CAXTON WORKS, THE MOSS BUILDINGS AND GOSWELL BAKERIES, CAXTON STREET NORTH, CANNING TOWN (SITE CODE: CSN14): ENVIRONMENTAL ARCHAEOLOGICAL ASSESSMENT REPORT

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INTRODUCTION

This report summarises the findings arising out of the environmental archaeological assessment undertaken by Quaternary Scientific (University of Reading) in connection with the proposed development at Caxton Works, The Moss Buildings and Goswell Bakeries, Caxton Street North, Canning Town (National Grid Reference: TQ 397 810; site code: CSN14; Oasis ID: quaterna1-188235; Figure 1). The site is in the lower valley of the River Lea, to the east of the river and close to the confluence of the Lea with the River Thames. The western boundary of the site is approximately 300m from the present-day channel of the Lea at a point where the river, known here as Bow Creek, follows a very convoluted meandering course. The mouth of Bow Creek, at its confluence with the Thames, lies *ca*. 400m to the southeast of the site. The British Geological Survey (1:50,000 Sheet 257 Romford 1996) shows the site underlain by Alluvium, described as comprising mainly sand, silt and clay with some gravel, resting on London Clay bedrock. In fact, the Holocene Alluvium of the Lower Thames and its tributaries is almost everywhere underlain by Late Devensian Late Glacial Gravels (in the Thames valley, the Shepperton Gravel of Gibbard, 1985, 1994; in the Lea valley, the Lea Valley Gravel of Gibbard, 1994), and this gravel is widely recorded in boreholes in the vicinity of Canning Town.

The site lies within the area that has been investigated in the Lea Valley Mapping Project (Corcoran *et al*., 2011). In this project the Lea Valley has been divided into Landscape Zones characterised by their Holocene landscape history based largely on sedimentary evidence derived from borehole records. The present site lies within Landscape Zone 1.3, characterised by a Gravel surface at between *ca*. -2.0 and -4.0m OD and Holocene Alluvium containing ‘a single peat bed, likely to be of Neolithic date at its base and Bronze Age at the top… interleaved between alluvial clay units’. During the course of a recent deposit modelling exercise (Young, 2014), a series of geoarchaeological boreholes were put down across the site (Figure 2). These investigations were carried out in order to clarify the nature of the sub-surface stratigraphy of the site, and to evaluate the potential of the sedimentary sequences for reconstructing the environmental history of the site and its environs. The results of this

investigation (see Appendix and Figures 3 to 8) revealed that the Gravel surfaces recorded across the site are generally within or slightly above the range identified by Corcoran *et al.* (2011), lying at between *ca*. -1.75 and -2.86m OD and generally consistent with those levels recorded to the north at St Luke's Square (-1.75 to -2.03m OD; Weale, 2008) and Tarling Road (-2.29 to -2.86m OD; Batchelor & Young, 2014; see Figure 1). The results of the borehole investigations demonstrated the presence of significant thicknesses of Peat, generally recorded at between *ca*. -0.2 and -1.9m OD and again consistent with Peat horizons recorded at the nearby St Luke's Square (Wicks, 2008; -2.03 to -0.61m OD) and Tarling Road sites (Batchelor & Young, 2014; -1.5 to -2.0m OD). At St Luke's Square the Peat was radiocarbon dated to between 5660–5580 (middle Neolithic) and 3570-3440 cal BP (middle Bronze Age) (Wicks, 2008). Significantly, the pollen record from this site contains evidence for the well-documented Neolithic lime decline (e.g. Thomas & Rackham, 1996; Sidell *et al*., 2000). Peat of very similar age and elevation was identified at the Tarling Road site, where it was recorded at between *ca*. -1.5 and -2.0m OD and radiocarbon dated to between 5730-5600 cal BP and 3630-3460 cal BP (Batchelor & Young, 2014). Here, potential evidence of human activity was recorded in conjunction with a potential decline in elm populations towards the base of the Peat (possible evidence of the early Neolithic elm decline), whilst a decline in lime was recorded towards the middle of the Peat, with persuasive evidence of human activity and a saline influence recorded towards the top of the Peat. Approximately 600m to the north of the present site no Peat horizons were recorded at the Canning Town Regeneration Area 7/1C site (Green & Young, 2011), where the gravel surface fell northwards from -0.5 to -2.81m OD and was overlain by a single unit of inorganic Alluvium. However, immediately to the north of this site at Rathbone Market (Young *et al*., 2013) a depression in the gravel surface (-3.81m OD) was recorded to the west of the site, thought likely to represent the same palaeochannel recorded by Stafford (2012) along the Ironbridge-Canning Town section of the A13 and containing Peat horizons up to 3m in thickness.

Given that environmental archaeological investigations have been undertaken in close proximity to the Caxton Works site, a basic environmental archaeological assessment of one selected sequence (<QBH3>) was recommended, incorporating: (1) rangefinder radiocarbon dating, to provide an age for the onset and cessation of Peat formation; (2) assessment of the pollen remains to provide a provisional reconstruction of the vegetation history; and (3) assessment of the plant macrofossil remains in order to provide a reconstruction of the environmental history of the site. The environmental assessment will also highlight any indications of nearby human activity, and provide recommendations for further analysis (if necessary).

Figure 1: Location of (1) Caxton Works, The Moss Buildings and Goswell Bakeries, Caxton Street North, Canning Town and other geoarchaeological and archaeological sites nearby: (2) Canning Town Phase 1 (CTR12; Green & Young, 2012); (3) Rathbone Market (RBO10; Young *et al*., 2013); (4) A13 Ironbridge-Canning Town (Stafford, 2012); (5) Tidal Basin Road (Young & Batchelor, 2013); (6) 118 Victoria Dock Road (Barnett *et al*., 2010); (7) area of the Lower Lea Valley Mapping Project (Corcoran *et al*., 2011); (8) the Cable Car route ((A) North Station; (B) North Intermediate Tower; (C) North Tower (Batchelor *et al*., 2012); (9) Silvertown (BWC96; Wilkinson *et al*., 2000); (10) Fort Street (HW-FO94; Wessex Archaeology, 2000); (11) The Pitts Head (PHD12; Batchelor *et al*., 2013); (12) Fords Park Road (FDP07; Eastbury *et al*., 2009); (13) Crediton Road (CDZ07; Eastbury *et al*., 2009); (14) Butchers Road (BUZ07; Eastbury *et al*., 2009); (15) Fife Road (FlH12; Killock, 2012); (16) Butchers Road Garages (BCQ97; Eastbury *et al*., 2009); (17) Vandome Close (VAD07; Eastbury *et al*., 2009) and (18) Canning Town Phase 2 (Young, in prep.); (19) St Luke's Square (LUC07; Weale, 2008; Wicks, 2008) and (20) 105-107 Tarling Road (Batchelor & Young, 2014). *Contains Ordnance Survey data © Crown copyright and database right [2013]*

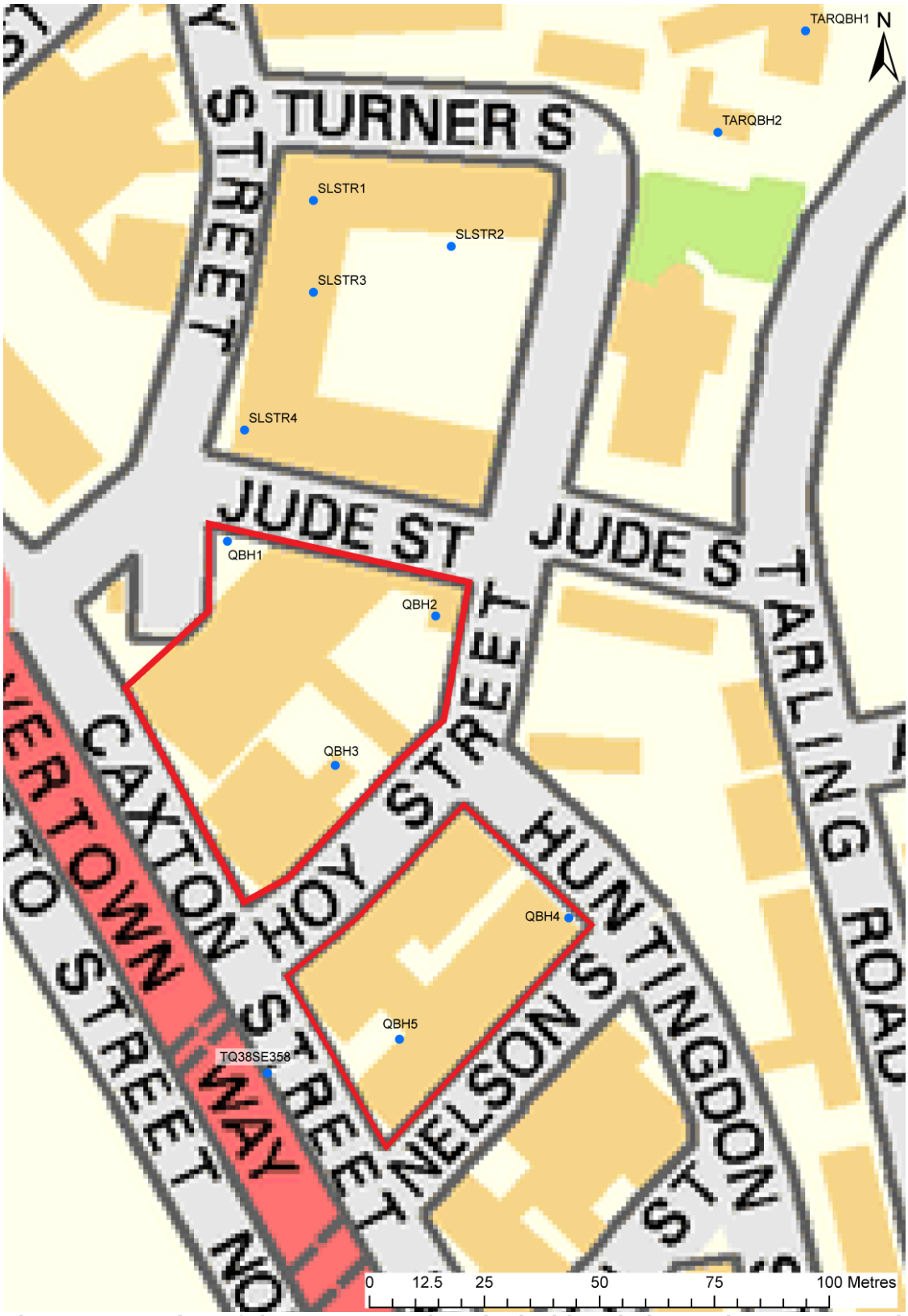

Figure 2: Location of the new geoarchaeological boreholes at the Caxton Works site, and those records used in the deposit model: existing archaeological trenches at St Luke's Square (SLS; Weale, 2008), geoarchaeological boreholes from Tarling Road (TAR; Batchelor & Young, 2014) and BGS borehole record TQ38SE358 (www.bgs.ac.uk/opengeoscience). *Contains Ordnance Survey data © Crown copyright and database right [2014]*

METHODS

Previous investigations (field investigations and deposit modelling)

Five geoarchaeological boreholes (<QBH1> to <QBH5>; Figure 2) were put down at the site (see Figure 2). The spatial attributes of each borehole were recorded using a Leica DGPS (Table 1). The lithostratigraphy of the boreholes was described in the field and laboratory using standard procedures for recording unconsolidated sediment and organic sediments, noting the physical properties (colour), composition (gravel, sand, clay, silt and organic matter) and inclusions (e.g. artefacts) (Tröels-Smith, 1955). The procedure involved: (1) cleaning the samples with a scalpel to remove surface contaminants; (2) recording the physical properties, most notably colour using a Munsell Soil Colour Chart; (3) recording the composition; gravel (Grana glareosa; Gg), fine sand (Grana arenosa; Ga), silt (Argilla granosa; Ag) and clay (Argilla steatoides); and (4) recording the unit boundaries e.g. sharp or diffuse. The results are displayed in Tables 2 to 6.

Table 1: Spatial data for the new geoarchaeological boreholes at Caxton Works, The Moss Buildings and Goswell Bakeries, Caxton Street North, Canning Town (Site Code: CSN14)

Borehole number	Easting	Northing	Elevation (m OD)
<QBH1>	539731.3	181105.8	1.50
<QBH2>	539776.6	181089.5	1.00
<QBH3>	539754.8	181057.0	1.30
<QBH4>	539805.6	181023.8	0.80
<QBH5>	539768.7	180997.4	1.30

The reconstruction of the sedimentary architecture beneath the site was undertaken using records from the five new geoarchaeological boreholes, two geoarchaeological boreholes from Tarling Road (Young & Batchelor, 2013b) and four archaeological trenches at St Luke's Square (Weale, 2008). Relatively few British Geological Society (BGS) boreholes with recorded OD heights are available in the area of the site; only one borehole from the BGS archive (www.bgs.ac.uk/opengeoscience) is therefore included in the model (TQ38SE358). Modelling was undertaken using RockWorks v16 software. The term 'deposit modelling' describes any method used to depict the sub-surface arrangement of geological deposits, but particularly the use of computer programmes to create contoured maps or three dimensional representations of contacts between stratigraphic units. The first requirement is to classify the recorded borehole sequences into uniformly identifiable stratigraphic units. At the site five stratigraphic units were recognised: (1) Lea Valley Gravel; (2) Lower Alluvium; (3) Peat; (4) Upper Alluvium; (5) Made Ground. The results of the deposit modelling are displayed in Figures 3 to 8.

How effectively Rockworks portrays the relief features of stratigraphic contacts or the

thickness of sediment bodies depends on the number of data points (boreholes) per unit area, and the extent to which these points are evenly distributed across the area of interest. Across the site a relatively good distribution of boreholes is achieved; however, the models are less reliable where the boreholes are distributed less evenly beyond the margins of the site. In some cases, because of the 'smoothing' effect of the modelling procedure the modelled levels of stratigraphic contacts may differ slightly from the levels recorded in borehole logs. The portrayal is also affected by the significance assigned to these data points, in terms of the extent of the area around the point to which the data are deemed to apply. This can be predetermined for each data set, and in the present case was restricted to a maximum radius of 50m around each borehole record.

Radiocarbon dating

Sub-samples of aerial unidentified twig wood (<5 years old) were extracted towards the top and base of the Peat in borehole <QBH3> for radiocarbon dating. Both samples were submitted for AMS radiocarbon dating to the Beta Analytic Radiocarbon Dating Facility, Miami, Florida. The results have been calibrated using OxCal v4.2 Bronk Ramsey (1995, 2001) and IntCal04 atmospheric curve (Reimer *et al*., 2013). The results are displayed in Table 2 and in Figure 9.

Pollen assessment

Six samples were extracted from borehole <QBH3>. The pollen was extracted as follows: (1) sampling a standard volume of sediment ($1cm^3$); (2) adding two tablets of the exotic clubmoss *Lycopodium clavatum* to provide a measure of pollen concentration in each sample; (3) deflocculation of the sample in 1% Sodium pyrophosphate; (4) sieving of the sample to remove coarse mineral and organic fractions (>125µ); (5) acetolysis; (6) removal of finer minerogenic fraction using Sodium polytungstate (specific gravity of $2.0g/cm^3$); (7) 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. Initially, an assessment of the samples was carried out, to record the concentration, preservation and main taxa of pollen and spores recorded on 10% of the slide. Pollen grains and spores were identified using the University of Reading pollen type collection and the following sources of keys and photographs: Moore *et al* (1991); Reille (1992). The concentration of microscopic charred particles is also recorded. The results are displayed in Table 3.

Macrofossil assessment

A total of seven small bulk samples from borehole <QBH3> were extracted for the recovery of macrofossil remains including waterlogged plant macrofossils, waterlogged wood, insects and Mollusca. The extraction process involved the following procedures: (1) removing a sample up to 10cm in thickness; (2) measuring the sample volume by water displacement, and (3) processing the sample by wet sieving using 300µm and 1mm mesh sizes. Each sample was scanned under a stereozoom microscope at x7-45 magnifications, and sorted into the different macrofossil classes. The concentration and preservation of remains was estimated for each class of macrofossil (Table 4). Preliminary identifications of the waterlogged seeds have been made using modern comparative material and reference atlases (e.g. Cappers *et al.* 2006). Nomenclature used follows Stace (2005) (also shown in Table 4).

RESULTS AND INTERPRETATION OF THE LITHOSTRATIGRAPHIC DESCRIPTIONS, DEPOSIT MODELLING AND RADIOCARBON DATING

The results of the geoarchaeological investigations have been reported previously (Young, 2014), and are displayed in Figures 3 to 9 and in Appendix 1 (Tables A1 to A5). The results of the subsequent radiocarbon dating are displayed in Figure 9 and Table 2.

The deposit models of the major stratigraphic units are displayed in Figures 3 to 8. Figures 3, 4 and 6 provide surface elevation models for selected stratigraphic units, whilst Figures 5, 7 and 8 provide thickness models for the Peat, total Alluvium (incorporating the Lower Alluvium, Peat and Upper Alluvium) and Made Ground. The basal unit at the site is a horizon of sand and gravel (interpreted as the Lea Valley Gravel; Figure 3). These sediments were deposited during the Late Devensian (10-15,000 years before present) within a high energy braided river system. The deposit model (Figure 3) demonstrates that the Gravel surface is fairly even in the area of the site and to the north, consistently recorded at between ca. -1.75 and -2.86m OD but with relief amplitude of approximately 1m. The Gravel surface within the site itself is recorded at between -1.80 (<QBH5>) and -2.78m OD (<QBH4>). In borehole TQ38SE358 (ca. 20m to the southwest) the Gravel surface is recorded at -2.05m OD, whilst to the north of the site the Gravel surface is recorded at between -1.75 and -2.03m OD (SLSTR1 to SLSTR4) at St Luke's Square (Weale, 2008), and between -2.29 (TARQBH2) and -2.86m OD (TARQBH1) at Tarling Road (Young & Batchelor, 2013b).

The Gravel is overlain in all three boreholes by a horizon of generally silty, sandy clay interpreted as the Lower Alluvium, recognised elsewhere in the Lower Thames Valley and its tributaries, the sediments of which were deposited during the Early to Mid-Holocene as the

energy of flow decreased and the Lea probably became confined to a single meandering channel. Within the site this unit is between 0.91 (<QBH3>) and 0.10m thick (<QBH4> and <QBH5>), the surface lying at between ca. -1.70 (<QBH5>) and -2.10m OD (<QBH4>). In boreholes <QBH4> and <QBH5> in the southern area of the site the sandy Lower Alluvium is overlain by organic Alluvium, between -1.01 and -2.10m OD (<QBH4>) and -1.12 and -1.70m OD (<QBH5>), before a transition to a generally woody, humified Peat which in the northern area of the site directly overlies the Lower Alluvium. Significantly, the Peat horizon is indicative of a transition towards a semi-terrestrial environment, supporting the growth of wetland vegetation and which may have been utilised by prehistoric people. The Peat is recorded at between ca. -0.2 and -1.9m OD, and is generally between 0.6 and 1.2m thick within the area of the site. The surface and approximate elevation of the Peat is consistent with that recorded at the St Luke's Square and Tarling Road sites (see Figure 4); however, the thickness of the Peat is greatest in the northern area of the site (boreholes <QBH1> and <QBH2>), whilst greater thicknesses are recorded north of the site at St Luke's Square (see Figure 5), where it is recorded at up to 1.5m thick (SLSTR1).

The results of the radiocarbon dating of samples from borehole <QBH3> (Table 2) indicate that Peat accumulation began during the Middle Neolithic (4960 to 4840 cal BP; -1.74 to -1.79m OD), and continued until at least the Late Neolithic (4385 to 4100 cal BP; -1.35 to -1.40m OD). The latter radiocarbon date was extracted below the transition to very silty Peat in borehole <QBH3>; this, and the higher elevation of the Peat in selected boreholes elsewhere at the site, indicates that Peat accumulation may have continued at the site until a later date (perhaps in to the Bronze Age as at both Tarling Road and St Luke's Square).

The Peat is overlain in all five boreholes by a horizon of generally silty or clayey Alluvium, described here as the Upper Alluvium, indicative of sediment accumulation on the floodplain at a distance from any active channels. The surface of the Upper Alluvium is recorded at between 1.4 <QBH1> and -0.76m OD (<QBH3>) (Figure 6). In general, the thickness of the Made Ground is greater towards the centre and south of the site, where the contact between the Alluvium and Made Ground lies at a lower elevation and is indicative of greater truncation of the natural sequence in this area. This is reflected in the thickness of the total Alluvium (Figure 7) and Made Ground across the site (Figure 8). In the northern area of the site the Made Ground is recorded as 0.1m thick in <QBH1> and 0.75m thick in <QBH2>, whilst towards the centre of the site it is 2.06m thick in the area of borehole <QBH3> and between 1.0 and 1.12m thick in boreholes <QBH4> and <QBH5> respectively.

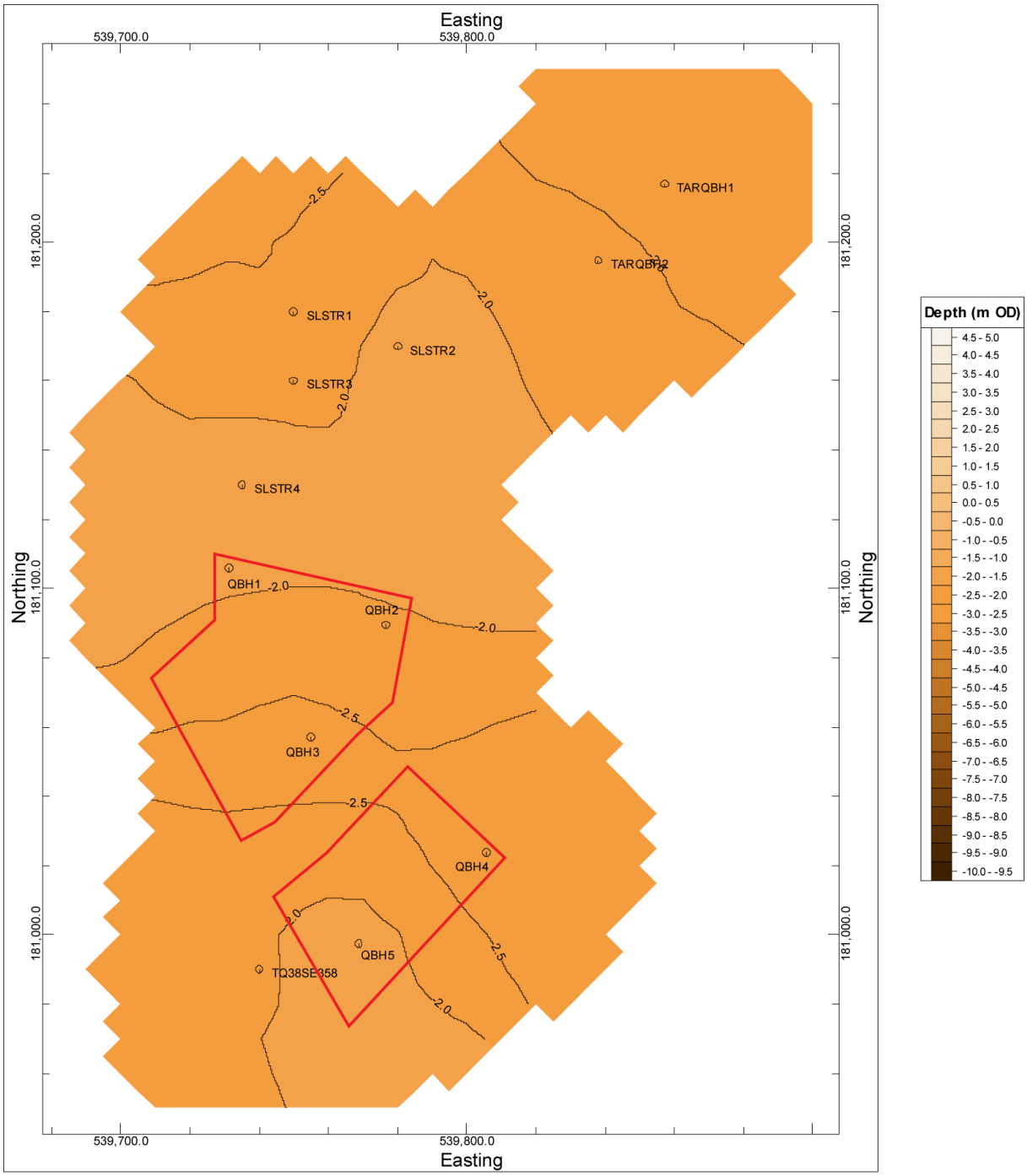

Figure 3: Surface of the Lea Valley Gravel (m OD)

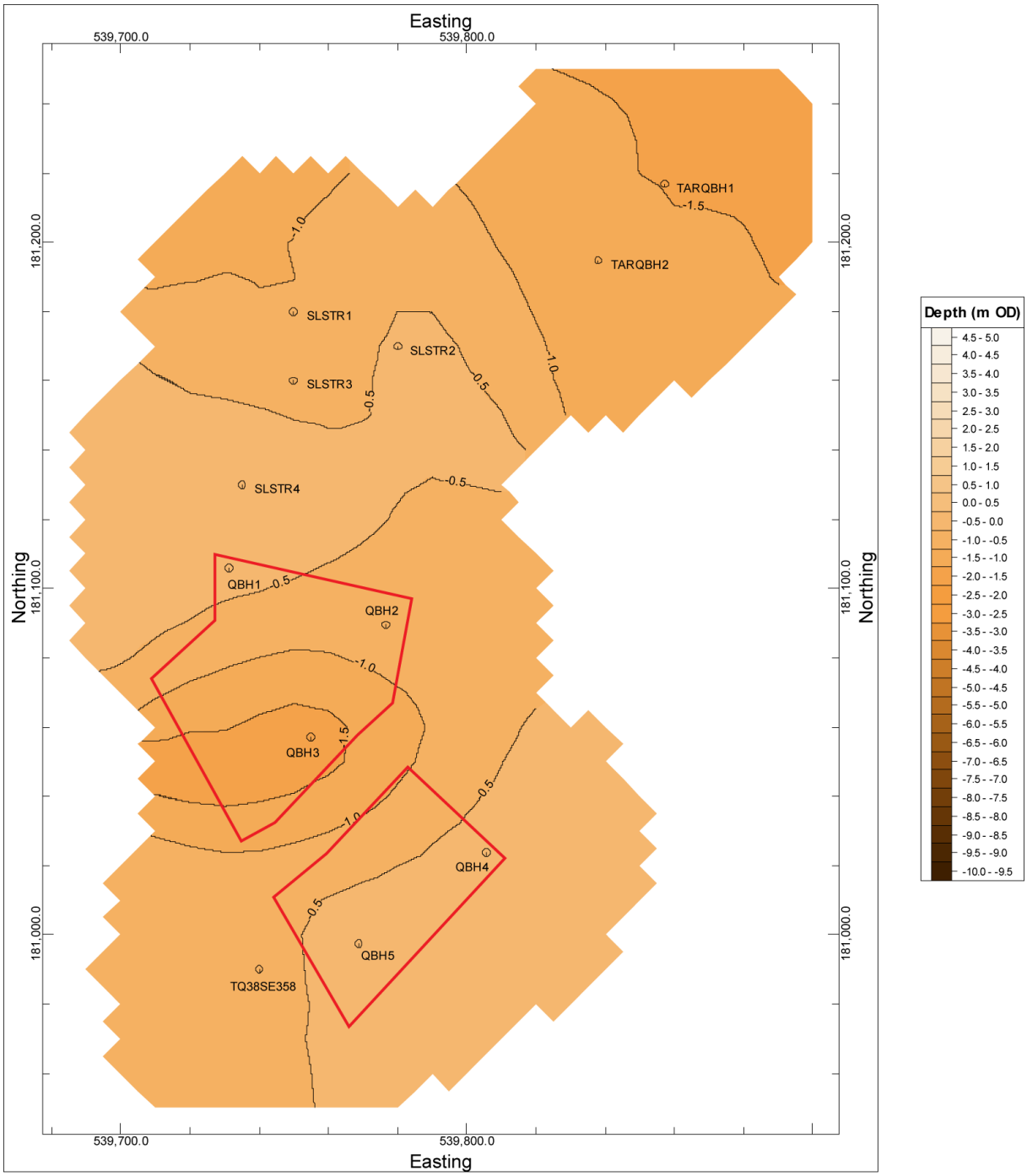

Figure 4: Surface of the Peat (m OD)

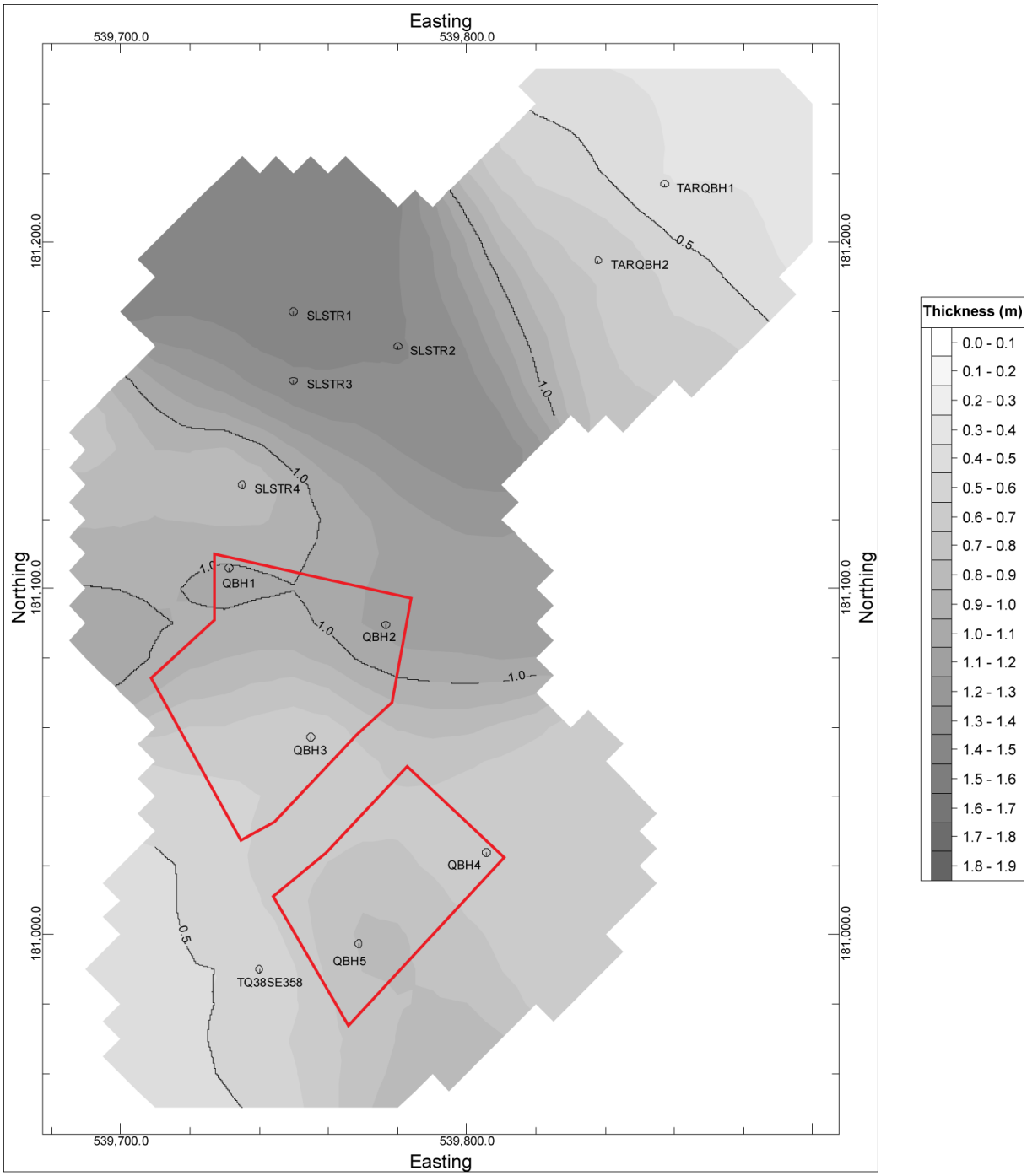

Figure 5: Thickness of Peat (m)

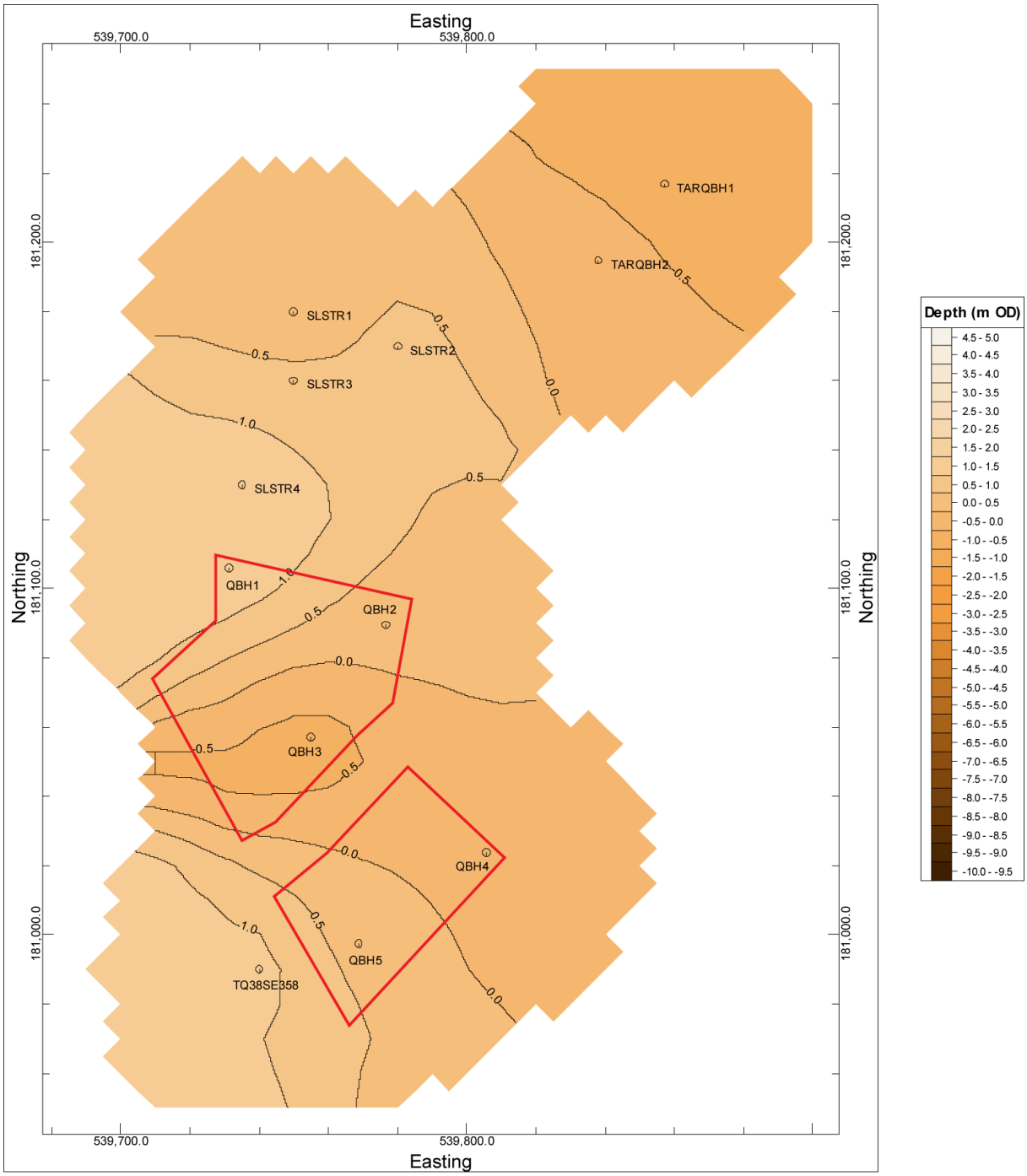

Figure 6: Surface of the Upper Alluvium (m OD)

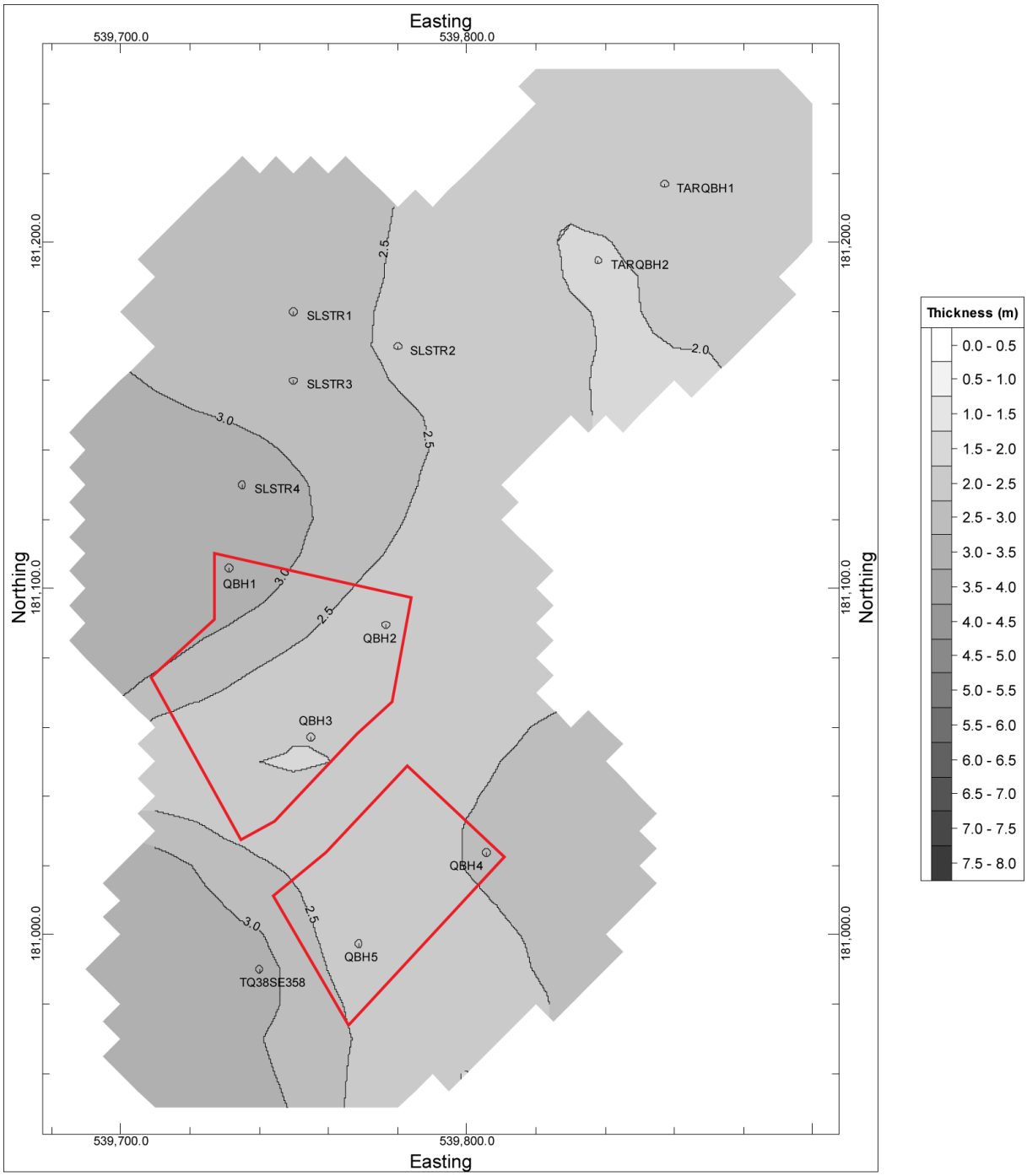

Figure 7: Thickness of Alluvium (incorporating Lower Alluvium, Peat and Upper Alluvium) (m)

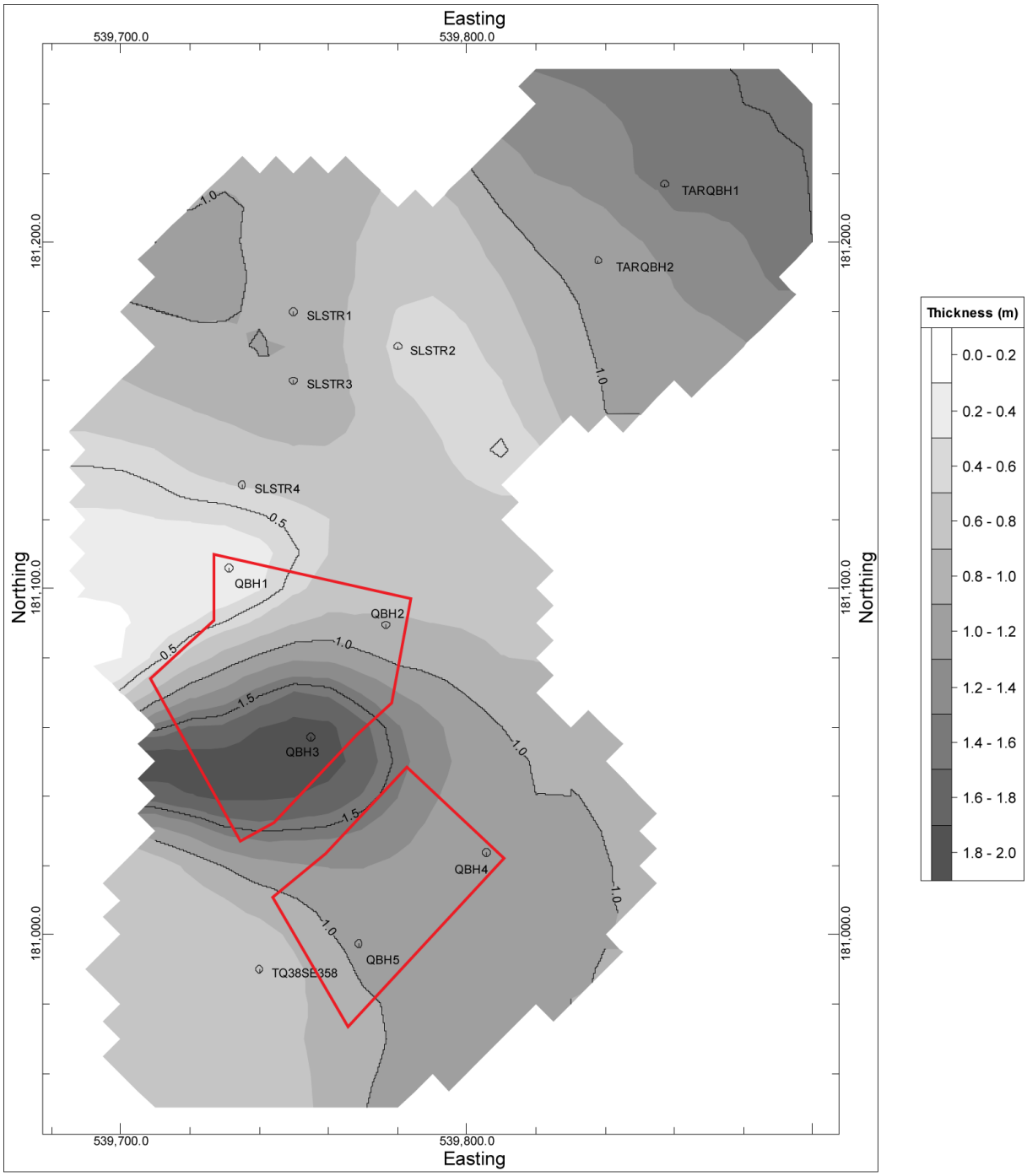

Figure 8: Thickness of Made Ground (m)

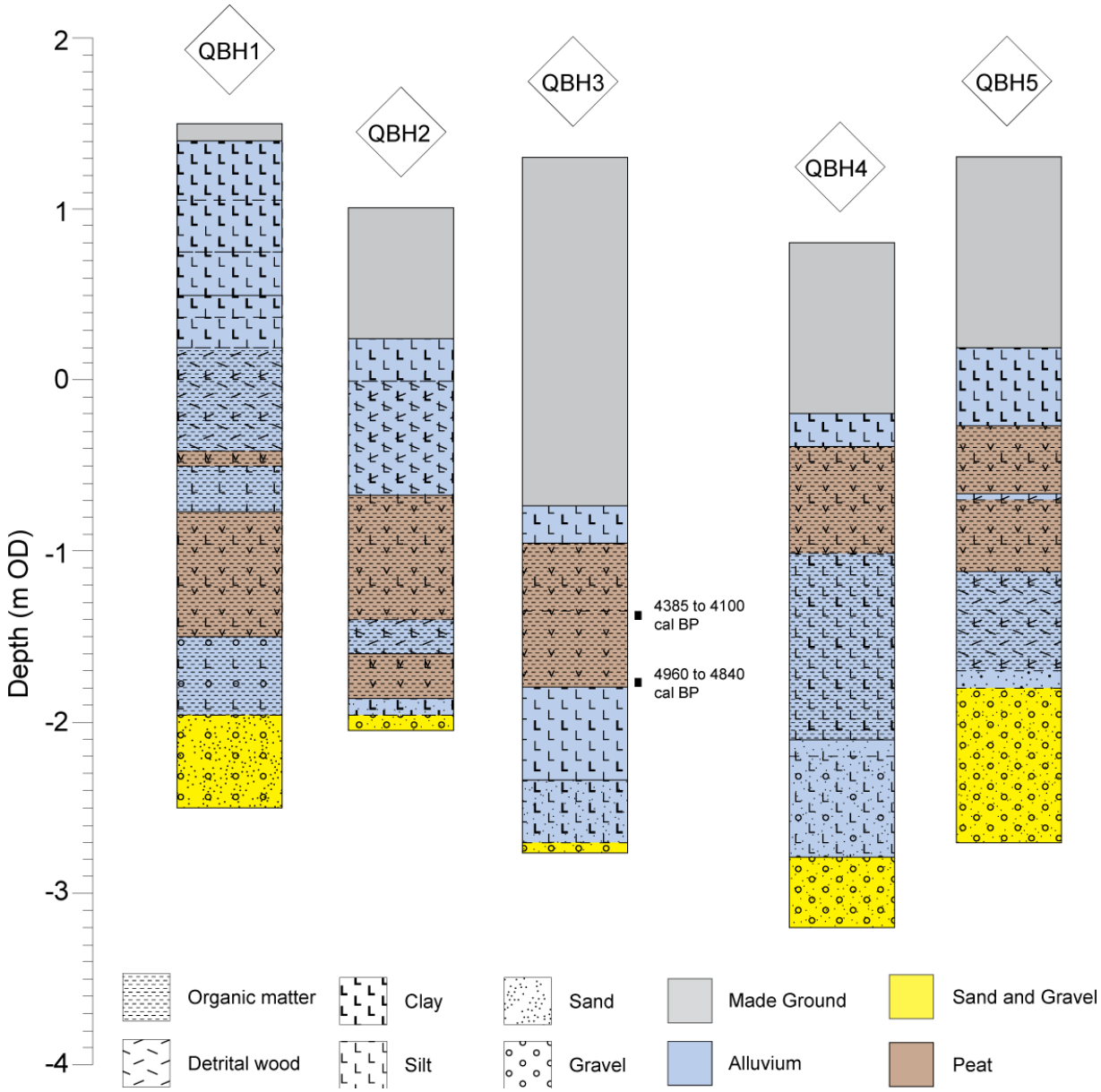

Figure 9: Lithostratigraphy of the five boreholes at Caxton Works, The Moss Buildings and Goswell Bakeries, Caxton Street North, Canning Town (Site Code: CSN14), incorporating the results of the radiocarbon dating of samples from <QBH3>.

Table 2: Results of the radiocarbon dating of samples from borehole <QBH3>, Caxton Works, The Moss Buildings and Goswell Bakeries, Caxton Street North, Canning Town (Site Code: CSN14)

Laboratory code / Method	Material and location	Depth (m OD)	Uncalibrated radiocarbon years before present (yr BP)	Calibrated age BC/AD (BP) (2-sigma, 95.4% probability)	δ13C (‰)
BETA 390519 (AMS)	Aerial plant remains: twig wood	-1.35 to -1.40	3830 ± 30	2435 to 2150 cal BC (4385 to 4100 cal BP)	-28.8
BETA 390520 (AMS)	Aerial plant remains: twig wood	-1.74 to -1.79	4320 ± 30	3010 to 2890 cal BC (4960 to 4840 cal BP)	-30.9

RESULTS AND INTERPRETATION OF THE POLLEN ASSESSMENT

The results of pollen analysis are presented Table 3. Pollen concentration was very high in two of the six samples assessed; low values were recorded in the remaining four. Pollen preservation was moderate to good. Basal samples -1.80 and -1.64m OD were dominated by *Alnus* (alder), *Quercus* (oak), *Corylus* type (e.g. hazel) with *Tilia* (lime), Cyperaceae (sedges) and *Polypodium vulgare* (polypody) recorded at -1.64m OD only. This assemblage is indicative of alder dominated carr woodland occupying the peat surface with a ground flora incorporating (at minimum) sedges and polypody ferns. Oak and lime woodland dominated the dryland with hazel shrubs. The lack of *Ulmus* pollen indicates that the sequence post-dates the well-documented Neolithic elm decline (e.g. Parker *et al*., 2002). No indications of human activity were recorded within this part of the sequence.

The limited concentration of pollen above -1.64m OD prevents a similarly detailed preliminary reconstruction of vegetation history. However, the dominance of *Alnus* with *Tilia*, *Quercus* and *Ulmus* (elm) enables the tentative suggestion that alder woodland and mixed deciduous woodland continued to occupy the floodplain and dryland environments until at least -1.30m OD. Above this, too little pollen is present to make any reliable interpretation. The sequence from the Caxton Works site shares some affinities with that recorded at the nearby 105-107 Tarling Road (Batchelor & Young, 2014) and St Lukes Square sites (Wicks, 2010), however the concentration, preservation and diversity of remains is distinctly lower, and there is no definitive evidence of either human activity or a saline influence at the site.

Table 3: Results of the pollen assessment of samples from Borehole <QBH3>, Caxton Works, The Moss Buildings and Goswell Bakeries, Caxton Street North, Canning Town (Site Code: CSN14)

	Depth (meters OD)	-0.96	-1.12	-1.30	-1.46	-1.64	-1.80
Latin name	**Common name**						
Trees							
Alnus	alder		1	6	7	25	25
Quercus	oak	1	1		2	10	6
Pinus	pine		1	1		1	
Ulmus	elm				1		
Tilia	lime		1	4		3	
Shrubs							
Corylus type	e.g. hazel		1	1		8	1
Hedera	ivy						1
Herbs							
Cyperaceae	sedge family					1	
Poaceae	grass family	2					
Lactuceae	dandelion family	1					
Asteraceae	daisy family	1					
Spores							
Filicales	ferns	1	1		3		
Pteridium aquilinum	bracken			1			
Polypodium vulgare	polypody	1	1		1	5	
Total Land Pollen (grains counted)		5	5	12	10	48	33
Concentration*		1	1	2	2	5	5
Preservation**		3	3	4	4	3-4	4
Microcharcoal Concentration***		2	1	0	0	0	0
Suitable for analysis		**NO**	**NO**	**NO**	**NO**	**YES**	**YES**

Key:
**Concentration: 0 = 0 grains; 1 =1-75 grains, 2 = 76-150 grains, 3 =151-225 grains, 4 = 226-300, 5 =300+ grains per slide*
***Preservation: 0 = absent; 1 = very poor; 2 = poor; 3 = moderate; 4 = good; 5 = excellent*
****Microcharcoal Concentration: 0 = none, 1= negligible, 2 = occasional, 3 = moderate, 4 = frequent, 5 = abundant*

RESULTS AND INTERPRETATION OF THE MACROFOSSIL ASSESSMENT

A total of seven small bulk samples were extracted from borehole <QBH3> for the recovery of macrofossil remains including waterlogged plant macrofossils, waterlogged wood, insects and Mollusca (Table 4). The results of the assessment indicate that waterlogged wood is present in low to moderate quantities in all seven samples; the majority of these specimens are identifiable (greater than 2mm in length on all axes). Waterlogged seeds were recorded in only one sample (-1.40 to -1.45m OD); this contained two specimens of cf. *Ranunculus fluitans* (possible river water crowfoot) and *Ranunculus* cf. *repens* (possible creeping buttercup). The limited assemblage prevents any further environmental interpretation of the samples; however, both taxa are typical of vegetation found in wetland fens. No charred remains, bone, Mollusca or insects were recorded during the assessment.

Table 4: Results of the macrofossil assessment of samples from borehole <QBH3>, Caxton Works, The Moss Buildings and Goswell Bakeries, Caxton Street North, Canning Town (Site Code: CSN14)

				Charred					Waterlogged		Mollusca		Bone			
Depth (m OD)	Volume sampled (l)	Volume processed (l)	Fraction	Charcoal (>4mm)	Charcoal (2-4mm)	Charcoal (<2mm)	Seeds	Chaff	Wood	Seeds *Main taxa* (quantity)	Whole	Fragments	Large	Small	Fragments	Insects
-1.05 to -1.15	0.10	0.10	>300µm	-	-	-	-	-	2	-	-	-	-	-	-	-
-1.25 to -1.35	0.10	0.10	>300µm	-	-	-	-	-	2	-	-	-	-	-	-	-
-1.35 to -1.40	0.05	0.05	>300µm	-	-	-	-	-	1	-	-	-	-	-	-	-
-1.40 to -1.45	0.05	0.05	>300µm	-	-	-	-	-	2	1 *Ranunculus* cf. *repens* (1) cf. *Ranunculus fluitans* (1)	-	-	-	-	-	-
-1.64 to -1.69	0.10	0.10	>300µm	-	-	-	-	-	2	-	-	-	-	-	-	-
-1.69 to -1.74	0.05	0.05	>300µm	-	-	-	-	-	3	-	-	-	-	-	-	-
-1.74 to -1.79	0.05	0.05	>300µm	-	-	-	-	-	1	-	-	-	-	-	-	-

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+

DISCUSSION

The aim of the basic environmental archaeological assessment at the Caxton Works site was to clarify the age of the Peat horizons recorded here, and to provide a basic assessment of the potential of the borehole sequences for reconstructing the past environmental conditions of the site and its environs. In order to achieve this aim, two radiocarbon dates were obtained from borehole <QBH3> and a basic assessment of the pollen and waterlogged macrofossils carried out.

Within the initial deposit model report (Young, 2014) it was concluded that the sequences recorded at the site were analogous to those recorded across much of the Lower Thames Valley and its tributaries, with a sequence of Gravel overlain by Alluvium and Peat. The surface of the Lea Valley Gravel at the site is generally within or slightly above the range suggested by Corcoran *et al.* (2011; Landscape Zone 1.3, -2.0 to -4.0m OD), lying at between *ca*. -1.75 and -2.86m OD and generally consistent with those levels recorded to the north at St Luke's Square (-1.75 to -2.03m OD; Weale, 2008) and Tarling Road (-2.29 to -2.86m OD; Batchelor & Young, 2014). The initial deposit modelling report (Young, 2014) highlighted the presence of significant thicknesses of Peat at the site, generally recorded at between *ca*. -0.2 and -1.9m OD and consistent in terms of elevation with Peat horizons recorded at the nearby St Luke's Square (Wicks, 2008; -2.03 to -0.61m OD) and Tarling Road sites (Batchelor & Young, 2014; -1.5 to -2.0m OD). At St Luke's Square the Peat was radiocarbon dated to between 5660–5580 (middle Neolithic) and 3570-3440 cal BP (middle Bronze Age) (Wicks, 2008), whilst at Tarling Road the Peat was radiocarbon dated to between 5730-5600 cal BP and 3630-3460 cal BP (Batchelor & Young, 2014). The results of the subsequent radiocarbon dating of the Peat in borehole <QBH3> have demonstrated that Peat accumulation began at the present site during the Middle Neolithic (4960 to 4840 cal BP; -1.74 to -1.79m OD), and continued until at least the Late Neolithic (4385 to 4100 cal BP; -1.35 to -1.40m OD). The higher elevation of the Peat in selected boreholes elsewhere at the site indicates that Peat accumulation may have continued at the site for up to another 1000 years (i.e. in to the Middle Bronze Age), on the very approximate assumption that 1000 years of peat accumulation = 1m of sediment. The Peat at the Caxton Works site is thus broadly contemporaneous with that recorded at both Tarling Road and St Luke's Square.

Significantly, the pollen record from the St Luke's Square site contains evidence for the well-documented Neolithic lime decline (e.g. Thomas & Rackham, 1996; Sidell *et al*., 2000), whilst at the Tarling Road site potential evidence of human activity was recorded in conjunction with a potential decline in elm populations towards the base of the Peat (possible evidence of the early Neolithic elm decline), whilst a decline in lime woodland was recorded towards the

middle of the Peat, with persuasive evidence of human activity and a saline influence recorded towards the top of the Peat. The combined results of the basic palaeobotanical (pollen and seeds) assessment of samples from borehole <QBH3> indicate that the sequence post-dates the well-documented Neolithic elm decline (e.g. Parker *et al*., 2002), whilst no indications of human activity were recorded. In general, the palaeobotanical assessment is indicative of alder dominated carr woodland occupying the Peat surface, with a ground flora incorporating (at minimum) sedges and polypody ferns. Initially oak and lime woodland dominated the dryland with hazel shrubs, whilst above -1.64m OD mixed deciduous woodland (including oak and elm) occupied the dryland with alder woodland on the wetland surface. The preservation of pollen above -1.30m OD was too poor to provide an environmental interpretation. With the exception of the absence of the Neolithic elm decline and evidence for human activity, the sequence from the Caxton Works site is clearly similar in nature to that recorded at the nearby Tarling Road (Batchelor & Young, 2014) and St Luke's Square sites (Wicks, 2010), however the concentration, preservation and diversity of pollen remains is distinctly lower.

CONCLUSIONS & RECOMMENDATIONS

The results of the radiocarbon dating have demonstrated that the Peat at the Caxton Works site is consistent both in elevation and age with that recorded at the nearby Tarling Road (Batchelor & Young, 2014) and St Luke's Square (Wicks, 2008) sites. Although in terms of general environmental conditions the palaeobotanical record shows similarities with these two sites, the assessment has demonstrated that the sequence post-dates the early Neolithic elm decline, and no evidence for human activity was recorded. In addition, waterlogged seed preservation was poor, and preservation of the pollen remains is significantly poorer than at the Tarling Road and St Luke's Square sites. No further work is therefore recommended on the sequences from the Caxton Works site.

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APPENDIX 1

Table A1: Lithostratigraphic description of borehole <QBH1>, Caxton Works, The Moss Buildings and Goswell Bakeries, Caxton Street North, Canning Town (Site Code: CSN14)

Depth (m OD)	Depth (m bgs)	Composition
1.50 to 1.40	0.00 to 0.10	Made ground
1.40 to 1.05	0.10 to 0.45	2.5Y 4/1; As4 Ag+; dark grey clay with a trace of silt. Diffuse contact in to:
1.05 to 0.75	0.45 to 0.75	2.5Y 4/1; As3 Ag1; dark grey silty clay. Diffuse contact in to:
0.75 to 0.50	0.75 to 1.00	2.5Y 4/1; As2 Ag2; dark grey silt and clay.
0.50 to 0.38	1.00 to 1.12	2.5Y 4/1; As3 Ag1; dark grey silty clay with some iron staining. Diffuse contact in to:
0.38 to 0.20	1.12 to 1.30	10YR 3/2; As2 Ag2 Sh+; very dark greyish brown silt and clay with a trace of organic matter. Diffuse contact in to:
0.20 to -0.41	1.30 to 1.91	10YR 3/1; Ag2 Sh1 Dl1; very dark grey organic silt with detrital wood. Diffuse contact in to:
-0.41 to -0.50	1.91 to 2.00	10YR 2/1; Sh2 Ag1 Tl1 Th+; humo. 3/4; black well to very well humified silty wood peat with a trace of herbaceous material.
-0.50 to -0.77	2.00 to 2.27	10YR 3/1; Ag3 Sh1 Dl+ Dh+ Dl+; very dark grey organic silt with traces of detrital herbaceous material and detrital wood. Sharp contact in to:
-0.77 to -1.50	2.27 to 3.00	10YR 2/1; Sh2 Ag1 Tl^{2}1 Th+; humo. 3; black well humified silty wood peat with a trace of herbaceous material.
-1.50 to -1.96	3.00 to 3.46	10YR 3/1; Ag2 Gg1 Sh1 Ga+; very dark grey organic gravelly silty with a trace of sand. Diffuse contact in to:
-1.96 to -2.50	3.46 to 4.00	Gg2 Ga2; sand and gravel. Clasts are flint 5-40mm in diameter, sub-rounded to sub-angular. Some horizontal beds of sandier material (Ga3 Gg1; gravelly sand).

Table A2: Lithostratigraphic description of borehole <QBH2>, Caxton Works, The Moss Buildings and Goswell Bakeries, Caxton Street North, Canning Town (Site Code: CSN14)

Depth (m OD)	Depth (m bgs)	Composition
1.00 to 0.25	0.00 to 0.75	Made ground
0.25 to 0.00	0.75 to 1.00	10YR 3/1; As2 Ag2; very dark grey silt and clay.
0.00 to -0.68	1.00 to 1.68	10YR 3/1; Ag2 As1 Dl1; very dark grey clayey silt with detrital wood. Sharp contact in to:
-0.68 to -1.40	1.68 to 2.40	10YR 2/1; Sh2 Ag1 Tl^{2}1 Th+; humo. 3; black well humified silty wood peat with a trace of herbaceous material. Diffuse contact in to:
-1.40 to -1.60	2.40 to 2.60	10YR 4/1; Ag2 Dl1 Sh1; dark grey organic silt with detrital wood. Sharp contact in to:
-1.60 to -1.86	2.60 to 2.86	10YR 2/1; Sh2 Ag1 Tl^{2}1 Th+; humo. 3; black well humified silty wood peat with a trace of herbaceous material. Sharp contact in to:
-1.86 to -1.97	2.86 to 2.97	2.5Y 4/1; As2 Ag1 Ga1 Gg+; dark grey silty sandy clay with occasional gravel clasts. Diffuse contact in to:

-1.97 to -2.05	2.97 to 3.05	Gg3 Ga1 Ag+; sandy gravel with a trace of silt. Clasts are flint 5-40mm in diameter, sub-rounded to sub-angular.

Table A3: Lithostratigraphic description of borehole <QBH3>, Caxton Works, The Moss Buildings and Goswell Bakeries, Caxton Street North, Canning Town (Site Code: CSN14)

Depth (m OD)	Depth (m bgs)	Composition
1.30 to 0.30	0.00 to 1.00	Made ground
0.30 to -0.76	1.00 to 2.06	Made ground/redeposited alluvium. Sharp contact in to:
-0.76 to -0.97	2.06 to 2.27	2.5Y 4/1; Ag3 As1; dark grey clayey silt. Sharp contact in to:
-0.97 to -1.35	2.27 to 2.65	10YR 2/1; Sh2 Ag2 Th+; humo. 3/4; black well to very well humified silt and wood peat with a trace of herbaceous material.
-1.35 to -1.79	2.65 to 3.09	2.5YR 2.5/1; Sh3 $Tl^2$1 Th+; humo. 3; reddish black well humified wood peat with a trace of herbaceous material. Sharp contact in to:
-1.79 to -2.37	3.09 to 3.67	2.5Y 4/1; Ag3 As1 Ga+ Dl+; grey clayey silt with traces of sand and detrital wood. Sharp contact in to:
-2.37 to -2.70	3.67 to 4.00	2.5Y 5/1; As2 Ag1 Ga1; grey sandy silty clay.
-2.70 to -2.75	4.00 to 4.05	Gg3 Ga1; sandy gravel. Clasts are flint 10-40mm in diameter, sub-rounded to sub-angular.

Table A4: Lithostratigraphic description of borehole <QBH4>, Caxton Works, The Moss Buildings and Goswell Bakeries, Caxton Street North, Canning Town (Site Code: CSN14)

Depth (m OD)	Depth (m bgs)	Composition
0.80 to -0.20	0.00 to 1.00	Made Ground
-0.20 to -0.39	1.00 to 1.19	7.5YR 4/2; As3 Ag1; brown silty clay with some iron staining (orange mottling). Sharp contact in to:
-0.39 to -1.01	1.19 to 1.81	7.5YR 2.5/1; Sh2 Ag1 $Tl^2$1; humo. 3; black well humified silty woody peat. Diffuse contact in to:
-1.01 to -2.10	1.81 to 2.90	7.5YR 3/2; Ag3 Sh1 Dl+; dark brown organic silt with a trace of detrital wood. Sharp contact in to:
-2.10 to -2.20	2.90 to 3.00	Gley1 4/N; Ag3 Ga1 Gg+ Dl+; dark grey sandy silt with occasional gravel clasts and a trace of detrital wood. Clasts mainly flint, sub-angular to sub-rounded.
-2.20 to -2.78	3.00 to 3.58	Gley1 4/10Y; Ag2 Ga1 Gg1 Dh+ Dl+; dark greenish grey sandy silt with occasional gravel clasts and a trace of detrital wood. Clasts predominantly flint, sub-angular to sub-rounded, up to 40mm in diameter. Sharp contact in to:
-2.78 to -3.20	3.58 to 4.00	Gg3 Ga1; sandy gravel. Clasts predominantly flint, sub-angular to well-rounded, up to 50mm in diameter.

Table A5: Lithostratigraphic description of borehole <QBH5>, Caxton Works, The Moss Buildings and Goswell Bakeries, Caxton Street North, Canning Town (Site Code: CSN14)

Depth (m OD)	Depth (m bgs)	Composition
1.30 to 0.30	0.00 to 1.00	Made Ground
0.30 to 0.18	1.00 to 1.12	Made Ground/disturbed Alluvium
0.18 to -0.24	1.12 to 1.54	10YR 4/2; As3 Ag1; dark greyish brown silty clay with some iron staining and small iron nodules. Sharp contact in to:
-0.24 to -0.63	1.54 to 1.93	7.5YR 2.5/1; Sh2 Ag1 $Tl^2$1 Th+; humo. 2; black moderately humified silty woody peat with traces of herbaceous material. Sharp contact in to:
-0.63 to -0.70	1.93 to 2.00	10YR 4/2; Ag2 As1 Dl1 Dh+; dark greyish brown clayey silt with detrital wood and a trace of detrital herbaceous material.
-0.70 to -1.12	2.00 to 2.42	7.5YR 2.5/1; Sh2 $Tl^2$1 Ag1 Th+; humo. 2; black moderately humified silty woody peat with traces of herbaceous material. Sharp contact in to:
-1.12 to -1.70	2.42 to 3.00	7.5YR 3/1; Ag2 Sh1 Dl1; very dark grey organic silt with detrital wood.
-1.70 to -1.80	3.00 to 3.10	Gley1 5/10Y; Gs2 Ga2 Ag+ Gg+; dark greenish grey coarse and fine sand with a trace of silt and occasional gravel clasts <5mm in diameter.
-1.80 to -2.70	3.10 to 4.00	Gg3 Ga1; sandy gravel. Clasts predominantly flint, sub-angular to well-rounded, up to 50mm in diameter. Some horizontal bedding of variably sandy/silty material.