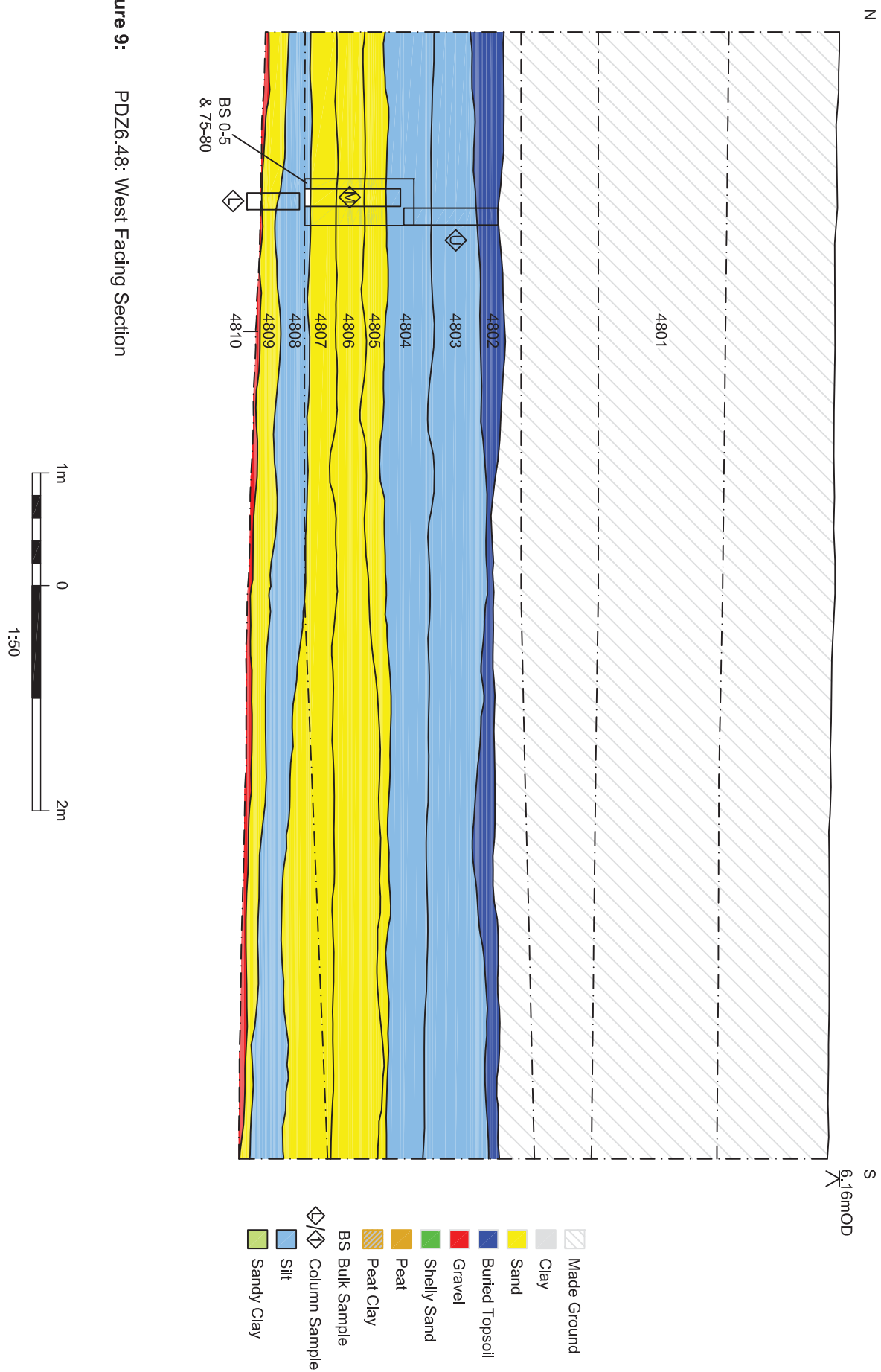


Figure 9: PDZ6.48: West Facing Section

APPENDIX A – CZ5 CONTEXT REGISTER

Context No.	Context Description	Length	Width	Depth	Image No.	Single Ctxt. Plan?	Plan No.	Section No.	Specialist Drwg. No.
101	Mid - dark brown gravelly silty clay. Made Ground.	12.00m	8.00m	1.55m		N		1	
102	Mid bluish grey silt	10.00m	6.00m	1.17m		N		1	
103	Mid - light brown organic peat clay	8.00m	4.00m	0.22m		N		1	
104	Mid - light greyish blue clay	6.00m	2.00m	0.60m		N		1	
105	Mid - dark brown silty sand	6.00m	2.00m	0.13m		N		1	
106	Mid - light yellowish grey, sand lens underlying peat	6.00m	2.00m	0.10m		N		1	
107	Mid - light greyish yellow gravelly sand	6.00m	2.00m	0.10m		N		1	
108	Dark- mid greyish blue silt	8.00m	4.00m	0.10m		N		1	

109	Light yellowish brown, highly organic peat clay	8.00m	4.00m	0.10m		N		1	
						N			
201	Mid - dark brown gravelly silty clay. Made Ground.	12.00m	8.00m	1.56m		N		3	
202	Mid - light greyish yellow silt	10.00m	6.00m	1.20m		N		3	
203	Mid grey gravelly silt	8.00m	4.00m	0.67m		N		3	
204	Mid orangey yellow gravelly sand	6.00m	2.00m	0.08m		N		3	
205	Mixed mid grey and dark black organic clayey gravels	6.00m	2.00m	0.32m		N		3	
206	Dark blackish brown, organic, gravelly sands	6.00m	2.00m	0.10m		N		3	
						N			
301	Mid - dark brown	12.00m	8.00m	1.92m		N		2	

	gravelly silty clay. Made Ground.								
302	Mid - dark bluish grey silt	10.00m	6.00m	1.28m		N		2	
303	Mid - light grey clayey, gravelly sandy silt	6.00m	2.00m	0.40m		N		2	
304	Mid - light yellow gravel	6.00m	2.00m	0.18m		N		2	
305	Rounded and sub rounded gravels in a dark black organic clay matrix	6.00m	2.00m	0.07m		N		2	
306	Mid - light brownish yellow gravelly sand	6.00m	2.00m	0.03m		N		2	

APPENDIX B – CZ6 CONTEXT REGISTER

Context No.	Context Description	Length	Width	Depth	Image No.	Single Ctxt. Plan?	Plan No.	Section No.	Specialist Drwg. No.
701	Mid - dark brown silty, gravelly clay. Made ground.	40.00m	14.00m	3.20m		N	5	1,2 and 3	
702	Mid bluish grey clay	34.00m	8.00m	0.60m		N	5	1,2 and 3	
703	Mid brownish yellow silt	34.00m	8.00m	0.40m		N	5	1,2 and 3	
704	Mid bluish green silty sand	21.00m	?	0.40m		N	5	1,2 and 3	
705	Mid - dark brown peat	32.00m	6.00m	0.30m		N	5	1,2 and 3	
706	Light grey clayey sand	30.00m	6.00m	0.30m		N	5	1,2 and 3	
707	Mid greyish brown gravel	30.00m	4.00m	0.05m		N	5	1,2 and 3	
708	Light grey silt	30.00m	4.00m	0.60m		N	5	1,2 and 3	
709	Mid brown organic peat clay	30.00m	4.00m	0.50m		N	5	1,2 and 3	
710	Possible unworked stake	0.40m	0.04m	0.004m		N	5	1,2 and 3	
711	Palaeochannel	?	0.80m	0.30m		N	5	1,2 and 3	
712	Dark brownish organic clay fill of Palaeochannel 711	?	0.80m	0.30m		N	5	1,2 and 3	
801	Mid - dark brown silty, gravelly clay. Made ground.	38.00m	14.00m	2.50m		N		9 and 10	
802	Mid - pale beigish yellow clay	38.00m	14.00m	0.96m		N		9 and 10	
803	Mid bluish grey silt	26.00m	5.60m	0.30m		N		9 and 10	
804	Mid - light clayey sand	5.00m	?	0.30m		N		9 and 10	

805	Mid - light bluish grey silt	28.00m	4.00m	0.30m		N		9 and 10	
806	Mixed decaying wood, peat and mid brownish beige shelly sand	28.00m	4.00m	0.74m		N		9 and 10	
807	Mid - dark brown organic peat clay	26.00m	1.80m	0.69m		N		9 and 10	
808	Mid bluish grey peat clay	28.00m	4.00m	0.95m		N		9 and 10	
809	Mid yellowish brown gravelly, shelly sand	28.00m	4.00m	0.26m		N		9 and 10	
810	Mid orange brown silty clay secondary fill of Palaeochannel 812	?	1.82m	0.68m		N		9 and 10	
811	Dark greyish brown sandy clay primary fill of Palaeochannel 813	?	1.10m	0.14m		N		9 and 10	
812	Linear Palaeochannel orientated East - West	?	1.82m	0.82m		N		9 and 10	
813	Dark brown peat	6.20m	?	0.12m		N		9 and 10	
814	Mid - dark brown organic peat clay	2.00m	?	0.22m		N		9 and 10	
901	Mid - dark brown silty, gravelly clay. Made ground.	40.00m	14.75m	2.25m		N	3	4, 5 and 6	
902	Mid bluish grey clay	34.00m	8.75m	1.15m		N	3	4, 5 and 6	
903	Mid - dark greyish blue silt	30.00m	2.00m	0.55m		N	3	4, 5 and 6	
904	Mid - dark brown peat	5.00m	5.00m	0.34m		N	3	4, 5 and 6	
905	Mid - light beige brown slightly sandy clay	30.00m	4.10m	0.40m		N	3	4, 5 and 6	
906	Mid greyish brown sandy	30.00m	4.75m	0.90m		N	3	4, 5 and 6	

	clay								
907	Mid brown clay	5.04m	?	1.00m		N	3	4, 5 and 6	
908	Mid - dark reddish brown organic peat clay	21.6m	?	0.30m		N	3	4, 5 and 6	
909	Mid grey gravelly sand	2.30m	0.60m	0.13m		N	3	4, 5 and 6	
910	Mid grey sandy gravels	11.50m	4.75m	0.05m		N	3	4, 5 and 6	
911	Horse Skeleton					N	3 and 4	4, 5 and 6	
912	Wooden yoke associated with skeleton 911	0.70m	0.23m			N	2 and 3	4, 5 and 6	
4801	Mid - dark brown silty, gravelly clay. Made ground.	20.00m	10.00m	3.20m		N	1	7 and 8	
4802	Dark brownish black, silty clay. Buried topsoil.	20.00m	10.00m	0.30m		N	1	7 and 8	
4803	Pale yellowish grey silt	20.00m	10.00m	0.40m		N	1	7 and 8	
4804	Dark bluish grey sandy silt	20.00m	10.00m	0.35m		N	1	7 and 8	
4805	Mid brownish grey silty sand	20.00m	10.00m	0.15m		N	1	7 and 8	
4806	Dark Brownish grey silty sand	20.00m	10.00m	0.35m		N	1	7 and 8	
4807	Pale bluish grey sand	20.00m	10.00m	0.20m		N	1	7 and 8	
4808	Mid bluish grey sandy silt	20.00m	10.00m	0.10m		N	1	7 and 8	
4809	Pale brownish grey sand	20.00m	10.00m	0.34m		N	1	7 and 8	
4810	Bluish grey gravel	20.00m	10.00m	0.05m		N	1	7 and 8	

APPENDIX C – GEO-ARCHAEOLOGICAL RAPID ASSESSMENT

Planning Delivery Zones 5 And 6 (PdZ5 And PdZ6), Olympic Park: Rapid Environmental Archaeological Assessment

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INTRODUCTION

This report summarises the findings arising out of the rapid environmental archaeological assessment undertaken by Quaternary Scientific (QUEST) in connection with the proposed development of Planning Delivery Zones (PDZ's) 5 and 6 of the Olympic Park (Figure 1). During recent archaeological investigations at the site undertaken by AOC Archaeology, QUEST and AOC Archaeology recorded the sedimentary sequences in Trenches 1, 2 and 3 (PDZ 5) and 7, 8, 9 and 48 (PDZ6) and obtained column and bulk samples suitable for a laboratory-based environmental archaeological rapid assessment, and possible future assessment and analysis (Figure 2). The key aims of the environmental archaeological (including geoarchaeology, zooarchaeology and archaeobotany) rapid assessment are outlined in the following documents: PDZ5 Method Statement for an Archaeological Evaluation (MoLAS-PCA, 2007a), PDZ6 Method Statement for an Archaeological Evaluation (MoLAS-PCA, 2007b), PDZ5 Detailed Desk Based Assessment (MoLAS-PCA, 2007c), PDZ6 Detailed Desk Based Assessment (MoLAS-PCA, 2007d), PDZ5 Addendum to a Method Statement for an Archaeological Investigation (AOC-RPS Planning, 2008a) and PDZ6 Addendum to a Method Statement for an Archaeological Investigation (AOC-RPS Planning, 2008b). The environmental archaeological aims for PDZ5 are:

1. Do deposits pre-dating the Last Glacial Maximum, which might correspond with the Arctic Beds, exist within non-reworked gravels on the site? What is the potential for past environment reconstruction and/or Late Upper Palaeolithic activity in these deposits?
2. Do Late Glacial Deposits exist within re-worked gravels? What is the potential for past environment reconstruction and/or Late Upper Palaeolithic activity from these deposits?

3. Does evidence for Mesolithic activity (similar to that in the Colne Valley) exist in the clayey gravels recorded above Pleistocene gravel on the site?
4. What are the characteristics of the gravel surface and overlying alluvium in the central and southern parts of the site, for which no data currently exists?
5. Did the Hackney Brook and/or River Lea cross the site in the Holocene and is there evidence for human activity from the Mesolithic onwards associated with these rivers?
6. What environmental evidence suitable for past landscape reconstruction exists within wetland deposits associated with ancient channels of the River Lea and Hackney Brook?
7. Can episodes of channel activity and abandonment be dated?
8. Is there evidence for areas of mud flats that are suggested to have covered much of the area in the later prehistoric eras?
9. Is there evidence for an agricultural landscape in the post-prehistoric eras, and if so how does it present itself? Is it possible to determine field boundaries and if so can they be dated?

The environmental archaeological aims for PDZ6 are:

1. Do Late Glacial deposits exist within re-worked gravels in the southwest part of the zone (Landscape Zone 3)? What is the potential for past environment reconstruction and/or Late Upper Palaeolithic activity in these deposits?
2. Did the Leyton River cross the zone in the Pleistocene or Holocene and is there evidence for human activity associated with the river?
3. Can channels of the River Lea be distinguished from its tributaries in the southwestern part of the zone? Does evidence for human activity, similar to that found in the Stratford Box, associated with the river, survive?
4. What environmental evidence suitable for past landscape reconstruction exists within deposits associated with ancient channels of the River Lea and its tributaries?
5. Can episodes of channel activity and abandonment and wetland expansion across previously dry land surfaces on the zone be dated?
6. Is there any evidence of a Roman road and/or occupation activity within the area of the zone? If so, how does it relate to what is known of the settlement pattern further north in the Leyton area during the Roman period?
7. Is there any evidence of medieval and post-medieval agricultural activity present on the zone?

8. What was the pre-modern/pre-Victorian topography of the zone?
9. Is there evidence for past water management, i.e. drainage ditches, mill remains, sluices and revetments associated with earlier courses of the Channelsea River/Henniker's Ditch and River Lea?

In order to evaluate the potential of the samples for achieving the research aims and questions proposed for PDZ5 and PDZ6, the environmental archaeological rapid assessment consisted of:

1. Integration of detailed sediment descriptions from the column samples, field-based descriptions and archaeological sections, to produce a preliminary interpretation of the depositional history of the site (deposit model)
2. A rapid assessment of the concentration of pollen grains and spores (from the column samples) to evaluate the potential for reconstructing the vegetation history and detecting evidence for human activities
3. A rapid assessment of the concentration of diatom frustules (from the column samples) to evaluate the potential for reconstructing the hydrological history, in particular changes in the riverine environment and salinity
4. A rapid assessment of the concentration of macroscopic plant remains (waterlogged and charred seeds, waterlogged wood and charcoal), insect remains, Ostracoda and Mollusca (from the bulk samples) to evaluate the potential for reconstructing the environmental and land-use history. In particular, the former vegetation cover, the nature of woodland utilisation, cultivation and diet, and changes in the aquatic and terrestrial environment.

THE SITE

The area occupied by PDZ5 and PDZ6 (Figures 1 and 2) is on the floor of the lower Lea valley towards the southern end of the area formerly occupied by Hackney Marshes. The site is underlain by the floodplain Alluvium of the river (British Geological Survey 1:50,000 Sheet 256 North London 1994). The floodplain here is *ca.*1.6km in width and is flanked on both sides by discontinuous remnants of a low terrace, now regarded as equivalent to the Kempton Park Terrace of the River Thames. The bedrock beneath the valley floor is the sands, clays and pebble beds of the Lower Tertiary (Palaeocene) Lambeth Group (formerly Woolwich and Reading Beds). The valley floor of the Lea has been extensively modified, particularly since the mid-19th century, by quarrying, the construction and demolition of industrial premises and the development of water-supply, power and communications

networks. Made and disturbed ground are widely present reflecting extensive programmes of ground raising.

The western and eastern boundaries of PDZ5 are respectively the artificial channel occupied by the Lea Navigation, close to the western edge of the valley floor and the Waterworks River, which separates PDZ5 from PDZ6. This channel probably follows quite closely the course of an ancient tributary of the River Lea, the Leyton River. Within PDZ6, two other historic waterways survive. The Channelsea River, flows from north to south parallel with part of the course of the Waterworks River and probably also originated as an ancient distributary of the Lea. Henniker's Ditch, aligned from east to west across the valley floor and joining the Channelsea River at its northern end seems more likely to be an ancient drainage cut. Eastward PDZ6 extends to the eastern edge of the valley floor.

Previous investigations in the area occupied by PDZ5 and PDZ6, based on borehole records (MoLAS-PCA, 2007c, d) suggest that the active channels and associated floodplains of two substantial prehistoric rivers can be traced within the area. One of these rivers, regarded as the proto-Lea, crosses PDZ5 from north west to south east; the other, the Leyton River, approaches the area from the north and, straddling the boundary between PDZ5 and PDZ6, is confluent with the proto-Lea near the southern end of PDZ6. The alignment of this ancestral river coincides quite closely with the course of the Waterworks River.

The borehole record suggests that the floodplains of both these prehistoric rivers are underlain by buried channels cut into sands and gravels of Late Devensian Late Glacial age and locally through the sand and gravel into bedrock. This sand and gravel, the Lea Valley Gravel of Gibbard (1994), can be regarded as equivalent to the Late Devensian Shepperton Gravel of the River Thames. These and similar gravels are widely recognised beneath the Holocene floodplain alluvium of the Thames and its tributaries. They have a characteristically uneven surface representing the bars and channels that formed during the final stages of their deposition.

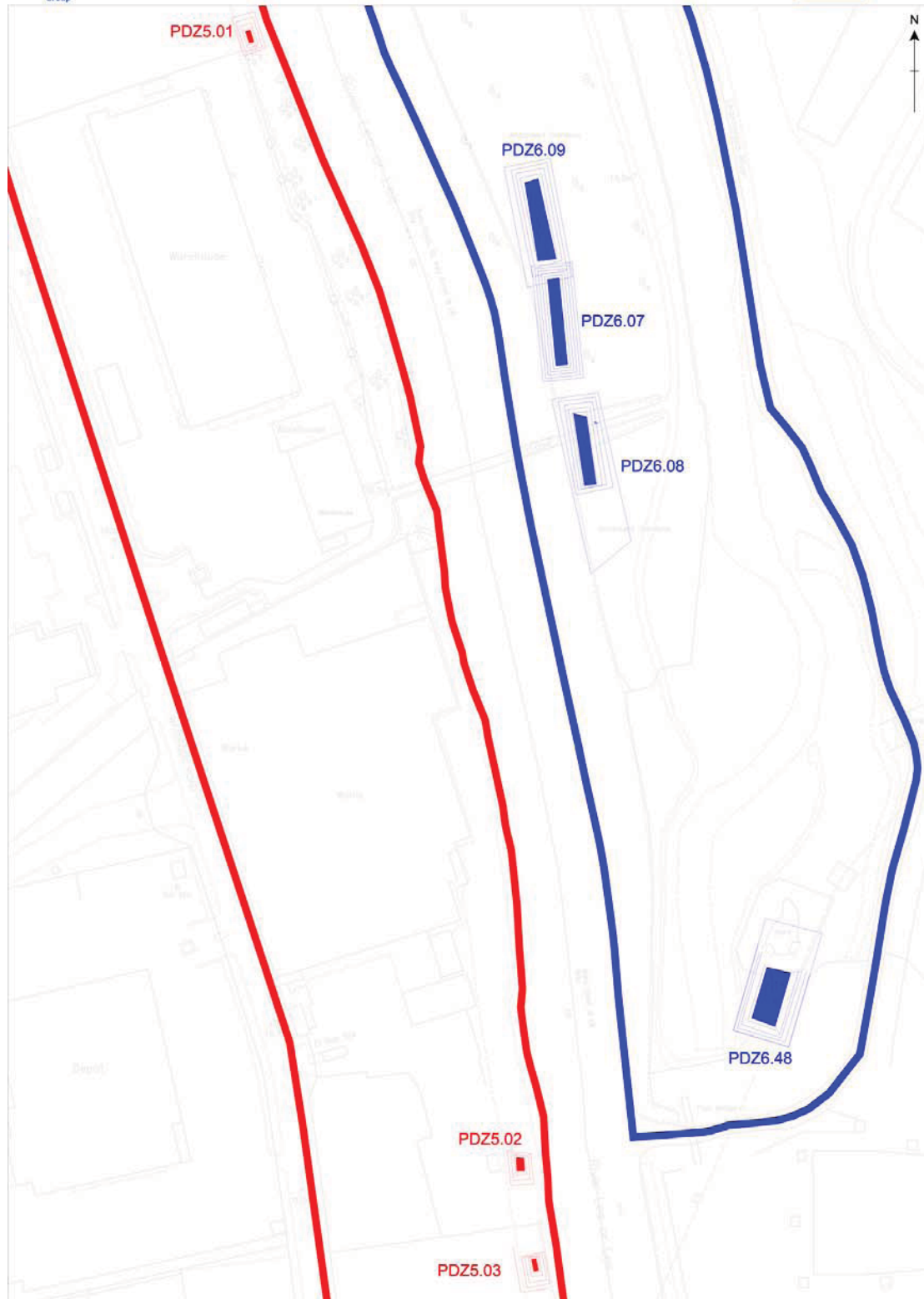
River deposits of Holocene age have been identified infilling the buried channels of the proto-Lea and the Leyton River and spreading out extensively across the adjacent surface of the Late Devensian sand and gravel. These alluvial deposits formed the natural floor of the Lea valley prior to the land-raising programmes of the late nineteenth and early twentieth century. A mature soil is present in the upper part of this Holocene alluvium.

The surface of the Late Devensian sand and gravel in both PDZ5 and PDZ6 is at levels close to 2.0m OD, with local 'islands' (former gravel bars) rising to between 3.0m and 4.0m. The deep channel beneath the proto-Lea extends down to ca. -9.0m at its downstream end within PDZ5, close to the inferred confluence with the Leyton River. Beneath the Leyton River, the buried channel is recognised down to ca. -4.0m OD close to the confluence with the proto-Lea. Upstream from this confluence area the buried channels of both rivers appear to be much shallower, down to between 0.0m and 1.0m OD, suggesting the possibility that the greater depths near the confluence may represent localised scour holes.

The Holocene alluvium across the greater part of both the Development Zones has been recognised in boreholes and trial trenches at levels between 0.0m and 4.0m OD. Channel deposits often form the lower part of these sediment sequences, between 0.0m and 2.0m OD, with fine-grained floodplain silts forming the upper part between 2.0m and 4.0m OD.



Figure 1: Location of Olympic Park



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Figure 3: Evaluation Trench Location Plan



- Fig 03 Location Plan
- Zone 5a Outline
- Zone 6d Outline
- Zone 5a Evaluation Trench
- Zone 6d Evaluation Trench

Figure 2: Location of the Trenches within PDZ5 and PDZ6, Olympic Park

METHODS

Field investigations

1. DURING THE EXCAVATIONS, COLUMN AND BULK SAMPLES WERE RECOVERED FROM TRENCHES 1, 2 AND 3 (PDZ 5) AND TRENCHES 7, 8, 9 AND 48 (PDZ6). THE SAMPLES WERE COLLECTED FROM SPECIFIC ARCHAEOLOGICAL CONTEXTS THAT WOULD ENABLE A RAPID ASSESSMENT OF THE POTENTIAL OF THE DEPOSITS TO ADDRESS THE SITE-SPECIFIC RESEARCH AIMS.

Lithostratigraphic descriptions (Geoarchaeology)

The field investigation records were enhanced by laboratory-based lithostratigraphic descriptions of all column samples using standard procedures for recording unconsolidated sediment and peat, noting the physical properties (colour), composition (gravel, sand, clay, silt and organic matter) and inclusions (e.g. artefacts). The procedure involved: (1) cleaning the samples with a spatula or scalpel blade and distilled water to remove surface contaminants; (2) recording the physical properties, most notably colour; (3) recording the composition e.g. gravel, fine sand, silt and clay; (4) recording the degree of peat humification, and (5) recording the unit boundaries e.g. sharp or diffuse.

Range-finder radiocarbon dating (Geochronology)

Two samples were taken from PDZ5, Trench 1: (1) the sandy peat towards the base of the west facing section (context (105); 1.65m to 1.63m OD), and (2) the peat towards the top of the west facing section (context (103); 2.50 to 2.48m OD). An additional two samples were taken from PDZ6, Trench 8: (1) the peat towards the base of the west-facing south section (context (813); 0.95 to 0.93m OD), and (2) the peaty silt towards the top of the west-facing south section (context (807); 2.15m to 2.13m OD). These four samples (Table 1) were submitted as range-finder bulk peat radiometric radiocarbon dates to Beta Analytic Inc, Florida.

Pollen rapid assessment (Archaeobotany)

A total of twenty-one pollen samples were extracted from the contexts recorded in the column sequences obtained from Trench 1 (10 samples), 2 (5 samples) and 3 (6 samples) from PDZ05. A total of forty-five pollen samples were extracted from the contexts recorded in the column sequences obtained from Trench 7 (11 samples), 8 (16 samples), 9 (9 samples)

and 48 (9 samples) from PDZ06. The pollen was extracted as follows: (1) sampling a standard volume of sediment (1ml); (2) deflocculation of the sample in 1% Sodium pyrophosphate; (3) sieving of the sample to remove coarse mineral and organic fractions ($>125\mu$); (4) acetolysis; (5) removal of finer minerogenic fraction using Sodium polytungstate (specific gravity of 2.0g/cm^3); (6) mounting of the sample in glycerol jelly. Each stage of the procedure was preceded and followed by thorough sample cleaning in filtered distilled water. Quality control is maintained by periodic checking of residues, and assembling sample batches from various depths to test for systematic laboratory effects. Pollen grains and spores were identified using the Reading University pollen type collection and the following sources of keys and photographs: Moore *et al* (1991); Reille (1992). The rapid assessment procedure consisted of scanning the prepared slides, and recording the concentration and preservation of pollen grains and spores on four transects (10% of the slide) (Tables 2 and 2).

Diatom rapid assessment (Archaeobotany)

A total of twenty-one diatom samples were extracted from the contexts recorded in the column sequences obtained from Trench 1 (10 samples), 2 (5 samples) and 3 (6 samples) from PDZ 5. A total of forty-five diatom samples were extracted from the contexts recorded in the column sequences obtained from Trench 7 (11 samples), 8 (16 samples), 9 (9 samples) and 48 (9 samples) from PDZ 6. The diatom extraction involved the following procedures (Battarbee *et al.*, 2001):

1. Treatment of the sub-sample (0.2g) with Hydrogen peroxide (30%) to remove organic material and Hydrochloric acid (50%) to remove remaining carbonates
2. Centrifuging the sub-sample at 1200 for 5 minutes and washing with distilled water (4 washes)
3. Removal of clay from the sub-samples in the last wash by adding a few drops of Ammonia (1%)
4. Two slides prepared, each of a different concentration of the cleaned solution, were fixed in mounting medium of suitable refractive index for diatoms (Naphrax).

The rapid assessment procedure consisted of scanning the prepared slides, and recording the concentration and preservation of diatom frustules (Tables 2 and 3).

Bulk sample assessment (charred and waterlogged seeds, waterlogged wood, charcoal, insects, Ostracoda and Mollusca) (Archaeobotany and Zooarchaeology)

Eleven of the twenty-two bulk samples collected from PDZ5, Trenches 1 (7 of 14 samples) and 2 (4 of 8 samples), and twenty-six of the forty-six samples collected from PDZ6, Trenches 7 (5 of 10 samples), 8 (6 of 11 samples), 9 (5 of 9 samples) and 48 (10 of 16 samples) were processed and rapidly assessed for charred and waterlogged seeds, waterlogged wood, charcoal, insects, and Mollusca. In order to maximise the recovery of each class of sub-fossil remains, a minimum 1litre sub-sample was processed by wet-sieving using 300 micron, 500 micron and 1mm mesh sizes. The residues from each sieve size were then scanned using a low power zoom-stereo microscope. The quantities of each class were recorded for each sample (Table 4 and 5).

RESULTS AND INTERPRETATION OF THE SEDIMENTARY SEQUENCES REPRESENTED IN EACH TRENCH (GEOARCHAEOLOGY)

Records obtained from seven trenches are described here; three in PDZ5 and four in PDZ6. All the trenches were located close to the course of the Waterworks River. In PDZ5 Trenches 2 and 3 were close together towards the southern end of the site, with Trench 1 some 400m to the north. In PDZ6, Trench 48 was near the southern boundary of the area with Trenches 7-9 forming an almost continuous opening, parallel with the Waterworks River and some 200m to the north of Trench 48. A total of 45 column samples have been described, allowing the reconstruction of 13 sedimentary sequences.

PDZ5

Trench 1

Column samples were taken from two sections in this trench. A set of four overlapping column samples (<1>, <2>, <3> and <4>) was taken from west-facing Section S14 between 3.42m and 1.39m OD from sediments forming contexts (102), (103), (104), (105), (106), (107) and (109). These were accompanied by a set of fourteen bulk samples obtained between 2.59m and 1.59m OD. A single column sample <5> was taken from east-facing Section S12 between 1.94 and 1.44m OD.

Section S14 (west-facing) - column samples: <1>, <2>, <3>, <4>

The lowest unit (Unit 1), representing context (107), was a dark brown sandy gravel with an upper surface at 1.55m OD and representative of the gravel forming the floor of the trench. It was overlain by a thin bed of dark grey sand (Unit 2) succeeded by a thin bed of dark brown

slightly silty sand (Unit 3). All three units, including the gravel of Unit 1, contained common plant remains. Overlying Unit 3 was a thin layer of slightly sandy peat (Unit 4) between 1.61m and 1.65m OD. Several twigs were noted in the peat. The peat and underlying sands (Units 2 and 3) represent context (106). Overlying the peat was a bed of slightly silty sand (Unit 5) succeeded by a slightly sandy silt (Unit 6). Together these beds represent context (105). Units 7-9 form a fining upward sequence from silty sand (Unit 7) to silty clay (Unit 9). There is also a progressive upward increase in organic content, including detrital wood in Unit 8. The succeeding unit (Unit 10), representing context (103) is an organic-rich peaty silt, between 2.28m and 2.50m OD containing a large amount of detrital plant material and scattered mollusc remains, including opercula of *Bithynia tentaculata*. There was some root penetration into this unit from above. Overlying Unit 10 was a massive, dark bluish grey (oxidising to very dark greyish brown) very well sorted silt (Unit 11) penetrated from above by occasional root channels. The uppermost units in the sequence (Units 12 and 13) were massive silts mottled and extensively penetrated by root channels with iron-stained margins. Faunal burrows and mollusc remains were also identified.

At the base of the sediment sequence, gravel and sand are present (Units 1 and 2) that are regarded here as representing deposition reworking gravel of Devensian Late Glacial in the earliest Holocene. The upper surface of the gravel is at 1.55m OD. The beds of sand, silt, peaty silt and peat that overlie the gravel, between 1.58m and 2.5m OD are typical deposits of a meandering river and include evidence of both in-channel deposition in the form of sands and gravelly sands and floodplain accumulations in the form of silts and peat. Detrital herbaceous and woody remains and mollusc remains are common, especially at the bottom and top of this organic-rich sequence, with a thin peat (Unit 4) in the lower part of the sequence between 1.61m and 1.65m OD and a thicker bed of peaty silt (Unit 10) forming the upper part of the sequence between 2.28m and 2.50m OD. No anthropogenic material was recognised in this sequence of sands, silts and peat and they seem likely to be of Early to Mid Holocene age. Overlying the peaty silt of Unit 10 was a thick (0.92m) succession of massive very well-sorted silts, mottled in their upper part and penetrated throughout by root channels. Mollusc shell and probable anthropogenic debris (?clinker) were present in the upper part of these silts. They appear to represent evidence of overbank deposition from still or very slow moving water. They are likely to be of Mid to Late Holocene age (post-Neolithic). They have evidently been affected by soil forming processes, almost certainly in the lower part (B and C horizons) of the soil developed from the surface of the natural floodplain of the

Lea or one of its tributaries in the period prior to the programmes of land-raising undertaken in the late 19th and early 20th centuries.

Section S12 (east-facing) - column sample <5>

The lowest unit (Unit 1) was a sandy gravel with an upper surface at 1.54m OD. It was overlain by a bed of silty sandy clay (Unit 2) and together these units represent context (107). The succeeding units (Units 3 and 4) were massive richly-organic very dark grey sandy silts representing context (105) and containing abundant mollusc remains and detrital wood.

The lower part of the sediment sequence recorded in Section S14 was replicated in this sequence. Gravel and sand were present at the lowest level forming Units 1 and 2, with the upper surface of the gravel at 1.54m OD. The overlying calcareous sands and silts (Units 3 and 4) between 1.61m and 1.94m OD incorporating detrital wood remains and concentrations of mollusc remains resembled the sandy and silty sediments at the same level in Section S14.

Trench 2

A single set of five overlapping column samples (<1> to <5>) was taken from this trench, from west-facing section S11 at levels between 3.44m and 1.56m OD, representing contexts (201), (202), (203), (205) and (206). These were accompanied by a set of eight bulk samples obtained between 2.06m and 1.71m OD

Section 11 (west-facing) - column samples: <1>, <2>, <3>, <4>, <5>

At the base of the section, Unit 1, representing context (206), was a massive black (oxidising to yellowish brown) slightly silty medium sand with widely scattered clasts of flint. It was overlain by Unit 2, a yellowish brown sandy gravel representing context (205) and having an upper surface at 2.19m OD. Root channels were present in the upper part of this unit. The overlying unit (Unit 3), representing context (203) passing up to context (202) was a massive gritty silt with scattered flint clasts. Root channels were present with some localised iron-staining of the channel margins. Discontinuous faunal burrows were also noted. Above this unit was a succession of massive greenish brown and greyish green silty clays (Units 4-5), representing contexts (202) and (201), differentiated on the basis of colour and containing scattered clasts of flint and inclusions of brown sand. Particles of charcoal were identified in both units and particles of CBM in the upper part of Unit 5.

The sand and gravel forming Units 1 and 2 of the sediment sequence recorded in Section S11 had their upper surface at 2.19m OD. Sands and gravels at this level, with an upper surface close to 2.0m OD have been widely recognised in borehole records within PDZ5 and PDZ6, e.g. in evaluation trenches 7a, 7b and 8 in PDZ6 (MoLAS-PCA, 2007c, d). They are interpreted as undissected remnants of Late Devensian Late Glacial gravels - the Lea Valley Gravel of Gibbard (1994). The channels of the Holocene river system are regarded as having cut into these sands and gravels and the sequence of sandy and stony clayey silts that overlie the gravel in Section S11 and form Units 3-5 of the sediment sequence are considered here to represent the overbank deposits of these rivers. In the upper part of these silty deposits (Unit 5) between 3.23m and 3.44m OD, material of anthropogenic origin is present in the form of CBM and charcoal particles.

Trench 3

Two sets of column samples, each of three columns were taken from this trench. A set of three overlapping column samples (<1>, <2>, <3>) was taken from east-facing Section S13 between 3.24m and 1.80m OD and representing contexts (302), (303), (304), and (306). A second set of three overlapping column samples (<5>, <6>, <7>) was taken from west-facing Section S15 between 3.29m and 2.05m OD and representing contexts (302) and (303).

Section 13 (east-facing) - column samples <1>, <2>, <3>

The lowest Unit (Unit 1), representing context (306) passing up to context (304), was a brown sandy gravel containing scattered plant remains and having an upper surface at 2.09m OD. The overlying unit (Unit 2) representing context (303) passing up to context (302) was a massive dark grey gritty silt with scattered flint clasts and inclusions of brown sand. Clasts were most common near the base of the unit, where detrital plant remains were also common and a few calcareous worm granules were noted. Particles of charcoal were also noted in this unit. The uppermost unit (Unit 3) was generally similar to Unit 2 but distinguished from it by mottled colouring and the presence of occasional particles of CBM.

The sandy gravel forming Unit 1 of the sediment sequence had an upper surface at 2.09m OD, close to the level of similar gravel in nearby Trench 2. The sediment overlying the gravel in Trench 3 and forming Units 2-4 comprised a sequence of massive silty and slightly stony clays, closely similar to sediments at the same level in Trench 2 and considered here to have

the same origin as overbank deposits of the natural river system active on the floor of the Lea valley in the period prior to large-scale programmes of land-raising in the late 19th and early 20th centuries. Plant remains, calcareous worm granules and charcoal were recorded in the lower part of this sequence of massive silts and at higher levels mollusc remains, charcoal and CBM were present.

Section 15 (west-facing) - column samples <4>, <5>, <6>

At the base of the sequence dark grey gravelly and slightly sandy clay was present (Unit 1), overlain with a sharp contact by dark grey clay with scattered flint clasts (Unit 2), succeeded, again with a sharp contact, by stony greenish grey clay with brown sand inclusions (Unit 3). Together these three units represent context (303). Overlying Unit 3 and separated from it by a sharp uneven contact was a massive dark grey stony clay with brown sand inclusions and occasional particles of charcoal (unit 4). This unit passed up gradually to a light olive brown unit (Unit 5) which was transitional to the uppermost unit in the succession (Unit 6). Unit 6 was a massive slightly stony silty clay, light olive brown below passing up to greyish brown with brown sandy inclusions throughout. Mollusc remains were present together with particles of CBM and possibly charcoal.

All of the sediment recorded in this sequence of samples taken between 2.05m and 3.29m OD, was in the form of massive sandy and stony clayey silts similar to those seen overlying gravel in the east-facing section (S13) of the trench and in nearby Trench 2, and all are considered to have the same origin as overbank deposits of the prehistoric and historic rivers on the floor of the Lea valley. Charcoal was recorded at several levels within the sequence and mollusc remains and CBM were present at the uppermost level between 2.91m and 3.29m OD.

PDZ6

Trench 7

Column samples were taken from two sections in this trench. A set of three overlapping column samples (<upper>, <middle> and <lower>), were taken from east-facing Section 2 between 2.45m and 0.88m OD and representing contexts (703), (704), (709) and (706). These were accompanied by a set of ten bulk samples obtained between 1.50m and 1.00m OD. A second set of two overlapping column samples (<upper> and <lower>) was taken

from west-facing Section 1 between 2.38m and 1.50m OD and representing contexts (703), (705) and (708). A further single column sample was taken from west-facing Section 1 between 1.49m and 0.93m OD and representing contexts (708), (712) and (706).

Section 2 (east-facing) - column samples <upper>, <middle>, <lower>

Unit 1 at the base of the sequence was a massive dark greyish brown silty calcareous sand representing context (706), fining slightly upward and with scattered clasts of flint. Detrital plant remains were common and root channels were present, with localised iron-staining of the channel margins. This unit passed up gradually to a slightly finer-grained unit (Unit 2) of dark greyish brown calcareous and slightly glauconitic sandy silt, penetrated by numerous root channels and containing scattered detrital plant remains. A very sharp and inclined contact separated this unit from a thin bed of sandy peat (Unit 3) between 1.19m and 1.13m OD. A very sharp contact separated the peat from an overlying bed of dark olive brown laminated calcareous fine sandy silt (Unit 4) containing scattered plant, mollusc, insect and ostracod remains and calcareous worm granules. This unit passes gradually upward into Unit 5, a very dark greyish brown gritty silt, laminated below, becoming more massive upward and containing scattered remains of plants, insects and ostracods. Units 2, 3 and 4 together form context (709). Overlying Unit 4 was a bed of brown silty sand (Unit 5) representing context (704). This unit passes gradually up into massive dark and very dark grey organic clays (Unit 6) containing scattered detrital wood remains. The uppermost unit in the sequence (Unit 7) is a silty clay light brown in colour with reddish yellow mottling and containing scattered clasts of flint.

Slightly gravelly calcareous sands with a base at 0.88m OD form the lowest unit (Unit 1) in the sediment sequence and were taken from immediately above the sands and gravels that formed the floor of the trench. The succeeding units (Units 2-6) between 1.06m and 1.65m OD formed a sequence of beds of fine sandy silts, peat and sand in which detrital plant remains, Mollusca and ostracod valves were commonly present. A thin peat was recognised between 1.13m and 1.19m OD. These sediments are all consistent with deposition in the active channel or channel backwaters of a meandering river. No evidence of anthropogenic material was recognised in these sediments and they are regarded here as being of Early to Mid Holocene age. They are overlain by organic clayey silts forming Unit 7 in which detrital wood remains were recognised. These silts are interpreted as backwater deposits and have an upper surface at 2.29m OD. Above this level, massive silts are present forming Unit 8 and interpreted here as overbank deposits.

Section 1 (west-facing) - column samples <upper>, <lower>

At the base of the sequence, Unit 1, representing context (708), is a gritty dark grey slightly glauconitic silt with numerous root channels and root remains, calcareous worm granules and common detrital plant remains. At the contact with the overlying bed, a seam of flint clasts is present. The overlying unit (Unit 2) is a bed of peat between 2.14m and 1.80m OD and representing context (705). The peat is overlain by a succession of massive and very well sorted silts (Units 3-6), representing context (703). Root channels are present throughout, usually with iron-staining of the channel margins. Vivianite is also commonly present except in the uppermost unit (Unit 6).

The base of the sequence in west-facing Section S1 is at 1.71m OD in calcareous slightly glauconitic gritty silt (Unit 1). The presence of root channels and calcareous worm granules in this unit suggests the development of a terrestrial surface at this level and this possibility is confirmed by the overlying peat deposit between 1.80m and 2.14m OD. In the wider context of river channel development on the prehistoric floor of the Lea valley (discussed below), these deposits seem likely to occupy an abandoned channel on a prehistoric floodplain surface. They are overlain by massive very well sorted silts in which root channels are common with iron-staining on the channel margins in the upper part of the sequence. Root remains are common, but visible organic content is otherwise almost completely lacking. These silty deposits are interpreted here as overbank deposits of Mid to Late Holocene age (post-Neolithic).

Section 1 (west-facing) - column <[712]>

This column was taken to sample the infill of a small channel-like depression - cut [711] - cut into context (706) and overlain by context (708). At the bottom of the column, Unit 1 representing context (706) comprised a massive dark grey slightly glauconitic sandy silt with scattered flint clasts and common detrital plant remains. The infill of the channel-like depression forms context (712) and consisted of a lower unit (Unit 2) consisting of compact, well-humified silty peat with two sub-horizontal beds of silt pellets and in the lower part some discrete inclusions of gritty sand. The upper unit of the infill (Unit 3) was a fibrous peat between 1.35m and 1.22m OD and was truncated by context (708) in the form of a brown sand containing flint granules and silt pellets, common detrital plant remains and common mollusc remains, including small bivalves and opercula of *Bithynia tentaculata*.

The infill of a narrow channel in west-facing Section S1 between 1.00m and 1.35m OD consisted of silty peat passing up to peat. The entire infill seems likely to represent accumulation in a short-lived channel belonging to the same active channel complex represented in Section S2 between 1.06m and 1.65m OD.

Trench 8

Column samples were taken from two sections in this trench. Three sets of column samples were taken from west-facing Section S10. At its southern end a set of four overlapping column samples was taken between 2.54m and 0.84m OD, representing contexts (802), (803), (806) (807), (808), (809), (813) and (814). Towards the northern end of Section S10, a set of three overlapping samples was taken between 2.72m and 1.22m OD, representing contexts (802), (803), (806), (807), (808) and (809). These were accompanied by a set of eleven bulk samples obtained between 2.24m and 1.69m OD. Immediately to the south of this set of samples, three further overlapping column samples were taken between 2.58m and 1.70m OD to investigate the infill (810) of an extensive cut [812] through contexts (802) and (803) and into context (807). A single column sample <8> was taken from south-facing Section S9 between 2.19m and 1.69m OD and representing contexts (802) and (805).

Section 10 (west-facing - south) - column samples <1>, <2>, <3>, <4>

At the base of the sequence (Unit 1) a very dark brown very organic shelly sand representing context (809) passed up gradually into sandy and shelly peat with detrital wood, representing context (813). The upper contact of the peat was at 0.93m OD. Overlying the peat with a sharp contact was a massive bed of brown medium to coarse sand (Unit 2) representing context (806). Consisting largely of mollusc shell debris at the base, this unit passed up into tufa-rich sand incorporating larger (30mm) pieces of rolled tufa and concentration of detrital wood. A rich mollusc fauna was also present including *Theodoxus fluviatilis*, *Valvata piscinalis*, *Valvata crista*, *Bithynia tentaculata* and *Ancylus fluviatilis*. Overlying this bed of shell and tufa sand were dark grey organic clays with peaty inclusions, forming Unit 3 and representing context (814). They passed up gradually into similar but light olive brown clays (Unit 4) containing broken mollusc shell and detrital wood and representing context (808). The upper part of context (808) was recognised as a separate unit of coarse silt (Unit 5), calcareous in its upper part with common root channels and root remains. This unit passed up gradually into a slightly coarser obscurely laminated fine sandy silt (Unit 6), rich in detrital plant remains and containing calcareous worm granules and scattered mollusc and ostracod remains. Overlying this sandy silt, between 2.17m and 1.99m OD, was a bed of very dark

brown obscurely laminated peaty silt (context (807); Unit 7), calcareous and more silty in its lower part where calcareous worm granules and opercula of *B. tentaculata* were noted, becoming increasingly peaty and non-calcareous upward.

This peaty horizon passed gradually up into very well sorted silt (Units 8-10). Root channels are present in this silt, which becomes blocky and mottled in its upper part (Units 9 and 10) where scattered mollusc and detrital plant remains were also present (context (803)). The uppermost unit (Unit 10) is calcareous and contains calcareous worm granules (context (802)).

Very organic very shelly sands passing up into sandy peat form the lowest unit (Unit 1) in the sediment sequence towards the south end of west-facing Section S10. The upper surface of the peat is at 0.93m OD. The succeeding units (Units 2-7) between 0.93m and 2.17m OD formed a variable but generally fining-upward sequence of beds of calcareous sands silts and peaty silts. The tufa-rich sand forming the lowest unit in this sequence (Unit 2) contained a rich mollusc fauna including several species characteristic of fairly large, well-oxygenated rivers. The sequence as a whole appears to represent deposits laid down in the channel of an initially active and probably meandering river, which gradually silted up. The presence of rooting in Unit 5 and of calcareous worm granules in the peaty silt of Unit 7 suggests the early stages in the development of a terrestrial surface. The absence of anthropogenic material in this sequence of sands and silts suggests that it is of Early to Mid Holocene age. The overlying massive very well sorted silts (Units 8-10) between 2.17m and 2.54 m OD are penetrated throughout by root channels, which in Units 9 and 10 have iron-stained margins. Units 9 and 10 are also blocky in structure and mottled, indicating the operation of soil-forming processes at this level (2.54-2.24m OD)

Section 10 (west-facing - north) - column samples <1/3>, <3/3>, <5>

At the base of the sequence (Unit 1) was a light brown gravelly sandy silt containing detrital wood remains and representing context (809). Overlying this unit with a sharp contact was a calcareous sand (Unit 2) representing context (806) and containing mollusc and detrital wood remains. This sand was succeeded with a sharp contact by a sequence of dark grey and brown organic clays (Units 3-6) representing context (808), (807) and (803) and containing scattered mollusc and detrital plant remains. Between 2.27m and 2.14m OD (Unit 5) plant remains were very common and the sediment was quite peaty in character. The upper part of

the sequence, the upper part of Unit 6 and the whole of Unit 7, was a light yellowish brown in colour and in Unit 7 contained a few clasts of flint.

Section 10 (west-facing) - infill of [812] - Column samples <2/3>, <6>, <7>

Cut [812] bottomed in context (807) which was sampled in the lowest units in columns <2/3> and <7>. In column <2/3>, Unit 1 was a dark grey very organic peaty clay with mollusc and detrital plant remains. In column <7>, Unit 1, representing a lower level in context (807) was a calcareous very dark brown fine sandy silt with common plant and mollusc remains.

The infill (810) of cut [812] was sampled in columns <6> and <7> and is described here as a separately numbered sequence. At the base of the sequence (Unit 1*) was a calcareous very dark bluish grey (oxidising to brown) silty medium sand rich in tufa granules and containing numerous mollusc remains, including *Planorbis*, *Bithynia tentaculata* and *Ancylus fluviatilis*. This unit was overlain with a sharp inclined and uneven contact by a calcareous dark greyish brown fine sandy silt (Unit 2*) in which plant remains were common together with ostracods and molluscs, including whole gastropods and small bivalves. The upper contact of this organic-rich unit was at ca. 2.14m OD where it passed up gradually into light olive brown silty clay (Unit 3*) with scattered mollusc and detrital wood remains. Similar sediment was recorded from units in column sample <2/3> representing context (812) at the same level as Unit 3* in column sample <6>.

A substantial channel-like cut [812] was present towards the north end of Section S10 between 1.82m and 2.72m OD and the sampling in this area was undertaken to investigate the age and origin of this feature. The sediments into which the channel was cut and which seal the infill of the channel form, in their lower part between 1.22m and 2.17m OD, a sequence of sands, silts and peaty silts calcareous in part and containing common mollusc and detrital herbaceous and woody plant remains, particularly in the calcareous sand towards the base of the sequence between 1.24m and 1.34m OD and in the peaty silt at the top of the sequence between 2.04 and 2.17m OD. Similar sediments were also seen immediately underlying the channel-like cut [812]. Calcareous sandy silt with common plant and mollusc remains was present in column sample <7> at levels between 1.70m and 1.82m OD. Peaty silt was present in column sample <2/3> between 1.94 and 2.11m OD. Above 2.17m OD, in the sediment sequence enclosing the channel-like feature, massive very well sorted silts were present and are interpreted here as overbank sedimentation, probably of Mid to Late Holocene age. The channel-like feature is sealed at a level of 2.72m OD.

The infill of the channel-like feature was regarded in the field as a single context (810) between 1.82 and 2.72. The infill was a fining upward sequence of calcareous sand and silt containing mollusc and detrital plant remains throughout including towards the bottom of the sequence the freshwater limpet *Ancylus fluviatilis*, a species characteristic of fairly large well-oxygenated rivers. No anthropogenic material was recognised in the infill sediments. As a whole, the infill of the feature seems likely to represent the silting up of an active channel on the floor of the Lea valley. It is cut through and sealed by sediments regarded here as overbank deposits and probably of Mid to Late Holocene age. The cut must therefore also have been formed during this time interval.

Section S9 (south-facing) - column sample <8>

At the base of the section (Unit 1) was a calcareous very dark bluish grey (oxidising to very dark greyish brown) very well sorted coarse silt containing common detrital plant remains. This unit was succeeded, with a thin bed of sand with flint granules forming the contact, by a fining upward dark brown sandy silt (Unit 2), calcareous in its lower part but non-calcareous above. Opercula of *Bithynia tentaculata* were noted in the lower part of the unit together with numerous calcareous worm granules. Together, Units 1 and 2 represent Context (805). Unit 2 passed up gradually into a massive very dark greyish brown very well sorted silt (Unit 3), representing context (802), in which scattered iron-stained root channels were present.

The single column sample taken in south-facing Section S9 between 2.19m and 1.69m OD consists in its lower part (between 1.69 and 2.08m OD) of calcareous silt and sandy silt containing variable amounts of mollusc and detrital plant remains and numerous calcareous worm granules. These sediments are very similar to those recorded towards the southern end of west-facing section S10 at levels between 1.83m and 1.99m OD (Unit 6) and are regarded here as being directly equivalent. Above 2.08m OD in Section S9, massive very well sorted silt is present penetrated by root channels with iron-stained margins, considered here to be directly equivalent to similar massive silts forming Unit 8 in Section S10.

Trench 9

Column samples were taken from two sections in Trench 9. A set of six largely overlapping column samples (<1>, <2>, <3>, <4>, <5>, <6>) was taken between 2.47m and 0.60m OD from east-facing Section S5, representing sediment forming contexts (901), (902), (903),

(904) and (906). These were accompanied by a set of nine bulk samples obtained between 1.58m and 1.13m OD. A set of three overlapping column samples (<7>, <8> and <9>) was taken between 2.42m and 1.20m OD from east-facing Section S6, representing sediment forming contexts (902), (908), (905), (907) and (906).

Section S5 (east-facing) - column samples <6>, <5>, <4>, <3>, <2>, <1>

At the base of the section (Units 1-3) a fining upward sequence representing context (906) was present comprising greyish brown silty sandy clay passing up to silty clay and containing detrital wood remains and plant material. In the upper part of this sequence (Unit 3), yellowish red mottling was present and root channels and root remains were common. The upper contact of Unit 3 was very sharp and steeply inclined. The overlying unit (Unit 4), comprised a complex mixture of the underlying silty clay with the overlying peat of Unit 5. The peat comprising Unit 5 (context (904)) forms the upper part of column sample <2> between 1.32m and 1.05m OD. The contact was recorded in the field as a continuous sub-horizontal feature, lying between 1.32m and 1.40m OD. The unit (Unit 6) overlying the peat was seen in the bottom of column sample <3> and was a massive black very well sorted silt penetrated by a few root channels with scattered root remains and localised iron-staining of the channel margins. This unit passed up gradually into a massive somewhat crumbly dark olive grey slightly sandy silt (Unit 7) becoming brown and coarsening slightly upwards and penetrated throughout by well-preserved vertical root-channels coated with vivianite. In the upper part of this unit, possible CBM and clinker were noted (context (903)). Overlying Unit 7 was a massive greyish brown silty clay (Unit 8) representing context (902) with sandy and gravelly inclusions. The uppermost unit in the sequence (Unit 9) representing context (902) was a mottled slightly stony sandy silt with a blocky structure and scattered mollusc remains.

In the sandy clays (Units 1-3) at the bottom of the sediment sequence recorded in the east-facing section (S5) of Trench 9 evidence of soil forming processes was present in the form of mottling and root penetration, suggesting the development of a terrestrial surface within the sequence. However, the immediately overlying unit (Unit 4) rested on a very sharp contact and was a complex mixture of the underlying sediments and clasts of peat. It suggests some sort of erosional hiatus preceding the accumulation of the peat forming Unit 5 between 1.05 and 1.32m OD. Above the peat, massive very well sorted silts were present (Units 6 and 7), containing detrital herbaceous and woody plant material, becoming sandy and more crumbly upward and penetrated by well preserved sub-vertical root channels coated with vivianite. These features suggest the presence of a terrestrial surface developed on overbank river

deposits. The upper limit of these features was at 2.00m OD. At this level there was a well-marked discontinuity, above which massive silts were again present (Unit 8) but little plant material was recognised and no evidence of root penetration. Only at the top of the sequence in Unit 9 between 2.80m and 3.30m OD was there again evidence of soil forming activity with the development of mottling and a blocky structure and the presence of charcoal and mollusc remains.

There is little evidence of in-channel river activity in the sediments preserved in Section S5 in Trench 9. The site appears to have been floodplain throughout most of its history with deposition of fine-grained predominantly silty sediments, phases of soil development and opportunities for peat accumulation.

Section S6 (west-facing) - column samples <7>, <8>, <9>

At the base of the section, a light olive brown sandy clayey silt was present (Unit 1) representing context (906) and containing scattered detrital wood remains. The overlying unit (Unit 2) representing context (905) was a calcareous dark greyish brown sandy silt with common detrital plant and wood remains and thin sandy horizons rich in mollusc and ostracod remains. This richly organic unit was overlain by a compact peat (Unit 3) between 2.09m and 1.81m OD, representing context (908). The lower part of the peat was silty and contained opercula of *Bithynia tentaculata*. The peat passed up gradually into dark to very dark grey organic clay (Unit 4) representing the upper part of context (908). The uppermost unit in the sequence (Unit 5) representing context (902) was a greenish grey clay with strong red mottles.

At the base of the sequence is a non-calcareous inorganic sand (Unit 1) possibly associated with a late stage in the deposition of the sand and gravel that forms the floor of the trench. Overlying Unit 1 is a sequence of calcareous sands and silts (Unit 2) between 1.29m and 1.81m OD in which mollusc remains, ostracods and detrital herbaceous and woody plant remains are common. Overlying these sandy and silty sediments is a compact bed of peat between 1.81m and 2.09m OD. Units 2 and 3 appear to represent the infilling of an initially active channel culminating in the development of a terrestrial surface on which peat accumulated. Massive silts (Units 4 and 5) overlie the peat and are interpreted here as overbank deposits.

Trench 48

A set of three overlapping column samples (<upper>, <middle>, and <lower>) was taken from this trench from north-facing Section S7 between 3.09m and 0.86m OD and representing contexts (4802), (4803), (4804), (4805), (4806), (4807), (4808), (4809) and (4810). These were accompanied by a set of 16 bulk samples obtained between 2.01m and 1.21m OD.

At the base of the sequence Unit 1 representing context (4810) was a sandy gravel containing scattered detrital plant remains. The overlying unit (Unit 2) representing the upper part of context (4810) was a dark grey gravelly and sandy silt in which detrital plant remains were common. Overlying Unit 2, a sequence of gritty brown sands with irregular inclusions of greyish silt formed Unit 3 representing context (4809). Scattered flint clasts were present in the upper part of the unit and detrital plant remains were present, mainly in the silty inclusions. The succeeding unit (Unit 4) representing context (4808) was a crudely bedded grey sandy silt with scattered flint clasts and common mollusc and detrital plant remains. Overlying Unit 4 was a thick unit (Unit 5) of brown calcareous well-bedded slightly silty tufa-rich sand. Bedding was inclined with apparent dips in both directions across the column. Detrital plant remains and mollusc remains were common including small bivalves with valves conjoined. Insect parts were also noted. This unit passed up gradually into a silty sand (Unit 6) representing context (4805) fining upward and interrupted by thin (<10mm) beds of sand dipping across the column. Detrital plant remains and broken mollusc shell were common in this unit. The overlying unit (Unit 7) was a dark grey calcareous fine sandy silt representing context (4804). It was obscurely bedded below becoming more massive upward. Detrital plant remains, broken mollusc shell and calcareous worm granules were all common and the unit was penetrated by numerous root channels in which root remains were preserved. This unit passed up gradually into a massive non-calcareous dark greyish brown very well sorted silt with reddish brown mottles (Unit 8) representing context (4803) in which root channels were common with iron-staining of the channel margins. A few scattered mollusc remains were present. The uppermost unit in the sequence (Unit 9) representing context (4802) was a moderately calcareous blocky dark greyish brown gritty silt with red mottling and scattered flint clasts. The unit was penetrated by numerous root channels with iron-staining of the channel margins. Mollusc remains were common including *Limnaea truncatula*, *Succinea* spp., *Trichia hispida* and *Vallonia pulchella*.

The lower part of the sediment sequence (Units 1-3) in this location was formed by beds of gravel and gravelly sand. The gravel probably represents the Lea Valley Gravel of Gibbard (1994). Its upper surface was at a level of 1.02m OD. In the overlying gravelly sands (Units 2 and 3) plant remains are common, especially in the numerous silty inclusions. These units probably represent Holocene reworking of the underlying sands and gravels and of pre-existing beds of organic silt. The succeeding sediments formed a sequence of partly calcareous sands and silts between 1.21m and 2.50m OD. Detrital herbaceous and woody plant remains and mollusc remains including small bivalves are common throughout and ostracod valves and insect remains were noted in a tufa-rich sand between 1.32m and 1.94m OD. Above 2.50m OD massive very well sorted and mottled non-calcareous silts (Units 8 and 9) were present which were penetrated from above by root channels with iron-staining of the channel margins. In the uppermost Unit (Unit 9) a blocky structure has developed. Calcareous worm granules were noted in the lower part of Unit 8. Plant material was present throughout but scattered. Mollusc remains were also present throughout becoming increasingly common upward into Unit 9 where several terrestrial species were noted. These sediments between 2.50m and 3.09m OD are interpreted here as overbank deposits in the upper part of which there was varied evidence of soil forming processes and proximity to the ground surface.

SUMMARY OVERVIEW OF THE SEDIMENTARY SEQUENCES

The evidence described above from 14 sediment sequences in PDZ5 and PDZ 6 indicates a rather consistent pattern of sedimentation in the areas investigated and good agreement in most cases with the stratigraphic and palaeogeographical models proposed in the Detailed Desk Based Assessments (MoLAS-PCA, 2007c, d) for the two areas.

In PDZ5 Trench 1, and in all four trenches opened in PDZ 6 (Trenches 7, 8, 9 and 48) similar sediments are present at various levels between 0.93m OD (in PDZ6 Trench 8 Section S10 south) and 2.50m OD (in Trenches PDZ5 Trench 1 and PDZ6 Trench 48). These sediments are present in ten of the fourteen sample sequences examined and form beds of calcareous sand and silt, peaty silt and peat in various sequences. These sediments in all cases rest on gravel or sand representing the upper surface of the sand and gravel forming the floors of the trenches in which the samples were collected. The gravel itself was recorded in two of the sample sequences, at 1.54m OD in PDZ5 Trench 1, and at 1.02m OD in PDZ6 Trench 48. Slightly gravelly sediments were present near the bottom of several of the other sequences. These gravels and gravelly sands represent the Lea Valley Gravel of Gibbard (1994), or, and

more likely, the reworking of the Lea Valley Gravel in the earliest Holocene. In the overlying sandy and silty sediments, there is a general fining upward tendency in most of the sequences, from tufa-rich sands to peaty silts, but peat deposits are also present, apparently at two principal levels, either near the bottom of the sediment sequence or at the top.

Apart from PDZ5 Trench 1 and PDZ6 Trench 48, in which sediments of this type extend up to 2.50m OD, the upper surface of these sediments lies very consistently between 2.00m and 2.20m OD. The sediments contain a rich variety of organic material including detrital herbaceous and woody plant remains, and mollusc, ostracod and insect remains. The upward transition from sandy deposits near the base of the sequences to peaty silts and peats at the top suggests that these sediments represent the infilling of initially active fluvial channels. The complete absence of material of possible anthropogenic origin suggests that these sediments are of Early to Mid Holocene Age.

Overlying these organic-rich sandy, silty and peaty sediments in all cases there are massive, generally very well sorted silty sediments in which organic material is relatively uncommon. These sediments are interpreted here as representing deposition on floodplain sites from standing or very slow moving water. They are probably of Mid to Late Holocene (Neolithic or post-Neolithic) date. There is often evidence of soil forming processes in these silty deposits, in the form of root penetration, mottling and blocky or crumbly structure. Most of the sediment sequences examined terminated at *ca.* 2.5m OD and appeared to include only features typical of the B or C horizon of a soil profile. Sequences that extended up towards 3.5m OD included undoubted anthropogenic material and a more abundant and varied mollusc fauna, suggesting closer proximity to the natural ground surface. This evidence of soil forming processes, almost certainly relates to soil development on the surface of the natural floodplain of the Lea or one of its tributaries in the period prior to the programmes of land-raising undertaken in the late 19th and early 20th centuries.

Among the 14 sedimentary sequences examined, there are four exceptions from the pattern described in the previous paragraphs. In two of the three sequences examined in PDZ5 Trenches 2 and 3, gravel was recorded at levels of 2.09m OD (Trench 2) and 2.19m OD (Trench 3). This level is close to the level at which the upper surface of the Late Devensian Late Glacial Lea Valley Gravel has been recognised in boreholes recorded in the DDBAs for the two areas (MoLAS-PCA, 2007c, d). In all three sediment sequences in PDZ5 Trenches 2 and 3, the sediments above the level of the gravel and extending up to levels between 3.0m

and 3.5m OD are slightly gravelly silts and clays in which evidence of soil formation is present. They are interpreted here as overbank floodplain deposits similar to those described in the previous paragraph.

In PDZ6 Trench 9 in east-facing Section S5, the whole sediment sequence is in silty fine grained deposits or peat. The tufa sands and the calcareous silts and sands rich in mollusc, ostracod and plant remains, seen elsewhere in PDZ6 Trenches 7, 8, 9, and 48 and in PDZ5 Trench 1, were not present. Instead, evidence of soil formation was present in the silty sediments, between 0.82m and 0.94m OD, below the peat bed and between 1.40m and 1.90m OD immediately above the peat bed and again closer to the presumed level of the natural 19th century land surface between 2.80m and 3.30m OD. It would seem that this site lay outside any river channel for the whole of the period represented in the sediment sequence and was for most of that time occupied by terrestrial surfaces subject to deposition from slow moving or standing water

Palaeogeography

As noted above in the general description of the area occupied by PDZ5 and PDZ6, all the sediments described in this account lie close to the course of the Waterworks River, which coincides, with the reconstructed prehistoric course of the Leyton River or further south, with the confluence between that river and the proto-Lea. Having regard to the borehole records and the palaeogeographical models based on them in the DDBAs, Trench 1 in PDZ5 seems likely to be within the valley of the Leyton River towards the western edge of the prehistoric valley floor and slightly upstream from the confluence with the Lea. Trenches 7, 8, and 9 in PDZ6 lie further downstream on the opposite, eastern side of the same valley floor and perhaps 50m to 100m upstream from the confluence. Trench 48 in PDZ6 is further downstream again and in one of the channels of the Lea downstream from its confluence with the Leyton River and towards the eastern edge of the contemporary floodplain. The evaluation Trench 35 in PDZ6 is close to Trench 48 and exposed similar sediments in a similar height range. Trenches 2 and 3 in PDZ5 lie close to the modelled centre line of the prehistoric River Lea and at about the same distance downstream as Trench 48 in PDZ6. It would be expected that they would expose channel deposits similar to those seen in Trench 48. In fact, no channel sediments were encountered in these trenches and the sediments that were exposed and sampled suggest that there was no channel in this area, but an undissected remnant of the Lea Valley Gravel. If this reconstruction is correct, the prehistoric

Lea must have flowed in two channels at this point on either side of this upstanding gravel remnant. Trench 48 in PDZ6 would have been in the more easterly channel.

RANGE-FINDER RADIOCARBON DATES (PENDING)

Following the results and interpretation of the sedimentary sequences, four horizons were selected for range-finder radiocarbon dating (Table 1). Two samples were taken from PDZ5, Trench 1: (1) the sandy peat towards the base of the west facing section (context (105); 1.65m to 1.63m OD), and (2) the peat towards the top of the west facing section (context (103); 2.50 to 2.48m OD). An additional two samples were taken from PDZ6, Trench 8: (1) the peat towards the base of the west-facing south section (context (813); 0.95 to 0.93m OD), and (2) the peaty silt towards the top of the west-facing south section (context (807); 2.15m to 2.13m OD). These samples were specifically selected to provide an approximate date for the onset and cessation of calcareous sand and silt, peat and peaty silt accumulation occurring above the gravel and sand surface at the base of the trench. The results of the range-finder radiocarbon dating will be submitted in an updated version of this report.

Table 1: Selected rangefinder radiocarbon dates

PDZ	Trench number	Section	Column sample	Depth from top of sample	Context number
5	Trench 1	West facing (base of sequence)	<1>	1.65m to 1.63m OD	(105)
5	Trench 1	West facing (top of sequence)	<3>	2.50m to 2.48m OD	(103)
6	Trench 8	West facing – south (base of sequence)	<4>	0.95m to 0.93m OD	(813)
6	Trench 8	West facing – south (top of sequence)	<2>	2.15m to 2.13m OD	(807)

RESULTS AND INTERPRETATION OF THE RAPID POLLEN ASSESSMENT

A total of twenty-one pollen samples were extracted from the contexts recorded in the column sequences obtained from Trench 1 (10 samples), 2 (5 samples) and 3 (6 samples) from PDZ05 (Table 2). A total of forty-five pollen samples were extracted from the contexts recorded in the column sequences obtained from Trench 7 (11 samples), 8 (16 samples), 9 (9 samples) and 48 (9 samples) from PDZ06 (Table 3).

PDZ5

Trench 1

Pollen was recorded in moderate to high concentrations and moderate preservation in contexts (103), (108), and (109). Pollen was either absent or recorded in low concentrations in contexts (102), (104), (105), (16), and (107). Microscopic charcoal was recorded in low to moderate concentrations in contexts (102), (103), (106), (107), (108) and (109), and was absent from contexts (104) and (105).

Trench 2

Pollen was absent from all samples, except those from contexts (201) and (203) where it was preserved in very low concentrations. Low to moderate concentrations of microscopic charcoal were recorded in contexts (201) and (202).

Trench 3

Pollen was absent from all contexts. Microscopic charcoal was recorded in moderate to high concentrations in contexts (302) and (303).

PDZ6

Trench 7

Pollen concentration and preservation generally ranged between moderate and high in the samples taken from different contexts in Trench 7. However, pollen concentration and preservation in samples taken from the same context (e.g. contexts (705) and (708)), did vary considerably between very high, and absent. Microscopic charcoal was recorded in generally low concentrations in all contexts. The sample taken from cut [711], context (712) also recorded high pollen concentration and preservation, and microscopic charred particles were absent.

Trench 8

Pollen concentration and preservation generally ranged between moderate and high in the samples taken from different contexts in Trench 8. Contexts (806), (807), (813) and (814) recorded pollen in a moderate to high concentration and state of preservation. Contexts (802) and (803) were absent in the samples taken from the west-facing north section, but were recorded in moderate concentrations in the west facing south and south sections respectively. Pollen was not preserved in the samples taken from contexts (805), (808), (809), (810) and (811) (the latter two were taken from cut [812]). Generally low concentrations of microscopic charcoal were recorded in samples from all contexts, except context (813) where it was not recorded.

Trench 9

Pollen was recorded in moderate to high concentrations and preservation in contexts (904), (905), and (907), and was low to absent in contexts (903), (906), and (908). Pollen was variable in context (902), being very high in the sample taken from the west section, but absent in the sample taken from the east section. Microscopic charcoal was recorded in low concentrations in samples from contexts (902), (905), (906) and (907) only.

Trench 48

Pollen was either absent or recorded in very low concentrations from all contexts in Trench 48 (contexts (4802), (4803), (4804), (4805), (4807), (4808), (4809) and (4810)). The only exception was context (48/006), in which pollen was preserved well and in very high concentrations. Low concentrations were recorded in contexts (4803), (4808) and (4810) only.

RESULTS AND INTERPRETATION OF THE RAPID DIATOM ASSESSMENT

A total of twenty-one diatom samples were extracted from the contexts recorded in the column sequences obtained from Trench 1 (10 samples), 2 (5 samples) and 3 (6 samples) from PDZ 5 (Table 2). A total of forty-five diatom samples were extracted from the contexts recorded in the column sequences obtained from Trench 7 (11 samples), 8 (16 samples), 9 (9 samples) and 48 (9 samples) from PDZ 6 (Table 3).

PDZ5

Trenches 1, 2 and 3

There were no identifiable diatoms present on the slides from the contexts recorded in Trenches 2 and 3. Diatoms were also absent in Trench 1 from contexts (102), (103), (106),

(107) and (109); however, some poorly preserved frustules were present in low concentrations in contexts (104), (105) and (108).

PDZ6

Trench 7

Diatoms were recorded in moderate concentrations in contexts (704) and (708), and low concentrations in context (706). Preservation was generally poor in all samples. No identifiable diatom remains were recorded in the samples from contexts (703), (705), (706), (709) and (712).

Trench 8

Diatom remains were absent from the majority of the contexts recorded in Trench 8: contexts (802), (803), (805), (806), (808), (809), (810), and (814). However, a few sporadic poorly preserved frustules were recorded in a few samples from (807) and (811).

Trench 9

Diatom remains were recorded in high quantities, and a variable state of preservation in samples from contexts (905) and (908). However, frustules were absent in all samples from contexts (902), (903), (904), and (906). No samples were assessed from context (907) and therefore the concentration and preservation of diatom remains is unknown.

Trench 48

Diatom remains were recorded in high quantities, and a variable state of preservation in samples from contexts (4804), (4805) and (4806). However, frustules were absent in all samples from contexts (4802), (4803), (4808), (4809), and (4810). No samples were assessed from context (4807) and therefore the concentration and preservation of diatom remains is unknown.

Table 2: Results of the pollen and diatom rapid assessment, Trenches 1, 2, and 3, PDZ5, Olympic Park

Column sample	Depth (m OD)	Context	Pollen Rapid Assessment			Diatom Rapid Assessment	
			Concentration	Preservation	Microscopic charcoal	Concentration	Preservation
Trench 1; West facing							
<3>	2.68 to 2.67	(102)	1	2	1	0	-
<3>	2.44 to 2.43	(108)	4	4	2	0	-
<2>	2.35 to 2.34	(103)	2	3	1	0	-
<2>	2.27 to 2.26	(109)	2	3	1	0	-
<2>	2.04 to 2.03	(104)	0	-	0	1	1
<1>	1.64 to 1.63	(105)	1	1	0	2	1
<1>	1.54 to 1.55	(106)	0	-	1	0	-
<1>	1.40 to 1.39	(107)	1	2	2	0	-
Trench 1; East facing							
<5>	1.85 to 1.84	(108)	4	3	0	1	1
<5>	1.45 to 1.44	(107)	1	3	1	0	-
Trench 2; West facing							

<5>	3.49 to 3.48	(201)	1	3	2	0	-
<2>	2.39 to 2.38	(202)	0	-	1	0	-
<2>	2.13 to 2.12	(203)	1	2	0	0	-
<1>	1.89 to 1.88	(205)	0	-	0	0	-
<1>	1.65 to 1.64	(206)	0	-	0	0	-
Trench 3; West facing							
<6>	2.46 to 2.45	(302)	0	-	1	0	-
<6>	2.22 to 2.21	(303)	0	-	2	0	-
Trench 3; East facing							
<3>	2.29 to 2.28	(302)	0	-	0	0	-
<3>	2.13 to 2.12	(303)	0	-	0	0	-
<3>	1.97 to 1.96	(304)	0	-	0	0	-
<3>	1.89 to 1.88	(306)	0	-	0	0	-

Key: 0 = 0 estimated grains or frustules per slide; 1 = 1 to 75; 2 = 76 to 150; 3 = 151 to 225; 4 = 226-300; 5 = 300+. Estimated number based on assessment of 10% of total number of slide transects (4 of 40 transects)

Table 3: Results of the pollen and diatom rapid assessment, Trenches 7, 8, 9 and 48, PDZ6, Olympic Park

Column sample	Depth (m OD)	Context	Pollen Rapid Assessment			Diatom Rapid Assessment	
			Concentration	Preservation	Microscopic charcoal	Concentration	Preservation
Trench 7; West facing							
<Upper>	2.23 to 2.22	(705)	0	-	1-2	0	-
<Lower>	1.98 to 1.97	(705)	2	3	3	0	-
<Lower>	1.75 to 1.74	(708)	5	3	0	0	-
<Lower>	1.51 to 1.50	(708)	0	-	0	0	-
Trench 7; East facing							
<Upper>	1.93 to 1.92	(703)	2	3	1	0	-
<Middle>	1.45 to 1.44	(704)	3	3	1	2	1-2
<Lower>	1.17 to 1.16	(709)	5	4	1	0	-
<Lower>	0.97 to 0.96	(706)	1	2	1	0	-
Trench 7; West facing [711]							
[711]	1.43 to 1.42	(708)	1	3-4	1	2-3	1-2
[711]	1.26 to 1.25	(712)	5	4	0	0	-
[711]	0.94 to 0.93	(706)	2	3	1	1	1

Trench 8; West facing - north							
<1/3>	2.53 to 2.52	(802)	0	-	1	0	-
<1/3>	2.21 to 2.20	(803)	0	-	0	0	-
<3/3>	1.89 to 1.88	(807)	3	3-4	1	1	2
<5>	1.47 to 1.46	(806)	3	4	1	0	-
<5>	1.63 to 1.62	(808)	0	-	0	0	-
<5>	1.23 to 1.22	(809)	0	-	1	0	-
Trench 8; West facing - south							
<1>	2.29 to 2.28	(802)	2	2	2	0	-
<2>	1.81 to 1.80	(807)	1	3-4	1	0	-
<3>	1.57 to 1.56	(808)	1	3	2	0	-
<3>	1.41 to 1.40	(814)	4	3	1	0	-
<4>	1.09 to 1.08	(806)	3	3-4	1	0	-
<4>	0.85 to 0.84	(813)	2	3	0	0	-
Trench 8; West facing - [812]							
<2/3>	2.37 to 2.36	(810)	0	-	1		

<7>	1.91 to 1.90	(811)	1	3	1	1-2	1-2
Trench 8; South facing							
<8>	1.86 to 1.85	(805)	1	4	1	0	-
<8>	2.18 to 2.17	(803)	4	3	3	0	-
Trench 9; East facing							
<5>	2.85 to 2.84	(902)	0	-	0	0	-
<3>	1.65 to 1.64	(903)	0	-	0	0	-
<2>	1.33 to 1.32	(904)	5	3	0	0	0
<1>	0.85 to 0.84	(906)	1	3	1	0	0
Trench 9; West facing							
<9>	2.41 to 2.40	(902)	4	2	1	0	0
<8>	2.09 to 2.08	(908)	1	2	0	4	1-2
<7>	1.53 to 1.52	(905)	2	3	1	5	3-4
<7>	1.45 to 1.44	(907)	2	3	1	unknown	unknown
<7>	1.29 to 1.28	(906)	0	-	1	0	0
Trench 48; North facing							

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<Lower>	2.95 to 2.94	(4802)	0	-	0	0	0
<Lower>	2.63 to 2.62	(4803)	0	-	1	0	0
<Lower>	2.31 to 2.30	(4804)	0	-	0	4-5	2
<Middle>	1.99 to 1.98	(4805)	0	-	0	5	1-2
<Middle>	1.59 to 1.58	(4806)	5	4-5	0	3	1-2
<Middle>	1.43 to 1.42	(4807)	1	1	0	unknown	unknown
<Upper>	1.19 to 1.18	(4808)	0	-	1	0	0
<Upper>	1.07 to 1.06	(4809)	0	-	0	0	0
<Upper>	0.99 to 0.98	(4810)	0	-	1	0	0

Key: 0 = 0 estimated grains or frustules per slide; 1 = 1 to 75; 2 = 76 to 150; 3 = 151 to 225; 4 = 226-300; 5 = 300+. Estimated number based on assessment of 10% of total number of slide transects (4 of 40 transects)

RESULTS AND INTERPRETATION OF THE BULK SAMPLE ASSESSMENT (CHARRED AND WATERLOGGED SEEDS AND WOOD, INSECTS AND MOLLUSCA)

Eleven of the twenty-two bulk samples collected from PDZ5, Trenches 1 (7 of 14 samples) and 2 (4 of 8 samples), and twenty-six of the forty-six samples collected from PDZ6, Trenches 7 (5 of 10 samples), 8 (6 of 11 samples), 9 (5 of 9 samples) and 48 (10 of 16 samples) were processed and rapidly assessed for charred and waterlogged seeds, waterlogged wood, charcoal, insects, and Mollusca (Tables 4 and 5).

PDZ5

Trench 1

The sequence of bulk sample taken from west face of Trench 1 traversed five different contexts (contexts (104), (109), (103), (108) and (102)). Throughout the sequence, charred wood was recorded in low quantities, except sample <12> (context (103)) where it was absent. Waterlogged wood was recorded in variable concentrations, however, samples <2> and <4> (contexts (102) and (108)) contained high quantities. Waterlogged seeds were absent in samples <6> and <14> (contexts (108)/(103) and (104) respectively), but were recorded in all other samples; concentrations were particularly high in sample <10> (context (103)). Insects were recorded in low to moderate concentrations in samples from contexts (103) and (109), but were absent elsewhere. Charred seeds, chaff, Ostracoda and Mollusca were not recorded within the samples rapidly assessed.

Trench 2

The sequence of bulk samples taken from the west face of Trench 2 traversed two different contexts (contexts (205), and (206)). Macro-remains were absent from the entire sequence, except for an individual piece of charcoal identified in the basal sample (samples <13>, context (206)).

PDZ6

Trench 7

The sequence of bulk sample taken from the east face of Trench 7 traversed two different contexts (context (709) and (704)). Samples taken from context (709) contained moderate quantities of charcoal in samples <3> and <9>, but were absent in samples <5> and <7>. Charred seeds were not recorded, but high concentrations of chaff was noted in sample <7> only. Waterlogged wood was recorded in low to moderate concentrations in samples <3>, <7> and <9>, and low concentrations of waterlogged seeds were recorded in samples <5>

and <7> only. Ostracoda and Mollusca were not recorded in any samples, which is surprising considering their noted occurrence within the adjacent column samples. Insect remains were recorded in moderate to high concentrations in samples <3> and <5>, and low concentrations in sample <9>. The single sample (sample <1>) from context (704) contained moderate concentrations of charcoal only.

Trench 8

The sequence of bulk samples taken from the west-facing south section of Trench 8 contained samples from two different contexts (contexts (803) and (807)). Samples taken from context (807) contained low concentrations of charcoal throughout, except in sample <7> where it was absent. Charred seeds were absent in all samples except <9>, in which they were recorded in moderate quantities. Chaff was absent throughout. Waterlogged wood was absent except in samples <5> and <7> where it was noted in low to moderate concentrations. Waterlogged seeds were present in all samples and were in exceptionally high concentrations in sample <11>. Mollusca were recorded in low to moderate concentrations in samples <7>, <9>, and <11>, but were absent in samples <3> and <5>; Ostracoda were not noted. Insect remains were recorded in low to moderate concentrations throughout the context. In context (803), macro-remains were absent, except for low concentrations of Mollusca.

Trench 9

The sequence of bulk samples taken from the east facing section of Trench 9 contained samples from three different contexts (contexts (906), (904) and (903)). Sample <18> taken from the lower context (906) contained low charcoal and insect concentrations, and moderate to high waterlogged wood and seed concentrations. All other types of macro-remain were absent. In the samples taken from context (904), charred seeds and chaff was absent, whilst charcoal was present in either low or absent concentrations. Waterlogged wood was recorded in high quantities, whilst waterlogged seeds were not noted. Mollusca were absent, and insects only present in low concentrations in sample <12>. In the single sample <10>, taken from overlying context (903), only low concentrations of charcoal and waterlogged wood were recorded.

Trench 48

The sequence of bulk samples taken from the north facing section of Trench 48 contained samples from five different contexts (contexts (4804) to (4808)). Charcoal was recorded in all

samples from all contexts in low to moderate concentrations. Charred seeds were recorded in low to moderate concentrations in samples <20-25>, <30-35>, <35-40>, <40-45> and <75-80> (contexts (4805), (4806) and (4808)). Chaff was only recorded in very low concentrations in two samples: <0-5> and <60-65> (contexts (4804) and (4807)). Waterlogged wood was recorded in moderate concentrations in all contexts, except context (4806), in which no remains were noted in all three samples assessed (<30-35>, <35-40>, <40-45>). Waterlogged seeds were recorded in moderate to high concentrations in all samples from all contexts. Mollusca and insects were present in moderate concentrations in all contexts except for context (48/004). Ostracoda were not recorded in the bulk sample assessment, but were noted during assessment of the adjacent column samples.

Table 4: Results of the bulk sample rapid assessment, Trenches 1, 2, and 3, PDZ5, Olympic Park

Sample number	Depth from top of sequence (cm)	Depth (m OD)	Context number	Volume (litres)	Fraction (e.g. flot, residue, >300µm)	Charred			Waterlogged		Mollusca	Insects
						Wood	Seeds	Chaff	Wood	Seeds		
Trench 1; West facing												
<2>	5-10	2.54 to	(102)	1	>300µm	-	-	-	-	-	-	-
		2.49			500µm-1mm	1	-	-	-	1	-	-
					>1mm	2	-	-	4	-	-	-
<4>	15-20	2.44 to	(108)	1	>300µm	-	-	-	-	-	-	-
		2.39			500µm-1mm	1	-	-	-	-	-	-
					>1mm	2	-	-	4	1	-	-
<6>	25-30	2.34 to	(108)/	1	>300µm	-	-	-	-	-	-	-
		2.29	(103)		500µm-1mm	-	-	-	-	-	-	
					>1mm	1	-	-	3	-	-	

<8>	35-40	2.24 to	(103)	1	>300µm	-	-	-	-	-	-	-
		2.19			500µm-1mm	-	-	-	-	1	-	2
					>1mm	1	-	-	1	2	-	-
<10>	10-15	1.79 to	(103)/	1	>300µm	1	-	-	-	-	-	1
		1.74	(109)		500µm-1mm	1	-	-	-	3	-	2
					>1mm	2	-	-	2	5	-	2
<12>	20-25	1.69 to	(109)	1	>300µm	-	-	-	-	-	-	-
		1.64			500µm-1mm	-	-	-	-	-	-	2
					>1mm	-	-	-	2	1	-	2
<14>	30-35	1.59 to	(104)	1	>300µm	1	-	-	-	-	-	-
		1.54			500µm-1mm	1	-	-	-	-	-	-
					>1mm	1	-	-	1	-	-	-
Trench 2; West facing												
<7>	5-10	2.01 to	(205)	1	>300µm	-	-	-	-	-	-	-
		1.96			500µm-1mm	-	-	-	-	-	-	-
					>1mm	-	-	-	-	-	-	-

<9>	15-20	1.91 to	(205)	1	>300µm	-	-	-	-	-	-	-
		1.86			500µm-1mm	-	-	-	-	-	-	
					>1mm	-	-	-	-	-	-	
<11>	25-30	1.81 to	(205)	1	>300µm	-	-	-	-	-	-	-
		1.76			500µm-1mm	-	-	-	-	-	-	
					>1mm	-	-	-	-	-	-	
<13>	35-40	1.71 to	(206)	1	>300µm	1	-	-	-	-	-	
		1.66										

Key: 0 = Estimated Minimum Number of Specimens (MNS) = 0; 1 = 1 to 25; 2 = 26 to 50; 3 = 51 to 75; 4 = 76 to 100; 5 = 101+

Table 5: Results of the bulk sample rapid assessment, Trenches 7, 8, 9 and 48, PDZ6, Olympic Park

Sample number	Depth from top of sequence (cm)	Depth (m OD)	Context number	Volume (litres)	Fraction (e.g. flot, residue, >300µm)	Charred			Waterlogged		Mollusca	Insects
						Wood	Seeds	Chaff	Wood	Seeds		
Trench 7; East facing												
<1>	0-5	1.50 to	(704)	6	>300µm	-	-	-	-	-	-	-
		1.45			500µm-1mm	-	-	-	-	-	-	
					>1mm	2	-	-	-	-	-	
<3>	10-15	1.40 to	(709)	5	>300µm	-	-	-	-	-	-	2
		1.35			500µm-1mm	2	-	-	-	-	-	2
					>1mm	2	-	-	2	-	-	2
<5>	20-25	1.30 to	(709)	5	>300µm	-	-	-	-	-	-	3
		1.25			500µm-1mm	-	-	-	-	1	-	2
					>1mm	-	-	-	-	-	-	-

<7>	30-35	1.20 to	(709)	6	>300µm	-	-	-	-	-	-	-
		1.15			500µm-1mm	-	-	-	1	1	-	-
					>1mm	3	-	4	-	-	-	-
<9>	40-45	1.10 to	(709)	1	>300µm	1	-	-	-	-	-	-
		1.05			500µm-1mm	-	-	-	-	3	-	1
					>1mm	-	-	-	2	2	-	-
Trench 8; West facing-south												
<1>	0-5	2.24 to	(803)	1	>300µm	-	-	-	-	-	1	-
		2.19										
<3>	10-15	2.14 to	(807)	1	>300µm	1	-	-	-	1	-	1
		2.09			500µm-1mm	1	-	-	-	1	-	2
					>1mm	1	-	-	-	-	-	-
<5>	20-25	2.04 to	(807)	1	>300µm	-	-	-	-	-	-	-
		1.99			500µm-1mm	1	-	-	1	-	-	1
					>1mm	-	-	-	2	2	-	-
<7>	30-35	1.94 to	(807)	1	>300µm	-	-	-	-	-	-	1

		1.89			500µm-1mm	-	-	-	1	2	1	2
					>1mm	-	-	-	2	-	3	1
<9>	40-45	1.84 to	(807)	1	>300µm	-	-	-	-	-	-	-
		1.79			500µm-1mm	-	-	-	-	2	-	2
					>1mm	3	2	-	-	-	2	2
<11>	50-55	1.74 to	(807)	1	>300µm	1	-	-	-	-	-	1
		1.69			500µm-1mm	-	-	-	-	-	2	2
					>1mm	2	-	-	-	5	2	-
Trench 9; East facing												
<10>	0-5	1.58 to	(903)	1	>300µm	-	-	-	-	-	-	-
		1.53			500µm-1mm	-	-	-	-	-	-	-
					>1mm	1	-	-	2	-	-	-
<12>	10-15	1.48 to	(904)	1	>300µm	-	-	-	-	-	-	-
		1.43			500µm-1mm	-	-	-	-	-	-	1
					>1mm	1	-	-	3	-	-	-
<14>	20-25	1.38 to	(904)	1	>300µm	-	-	-	-	-	-	-

		1.33			500µm-1mm	-	-	-	-	-	-	-
					>1mm	1	-	-	5	-	-	-
<16>	30-35	1.28 to	(904)	1	>300µm	-	-	-	-	-	-	-
		1.23			500µm-1mm	-	-	-	-	-	-	-
					>1mm	-	-	-	5	-	-	-
<18>	40-45	1.18 to	(906)	1	>300µm	-	-	-	-	-	-	-
		1.13			500µm-1mm	-	-	-	-	-	-	1
					>1mm	2	1	-	2	3	-	-
Trench 48; North facing												
<0-5>	0-5	2.01 to	(4804)	1	>300µm	1	-	-	1	1	-	-
		1.96			500µm-1mm	1	-	-	2	2	-	-
					>1mm	1	-	1	2	2	-	-
<10-15>	10-15	1.91 to	(4805)	1	>300µm	1	-	-	-	-	1	-
		1.86			500µm-1mm	-	-	-	-	1	2	1
					>1mm	2	-	-	2	3	-	-
<20-25>	20-25	1.81 to	(4805)	1	>300µm	-	-	-	-	1	-	-

		1.76			500µm-1mm	-	-	-	-	2	2	3
					>1mm	2	1	-	2	3	2	1
<30-35>	30-35	1.71 to	(4806)	1	>300µm	1	-	-	-	-	1	-
		1.66			500µm-1mm	-	-	-	-	-	2	3
					>1mm	-	2	-	-	2	3	3
<35-40>	35-40	1.66 to	(4806)	1	>300µm	1	-	-	-	-	-	1
		1.61			500µm-1mm	1	-	-	-	-	2	2
					>1mm	-	2	-	-	4	1	3
<40-45>	40-45	1.61 to	(4806)	1	>300µm	1	-	-	-	-	1	-
		1.56			500µm-1mm	1	-	-	-	1	2	1
					>1mm	2	1	-	3	3	2	2
<50-55>	50-55	1.51 to	(4807)	4	500µm-1mm	1	-	-	-	-	2	2
		1.46			>300µm	1	-	-	-	-	1	-
					>1mm	2	-	-	3	3	3	2
<60-65>	60-65	1.41 to	(4807)	1	>300µm	1	-	-	-	-	-	-
		1.36			500µm-1mm	1	-	-	-	2	-	1

					>1mm	2	-	1	3	2	-	3
<70-75>	70-75	1.31 to 1.26	(4807)/ (4808)	1	>300µm	1	-	-	-	-	-	1
					500µm-1mm	-	-	-	-	1	2	2
					>1mm	-	-	-	3	2	4	3
<75-80>	75-80	1.26 to 1.21	(4808)	1	>300µm	1	-	-	-	-	1	1
					500µm-1mm	1	-	-	-	-	-	1
					>1mm	3	1	-	2	3	3	-

Key: 0 = Estimated Minimum Number of Specimens (MNS) = 0; 1 = 1 to 25; 2 = 26 to 50; 3 = 51 to 75; 4 = 76 to 100; 5 = 101+

CONCLUSIONS

The rapid environmental archaeological assessment was conducted to evaluate the potential of the column and bulk samples collected during the archaeological excavations of Trenches 1, 2 and 3 (PDZ5), 7, 8, 9 and 48 (PDZ6) to address the aims proposed for PDZ5 and 6 (see MoLAS-PCA, 2007a, b, c, d; AOC-RPS Planning, 2008a, b). The organisation of the sediments described and discussed in this account is entirely consistent with the borehole records illustrated and described in the DDBAs (MoLAS-PCA, 2007c, d). The Holocene alluvium of the River Lea and its tributaries in the area of interest is mainly preserved between *ca.* 0.5m and *ca.* 3.5m OD with active channel deposits in the lower half of this height range and overbank deposits in the upper half. The channel deposits occupy depressions cut down into an underlying body of gravel, the Lea Valley Gravel, from a gravel surface that is generally found at a level close to 2.00m OD. The borehole record suggests that the floors of these depressions are not normally below 0.0m OD but may in some places be cut down to as much as -9.0m OD. The findings reported here give no indication of downcutting even as far as 0.0m OD. Although any palaeogeographical reconstruction of the channel network on the floor of the prehistoric Lea valley must at this stage be very tentative due to the scattered distribution of the sample points, nevertheless the present findings are largely consistent with existing reconstructions, but also indicate that further investigation is likely to refine the details of the model.

The results of the zooarchaeological and archaeobotanical rapid assessments indicate the preservation low to high concentrations of microfossil (pollen and diatoms), and macrofossil (charcoal, charred seeds, chaff, waterlogged wood and seeds, Mollusca, Ostracoda and insects) remains in all trenches from PDZ5 and PDZ6 (with the exception of Trench 2, PDZ5). In addition, an abundance of sedimentary/archaeobotanical material is available for the radiocarbon dating of specific events. Four horizons have been specifically selected for range-finder radiocarbon dating, the results of which are pending, and will be submitted in an updated version of this report.

Each of the PDZ5 and PDZ6 aims are addressed below based upon the results of the rapid assessment.

Aims

PDZ5

1. Do deposits pre-dating the Last Glacial Maximum, which might correspond with the Arctic Beds, exist within non-reworked gravels on the site? What is the potential for past environment reconstruction and/or Late Upper Palaeolithic activity in these deposits?
2. Do Late Glacial Deposits exist within re-worked gravels? What is the potential for past environment reconstruction and/or Late Upper Palaeolithic activity from these deposits?

The results of the rapid assessment indicate that no sediments from the Late Glacial or pre-dating the Last Glacial Maximum have been identified.

3. Does evidence for Mesolithic activity (similar to that in the Colne Valley) exist in the clayey gravels recorded above Pleistocene gravel on the site?

No indications of Mesolithic activity were identified in these sediments from PDZ5.

4. What are the characteristics of the gravel surface and overlying alluvium in the central and southern parts of the site, for which no data currently exists?

The results of the rapid assessment indicate that Trenches 2 and 3 show an undissected remnant of the Late Devensian Lea Valley Gravel of unknown extent surviving in the south-east corner of the area.

5. Did the Hackney Brook and/or River Lea cross the site in the Holocene and is there evidence for human activity from the Mesolithic onwards associated with these rivers?

There is no new evidence in the sedimentary record bearing on the course of the River Lea or the Hackney Brook, except that evidently neither flowed across the SE corner of the area. Further assessment and analysis (if required) of the column (recorded as containing low to moderate concentrations of pollen, and occasional diatoms) and bulk samples (recorded as containing charcoal, waterlogged wood and seeds, and insects) obtained from Trench 1, in combination with a programme of radiocarbon dating may provide evidence of human activity from the Mesolithic period onwards.

6. What environmental evidence suitable for past landscape reconstruction exists within wetland deposits associated with ancient channels of the River Lea and Hackney Brook?

There is an abundance of preserved floral and faunal remains in the channel deposits forming the lower part of the Holocene alluvium. Further assessment and analysis (if required) of the column (recorded as containing low to moderate concentrations of pollen, and occasional diatoms) and bulk samples (recorded as containing charcoal, waterlogged wood and seeds, and insects) obtained from Trench 1, in combination with a programme of radiocarbon dating may provide evidence suitable for this past landscape reconstruction.

7. Can episodes of channel activity and abandonment be dated?

Sediments and macro-remains suitable for radiocarbon dating these events were recorded during the rapid assessment.

8. Is there evidence for areas of mud flats that are suggested to have covered much of the area in the later prehistoric eras?

There is no evidence for mudflats as such but silty floodplain deposits are widely preserved. They are likely to have carried a cover of vegetation as modern floodplains do.

9. Is there evidence for an agricultural landscape in the post-prehistoric eras, and if so how does it present itself? Is it possible to determine field boundaries and if so can they be dated?

No evidence specifically relevant to this topic were examined. However, further assessment and possible analysis (if recommended) of the various microfossil and macrofossil remains preserved in Trench 1, in combination with a programme of radiocarbon dating may provide evidence for post-prehistoric management of the landscape within the local area.

PDZ6

1. Do Late Glacial deposits exist within re-worked gravels in the southwest part of the zone (Landscape Zone 3)? What is the potential for past environment reconstruction and/or Late Upper Palaeolithic activity in these deposits?

The results of the rapid assessment indicate that no sediments from the Late Glacial or pre-dating the Last Glacial Maximum have been identified.

2. Did the Leyton River cross the zone in the Pleistocene or Holocene and is there evidence for human activity associated with the river?

The results of the rapid assessment indicate that the Letyon River entered the area from the north at its western margin and flowed south to be confluent with the proto-Lea near the southern end of the area. No evidence for human activity was observed within the sedimentary record, however, further assessment and possible analysis (if recommended) of the pollen, diatoms, and different classes of macroremain preserved in the various contexts from all the Trenches, in combination with a programme of radiocarbon dating will reveal any evidence of human activity.

3. Can channels of the River Lea be distinguished from its tributaries in the southwestern part of the zone? Does evidence for human activity, similar to that found in the Stratford Box, associated with the river, survive?

The Lea and the Leyton Rivers cannot be distinguished on sedimentological grounds, and evidence for human activity was not observed within the sedimentary record. However, further assessment and possible analysis (if recommended) of the pollen, diatoms, and different classes of macroremain preserved in the various contexts from Trenches 7, 8, 9 and 48, in combination with a programme of radiocarbon dating will reveal any evidence of human activity.

4. What environmental evidence suitable for past landscape reconstruction exists within deposits associated with ancient channels of the River Lea and its tributaries?

There is an abundance of preserved floral and faunal remains in the channel deposits forming the lower part of the Holocene alluvium. Further assessment and possible analysis (if required) of the column (recorded as containing low to moderate concentrations of pollen, and occasional diatoms) and bulk samples (recorded as containing charcoal, waterlogged wood and seeds, and insects) obtained from Trenches 7, 8, 9 and 48, in combination with a programme of radiocarbon dating may provide evidence suitable for this past landscape reconstruction.

5. Can episodes of channel activity and abandonment and wetland expansion across previously dry land surfaces on the zone be dated?

Episodes of channel activity can certainly be dated, as sediments and macro-remains suitable for radiocarbon dating were recorded during the rapid assessment. No unequivocal evidence of wetland expansion was recognised in the present phase of investigation, further assessment and possible analysis (if required) of the various types of micro- and macrofossil remains, is therefore necessary.

6. Is there any evidence of a Roman road and/or occupation activity within the area of the zone? If so, how does it relate to what is known of the settlement pattern further north in the Leyton area during the Roman period?

No evidence was recorded in the sedimentary record. However, further assessment and analysis (if required) of the micro- and macrofossil remains preserved in all trenches, together with a programme of radiocarbon dating may reveal evidence of Roman activity.

7. Is there any evidence of medieval and post-medieval agricultural activity present on the zone?

No evidence specifically relevant to this topic were examined. However, further assessment and possible analysis (if recommended) of the various microfossil and macrofossil remains preserved in Trench 1, in combination with a programme of radiocarbon dating may provide evidence for Medieval and Post-Medieval management of the landscape within the local area.

8. What was the pre-modern/pre-Victorian topography of the zone?

There is evidence for the development of a soil at the surface of silty alluvium forming the floodplain of the Lea.

9. Is there evidence for past water management, i.e. drainage ditches, mill remains, sluices and revetments associated with earlier courses of the Channelsea River/Henniker's Ditch and River Lea?

Insufficient evidence relevant to this question fell within the purview of the present report.

RECOMMENDATIONS

It is therefore recommended that further assessment and possible analysis (if required) is carried out on the archaeobotanical and zooarchaeological remains from the column (pollen and diatoms) and bulk (charcoal, charred seeds, waterlogged wood and seeds, insects, Mollusca and Ostracoda) samples, collected from PDZ5 (Trenches 1, 2 and 3) and PDZ6 (Trenches 7, 8, 9, and 48), in combination with a suitable radiocarbon dating program.

REFERENCES

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APPENDIX D – WOOD ASSESSMENT

An assessment of 2 samples of waterlogged wood from the Olympics site, London, Site Code OL-101-08.

Phil Austin

Introduction.

Waterlogged wood recovered from excavations on the Olympics site in east London, Site Code: OL/10108, by AOC Ltd. were submitted for assessment. The purpose of this assessment was to a). determine the identity of the wood and b). to record any evidence of woodworking or other forms of modification. The 2 pieces of wood investigated here, sample <912>, were recovered from context TR104.

Methodology.

Preparation for and identification of the wood followed standard procedures for the analysis of waterlogged wood as described in Hather (2000).

The overall dimensions: width, length and depth, of each piece of wood were recorded (in mm) along with growth ring characteristics. Evidence of woodworking, e.g. tool marks or saw marks, and of conversion by splitting or sawing were recorded if present.

Results.

A summary of the findings of this assessment are presented in Table 1. (below). Both pieces of wood in this sample were identified as *Alnus glutinosa* (Alder). Two much smaller wood elements within the sample are believed to derive from the 2 larger wood elements and were also identified as Alder.

TABLE 1. SAMPLE <912> SUMMARY OF WOOD IDENTIFICATIONS AND DESCRIPTIONS

Samp No.	Identification	Dimensions	Description	Conversion	Woodworking
912	<i>Alnus glutinosa</i> (Alder)	W = 188mm. D = 70mm. L = 485mm.	Heavily weathered. 'Sickle' shaped.	Uncertain - Possibly split stem-wood.	None evident
	<i>Alnus glutinosa</i> (Alder)	W = 582mm. D = 210mm. L = 740mm.	Heavily weathered. Roughly rectangular.	Uncertain - Possibly radially split stem-wood.	None evident
KEY: W = Width; L = Length; D = Depth.					

2.

Remarks

Both wood elements were heavily weathered and exhibited extensive damage caused by the activities of wood boring invertebrates. Much of the original surface of the wood had been removed by water erosion and no evidence of tool marks or any other form of woodworking were evident on either element. Orientation of anatomical features (rays and growth rings) viewed in transverse section suggest that the wood may have been radially split, however, this is by no means certain. The 'sickle' shaped curvature of one element closely followed the longitudinal orientation of the wood grain and had not been formed artificially. In cross section this wood was oval rather than round. It is thought that it is more likely that it become partly flattened over time rather than having been split in some way. Though probable, it is unclear if the (more or less) rectangular wood element, which did appear to have been split radially, had been worked or not.

Alder is a tree closely associated with watercourses and wetlands and the wood studied here possibly came from trees growing in the area and could have been shed naturally as part of the ageing process.

The extensive and relatively broad tunnels (approx. 8mm diameter/width) were probably caused by marine wood-boring mollusca. In conjunction with clear evidence of significant weathering this suggests that these pieces of wood had been submerged or partly submerged in water for a considerable time.

REFERENCE

Hather, J. (2000) *The Identification of the Northern European Woods. A guide for archaeologists and conservators*. London: Archetype.

APPENDIX E - PRELIMINARY SCAN OF POTTERY, CLAY PIPE AND CERAMIC BUILDING MATERIALS

THE OLYMPICS (OL-101-08)

Preliminary Scan/Assessment Report prepared by Archaeology South-East on behalf on AOC Archaeology Group

January 2009 / February 2009

Archaeology South-East Finds and Environmental Specialist Services

Units 1 & 2
2 Chapel Place
Portslade
EAST SUSSEX
BN41 1DR

Preliminary Scan of the Pottery by Luke Barber

- 701** Several conjoining fragments from a refined white earthenware (REFW) funnel (a parallel to this vessel has not been found to date) with blue internal transfer-printed owner's mark: 'POPLAR AND STEPNEY SICK ASYLUM' in a garter. The Poplar and Stepney Sick Asylum was founded in 1868 under the Metropolitan Poor Act of 1867. It was built at Bromley-by-Bow and opened in 1873. It was later renamed St Andrews Hospital in 1921. The 'funnel', possibly used for feeding/sanitary purposes would be in keeping with a later 19th- to early 20th- century date.
- 702** X1 sherd of PMR flower pot rim. Although this could be placed in an 1800-1940+ date range this piece is probably after the mid 19th
- X1 sherd from a PMR glazed jar which could belong to anywhere between about 1750 and 1900.

The Clay Tobacco Pipe by Elke Raemen

A single stem fragment was recovered from alluvium [702]. The 19th-century piece is plain, lacking any stamps or decoration.

Significance and potential

As the fragment does not contain any maker's marks, it confirms rather than refines the pottery date. Only one fragment was recovered and there is therefore no potential for further work. However, further stages of the excavations may produce a more significant assemblage with more potential to contribute to the dating evidence.

Preliminary Scan of Ceramic Building Materials by Susan Pringle and Sarah Porteus

Ceramic building materials from four contexts were examined. The brick and tile were of Roman and post-medieval date; no medieval tile was noted. Two fragments of what may be prehistoric pierced clay slab were returned to AOC for accessioning [702].

Table 1 sets out the nature and date of material in each context.

Table 1

Context	Material	Date range
902	Post-medieval brick	Probably 17 th -18 th century AD
4808	Roman brick	c. AD 50-400
702	Pierced fired clay slab(?)	Probably prehistoric
702	Post-medieval Pegtile, pantile and brick.	Probably C16 th -C19 th
902	Peg tile	Post-medieval, probably 17 th -18 th c AD

The Post medieval assemblage from (702) consists mostly of unabraded unfrogged brick, pegtile and pantile typical of those used in London in the 17th and 18th centuries. Two highly abraded fragments of brick also from the context may be of slightly earlier date, probably from the 16th century onwards. The smaller abraded material may have been transported to the site as part of the alluvial deposition process.

Significance and potential

The material has the potential to date the context from which it was recovered. The assemblage is thought to hold little local or national significance and has no potential for further work.

The Roman brick has the imprints of a hob-nailed shoe or sandal, and on the base a thick layer of coarse opus signinum mortar which suggests it may have come from a substantial structure.

The post-medieval brick and tile is typical of that used in London in the 17th and 18th centuries. The absence of medieval tile suggests that in areas not occupied by post-medieval structures there may be good survival of Roman and possibly prehistoric archaeology.

The Fired Clay by Elke Raemen

Two fine sand-tempered, reduced slab fragments, including one corner fragment, were recovered from [702]. Occasional elongated organic temper has been observed both on the surfaces and within the fabric. The fragments measure 10 to 15 mm thick, with both surfaces crudely finished. Pieces exhibit irregular perforations, including at least five in one piece, ranging in diameter between 2 and 4 mm. The fragments, although appearing prehistoric, do not show any resemblance to the perforated clay slabs common on Late Bronze Age sites.

Significance and Potential

Parallels need to be sought in order to establish the nature of these pieces. Further, if they can be attributed to a period, they will provide some dating evidence for this particular feature.

APPENDIX F – ANIMAL BONE ASSESSMENT

OL-101-08 Animal bone

Three fragments of animal bone were recovered from alluvial deposits. One of the fragments is a complete right metatarsal III of an adult horse. No cut marks are visible on the bone. The following measurements were taken on the bone: Bp=46.1mm, SD=28.5mm, Bd=45.5mm. The other two animal bones are rib fragments from a large mammal and based on the cross section of the bones they were probably also from a horse.

One fragment of a large mammal longbone was recovered from (4808) and large mammal rib from context (708).

Horse (911)

The remains of a partial horse skeleton (911) comprising of the skull, axis, two cervical vertebrae, two thoracic vertebrae, left scapula, proximal radius and ulna, right radius and ulna, both sides of the pelvis, right femur, both tibiae, right astragalus, and left and right calcaneum (details of the skeleton are given in Table 1). All of the long bones were fused indicating that the horse was adult and the presence of canines demonstrates that the horse was a male. Disturbance of the skeleton is suggested by the incompleteness of the remains and there was also an additional left tibia indicating that the remains of a second adult horse were present. The proximal left ulna is slightly dog gnawed. No cut marks were visible on the bones. Measurements taken on the longbones indicate that the horse would have been approximately 1.33-1.37m high at the shoulder (based on the method of Kiesewalter 1888, published in von den Dreisch and Boessneck 1974). Crown heights of the maxillary teeth that are loose from the skull indicate that the horse approximately 9-10 years of age at death (based on the method of Levine 1982). There was no evidence of any pathologies on the skeletal remains.

If the horse is early in date (i.e. prehistoric) it is worth publishing the horse skeleton in comparison to other horses of a similar date, but the value of further analysis depends on dating of the botanical material associated with the horse or the skeleton itself.

Element	Present	Measurements (mm)	Comments
Skull	x	P2 crown height=36.1, P4=56.0, M1=46.9	left and right canines
Left mandible	x		
Right mandible			
Atlas			
Axis	x		
Cervical vertebrae	x		two vertebrae
Thoracic vertebrae	x		two vertebrae, epiphyses fusing, one slightly dog gnawed
Lumber vertebrae			
Sacrum			
Left scapula	x	GLP=95, SLC=64.9, BG=47.9	fused
Right scapula			
Left proximal humerus			
Right proximal humerus			
Left distal humerus			
Right distal humerus			
Left proximal radius	x	BFp=75.6	fused
Right proximal radius	x	Bp=80.9, BFp=72.9, GL=315, GIL=392	fused
Left distal radius			
Right distal radius	x	Bd=75.0m BFd=62.3	fused
Left proximal ulna	x		proximal end slightly dog gnawed
Right proximal ulna	x		fused
Left metacarpal II			
Right metacarpal II			
Left metacarpal III+IV			
Right metacarpal III+IV			
Left metacarpal V			
Right metacarpal V			

Left Pelvis	x		fused
Right pelvis	x		fused
Left proximal femur			
Right proximal femur	x		fused
Left distal femur			
Right distal femur	x		fused
Left patella	x		
Right patella			
			two bones, one complete and fused, the
Left proximal tibia	x	LL=308	other has post-mortem damage to proximal
			end, the complete one is a matched pair
			with the right tibia
Right proximal tibia	x		fused
		Bd=76.5, second bone Bd=70.0 and	
Left distal tibia	x	LL=307	two bones, both fused
Right distal tibia	x	Bd=71.3	fused
Left astragalus			
Right astragalus	x		
Left calcaneum	x	GL=107.1	
Right calcaneum	x	GL=107.2	fused
Left metatarsal II			
Right metatarsal II			
Left metatarsal III+IV			
Right metatarsal III+IV			
Left metatarsal V			
Right metatarsal V			
Phalanx I			
Phalanx II			
Phalanx III			

Table 1: Bones present, osteometric measurements and other details about the horse skeleton (911).

Von den Driesch, A. and Boessneck, J. 1974. Kritische anmerhungen zur widerristhöhenberechnung aus längenmaßen vor- und frühgeschichtliche tierknochen. *Säugetierkundliche mitteilungen* 22: 325-348.

Levine, M. 1982. The use of crown height measurements and eruption-wear sequences to age horse teeth. In Wilson, B., Grigson, C. and Payne, S. (eds.) *Ageing and sexing animal bones from archaeological sites*. pp. 223-250. Oxford: British Archaeological Reports, British series 109.

APPENDIX G – METALWORK ASSESSMENT REPORT

A Heald

February 2009

SUMMARY OF MATERIAL

One copper alloy circular object (SF 1) was recovered from modern made ground (Context 4801). The object's edge is chipped in places and both faces are corroded making recognition of distinctive marks, if any, difficult. The object has not been conserved. The circular disc may be a coin, although it is impossible to be sure.

SIGNIFICANCE OF DATA & RECOMMENDATIONS FOR FUTURE WORK

The modern context of the find, together with the lack of diagnostic features makes further discussion difficult. No further work is recommended.

APPENDIX H - OLYMPIC SITE ASSESSMENT REPORT FOR THE CONSERVATION OF A COPPER DISK

Summary

The following is an assessment of conservation needs for the finds from Olympic site OL 101 08. The work requested is to assess the conservation needs of the assemblage for long term curation in the Museum of London archives. Wherever possible, preventative rather than interventive conservation strategies are implemented. Procedures aim to obtain and retain the maximum archaeological potential of each object.

Description

One copper alloy circular object (SF 1) was recovered from modern made ground (Context 48/011).

Finds analysis/investigation

The accessioned finds were assessed by visual examination of both the objects and the X-radiographs, closer examination where necessary was carried out using a binocular microscope at high magnification. The accessioned finds were reviewed with reference to the finds assessments by Andy Heald. No analytical work was identified by the small finds specialist.

Condition

Object is in an unstable condition, with active corrosion apparent on the surface. The object's edge is chipped in places and both faces are corroded making recognition of distinctive marks, if any, difficult. The circular disc may be a coin, although it is impossible to be sure

List of artefacts:

Finds No	Site code	Context no.	Description	X-ray No.
1	OL 101 08	4801	Copper disk	1

X-ray catalogue:

X-Ray No	Volts(KeV)	Time (secs)	Finds no.
----------	------------	-------------	-----------

1	60	3	4811
	60	4	
	70	3	



X-ray 1

Recommended treatment

It is recommended that the artefact undergo superficial cleaning using scalpels and wooden tools under the microscope. To ensure stability of the find, chemical stabilisation should be carried out using 3% BTA in IMS in immersion under vacuum, followed by rinsing in IMS. A coating of 15% Inralac in acetone, applied by immersion and repeated up to three times should be applied to enhance stability. The last layer should contain a small amount of matting agent to minimise glare and shininess. The finds should be packed according to current standards at Museum London archive and stored in a sealed box with silica gel.

Packaging for archive

The Museum of London's archive standards (1999) state that the accessioned finds need to be appropriately packed and stabilised before the site can be accepted into the archive. The work is required to bring them into line with the set standards and ensure that the archive is stable before transfer. The accession record needs to be completed, with accession numbers given to all the identified artefacts

Estimated time for conservation

LABOUR	No. hours
Conservation of copper	4
Images	1
Reporting	1
Total	6

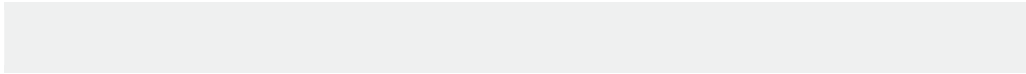
Proposed completion date: Within 1 month of approval

Conservator(s): Pieta Greaves

Date of report: 6/01/2009

APPENDIX I - OASIS FORMS

OASIS ID: AOCARCHA1-53280



Project details

Project name	Olympic Park, PDZ5
Project dates	Start: 12-11-2008 End: 02-12-2008
Previous/future work	Yes / No
Any associated project reference codes	OL-102-08 - Sitecode
Type of project	Field evaluation
Site status	None
Current Land use	Vacant Land 1 - Vacant land previously developed
Methods & techniques	'Environmental Sampling','Sample Trenches'
Development type	Olympic Park
Prompt	Planning condition

Position in the planning process After full determination (eg. As a condition)

Project location

Country England

Site location GREATER LONDON NEWHAM STRATFORD Planning Delivery
Zone 5, The Olympic Park, Stratford

Postcode E15 2

Study area 34.00 Hectares

Site coordinates TQ 37441 85460 51.5507702708 -0.01746127937860 51 33 02 N
000 01 02 W Point

Site coordinates TQ 37410 84610 51.5431388617 -0.01824018357130 51 32 35 N
000 01 05 W Point

Project creators

Name of Organisation AOC Archaeology Group

Project brief originator RPS Planning

Project design originator AOC Archaeology Group

Project director/manager Andy Leonard

Project supervisor Paul Harris

Name of sponsor/funding Olympic Delivery Authority (ODA)
body

Project archives

Physical Archive Exists? No

Physical Archive recipient Museum of London

Digital Archive recipient Museum of London

Digital Media available 'Images raster / digital photography','Text'

Paper Archive recipient Museum of London

Paper Media available 'Context sheet','Photograph','Plan','Report','Section'

Project bibliography 1

A forthcoming report

Publication type

Title Planning Delivery Zones 5 and 6, The Olympic Park, Stratford; An
Archaeological Evaluation

Author(s)/Editor(s) Harris, P.

Author(s)/Editor(s) Melikian, M

Date 2009

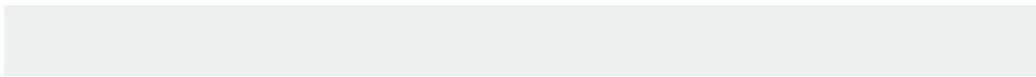
Issuer or publisher AOC Archaeology

Place of issue or
publication AOC Archaeology Twickenham

Entered by Paul Harris (paul.harris@aocarchaeology.com)

Entered on 29 January 2009

OASIS ID: AOCARCHA1-53273



Project details

Project name	Olympic Park, PDZ6
Project dates	Start: 02-06-2008 End: 12-11-2008
Previous/future work	Yes / Yes
Any associated project reference codes	OL-101-08 - Sitecode
Type of project	Field evaluation
Site status	None
Current Land use	Vacant Land 1 - Vacant land previously developed
Methods & techniques	'Sample Trenches'
Development type	Olympic development
Prompt	Planning condition

Position in the planning process After full determination (eg. As a condition)

Project location

Country England

Site location GREATER LONDON NEWHAM STRATFORD Planning Delivery
Zone 6, The Olympic Park, Stratford

Postcode E15 2

Study area 331170.00 Square metres

Site coordinates TQ 37430 85460 51.5507729565 -0.017619848453 51 33 02 N
000 01 03 W Polygon

Site coordinates TQ 37610 84775 51.5445728748 -0.01529306012930 51 32 40 N
000 00 55 W Polygon

Site coordinates TQ 38070 85660 51.5524137287 -0.00831553228885 51 33 08 N
000 00 29 W Polygon

Project creators

Name of Organisation AOC Archaeology Group

Project brief originator	EH GLAAS
Project design originator	RPS
Project director/manager	Andy Leonard
Project supervisor	Paul Harris
Type of sponsor/funding body	National Development Body
Name of sponsor/funding body	Olympic Delivery Authority



Project archives

Physical Archive recipient	Museum of London
Physical Contents	'Wood'
Digital Archive recipient	Museum of London
Digital Media available	'Database','Images raster / digital photography','Text'

Paper Archive recipient Museum of London

Paper Media available 'Context sheet', 'Plan', 'Report', 'Section'

Project bibliography 1

Publication type A forthcoming report

Title Planning Delivery Zones 5 and 6, The Olympic Park, Stratford; An
Archaeological Evaluation

Author(s)/Editor(s) Harris, P.

Author(s)/Editor(s) Melikian, M

Date 2009

Entered by Paul Harris (paul.harris@aocarchaeology.com)

Entered on 29 January 2009