

**A Geoarchaeological Evaluation at Unwins, Dartford, Kent**

**NGR 554020 174720  
Project No: 4217  
Site Code: DAU10**

**ASE Report No. 2010061  
OASIS id: archaeol6-76261**

**By Dr Matthew Pope and Liane Peyre**

**April 2010**

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**Abstract**

*A programme of archaeological and geo-archaeological evaluation was carried out at the former Unwins Depot Site, Dartford, Kent. The work was undertaken between March and April 2010. Three test pits (TP1-3) investigated the geological sequence with the specific aim of determining the presence of Pleistocene gravels and their potential for preserving Palaeolithic archaeology and palaeoenvironmental evidence.*

*Pleistocene gravels were not encountered in any of the trenches. Basal deposits did appear to indicate the sandy upper part of a Pleistocene fluvial sequence but these were devoid of finds and ecofacts. These sands were overlain by up to 1.5m of organic alluvium containing peat beds up to 200mm in thickness, samples of which are retained, but not processed due to heavy contamination by hydrocarbons. It is thought they are of Holocene age and appear to have been subject to drainage through ditch-cutting in the modern period.*

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## **1.0 INTRODUCTION**

### **1.1 Site Background**

- 1.1.1 Archaeology South East (ASE) were commissioned by Campbell-Reith (hereafter referred to as The Client) to undertake the excavation of three geoarchaeological test pits at the site, a former Unwins depot scheduled for demolition.
- 1.1.2 The site is centred on National grid Reference (NGR) 554020 174720 (Fig. 1). It is situated within the Victoria Industrial Park, Dartford. The site at the time of the excavation was covered with concrete slab and several buildings, including a large warehouse to the south of the site where the investigations were undertaken.
- 1.1.3 The site, since the excavation of the trial pits, has undergone demolition of existing warehouse buildings, the removal of concrete slabs covering the site and remediation of contaminated ground underlying the site. The redevelopment of the southern part of the site will include the erection of buildings with associated access, parking, turning and landscaping comprising a three storey building for B1 (office) purposes and a L-shaped one/two storey building to accommodate a mix of B1 (business uses) in workshops/studio units of varying sizes. Proposed foundations for the development would comprise of vibrated concrete columns penetrating into the gravels to a depth of up to 1m.

### **1.2 Geology and Topography**

- 1.2.1 The British Geological Survey (BGS) have mapped the site as being underlain by alluvium filling channels incised into the solid cretaceous Upper Chalk (Sheet 271: 1:50,000). The regional geological memoir suggests this part of the valley alluvial sequence contains bedded silt and clay sequences including peats beds with basal gravel units (Ellison et al 2004).
- 1.2.2 The gravels have not yet been characterised or assigned to any part of the Thames Terrace sequence, it may also be possible that they relate to the local terrace sequence of the River Darent. They are however, clearly of a character consistent with a Pleistocene age and consequently have potential to preserve Palaeolithic archaeology (Bridgland 1994, Wessex 1993; Wymer 1999).
- 1.2.3 A watching brief was carried out by Wessex Archaeology in November 2009. This was to monitor shallow ground contamination assessment pits excavated across the site. The investigation identified made ground to a depth of 1.7m across parts of the site resting on deposits of alluvial clay containing beds of peat. Examination of Borehole sequences indicated that gravel underlay the alluvial sequence at depths of depth 2.2 and 3m below ground level. These gravel deposits were substantial in depth, their contact with the underlying chalk being at around 9m below ground level (Wessex Archaeology 2010)

### **1.3 Aims and Objectives**

- 1.3.1 Archaeology South East were commissioned to characterise the Pleistocene Gravels at the site and assess these deposits for the potential to preserve either Palaeolithic artefacts or Pleistocene ecofacts/palaeoenvironmental evidence.
- 1.3.2 This work needed to be undertaken because the previous watching brief carried out at the site was only able to characterise the upper, alluvial part of the sequence and the bore hole records did not allow any direct assessment of potential.
- 1.3.3 The specific project objectives, as stated by Kent County Council (KCC) were to: a) ascertain the extent, depth below ground surface, depth of deposit, character, date and significance of any archaeological remains on site. b) establish the extent to which previous developments or other processes have affected archaeological deposits at the site. c) establish likely impact on archaeological deposits of the proposed development.
- 1.3.4 A Specification for the work was prepared by the Heritage Conservation Group of KCC (2010) and a subsequent Method Statement prepared by ASE (ASE 2010).
- 1.3.5 Given the contamination of Holocene sediments (see, Methodology, below), the primary aim of the investigation was directed to the cleaner, underlying, Pleistocene material. This change of approach from the WSI, was developed during the fieldwork and in consultation with Wendy Rogers (KCC) and Marian Cameron (Campbell Reith).

## **2.0 GEOARCHAEOLOGICAL BACKGROUND**

- 2.1** Archaeological potential at the site derives from two sources, the peat deposits within fine grained alluvium immediately underlying made ground at the site, and older coarse grained sand and gravel deposits of Pleistocene date at depths below 2m.
- 2.2** The peat deposits have the potential to produce datable palaeoenvironmental sequences and, potentially, to preserve structures of organic material such as at the Silvertown and Belmarsh trackways to the west of the site, but occurring in similar topographic positions (Wessex Archaeology 2010). These peat deposits were observed at the site by Wessex Archaeology during a watching brief at the site but no such structures were recorded. Despite obvious potential, detailed analysis of these Holecene peats was made impossible due to hydrocarbon contamination.

- 2.3** The underlying gravels offer potential in the form of a preservational context for Palaeolithic archaeology and associated palaeoenvironmental remains. The altitude of the gravels suggests they may belong to the Kemptown Park/Tilbury Marshes Formation and therefore date to the last glacial (MIS 5d-2). While deposits rich in Achuelean finds have been found previously within the lower reaches of the Darent Valley and the flanking valley sides (Wymer 1999) these have mostly come from deposits associated with either the Boyn Hill/Orsett Heath Terrace or the Taplow Mucking Terrace (Bridgland 1994; Gibbard 1994). No late Neanderthal or early AHM material dating to the last Glacial period has been recovered from these gravels within the immediate vicinity of the site (Roe 1968; Wymer 1999).

### **3.0 ARCHAEOLOGICAL METHODOLOGY**

- 3.1** Three test pits, measuring in excess of c. 2m x 3m, were machine excavated across the area of proposed development under archaeological supervision (Fig. 2).
- 3.2** Upon excavation, the ground was found to be heavily contaminated by hydrocarbons which affected the scope of approach to the investigation. Consequently, detailed analysis of the overlying, Holocene deposits carried an unquantifiable risk to specialists. Therefore, the Holocene sequence was recorded and sampled without the expectation of carrying out assessment of the material, (the samples were not processed but are retained by ASE). This approach was agreed during discussions between KCC, Campbell Reith and ASE.
- 3.3** The test pits were scanned prior to excavation using a Cable Avoidance Tool (CAT). All of the trenches were excavated under constant archaeological supervision, using a 12 tonne 360° tracked excavator, fitted with a toothless ditching bucket. All spoil removed from the test pits was scanned visually and with a metal detector for the presence of unstratified artefacts.
- 3.4** All encountered archaeological deposits, features and finds were recorded according to accepted professional standards in accordance with the approved KCC specification using pro-forma context record sheets. . Due to waterlogging and contamination, it was not possible to enter any of the test pits, therefore, the sampling and drawing of sections was not possible.
- 3.4** A full photographic record of the trenches and associated deposits and features was kept (including monochrome prints, colour slides and digital), and will form part of the site archive. The archive, which is presently held at the Archaeology South-East offices at Portslade, East Sussex, will be prepared and offered to Dartford Museum within the next 12 months.
- 3.5** Only undifferentiated topsoil, subsoil and overburden of recent origin was removed by machine and kept separately. The excavation was undertaken, in spits of no more than 0.1m for the top- and subsoil, down to the top of the first significant geoarchaeological horizon. Each test pit was excavated to depth of at least 3m to facilitate sampling of underlying deposits.

- 3.6** Where Holocene or Pleistocene sediments demonstrating moderate to excellent palaeoenvironmental potential were encountered, 40 litre bulk samples were to be taken off-site.. No sediment columns were taken as it was not safe to enter the pits. These samples were retained for future reference but given the established contamination of these sediments they were not to be sent for further analysis.
- 3.7** Once the Pleistocene sands and gravels were encountered the arisings were placed in 0.25m spit or stratigraphical order to enable description and recording. Dry sieving of 100 litre samples for each interval took place to look for lithic artefacts and ecofacts. In conjunction with the sieving, the spoil was constantly checked for artefacts/ecofacts as the trench was dug.

Number of Contexts	19 contexts
No. of files/paper record	1 file
Plan and sections sheets	3 sheet (6 sections)
Bulk Samples (40litres)	6
Photographs	20 photographs

Table 1: Quantification of site archive

#### 4.0 GEOARCHAEOLOGICAL OBSERVATIONS (Fig. 3)

##### TP 1

Depth (m)	Stratigraphy	Lithology	Colour	Coarse component	Sample	Notes
0	Made Ground	-	-			[100] Concrete raft
1.2	Made Ground	-	-	Sub-angular gravel		[101] Concrete raft
2.1	Chalk Raft	-	-			[103] flecks of cbm noted
2.2	Ditch cut and fill	Silt	10YR 2/2 very dark brown	80% sub-angular chalk 20-40mm	-	[104] fill of east west aligned [105] drainage ditch
2.2	Alluvium with peat beds	Silty clay	10YR2/2 very dark brown	none	BS1, BS2	[106] Base of hole 3.1m

Table 2: Sediment sequence within Geological Test Pit 1

##### TP 2

Depth (m)	Stratigraphy	Lithology	Colour	Coarse component	Sample	Notes
0	Made Ground	-	-			[200] Concrete raft
0.25	Made Ground	-	-	Sub-angular gravel		[201] Black Top
0.65	Made Ground	-	-	-	-	[202] Crushed Concrete.
1.1	Organic Deposits (Disturbed)	-	-	-	-	[203]
0.2-2.8m	Made Ground	-	-			[205] Concrete footing on north side of trench. [206] slot cut for foundation footings [207] chalk packing at base of slot cut. flecks of cbm noted
2.2	Alluvium with Peat Beds	Silt	10YR 2/2 very dark brown	-	BS1	[208] Reed fragments and hazel nut shell noted.
2.8-3.1m	Alluvium	Silty Sand-	G2 7/5BG Greenish Grey	Coarse sand laminations	BS2	[209] Concrete raft

Table 3: Sediment sequence within Geological Test Pit 2

**TP 3**

Depth (m)	Stratigraphy	Lithology	Colour	Coarse component	Sample	Notes
0	Made Ground	-	-			[300] Concrete raft
0.35	Made Ground	-	-	Sub-angular gravel		[301] Concrete raft
1.25	Chalk Raft	-	-			[303] flecks of cbm noted
1.45	Alluvium with peat beds	Silty clay	10YR2/2 very dark brown	none	BS1, BS2	[304] Base of hole 3.1m
2.35	Fine Sand	Fine Sand	G2 7/5BG Greenish Grey	<5% rounded flint gravel 10-40mm	100ltr Sieved at 0.25m intervals	[305] Base of hole at 3.2m

Table 4: Sediment sequence within Geological Test Pit 3

## **5.0 DISCUSSION**

- 5.1** The observed stratigraphic results revealed the following basic sedimentary sequence:
1. Made ground Including concrete rafts and tarmac over crushed concrete sub-base.
  2. Disturbed and contaminated alluvium
  3. Alluvium containing beds of peats up to 20mm in thickness.
  4. Coarse sand with thinly distributed gravels
- 5.2** The only archaeological features encountered appeared to be of a modern date. In TP1 a flat bottomed drainage ditch filled with packed chalk was encountered below made ground. This had flecks of ceramic building material (CBM) and a small fragment of modern brick (identified and discarded on site due to contamination). It is interpreted as a drainage ditch. In TP2 a deep slot cut had been made to take a concrete foundation footing for either a pre-existing concrete structure or some phase in the development of the current building. The base of the slot was packed with crushed chalk and the rest of the fill, to a depth of 2.8m, was filled with reinforced concrete foundations. A post-war date was considered likely for this structure.
- 5.3** The alluvial sequence was disturbed at the top and contaminated, on the basis of appearance and colour, by petrochemicals in TP1 and TP3. Towards the base it contained well preserved beds of reed peat up to 200mm in thickness within otherwise mineralgenic silty clay alluvial. While the object of the assessment was to characterise and sample the underlying Pleistocene fluvial gravels, these organic horizons were also sampled. The sampled material contains macroscopic plant remains including preserved wood which have been visually examined but not formally assessed due to the contamination of these deposits, as discussed above (3.2)
- 5.4** No gravel beds were encountered in any of the test pits. Instead, the basal part of each sequence comprised gleyed coarse to medium sands within a silty clay matrix. In TP3, there were thinly distributed fluvial gravel clasts but not discrete beds. The latter were sieved yet no human artefacts or ecofacts were encountered. The sands were waterlogged and excavation had to proceed carefully. Consequently, it was not possible to obtain an uncontaminated OSL (Optically Stimulated Luminescence) sample from the trench sides to directly date these basal deposits.
- 5.5** It is supposed these sands represent the upper facies of the underlying gravel beds, which form a fining-upwards sequence from coarser gravels at their base to these sandy facies encountered at 2.8m depth.

**6.0 CONCLUSION: SIGNIFICANCE AND POTENTIAL FOR FURTHER WORK**

**6.1** On the basis of altitudinal position and the results of the geotechnical borehole survey it is likely that gravels of Devensian Age underlie the Unwins site. Only the surface sandy facies of these fluvial deposits were encountered (at c.3m depth) during the excavation and these did not appear to contain Palaeolithic archaeology or significant palaeoenvironmental evidence.

**6.2** The overlying sequence of peat clays does potentially offer potential as depositional contexts. However, neither during this investigation nor the previous watching brief carried out by Wessex Archaeology, were any significant archaeological remains recovered from these relatively shallow deposits. The upper facies of these deposits are disturbed which probably occurred during the construction of the building. Below 2m however, these deposits are well preserved and retain their sedimentary structure. The Holocene deposits were contaminated throughout by hydrocarbons.

**6.3** The only archaeological features recorded were a single recent drainage ditch and a slot trench to take a concrete foundation.

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## **ACKNOWLEDGEMENTS**

ASE would like to thank Marion Cameron of Campbell-Reith for commissioning the work, David Hodgkins (Site Manager for support) and Wendy Rogers and Teresa Hawtin of KCC for their guidance. Illustrations were by Justin Russell (ASE)

**SMR Summary Form**

Site Code	DAU10					
Identification Name and Address	Unwins, Dartford. Victoria Industrial Park					
County, District &/or Borough	Dartford					
OS Grid Refs.	NGR) 554020 174720					
Geology	Alluvium over Upper Chalk					
Arch. South-East Project Number	4217					
Type of Fieldwork	Eval. x	Excav.	Watching Brief	Standing Structure	Survey	Other
Type of Site	Green Field	Shallow Urban	Deep x Urban	Other		
Dates of Fieldwork	Eval. March-April 2010	Excav.	WB.	Other		
Sponsor/Client	Reith-Campbell					
Project Manager	Jon Sygrave/Darryl Palmer					
Project Supervisor	Matthew Pope					
Period Summary	Palaeo.	Meso.	Neo.	BA	IA	RB
	AS	MED	PM x	Other Modern		
<p><i>A programme of archaeological and geo-archaeological evaluation was carried out at the former Unwins Depot Site, Dartford, Kent. The work was undertaken between March and April 2010. Three test pits (TP1-3) investigated the geological sequence with the specific aim of determining the presence of Pleistocene gravels and their potential for preserving Palaeolithic archaeology and palaeoenvironmental evidence.</i></p> <p><i>Pleistocene gravels were not encountered in any of the trenches. Basal deposits did appear to indicate the sandy upper part of a Pleistocene fluvial sequence but these were devoid of finds and ecofacts. These sands were overlain by up to 1.5m of organic alluvium containing peat beds up to 200mm in thickness, samples of which are retained, but not processed due to heavy contamination by hydrocarbons. It is thought they are of Holocene age and appear to have been subject to drainage through ditch-cutting in the modern period.</i></p>						

OASIS Form

OASIS ID: archaeol6-76261

Project details

Project name Unwins Dartford

Short description of the project A Geo-archaeological evaluation for Palaeolithic potential on an ex-industrial site in Dartford.

Project dates Start: 01-02-2010 End: 10-04-2010

Previous/future work Yes / No

Any associated project reference codes 4217 - Sitecode

Type of project Environmental assessment

Site status None

Project location

Country England

Site location KENT DARTFORD DARENTH Dartford Unwins

Study area 2.00 Hectares

Height OD / Depth Min: 0m Max: 3.00m

Project creators

Name of Organisation Archaeology South East

Project brief originator Campbell-Reith

Project design originator Kent County Council

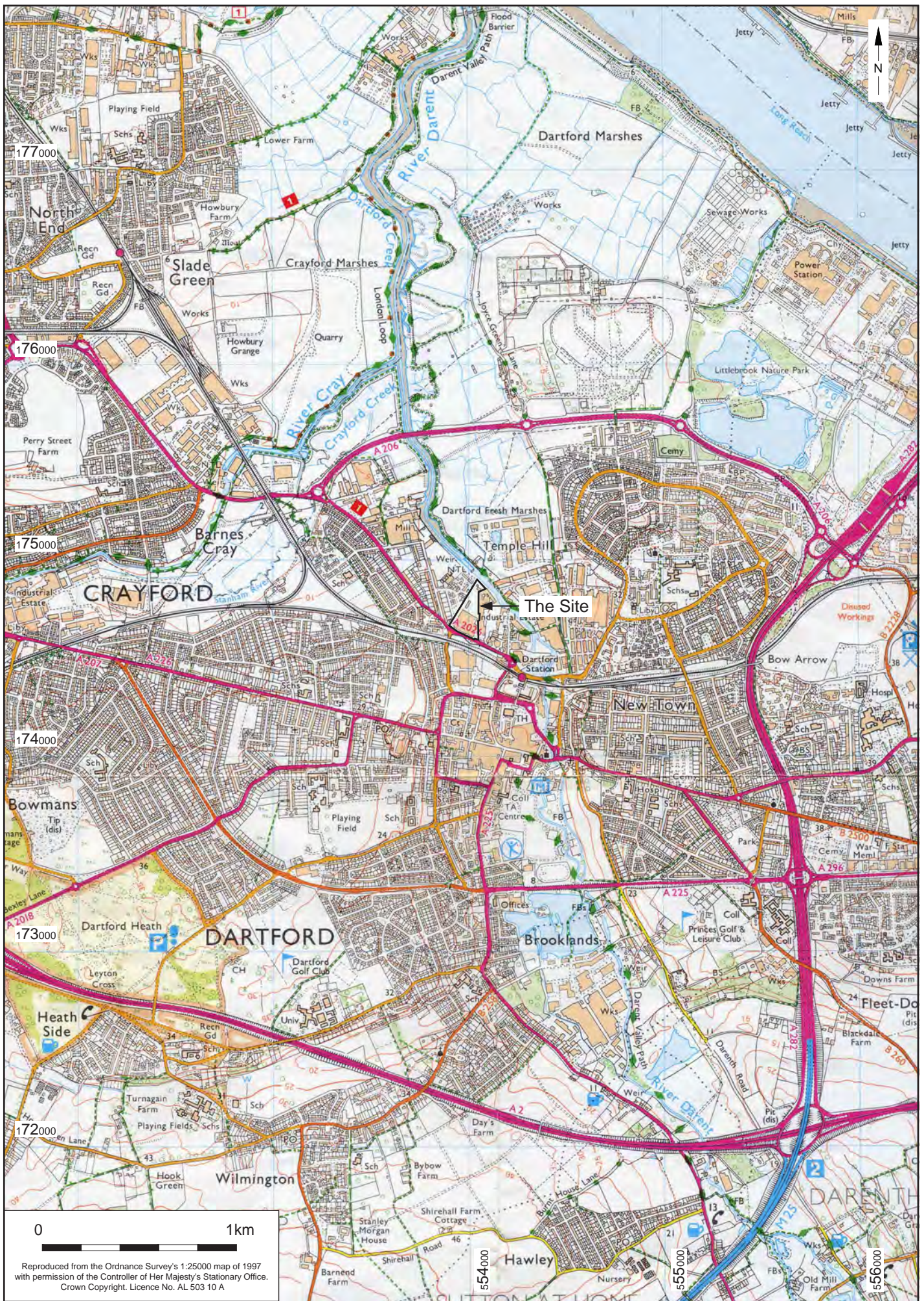
Project director/manager Darryl Palmer

Project supervisor Matt Pope

Type of sponsor/funding body Developer

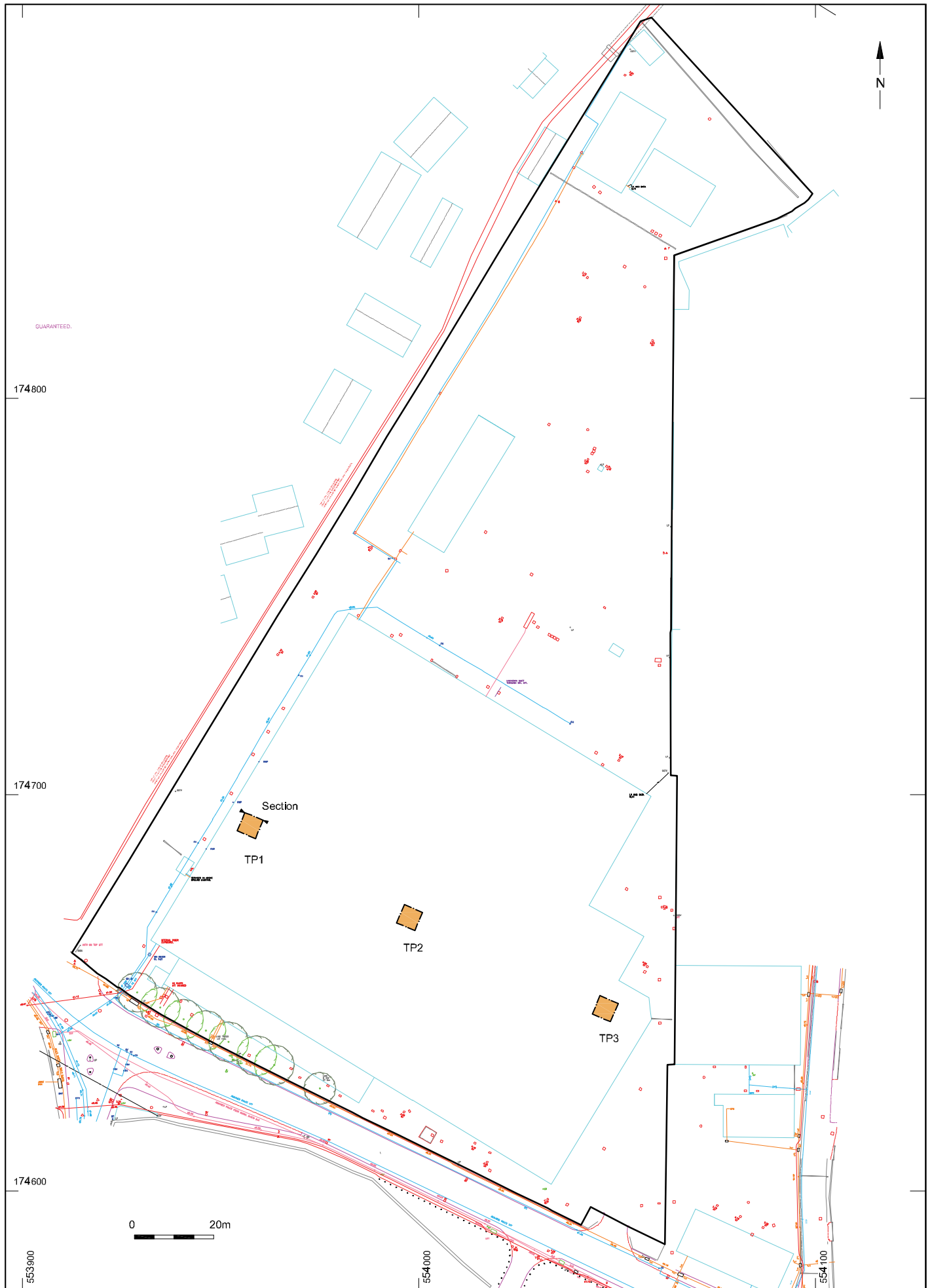
Entered by Matt Pope (m.pope@ucl.ac.uk)

Entered on 27 April 2010



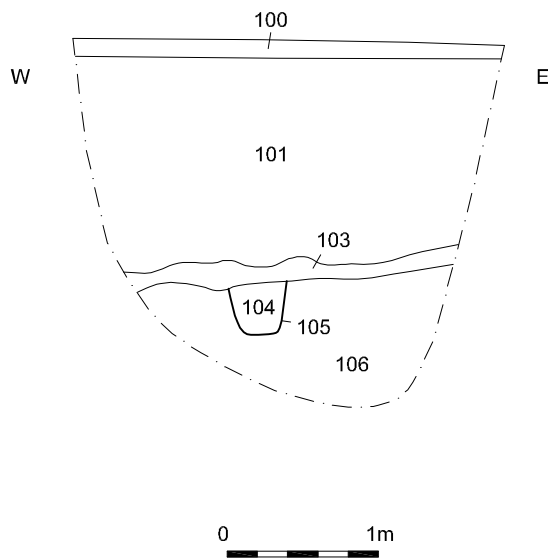
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Project Ref: 4217	May 2010	Site location	
Report Ref: 2010061	Drawn by: JLR		



© Archaeology South-East		Unwins, Dartford		Fig. 2
Project Ref: 4217	May 2010	Site plan showing location of test pits		
Report Ref: 2010061	Drawn by: JLR			

Geological test pit 1



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