Appendix 10:

Archaeological Watching Brief Report

Oxford Flood Alleviation Scheme Phase 2, Geo-technical investigations

Archaeological Watching Brief Report

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Summary

In September 2015 Oxford Archaeology (OA) undertook an archaeological watching brief during initial geotechnical ground investigations associated with the proposed Oxford Flood Alleviation Scheme (FAS). The work was commissioned by CH2M on behalf of the Environment Agency (EA).

The geotechnical survey comprises 140 interventions consisting of trial pits, augering, window sampling, boreholes and hand dug testpits. The primary purpose of the watching brief was to record any archaeological remains exposed during the excavation of trial pits. The results of the watching brief have been incorporated into the recently updated desk-based assessment of the scheme (OA 2016).

No archaeological features or finds of significance were located during the work, apart from occasional sherds of medieval and post-medieval pottery from the floodplain meadows between North and South Hinksey.

Overall minerogenic silt clay alluvium over gravel was recorded at most locations averaging 1.0m to 1.5m in thickness, although shallower deposits at 0.50m to 0.70m were noted, particularly at the western edge of the floodplain between the Hinksey villages and further south at Sandford. No extensive floodplain peat deposits were recorded. The gravel surface over much of the route (excluding Sandford) appears higher than the area around St Aldates and Westgate where laterally extensive later prehistoric reed swamp deposits have previously been recorded. However, localised organic units were noted at several locations, the deepest and most complex of which generally coincide with areas adjacent to current watercourses such as the Seacourt and Hinksey streams, reaching 2.5m to 3.0m in depth. Previous archaeological investigations in the region have found that some extant watercourses linked to the main Thames channel may be located within the footprint of earlier wider silted up channels, perhaps dating back to the end of the last glacial period and beginning of the Holocene (c 12,000 years) eg. the proto- Trill Mill Stream and proto- St Aldates channel in Oxford City. Thin organic deposits at the base of the alluvium over Pleistocene gravel were noted at a few locations on the general floodplain between North and South Hinksey (eg. TP275, TP278 and TP225). These do not appear to be associated with current channels and were recorded at shallower depths than described above and may represent ephemeral floodplain pools. Extensive deposits of modern made ground were noted around Redbridge. South of the Old Abingdon Road these are associated with historical landfill sites where ground elevations have been raised by 2-3m above the floodplain surface.

1 INTRODUCTION

1.1 Location and scope of work

1.1.1 In September 2015 Oxford Archaeology (OA), was commissioned by CH2M on behalf of the Environment Agency to undertake an archaeological watching brief during initial geotechnical ground investigations associated with the proposed Oxford Flood Alleviation Scheme (FAS) (Fig.1).

1.1.2 The FAS is critical in reducing the long term risk of flooding to residential and commercial properties in floodplain locations. A key component of the FAS is improvements to approximately 7km of the western conveyance route which is located on the floodplain of the River Thames on the western outskirts of Oxford, between Botley and Sandford Lock. Improvements to the conveyance will be achieved through construction of new sections of channel and widening of existing channels to create a combination of constrained, semi-constrained and natural channels. Additional components may include improvements to 1km of the eastern conveyance route between Donnington Bridge and the A483 and supporting drainage network. Creation of new channels will necessitate the construction of several bridges to maintain access routes.

1.1.3 The primary purpose of the watching brief was to record any archaeological remains exposed during the excavation of trial pits. The results of the watching brief have been incorporated into the recently updated desk-based assessment of the scheme (OA 2016).

1.2 Location and geology

1.2.1 The western conveyance route starts near Botley Bridge to the north and finishes near Sandford Lock to the south, covering a length of approximately 7km. The route predominantly traverses areas of low-lying floodplain meadow, criss-crossed by streams, drainage ditches and hedgrows. The eastern conveyance route runs for approximately 1km between Donnington Bridge and the A483.

1.2.2 BGS mapping of the area records predominantly Holocene alluvium, overlying Pleistocene river gravel of the Northmoor Floodplain Terrace, deposited towards the end of the last (Devensian) glaciation. Aerial imagery suggests a number of infilled palaeochannels of various sizes exist below ground surface. Localised or discrete areas of made ground or disturbance are known to be present from a limited number of historic boreholes in the vicinity of the route, frequently adjacent to roads and trackways. Modern landfill areas are located on the outskirts of Kennington.

1.3 Geoarchaeological Background

1.3.1 The archaeological and historical background has been described in detail in the recently updated desk-based assessment (DBA) (OA 2016) and this report should be read in conjunction.

1.3.2 The following is a summary of the general landscape development relevant to the route, much based on the seminal work of Robinson in Dodd (2003). Details of specific archaeological sites and find spots can be referenced in the DBA.

1.3.3 In the late Devensian (at the end of the last Ice Age, *c* 10,000 BC), minor and rapidly shifting channels reworked part of the first Thames terrace and lowered it to create the undulating gravel surface beneath the modern floodplain. There is no evidence of significant Holocene (post-glacial) reworking of the floodplain gravels which, together

with evidence of major late Devensian channels at Farmoor and Yarnton, suggests that river flow became restricted to channels eroded to their greatest extent before or during the early Holocene. Recent and ongoing investigations by OA, at Westgate and Luther Court, however, suggest locally in-channel gravel mobilisation occurred periodically, possibly during periods of high river discharge. Both sites are located immediately adjacent a steep rise in the second gravel terrace which may have been vulnerable to some undercutting and erosion.

1.3.4 The early changes on the floodplain are almost certainly related to climatic change, and the timing and duration of snow-melt at the end of the last glaciation. Initially, as the annual volume of melt-water increased, erosion outstripped accumulation of the floodplain gravels. The surface of the first gravel terrace which became the floodplain was therefore lowered. As the climate warmed and the snow melt was increasingly concentrated in the spring, the high volumes of melt water incised major channels within the gravels. When the climate had warmed further, melt-water discharges reduced, leaving excess channel capacity for the warmer temperate climate. As a result many underused channels silted up or were cut off from the main channel flow.

1.3.5 Organic and peat deposits dating to the earlier prehistoric period are rare in Thames floodplain locations and are mostly restricted locally to abandoned former channel courses, backwaters and tributary valleys. In the Oxford area peat has been recorded filling a deep E-W palaeochannel of the Thames in the vicinity of St Aldates (BT Tunnel and Luther Court) dating to the Mesolithic period (Dodd 2003; OA 2015). To the south Late Glacial and early Holocene peat sequences have been recorded at Minchery Farm, adjacent to the Northfield Brook which drains into the Thames at Sandford (Parker 2001; Parker and Anderson 1996; Parker and Preston 2015). Further afield early channel and peat sequences have been analysed at Thrupp, Abingdon (Aalto *et al* 1984), Farmoor (Robinson 1992) and Mingies Ditch in the Windrush Valley (Allen and Robinson 1993).

1.3.6 Hydrological changes during the early Holocene are difficult to establish due to the general lack of sedimentation during this period. It is clear that water levels may have been significantly lower then present day due to factors like greater woodland coverage and a lower sea level. The floodplain may therefore have been relatively dry throughout much of the early prehistoric period with only areas of localised flooding. This would help to explain the extensive prehistoric landscape features that have been identified on the floodplain at Port Meadow (Atkinson, 1942) and Binsey (Rhodes, 1949). This activity was based on dry land soils that developed on top of the floodplain gravels and were preserved under later accumulations of alluvium.

1.3.7 The original soils of the floodplain were a combination of alluvium, loess and weathering products of the gravel. By the Neolithic period, pedological processes of soil formation seem to have predominated over alluvial accretion for much of the floodplain, and only a thin soil, not necessarily of alluvial origin, covered the gravel on most of these sites. Most of the pre-Iron Age soils are ungleyed and non-calcareous; it is difficult to prove that flooding without alluviation was not taking place, but observations have been recorded of man-made dumps of limestone gravel sealing the pre-Iron Age surface of the floodplain, which would have buffered any later phases of decalcification.

1.3.8 Excavations at Port Meadow also revealed a lack of preserved organic remains or gleying in Neolithic and Bronze Age ditches, which suggests, at least, a seasonally low water-table on the floodplain. However, ditches of similar depth dating between the late Bronze Age and the middle Iron Age are known to contain both a high degree of organic preservation and gleying. This suggests that there was a rise in the watertable

of the floodplain from the middle prehistoric period, and may represent the onset of regular seasonal inundation of much of the area covered by the modern floodplain.

1.3.9 Nowhere in the Upper Thames has alluvial clay been observed stratified earlier than the mid-Iron Age. Sites such as Gravelly Guy, Farmoor and Drayton, show that this alluviation was well under way in the Roman period, and organic preservation at Mingies Ditch and Port Meadow suggest a continuing rise in water table after the Iron Age occupation. Similar evidence at Drayton shows that the Roman water-table was much higher than it had been in the late Neolithic. This theory is supported by the recent excavations at Yarnton (OA, in prep.) but it is uncertain whether alluviation or flooding continued in this area into the early Saxon period.

1.3.10 Many of the late Devensian / early Holocene channels were reactivated during the late prehistoric period. The excavations at Yarnton and more recently at the Westgate Centre (OA, 2007), have shown that many of these silted-up channels were re-incised. The accumulation of organic deposits overlying the gravels during this period have been shown to represent a period of rising water levels on the floodplain. Environmental analysis of these deposits has shown that they represent a reed swamp that developed within a drowned floodplain environment. These deposits continued to accumulate within areas of the floodplain into the Saxon period, whilst other areas at the lower elevations showed the first signs of clay alluviation in the post-Iron Age period.

1.3.11 The natural channel sequences of the Oxford floodplain were extensively remodelled and managed during the early medieval period. Channels became canalised and interconnected, most likely in response to the development of a network of water mills at the edges of the Oxford floodplain. At the Westgate Centre these channels were clay lined and reveted with wooden stakes.

1.3.12 The main phase of clay alluviation accumulated after the early medieval canalisation of the various streams that run through Oxford. Most of the sedimentation on the floodplain occurred during the medieval and post-medieval periods. The depth of organic preservation in later archaeological features shows that the water-table on the floodplain remained high to the present day, and historical records show that seasonal flooding continued throughout the medieval and post-medieval periods. Alluviation, however, may have decreased from the late post-medieval period onwards.

1.4 Previous geological floodplain modelling and ground investigation data

Groundwater Monitoring (BGS/EA)

1.4.1 From 2005 a research project has been carried out entitled ‘Groundwater and Surface Water monitoring Network and Hydrogeological interpretation at Oxford’, funded by the EA and BGS. As part of this project a number of boreholes have been installed across the floodplain and descriptions of sediments encountered are available for some of these locations.

1.4.2 The BGS used historical borehole data to produce a 3D geological model of the Oxford floodplain which includes the area of the proposed scheme. The product of this model was thickness maps of alluvium and terrace deposits as well as geological information on superficial deposits, summarised in Newell (2007). The 3D model has been made available for the purposes of this assessment and relevant data incorporated. However

the BGS data coverage in the immediate vicinity of the current route along the western edge of the Thames floodplain is sparse.

FRM Hydrogeological Review

1.4.3 In 2008 a hydrogeological review (Black and Veatch 2009) was carried out as part of the FRM Feasability Study. As part of this review the BGS 3D model was made available and used to prepare a geological long section along the proposed Western Conveyance Channel.

1.4.4 The report identified that the majority of the study area is underlain by alluvial clay overlying terrace deposits belonging to the Northmoor Sands and Gravel member. The alluvial clay varies from 0.3m to more than 2.5m thick, with an average thickness of 1m. The Terrace Deposits vary from 1m to more than 4m thick and are classed as minor aquifers of variable vulnerability.

1.4.5 The superficial deposits in the study area are underlain by Oxford Clay, except at the southern end of the scheme near Sandford Lock where the Upper and Lower Corallian Beds are anticipated. The limestones and fine grained sandstones of the Corallian Beds are considered to be the principal aquifer in the vicinity of the site. Groundwater levels generally occur 1m below ground level, within the Terrace Deposits.

FRM Geoarchaeological Assessment

1.4.6 In 2008 a geoarchaeological assessment (ArchaeoScape 2008) was carried out as part of the FRM Feasibility Study. The assessment comprised a literature review and GIS analysis of historical borehole data. Overall it was noted for the whole of the study area spatial coverage of borehole data was sparse, but particularly so along the western side of the floodplain, coinciding with the western conveyance route (as noted above). The study examined 109 boreholes from the BGS and 45 from an ongoing ground investigation (Fugro 2008). 46 records were rejected as they were either of insufficient quality to be useful or lay outside the study area. .

1.4.7 It was considered the limitations of the spatial data precluded detailed stratigraphic modelling of the area for archaeological purposes and GIS analysis was limited to lithological characterisation of the floodplain sequences. Gravel was noted in 89 records ranging from 0.8-5.4m in thickness, averaging 2.96m. The average thickness of silty clay alluvium was 1.4m with a range of 0.6-3.35m. Peat, an important geoarchaeological resource for preservation of pollen and plant macrofossils, was found in only 3 of the boreholes (2.8%) with an average depth of 1.77m and thickness of 0.32m. This indicated valley floor peats are not particularly thick or laterally extensive. Sand units were only present in 22 boreholes. Given the low energy river conditions as indicated by the widespread occurrence of alluvium, the sand is likely to indicate near-channel depositional environments.

1.4.8 The study concluded there was insufficient data to enable accurate geoarchaeological modelling of the subsurface gravel topography. For the majority of the Holocene the Thames at Oxford was an anastomosing river. However the data does not currently allow for assessing how many channels were functioning during the Holocene, where principle and secondary channels or gravel islands may be located. The majority of the published reports from the area relate to archaeological sites closer to the city, which in certain respects offer information on local floodplain conditions that may be influenced by human activity such as the digging of ditches, channel revetments, causeway construction and urbanisation.

1.4.9 The key recommendation from the study was that further direct ground data should be obtained at a greater spatial resolution.

Route Geology Assessment

1.4.10 In 2014 a desk-based study was carried out of the western conveyance route by Fugro, to estimate the volume and saleability of the different strata that may be excavated as part of the western conveyance works. Only records held by Fugro (including the 2008 interventions) and publicly held borehole records were assessed. This review did not incorporate historic boreholes installed for monitoring purposes with the BGS.

1.4.11 Fugro noted that the spread of ground information was not well distributed, with some areas containing clusters of boreholes and large parts of the route having no data. They recommended additional ground investigation to obtain a better spatial distribution of information along the scheme alignment.

2 Aims and Methodology

2.1 Aims

2.1.1 The primary aim of the watching brief was was to record any archaeological remains exposed during the excavation of trial pits.

2.1.2 In addition the opportunity was taken record the depth and nature of the natural sub-surface Quaternary sediments and stratigraphy. (ie. alluvium). This will be useful for future impact assessments and evaluation strategies.

2.1.3 The specific aims and objectives of the watching brief were to:

- determine the location, extent, date, character, condition, significance and quality of any archaeological remains or horizons exposed during the geotechnical works;
- characterise the sequence of sediments and patterns of accumulation along the route, including the depth and lateral extent of major stratigraphic units, and the character of any basal land surface pre-dating these sediments;
- identify significant variations in the deposit sequence indicative of localised features such as topographic highs (floodplain islands) or palaeochannels;
- identify the location and extent of any waterlogged organic deposits and address the potential and likely location for the preservation of archaeological and palaeoenvironmental remains;
- clarify the relationships between sediment sequences and other deposit types, including periods of 'soil' or peat growth, and the effects of relatively recent human disturbance, including the location and extent of made-ground;
- relate the site sequences to current regional models for the Upper Thames and Oxford floodplain.

2.2 Methodology

2.2.1 The geotechnical ground investigation comprised 140 individual interventions which included mainly trial pits (TP), with window samples (WS), augering (HSA) and a small number of cable percussion (CP) boreholes and hand dug testpits (HTP). A summary of the interventions is presented in Table 1 below. For assessment purposes the scheme has been divided into into the seven areas outlined in the route options (CH2M 2015).

Method	CP	HSA	WS	HTP	TP	
Average depth	**8.5m**	**4.0m**	**2.5m**	**1.20m**	**2.3m**	**Total**
Area 1: Botley Road				2	7	**9**
Area 2: Botley Road to Willow Walk	1	1	2		5	**9**
Area 3: Willow Walk to South Hinksey		15			30	**45**
Area 4: Redbridge	6	7	10	3	18	**44**
Area 5: Sandford North	2	2			9	**13**
Area 6:Sandford South	1	1			7	**9**
Area 7: Weirs Mill Stream		2	3		6	**11**
Total	**10**	**28**	**15**	**5**	**82**	**140**

Table 1: Summary of interventions carried out for the 2015 geotechnical ground investigation divided by the areas as outlined in the route options (CH2M 2015)

2.2.2 In general the watching brief was restricted to the monitoring of trial pit excavation, although some other interventions were also monitored where hand dug test pits for service inspection were excavated prior to drilling. The drilling of the boreholes, window sampling and augering was not generally monitored although geotechnical logs describing the sequence of sediments were made available on completion of fieldwork. No interventions were monitored in areas of known landfill around Redbridge.

2.2.3 The trial pits measured on average 0.5-0.7m wide and *c* 2.5m in length. Excavated depth varied from 1.10m to 3.60m with an average depth of 2.3m. Visibility was generally good for the first *c* 1.5m, but the narrow width of the trial pits reduced visibility beyond this depth. No excavations were entered beyond *c* 1m in depth.

2.2.4 Exposed sediments (including natural alluvial/fluvial deposits) were recorded on a summary proforma and photographed from the edge of excavation. Excavated spoil was regularly checked for artefactual material. Archaeological features and deposits were issued with unique context numbers, and context recording was in accordance with established best practice and the OA Field Manual. Finds were retained and bagged by context number.

2.2.5 The sedimentary sequences were recorded on site in accordance with English Heritage guidelines for geoarchaeology (EH 2007). The sediments were described according to OA standard methodologies based on Jones (1999) on a summary proforma. This includes a description of colour, compaction, texture, sorting, structure, inclusions (including abundance, shape and material and particularly the presence of charcoal fragments or flecks). Comment was also be made on the nature of observable contacts/boundaries indicative of erosion or truncation (eg abrupt and irregular) and any artefact inclusions (daub, pottery or worked flint). Particular attention was given to identifying the presence of medieval or post-medieval brick and ceramic building material (CBM), as opposed to modern material. Buried soils or landsurfaces sealed by or within alluvium may be identified by a suite of characteristics which may include iron mineralisation, rooting, a higher organic content and a diffuse lower contact.

2.2.6 At this early stage in the project, palaeoenvironmental sampling was confined to opportunistic bulk sampling of any organic or peat deposits within the alluvial sequence should they be exposed during excavation. The samples may prove useful in providing future range-finding radiocarbon dates (Appendix D).

2.2.7 Survey data, including locations of interventions relative to the National Grid and Ordnance Datum was provided by the client.

2.2.8 Following the completion of the fieldwork the lithological data was digitised and correlated into a series of broad stratigraphic units for geoarchaeological assessment purposes using specialist modelling software (Rockworks 17). In addition to the 2015 geotechnical data, logs from previous geotechnical interventions and those held at the BGS in Keyworth were examined to provide greater spatial coverage of the project area, resulting in a database containing a total of 265 interventions. The BGS data was cross referenced with data from the BGS/EA 3D model (see above). A small number of historical borehole records were considered from areas immediately adjacent to the current Study Area in order to offset the edge effects inherent in 3D modelling (Appendix B)

3 RESULTS

3.1.1 The general results of the watching brief are described below. The locations of the geotechnical interventions are presented in Figures 2-8. Detailed stratigraphic data used during the modelling exercise is presented in Appendix B.

3.2 Area summaries

Area 1: Botley Road (Fig.2)

3.2.1 This section of the route corridor, which lies to the north of the Botley Road. The geotechnical investigation included seven trial pits and two hand dug test pits, 1.20m to 3.25m in depth. The spacing of the interventions was quite wide and the underlying alluvial sequences and depth of the terrace gravel surface were quite variable reflecting the complex of floodplain channels and drainage ditches that exist in this area. Organic peaty deposits (0.8m thick) were recorded within the alluvial sequence at the Seacourt Park and Ride adjacent to the current Seacourt Stream. The terrace gravel surface at these locations lay up to 2.5m below surface (eg. TP292 and TP291). These deposits are probably associated with a former channel edge. However, to the east gravel depths appeared shallower at 0.6m to 1.3m depth, overlain by inorganic clay alluvium, perhaps reflecting more the general floodplain surface.

3.2.2 Although cropmarks are present in the area representing medieval ridge and furrow and undated enclosures (OA 2016), no archaeological features were identified during the watching brief. Artefacts included a single sherd of a Staffordshire red ware jug handle from TP294 from just beneath the topsoil at 0.2m depth dated to the 19th century, along with one fragment of brick or tile of 18th-20th century date.

Area 2: Botley Road to Willow Walk (Fig. 3)

3.2.3 This section of the route corridor crosses and area of open fields and meadows. The geotechnical investigation included five trial pits, two window samples, one auger hole and one borehole. The depths for the trial pits ranged from 1.6m to 3.2m depth but in the majority of cases they did not reach the underlying Pleistocene gravels. The window samples and borehole were more productive reaching depths of up to 5m and 10.45m respectively. All of the interventions were aligned along the eastern bank of the Hinksey Stream which is located along the western edge of the Thames floodplain. The edge of the floodplain rises steeply away on the western side of the stream. The depths of the

Holocene sequence as seen in the geotechnical works where much greater than seen in other areas and it is likely the deposits represent the silting of a much wider watercourse than the current stream. The majority of interventions identified a complex sequence of silts, sands and more organic peaty units with frequent plant remains, woody fragments and mollusc shell. The depths of the Holocene sequence over the gravel ranged from 1.5m to 4.2m below surface the deepest most organic sequences was noted in the vicinity of TP208 and BH201 at the southern extent of the area.

3.2.4 This section of the route contains no known archaeological sites or features (OA 2016). No archaeological remains were identified during the watching brief.

Area 3: Willow Walk to South Hinksey (Fig. 4)

3.2.5 The geotechnical investigation included 30 trial pits and 15 auger holes. Initially the interventions followed the banks of the Hinksey Stream and sequences were similar to those described above. However, further south the distribution is more dense covering a wider area of the floodplain. Here the sediment sequences were fairly typical, largely comprising inorganic orangey or yellow brown silty clay alluvium over gravel averaging 0.7m to 1m in thickness. Occasional thin organic units were noted above the gravel but these appeared to be discrete and ephemeral (eg. TP225, TP275 and TP278). Shallow sequences were noted towards the western floodplain edge where thin brickearth and/or colluvial sequences were noted to cap the gravels and alluvial deposits were either very thin or absent. These deposits were particularly obvious around the slopes of South Hinksey Village eg. TP283 and TP282.

3.2.6 This section of the scheme crosses an area which contains a number of known archaeological features including the possible location of a medieval routeway or causeway across the floodplain from North Hinksey towards Oxford's west gate. Another causeway is present near South Hinksey at the Devil's Backbone. A series of cropmarks defining probable post-medieval enclosures are also present between the Hinksey villages, and further south are the probable remains of a Bronze Age burial mound and series of enclosures (OA 2016). No archaeological features were identified during the watching brief. A single pottery sherd was recovered from the topsoil in TP273 of green glazed possibly late Brill Ware, dated to the 16th-17th century.

Area 4: Redbridge (Fig. 5)

3.2.7 The geotechnical ground investigation works at Redbridge comprised 18 trial pits, 10 window samples, 7 auger holes, three hand dug testpits and six boreholes. North of Old Abingdon Road, the sediment sequences were similar to those described above being relatively shallow inorganic silty clay alluvium over gravel with some evidence of colluvium on the slopes south of South Hinksey village. Medieval pottery sherds were recovered from TP285 at the edge of South Hinksey village comprising a jug handle of Brill Boarstall Ware (14th-15th century), a sherd of Ashampstead Ware (12th-14th century) and a sherd of an East Wilts Ware cooking pot (1150-1350 AD). The pottery along with a single animal bone derive from a dumped occupation deposit lying directly beneath the topsoil at *c* 0.40m depth. A single fragment of a 17th century clay pipe was also recovered from TP286 nearby. TP228 produced one sherd of cream ware, dated to 1760-1830AD, from the topsoil.

3.2.8 The line of the Old Abingdon Road is of archaeological significance as it is known to form the the southern end of the early medieval (Norman) Grandpont causeway which

runs from Folly Bridge (OA 2016). Substantial deposits of modern made ground were noted at Dairy Crest up to 1.45m, overlying alluvium with the surface of the gravel at c 2.6m depth. Generally trial pits were not monitored within areas of known landfill south of the Old Abingdon Road. Examination of the geotechnical logs suggest on average 2.5-3.0m of modern landfill deposits exist overlying a clay liner. Terrace gravels were occasionally noted beneath the liner at c 2.40-2.80m depth (eg. WS217, BH205, BH207, BH208). Two hand dug test pits, HP205 and HP206, suggest the area immediately east of the railway line does not contain land fill deposits. Here alluvial deposits with shell fragments and organic matter lie directly beneath the topsoil with gravel reached in HP206 at 0.70m depth.

Area 5: Sandford North (Fig. 7)

3.2.9 This section of the route corridor crosses an area of floodplain meadow between the existing Thames Channel and the railway line and contains limited known archaeology (OA 2016). The geotechnical ground investigation comprised nine trial pits, two auger holes and two boreholes along a roughly north-south alignment. No archaeological remains were encountered. The thickness of alluvial deposits varied. In the northern part of the area they measured up to 2.4m depth and did contain some organic units (eg TP250 and TP252). However southwards the sequences shallowed considerably to less than 1m becoming inorganic and more typical of the floodplain sequences seen between North and South Hinksey villages. This is possibly a reflection of the narrow width of the floodplain at this location and a deeply incised Thames channel. Alluvium was notably thin or absent in the vicinity of TP257 and TP258 in the southern part of the area.

Area 6: Sandford South (Fig. 8)

3.2.10 The geotechnical ground investigation comprised seven trial pits, one auger hole and one borehole along a roughly north-south alignment (Fig. 8). No archaeological remains were encountered apart from a single fragment of clay pipe dated to the 18th-19th century. The sequences were similar to those described above with alluvium averaging 0.7m depth over gravel. A single intervention at the southern extent of the area immediately adjacent to the current Thames channel (TP265) produced a thicker sequence with organic units to 2.35m depth.

Area 7: Weirs Mill Stream (Fig. 6)

3.2.11 The geotechnical ground investigation comprised six trial pits, two auger holes and three window samples along a roughly north-south alignment. The sequences were similar to those seen at Sandford North with several interventions recording deeper sequences of alluvium with organic units adjacent to extant watercourses. The thickness of alluvium ranged from 0.9m to 2.6m. No archaeological remains were encountered during the watching brief and there is limited known archaeology for this area (OA 2016).

3.3 Geoarchaeological modelling

3.3.1 As outlined above 265 data points were entered into the modelling software (Rockworks 17) which included historical data as well as the geotechnical data from

2015 (Appendix B). For the purposes of the geoarchaeological assessment, the floodplain stratigraphy has been correlated into a series of broad stratigraphic units:

- Topsoil
- Recent made ground
- Holocene fine grained alluvium (including organic silts and peat units)
- Pleistocene gravels
- Bedrock

3.3.2 It should be noted the distribution of data points across the extent of the study area is very uneven and for the purposes of spatial modelling preliminary interpretation is tentative. Of the 265 interventions 81 reached bedrock and 227 reached Pleistocene gravels. Significant organic or peaty units within the alluvial stack were noted in 23 interventions

3.3.3 The modelled surface of the Pleistocene deposits is presented in Figure 9. The edge of the floodplain is clearly visible along the western boundary of the route between North and South Hinksey. The surface of the gravel across much of the floodplain undulates a little but demonstrates no clear topographic highs taking into account the distribution of the data points. Much of the floodplain gravel surface (excluding Sandford) lies above 54.0-54.5m OD. Elevations lower than this appear to correlate with current watercourses such as the Hinksey Stream south of the Botley Road, although there are obvious gaps in data that produce anomalous features, particularly where the interventions follow a linear route veering away from extant channels.

3.3.4 A slightly elevated area appears at the western edge of the floodplain between the Hinksey villages which may be related to a lobe of slopewash/solifluction deposits extending onto the floodplain from the steep gradients of Boars Hill. Thin stoney brickearth or colluvial type deposits were noted capping the gravel here. Of note is what appears to be a promontory leading off Hinksey Hill in the vicinity of the Old Abingdon Road which coincides with the alignment of the Norman crossing which may be of significance. In general elevations appear lower towards Sandford which may be a result of past channel incision and the narrow width of the floodplain at this location.

3.3.5 Minerogenic alluvium was recorded over much of the floodplain averaging 1m to 1.5m in thickness. Overall no laterally extensive floodplain peat deposits were recorded. It should be noted the extensive later prehistoric organic reed swamp deposits recorded on the floodplain around St Aldates and the Westgate Centre occur at elevations of *c* 53.3 to 54.0m OD adjacent to the Thames Channel, which is lower than much of the gravel surface along the FAS route. Localised organic units were noted at several locations during the watching brief, the deepest and most complex of which generally coincide with areas adjacent to current watercourses such as the Seacourt and Hinksey streams, reaching 2.5m to 3.0m in depth but occasionally more, and at the southern extent of the route adjacent to the Thames Channel at Sandford.

3.3.6 Deposits of made ground were occasionally noted but were concentrated in areas of known landfills around Redbridge (Fig 10). The ground surface associated with the landfill areas is significantly higher than the surrounding floodplain. It is likely that some truncation of the underlying alluvial sequences has occurred in this area and in places made ground sits directly on the Pleistocene gravels.

3.4 Finds and sample summary

3.4.1 Occasional sherds of medieval and post-medieval pottery were recovered from the topsoil and alluvial deposits between North and South Hinksey (Appendix C).

3.4.2 A series of small bulk samples were retained for further sedimentary description and potential future radiocarbon dating (Appendix D).

4 Discussion

4.1 Reliability of field investigation

4.1.1 The results of the watching brief have served well in further characterising the nature of the floodplain sequences along the route. Although the number of interventions was quite high and well distributed, the linear nature of the route inhibits the 3D modelling process with reference to identifying landscape features such as meandering channels and floodplain islands and this should be taken into account when viewing the surface plots presented in this report. Account should be taken of the data gaps and the way this affects the computer modelling.

4.1.2 The trial pits were very numerous and well-distributed in Area 3 and as such if significant and extensive areas of occupation were present it is likely these would have been identified through concentrations of finds and occasional features. However, the footprint of the excavations was quite small and evidence of more ephemeral or localised activity may have been missed. Although visibility was relatively good for the initial 1-2m, this was reduced as the excavation progressed due to the narrowness of the trial pits.

4.1.3 Ground water was not a significant problem as a result of the fieldwork being carried out in late summer with the water table at its lowest. However, ingress was encountered, particularly adjacent to extant watercourses as excavations progressed beyond *c* 2m. Where this occurred visibility of the alluvial/gravel interface was poorer.

4.1.4 Access to the sediments for detailed recording and sampling was limited. No excavations were entered beyond 1m depth. Sediments were recorded from the edge of the trial pit and sampling was restricted to occasional bulk soil samples extracted from the machine bucket in c 0.1m spits.

4.2 Summary

4.2.1 The survey was able to achieve the main project aims and objectives outlined in Section 2.1. No significant archaeological remains were encountered other than the occasional sherds of pottery described.

4.2.2 The results provide an account of the character and sedimentation patterns across the Site, which will help to inform the positioning of any future evaluation trenches and required depth of excavation.

4.2.3 Deep complex waterlogged channel edge sequences with peaty organic units were noted adjacent to the Seacourt and Hinksey Streams in Areas 1 and 2. These sequences have high potential to preserve palaeoenvironmental remains suitable for landscape reconstruction. Although currently undated they have the potential to date from the early Holocene. Similar localised sequences were noted in Areas 5, 6 and 7. Channel edge locations tend to provide a focus for activity in the past due to the abundance of resources available for seasonal exploitation and as such have the potential to preserve a range of archaeological evidence which would include timber

structures such as bridges and jetties and other types of wetland archaeology. It is possible that other now silted up watercourses are present along the route, although significant features other than those described were not wholly apparent during the watching brief.

4.2.4 Across the general floodplain between the Hinksey villages and at Sandford the alluvial sequences are relatively shallow with much of the underlying gravel surface lying above 54m OD. As such it is highly likely that the area was relatively dry land for much of the Holocene, developing into seasonally inundated floodplain meadow in the later Holocene, much as it is today. There was no evidence for extensive areas of open water or reed swamp, contrasting to the lower areas of the floodplain at St Aldates. The type of activity likely to be represented is pastoral and agricultural in nature, although the potential for prehistoric ceremonial and burial activity has been demonstrated through the examination of the cropmark evidence (OA 2016).

4.3 Recommendations

4.3.1 The margins of currently extant major channels/streams provide a target for further geoarchaeological investigation. The geotechnical interventions tended to follow the alignment of the channels. Additional work could consist of selected transects running perpendicular to provide cross profiles of the channel banks. The transects should extend onto areas of mapped higher gravel to test the theory that the main floodplain watercourses sit within the footprint of larger, more ancient channels whose general course has remained stable for much of the Holocene. This would also allow for more accurate 3D modelling than that produced by a linear data array.

4.3.2 This work would be carried out by a combination of augering and mechanical coring to extract cores suitable for palaeoenvironmental assessment and scientific dating. Key targets could include the Seacourt, Bulstake and Hinksey streams as well as Weirs Mill stream, in the vicinity of geotechnical interventions that have proved significant depths of organic deposits.

4.3.3 It is unlikely geoarchaeological coring would provide significant additional information on the areas mapped as shallow alluvium (<1m thickness) on Figure 11, over and above the records made during the watching brief. Given the thin alluvial cover here these areas may be evaluated through standard archaeological field methodologies.

4.4 References

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Appendix A. Summary of Site Details

Site name: Oxford Flood Alleviation Scheme Phase 2

Site code: OXFLRD 15

Grid reference: SP490063 to SP530009

Type: Geoarchaeological Watching Brief

Date and duration: Fieldwork - September 2015

Summary of results: In September 2015 Oxford Archaeology (OA) undertook a geoarchaeological watching brief during initial geotechnical ground investigations associated with the proposed Oxford Flood Alleviation Scheme (FAS). The work was commissioned by CH2M on behalf of the Environment Agency (EA).

The geotechnical survey comprises 140 interventions consisting of trial pits, augering, window sampling, boreholes and hand dug testpits. The primary purpose of the watching brief was to record any archaeological remains exposed during the excavation of trial pits and, following a review of all geotechnical logs, provide baseline data on the nature and potential of the sedimentary sequences across the area to inform future evaluation strategies. The results of the watching brief have been incorporated into the recently updated desk-based assessment of the scheme (OA 2016).

No archaeological features or finds of significance were located during the work, apart from occasional sherds of medieval and post-medieval pottery from the floodplain meadows between North and South Hinksey.

Overall minerogenic silt clay alluvium over gravel was recorded at most locations averaging 1.0m to 1.5m in thickness, although shallower deposits at 0.50m to 0.70m were noted, particularly at the western edge of the floodplain between the Hinksey villages and further south at Sandford. No extensive floodplain peat deposits were recorded. The gravel surface over much of the route (excluding Sandford) appears higher than the area around St Aldates and Westgate where laterally extensive later prehistoric reed swamp deposits have previously been recorded. However, localised organic units were noted at several locations, the deepest and most complex of which generally coincide with areas adjacent to current watercourses such as the Seacourt and Hinksey streams, reaching 2.5m to 3.0m in depth. Previous archaeological investigations in the region have found that some extant watercourses linked to the main Thames channel may be located within the footprint of earlier wider silted up channels, perhaps dating back to the end of the last glacial period and beginning of the Holocene (*c* 12,000 years) eg. the proto- Trill Mill Stream and proto- St Aldates channel in Oxford City. Thin organic deposits at the base of the alluvium over Pleistocene gravel were noted at a

few locations on the general floodplain between North and South Hinksey (eg. TP275, TP278 and TP225). These do not appear to be associated with current channels and were recorded at shallower depths than described above and may represent ephemeral floodplain pools. Extensive deposits of modern made ground were noted around Redbridge. South of the Old Abingdon Road these are associated with historical landfill sites where ground elevations have been raised by 2-3m above the floodplain surface.

Location of archive: The archive is currently held at OA, Janus House, Osney Mead, Oxford, OX2 0ES, and will be deposited at Oxfordshire Museum

Appendix B. Stratigraphic Data

			Presence			Thickness (m)		Depth (m)
Area	Investigation	Intervention	Finds	Samples	Organic silt/Peat	Made Ground	Alluvium	Pleistocene surface
Area 1	2015	HP201				Y	?	
Area 1	2015	HP295					?	
Area 1	2015	TP291		Y	Y		Y	2.50
Area 1	2015	TP292		Y	Y		Y	1.95
Area 1	2015	TP293					Y	0.90
Area 1	2015	TP294	Y				Y	0.82
Area 1	2015	TP296					Y	0.60
Area 1	2015	TP297		Y	Y		Y	2.90
Area 1	2015	TP298					Y	1.30
Area 1	Historical	2008-BH123				Y	Y	3.40
Area 1	Historical	2008-BH125					Y	0.85
Area 1	Historical	2008-TPA				Y	Y	2.20
Area 1	Historical	2008-TPV				Y	?	
Area 1	Historical	B1				?	Y	2.10
Area 1	Historical	BR1					Y	3.10
Area 1	Historical	OS3					Y	1.20
Area 1	Historical	SP40NE24					Y	0.91
Area 1	Historical	SP50NW351						3.00
Area 1	Historical	SP50NW352				Y		1.80
Area 1	Historical	SP50NW353				Y		1.60
Area 1	Historical	SP50NW354				Y	Y	2.80
Area 2	2015	BH201			Y		Y	4.20
Area 2	2015	HSA201					Y	2.00
Area 2	2015	TP202			Y		?	
Area 2	2015	TP203					Y	2.00
Area 2	2015	TP204					Y	2.00
Area 2	2015	TP206					Y	1.50
Area 2	2015	TP208			Y		?	
Area 2	2015	WS219			Y		Y	2.75
Area 2	2015	WS220			Y		Y	2.70
Area 2	Historical	2008-BH101				Y	Y	3.30
Area 2	Historical	2008-BH102			Y		Y	2.40
Area 2	Historical	2008-WS01				Y	Y	1.65
Area 2	Historical	2008-WS02				Y		1.30
Area 2	Historical	SP40NE221						0.15
Area 2	Historical	SP40NE23					Y	1.20
Area 2	Historical	SP40NE33					Y	2.14
Area 2	Historical	SP40NE34					Y	4.28
Area 2	Historical	SP40NE35					Y	1.23
Area 2	Historical	SP40NE36						0.61
Area 2	Historical	SP40NE37						0.61
Area 2	Historical	SP40NE38					Y	0.92
Area 2	Historical	SP40NE39					Y	0.92
Area 2	Historical	SP40NE40					Y	1.84
Area 2	Historical	SP50NW370				Y	Y	3.05
Area 2	Historical	SP50NW371				Y	Y	3.05
Area 2	Historical	SP50NW372					Y	3.66
Area 2	Historical	SP50NW374				Y	Y	2.75
Area 2	Historical	SP50NW375				Y	Y	2.85
Area 2	Historical	SP50NW376				Y	Y	2.80
Area 2	Historical	SP50NW377				Y	Y	3.00
Area 3	2015	HSA202					Y	1.25
Area 3	2015	HSA203					Y	1.05
Area 3	2015	HSA204					Y	2.05
Area 3	2015	HSA205					Y	1.80
Area 3	2015	HSA206					Y	2.50
Area 3	2015	HSA207					Y	0.75
Area 3	2015	HSA208					Y	0.50
Area 3	2015	HSA209					Y	0.20
Area 3	2015	HSA210					Y	0.80

			Presence			Thickness (m)		Depth (m)
Area	Investigation	Intervention	Finds	Samples	Organic silt/Peat	Made Ground	Alluvium	Pleistocene surface
Area 3	2015	HSA211					Y	0.59
Area 3	2015	HSA212					Y	0.40
Area 3	2015	HSA213						0.30
Area 3	2015	HSA214					Y	1.05
Area 3	2015	HSA232					Y	0.45
Area 3	2015	HSA233					Y	0.70
Area 3	2015	TP209					Y	1.30
Area 3	2015	TP210			Y		Y	1.95
Area 3	2015	TP211		Y	Y		Y	2.35
Area 3	2015	TP213		Y	Y		Y	1.80
Area 3	2015	TP214					Y	2.60
Area 3	2015	TP216		Y	Y		Y	2.10
Area 3	2015	TP218						0.40
Area 3	2015	TP221					Y	0.65
Area 3	2015	TP222						0.25
Area 3	2015	TP223						0.30
Area 3	2015	TP224		Y	Y		Y	1.00
Area 3	2015	TP225		Y			Y	1.05
Area 3	2015	TP226		Y			Y	0.90
Area 3	2015	TP267						0.30
Area 3	2015	TP268					Y	0.64
Area 3	2015	TP269					Y	0.59
Area 3	2015	TP270					Y	0.65
Area 3	2015	TP271						0.28
Area 3	2015	TP272						0.30
Area 3	2015	TP273	Y				Y	0.70
Area 3	2015	TP274						0.35
Area 3	2015	TP275		Y	Y		Y	1.10
Area 3	2015	TP276			Y		Y	0.80
Area 3	2015	TP277						0.30
Area 3	2015	TP278					Y	0.80
Area 3	2015	TP279					Y	0.80
Area 3	2015	TP281					Y	2.10
Area 3	2015	TP282		Y			Y	1.00
Area 3	2015	TP283						0.32
Area 3	2015	TP289					Y	0.90
Area 3	Historical	2008-BH103				Y	Y	1.15
Area 3	Historical	2008-TPC					Y	1.30
Area 3	Historical	2008-WSB					Y	1.90
Area 3	Historical	NH4					Y	1.50
Area 3	Historical	SH2					Y	0.70
Area 3	Historical	SH3					Y	2.30
Area 3	Historical	SP40NE2					Y	1.80
Area 3	Historical	SP40NE3				Y	Y	2.10
Area 3	Historical	SP40NE62				Y		0.91
Area 3	Historical	SP40NE63				Y		0.45
Area 3	Historical	SP40NE74				Y	Y	2.10
Area 3	Historical	SP40SE35						0.30
Area 3	Historical	SP50NW101					Y	0.70
Area 3	Historical	SP50NW104					Y	1.30
Area 3	Historical	SP50NW106				?		
Area 3	Historical	SP50NW267				Y		2.71
Area 3	Historical	SP50NW31						0.08
Area 3	Historical	SP50NW34				Y	Y	1.45
Area 3	Historical	SP50NW36					Y	0.84
Area 3	Historical	SP50NW37					Y	0.96
Area 3	Historical	SP50NW38				Y		2.96
Area 3	Historical	SP50NW39				Y		3.28
Area 3	Historical	SP50NW40				Y		1.75
Area 3	Historical	SP50NW41				?		
Area 3	Historical	SP50NW49					Y	1.83
Area 3	Historical	SP50NW6					Y	1.50

			Presence			Thickness (m)		Depth (m)
Area	Investigation	Intervention	Finds	Samples	Organic silt/Peat	Made Ground	Alluvium	Pleistocene surface
Area 3	Historical	SP50NW81				Y	Y	3.25
Area 3	Historical	SP50NW82				Y		1.25
Area 3	Historical	SP50NW83					Y	0.80
Area 3	Historical	SP50NW84				Y	Y	3.20
Area 3	Historical	SP50NW85				Y	Y	4.80
Area 3	Historical	SP50NW89				Y	Y	3.80
Area 3	Historical	SP50NW93				Y	Y	3.00
Area 3	Historical	SP50NW98				Y		4.75
Area 3	Historical	SP50NW99				Y	Y	1.55
Area 3	Historical	SP50SW244						0.60
Area 3	Historical	SP50SW246						0.30
Area 3	Historical	SP50SW250					Y	3.30
Area 3	Historical	SP50SW5					Y	1.53
Area 3	Historical	SP50SW7					Y	1.42
Area 3	Historical	SP50SW8					Y	1.72
Area 4	2015	BH202		Y			Y	1.30
Area 4	2015	BH203					Y	1.40
Area 4	2015	BH205				Y		2.80
Area 4	2015	BH207				Y		2.80
Area 4	2015	BH208		Y		Y		2.70
Area 4	2015	BH210		Y		Y	Y	1.80
Area 4	2015	HP205					?	
Area 4	2015	HP206					Y	0.70
Area 4	2015	HP214		Y			?	
Area 4	2015	HSA215					Y	1.00
Area 4	2015	HSA216					Y	1.50
Area 4	2015	HSA217					Y	0.90
Area 4	2015	HSA218					Y	0.65
Area 4	2015	HSA219					Y	0.80
Area 4	2015	HSA220				Y	Y	2.40
Area 4	2015	HSA221				Y	Y	3.00
Area 4	2015	TP227					Y	1.45
Area 4	2015	TP228	Y				Y	0.75
Area 4	2015	TP230					Y	0.75
Area 4	2015	TP233					Y	1.30
Area 4	2015	TP235					Y	1.50
Area 4	2015	TP236					Y	1.60
Area 4	2015	TP237				?		
Area 4	2015	TP238				?		
Area 4	2015	TP239				?		
Area 4	2015	TP240				?		
Area 4	2015	TP241				?		
Area 4	2015	TP242				Y		2.35
Area 4	2015	TP243		Y		Y	Y	1.75
Area 4	2015	TP244				?		
Area 4	2015	TP284					Y	1.40
Area 4	2015	TP285	Y				Y	1.45
Area 4	2015	TP286	Y					0.25
Area 4	2015	TP287						0.25
Area 4	2015	WS203				?		
Area 4	2015	WS203A				?		
Area 4	2015	WS203B				Y	Y	2.64
Area 4	2015	WS204				?		
Area 4	2015	WS204A				?		
Area 4	2015	WS208				Y		1.10
Area 4	2015	WS215				?		
Area 4	2015	WS216				?		
Area 4	2015	WS217				Y		2.40
Area 4	2015	WS218				?		
Area 4	Historical	2008-BH104					Y	1.15
Area 4	Historical	2008-BH105				Y	Y	1.70
Area 4	Historical	2008-BH106				Y	?	

			Presence			Thickness (m)		Depth (m)
Area	Investigation	Intervention	Finds	Samples	Organic silt/Peat	Made Ground	Alluvium	Pleistocene surface
Area 4	Historical	2008-BH107				Y	?	
Area 4	Historical	2008-BH109				Y	?	
Area 4	Historical	2008-BH110				Y	?	
Area 4	Historical	2008-BH112				Y	?	
Area 4	Historical	2008-BH113					?	
Area 4	Historical	2008-BH114				Y	?	
Area 4	Historical	2008-BH121				Y		8.50
Area 4	Historical	2008-BH122			Y	Y	Y	7.15
Area 4	Historical	2008-TPE				Y	?	
Area 4	Historical	2008-TPF				Y	?	
Area 4	Historical	2008-TPG				?		
Area 4	Historical	2008-TPK				Y	?	
Area 4	Historical	2008-TPL				Y	?	
Area 4	Historical	2008-TPM				?		
Area 4	Historical	2008-TPP					Y	0.75
Area 4	Historical	2008-TPQ					Y	0.80
Area 4	Historical	2008-TPR					Y	1.30
Area 4	Historical	2008-TPS					Y	0.70
Area 4	Historical	2008-WS119					Y	0.62
Area 4	Historical	2008-WS120					Y	0.75
Area 4	Historical	2008-WSJA				Y	?	
Area 4	Historical	NH1					Y	1.10
Area 4	Historical	SBP44						0.46
Area 4	Historical	SBP45					Y	0.61
Area 4	Historical	SBP46					Y	0.77
Area 4	Historical	SBP47					Y	0.92
Area 4	Historical	SH1					Y	1.10
Area 4	Historical	SP50SW1					Y	1.50
Area 4	Historical	SP50SW2					Y	1.81
Area 4	Historical	SP50SW251					Y	1.20
Area 4	Historical	SP50SW252				Y	Y	3.90
Area 4	Historical	SP50SW253						0.75
Area 4	Historical	SP50SW3					Y	1.50
Area 4	Historical	SP50SW4					Y	2.10
Area 5	2015	BH211					Y	1.95
Area 5	2015	BH212					Y	1.90
Area 5	2015	HSA227					Y	0.80
Area 5	2015	HSA228					Y	0.55
Area 5	2015	TP250					Y	2.40
Area 5	2015	TP251					Y	1.35
Area 5	2015	TP252					Y	2.15
Area 5	2015	TP253					Y	1.50
Area 5	2015	TP254					Y	1.00
Area 5	2015	TP255					Y	0.65
Area 5	2015	TP256					Y	0.64
Area 5	2015	TP257					Y	0.50
Area 5	2015	TP258					Y	0.50
Area 5	Historical	2008-BH116					Y	2.40
Area 5	Historical	2008-WS115					Y	1.90
Area 5	Historical	2008-WSN					Y	1.80
Area 5	Historical	SP50SW175						0.30
Area 5	Historical	SP50SW184				Y		1.06
Area 6	2015	BH213					Y	1.95
Area 6	2015	HSA230					Y	0.64
Area 6	2015	TP259		Y			Y	1.30
Area 6	2015	TP260					Y	0.80
Area 6	2015	TP261					Y	0.89
Area 6	2015	TP262					Y	0.60
Area 6	2015	TP263		Y			Y	1.05
Area 6	2015	TP264					Y	1.45
Area 6	2015	TP265	Y	Y	Y		Y	2.35
Area 6	Historical	2008-BH117					Y	2.50

			Presence			Thickness (m)		Depth (m)
Area	Investigation	Intervention	Finds	Samples	Organic silt/Peat	Made Ground	Alluvium	Pleistocene surface
Area 6	Historical	2008-BH118					Y	2.50
Area 6	Historical	2008-WSO					Y	2.00
Area 6	Historical	SP50SW189						0.10
Area 6	Historical	SP50SW90						0.08
Area 7	2015	HSA224					Y	2.60
Area 7	2015	HSA225			Y	Y	Y	2.50
Area 7	2015	TP245		Y	Y		Y	2.30
Area 7	2015	TP246					Y	2.90
Area 7	2015	TP247		Y	Y		Y	2.10
Area 7	2015	TP248		Y	Y		Y	1.30
Area 7	2015	TP249		Y	Y		?	
Area 7	2015	TP299					Y	2.10
Area 7	2015	WS211					Y	1.10
Area 7	2015	WS212					Y	1.55
Area 7	2015	WS213					Y	2.30
Area 7	Historical	IF1					Y	3.40
Area 7	Historical	IF2					Y	1.16
Area 7	Historical	IF4					Y	1.60

APPENDIX C. FINDS

C.1 Pottery, clay tobacco pipe and ceramic building material.

John Cotter and Geraldine Crann

Context	Description	Date
TP 228	Topsoil. 1 body sherd cream ware (CREA DEV)	1760 - 1830
TP 265	0.35-0.70m BGL. 1 fragment clay pipe stem.	18th – early 19th century
TP 273	Topsoil. 1 sherd ?late Brill ware (OXBX) green glazed.	16th – 17th century
TP 285/1002	0.40m BGL.1 jug handle Brill Boarstall ware(OXAM), 1 sherd East Wilts ware (OXAQ) cooking pot sherd, 1 bodysherd Ashampstead ware(OXAG)	14th – 15th century 1150 – 1350 12th – 14th century
TP 286	0.00-0.25m BGL. 1 fragment clay pipe stem.	17th century
TP 294	0.2m BGL. 1 Staffordshire redware jug handle. I scrap brick/tile.	19th century pottery 18th – 19th century cbm

C.2 Animal bone

Lena Strid

Context	Description
TP 285/1002	0.40m BGL. 1 horse 1st phalanx, 1 medium mammal long bone, 1 indeterminate fragment, 76g.

C.3 Iron

Ian Scott

Context	Description	Date
TP 286	0.00 – 0.25m BGL. 1 fragment of cut nail, 2g	Undateable

APPENDIX D. SOIL SAMPLES

Area	Intervention	Depth (m)	No.	Notes
Area 1	TP291	0.8-0.9	1 tub	organic rich silt, WPR, 1L
		1.0-1.1	1 tub	organic clayey silt "peaty", WPR, 1L
		2	1 tub	organic rich silt, WPR, 1L
		2.6-2.7	1 tub	organic rich clayey silt with shells from organic lens, WPR, 1L
	TP292	1.8-1.95	1 tub	organic rich silt, wood, WPR, 1L
		1.95	1 tub	snails (c 50% of deposit), 1L
		1.8	1 bag	wood
	TP297	2.4-2.5	1 bag	organic silt “peaty”, 1.5L
Area 2	TP202	0.95	1 bag	organic silt, 4L
		1.75	1 bag	snails, organic rich clayey silt, 4L
	TP208	3.0-3.2	1 bag	organic silt, wood, 5L
		0.9	1 bag	organic silt, 5L
		1.85	1 bag	organic rich silt with snails, 5L
Area 3	TP210	0.95	1 bag	organic rich silty clay from organic pocket above alluvium, wood, 1L
	TP211	1.7-1.8	1 tub	organic rich clayey silt with snails, 1L
		1.2-1.3	1 tub	snails 30% of deposit, 1L
	TP213	1.8-1.85	1 bag	organic silt, wood, 0.2L
	TP216	1.4-1.6	2 bags	organic silt, 2L
	TP224	0.85-1.0	1 bag	organic clayey silt from inclusion, 1L
	TP225	0.18-0.35	1 tub, 1 bag	clayey sandy silt with snails, 1L
		0.2-0.35	1 bag	clayey, 1L
		0.85-1.05	1 bag	1.5L
	TP226	0.8-0.9	1 bag	fibrous clayey silt, 0.3L
	TP275	0.65	1 bag	organic clayey silt, 4L
	TP282	1	1 bag	brickearth type of deposit, fine sand, 1.5L
Area 4	TP243	1.15-1.75	1 tub	brick earth, 1L
	HP214	1	1 bag	wood
Area 6	TP259	1.25-1.6	2 bags	wood from sand, 2x1L
	TP263	1.3-2.6	1 bag	wood from sand, 1.5L
	TP265	1.5-2.35	1 bag	organic clayey silt, shells, wood, 1.5L
Area 7	TP245	1.9-2.0	2 bags	organic rich silt, 2x1L
	TP247	1.6-2.1	1 tub	organic rich silt, 1L
	TP248	0.9-1.0	1 tub	organic rich clayey silt, snails, 1L
	TP249	1.6-1.7	2 bags	organic rich silt, snails, wood, 2x0.3L

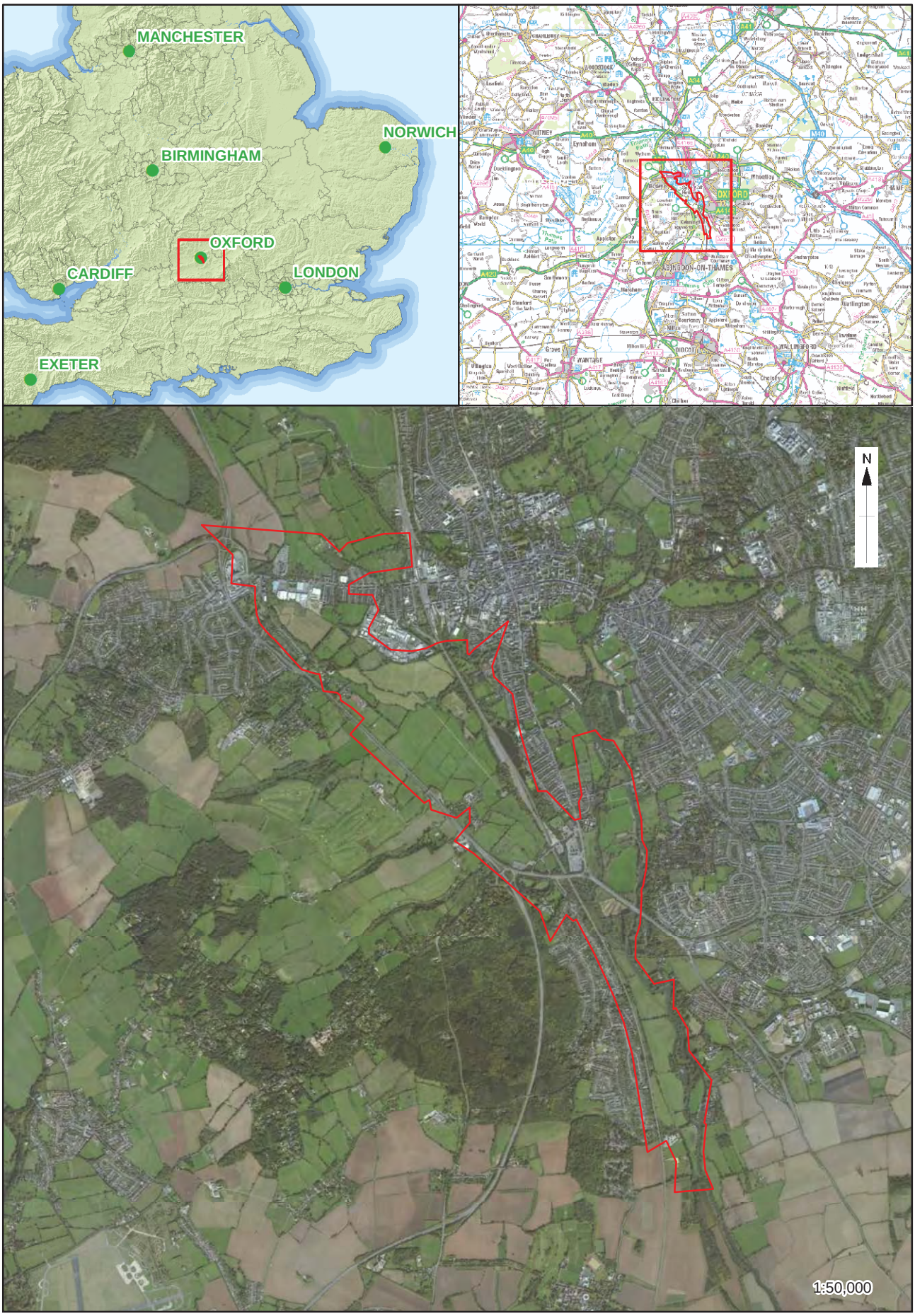

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Figure 1: Site location

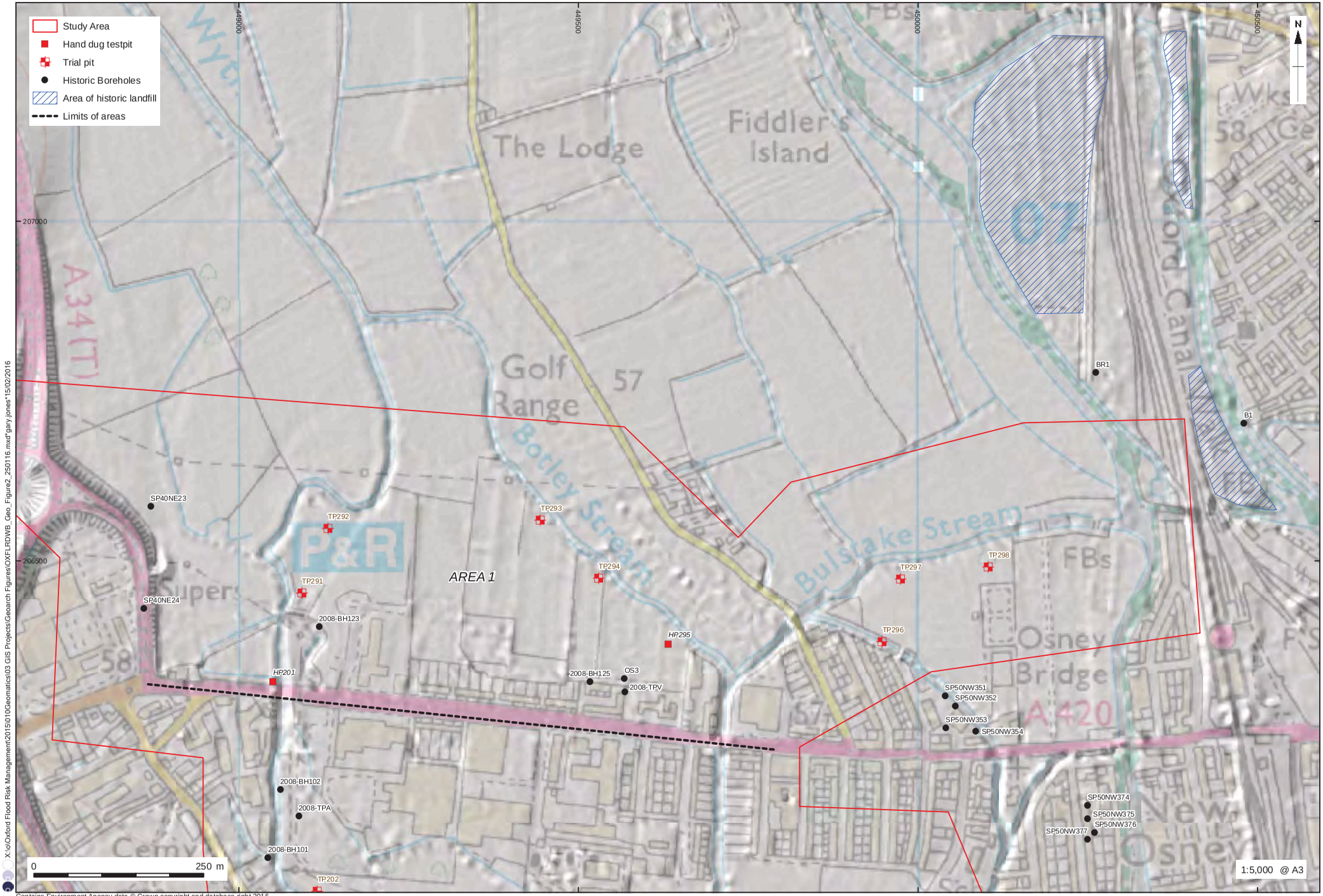

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Figure 2: Location of geotechnical interventions: Area 1 - Botley Road

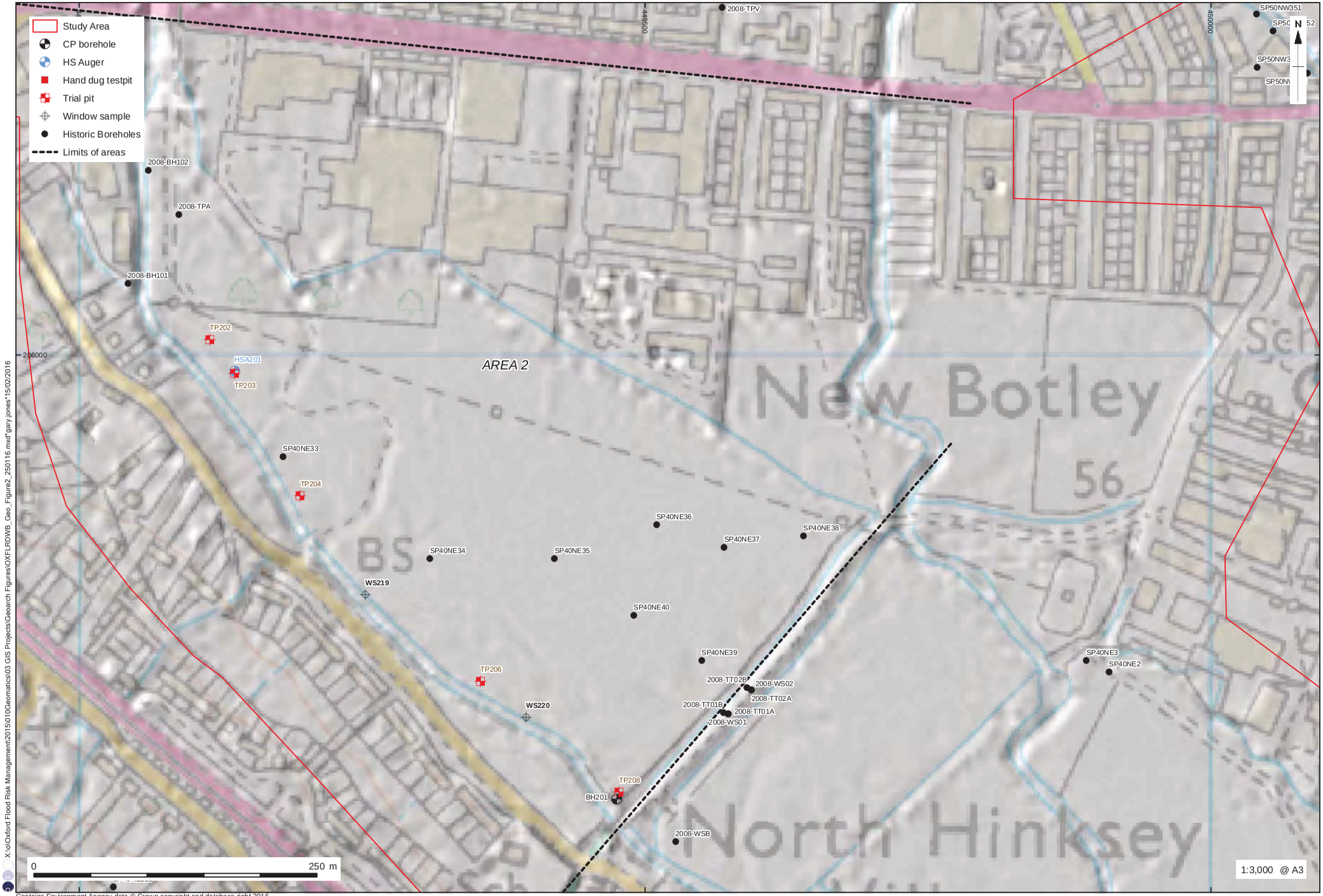

Figure 3: Location of geotechnical interventions: Area 2 - Botley Road to Willow Walk

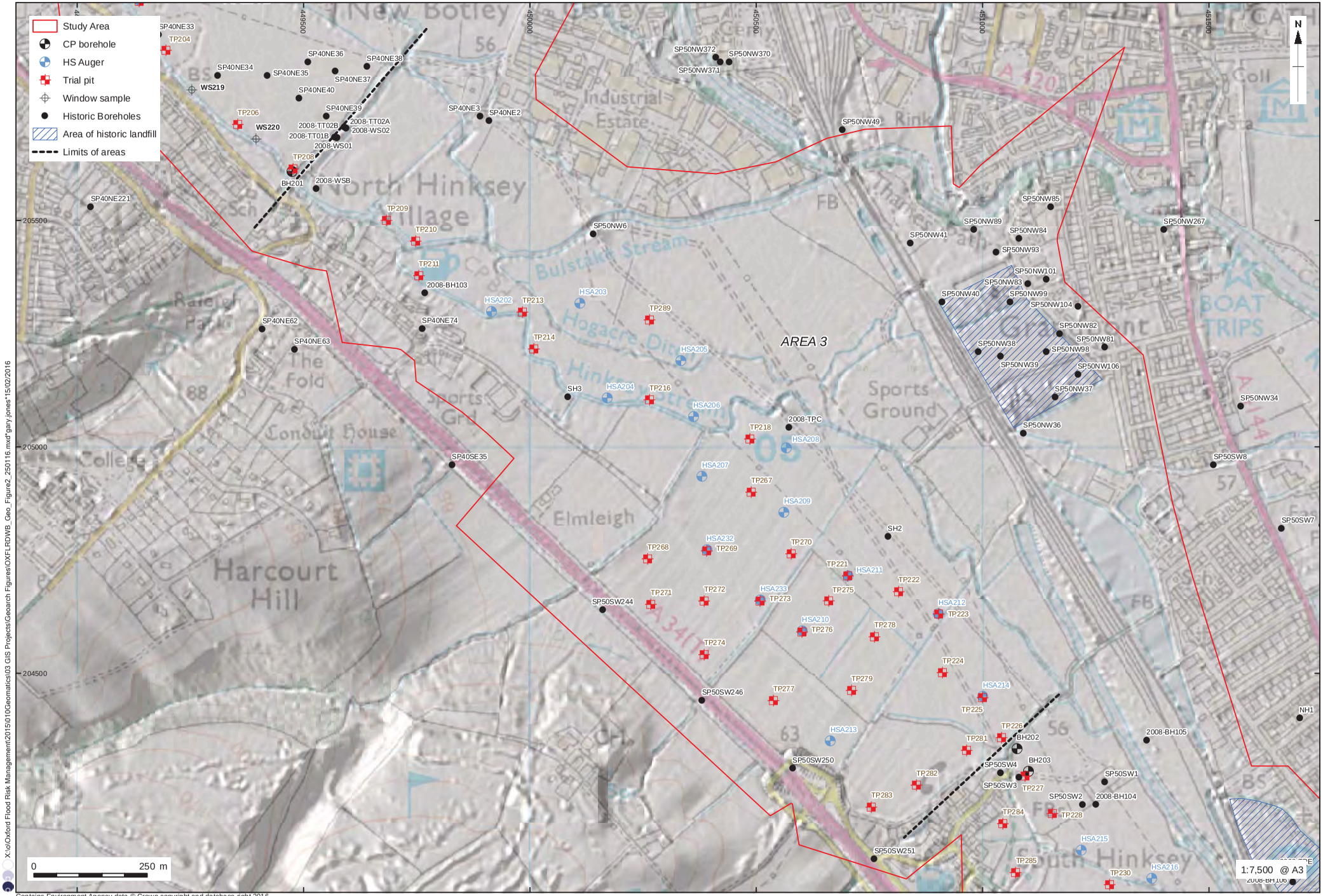

Figure 4: Location of geotechnical interventions: Area 3 - Willow Walk to South Hinksey

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Figure 5: Location of geotechnical interventions: Area 4 - Redbridge

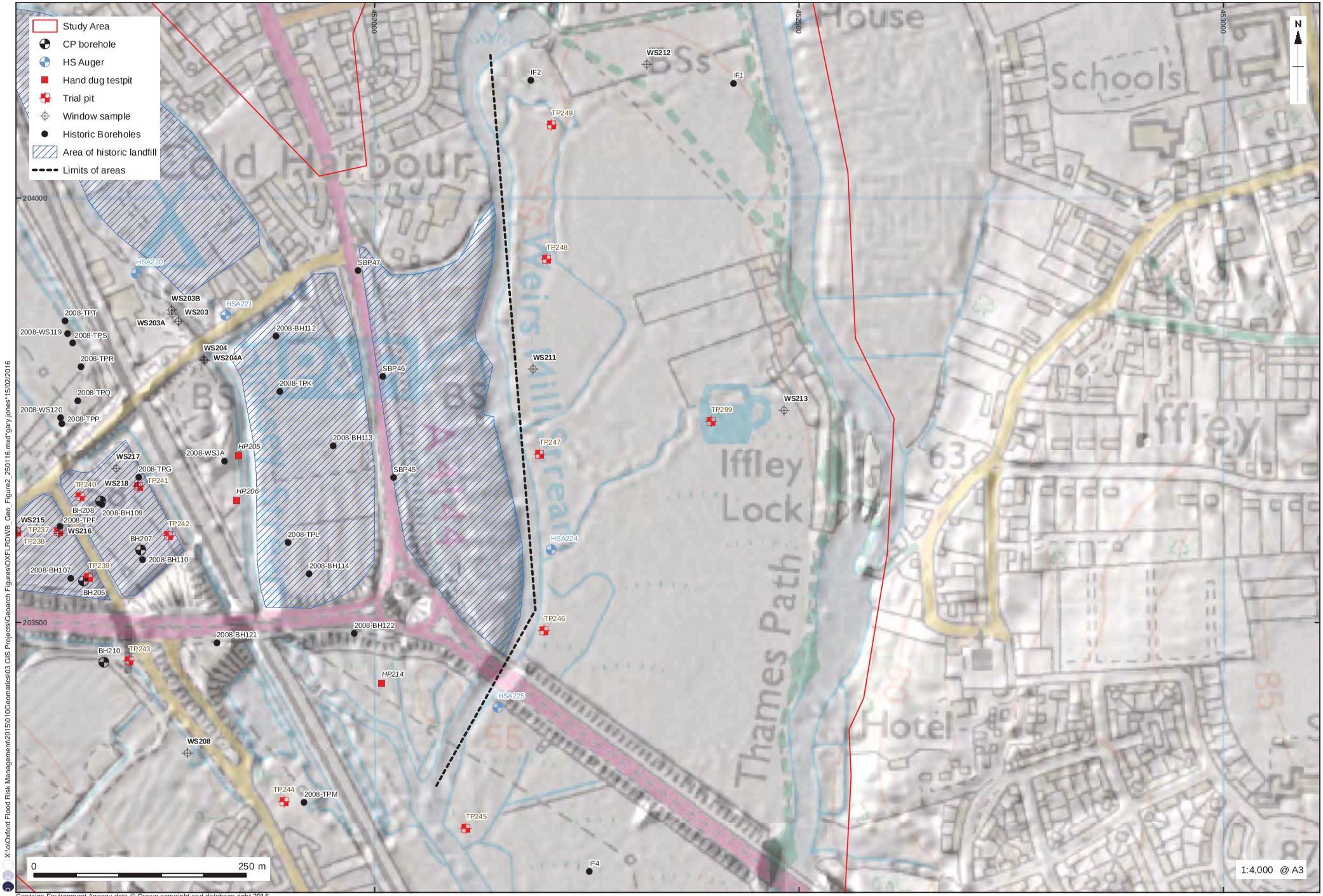

Figure 6: Location of geotechnical interventions: Area 7 - Weirs Mill Stream

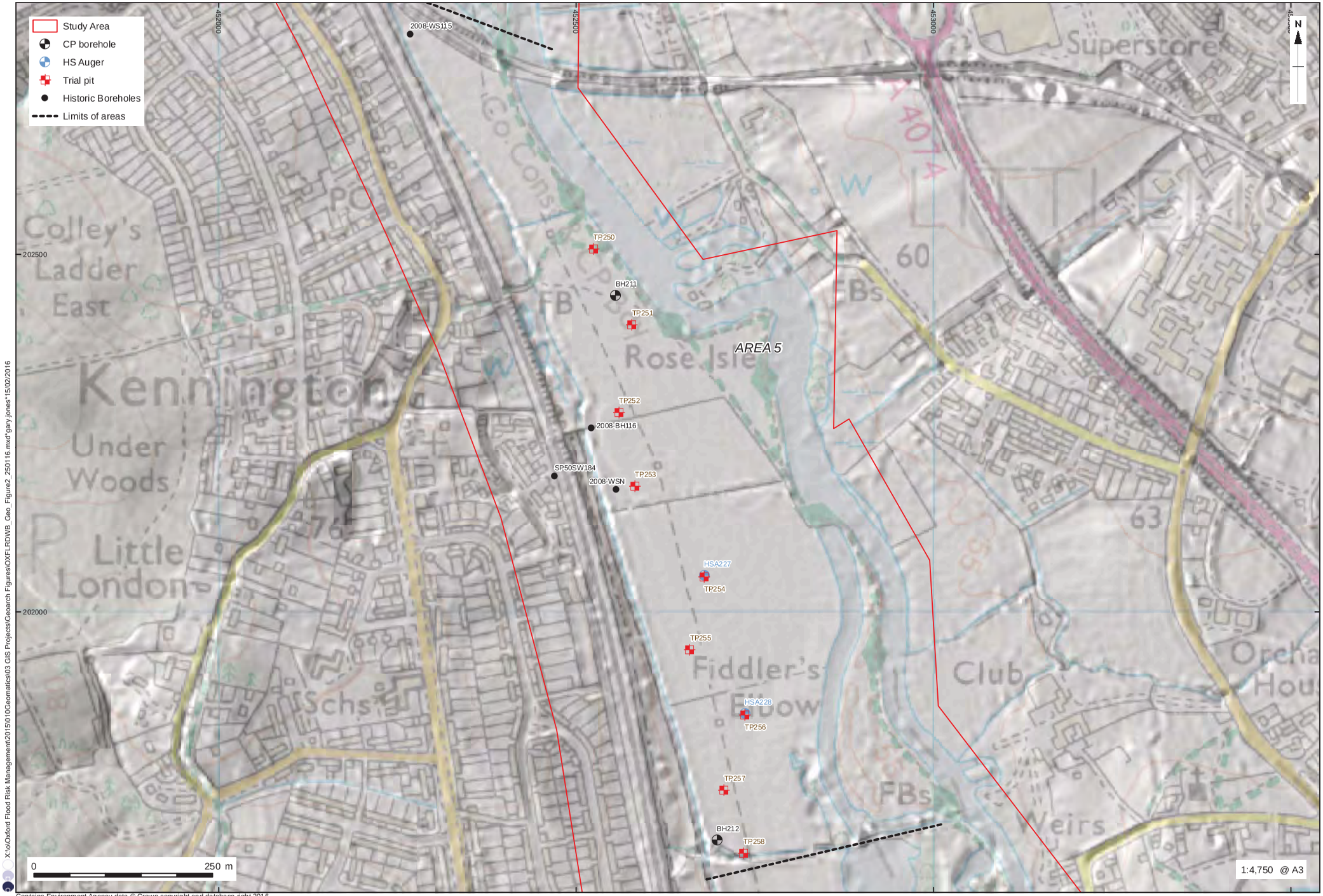

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Figure 7: Location of geotechnical interventions: Area 5 - Sandford North

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Figure 8: Location of geotechnical interventions: Area 6 - Sandford South

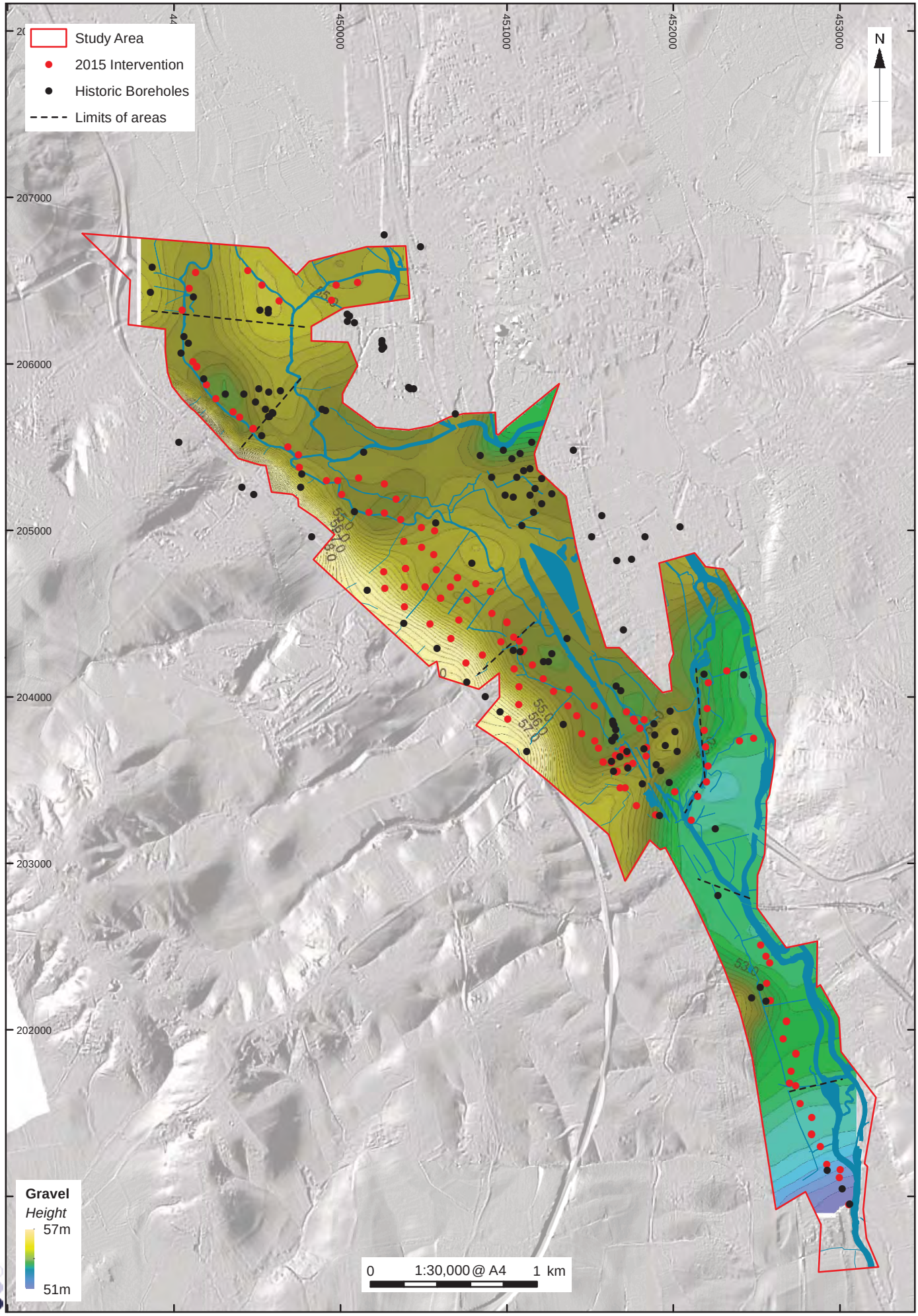

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Figure 9: Plot showing modelled top of gravel surface

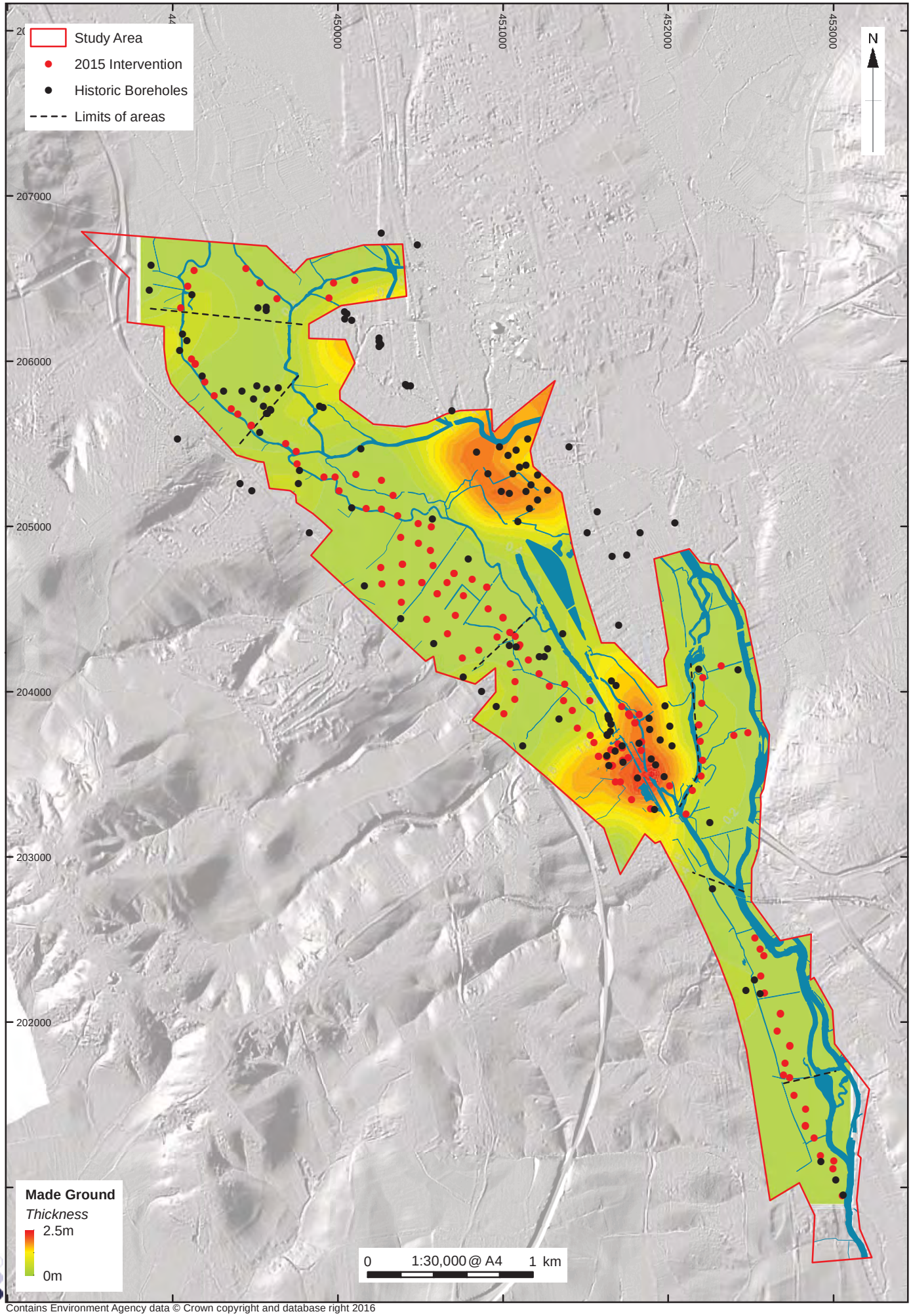

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Figure 10: Plot showing modelled thickness of made ground

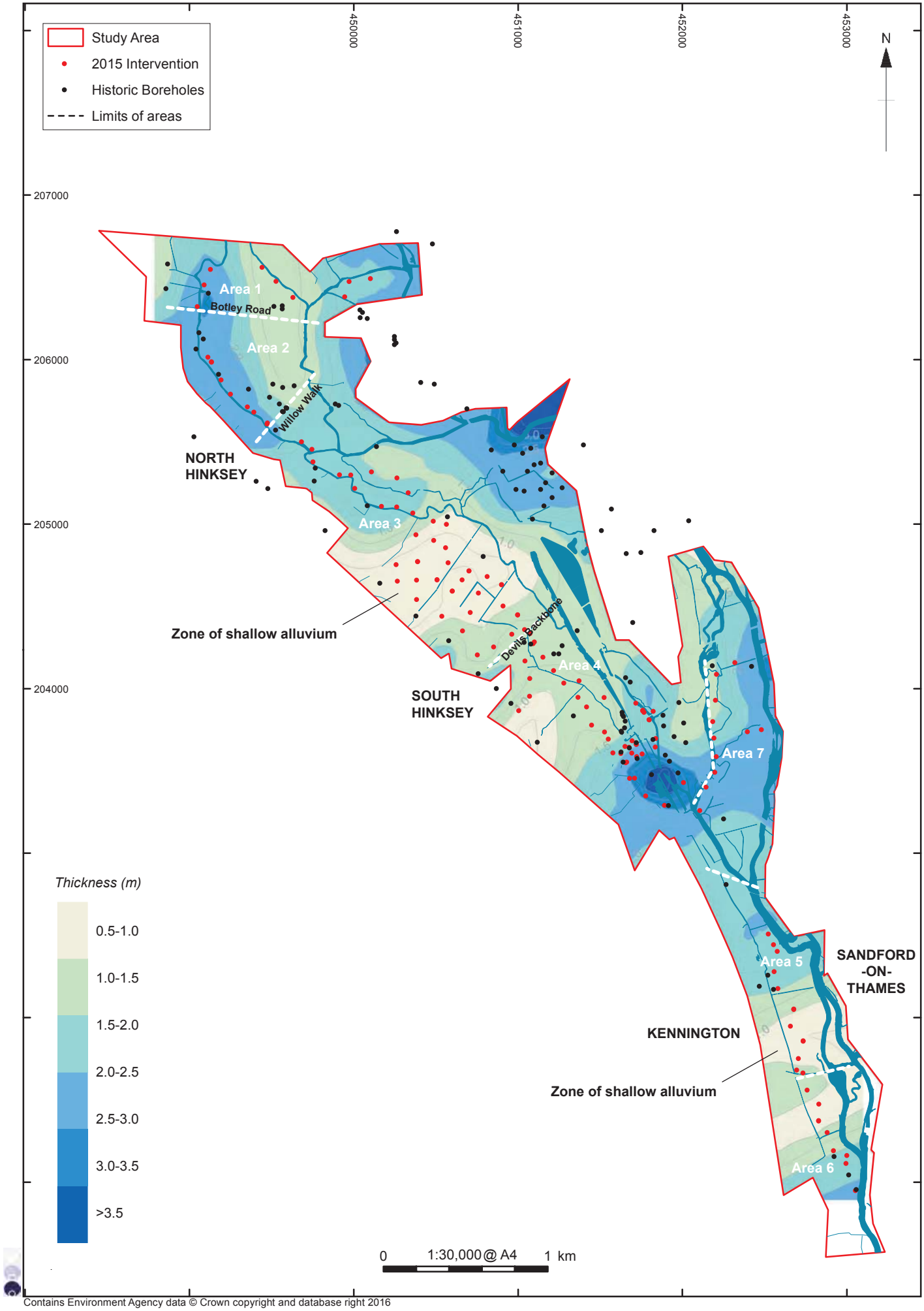

Figure 11: Plot showing modelled thickness of deposits to Pleistocene surface

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