

Report



Archaeological Monitoring and Recording Report: Edmonton EcoPark, Laydown Area West

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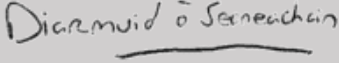
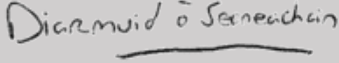
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Quality Assurance

ADAS Contract Code	ADAS Project Code	Document No.	Date Issued	
1050755	ART69105-401	02 (01)	23.09.2020	
NGR	Site Code	Planning Permission Ref.	Monument Consent Ref.	OASIS Reference No.
TQ 36104 92434	ECO19	Development Consent Order	TBC	adasuklt1-361515

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Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work.

This work has been undertaken in accordance with the quality management system of RSK ADAS Ltd.

Revision History

Revision	Date	Amendment
01	18.09.2020	Inclusion of Desk-Based Geoarchaeological Deposit Model (Young, 2020)



Summary

In June 2020 ADAS carried out an archaeological watching brief for Buckingham Group Contracting Ltd of groundworks required for the construction and installation of surface water and drainage infrastructure preceding the development of temporary office space and car parking centred on National Grid Reference TQ 35989 92485. The Laydown Area will serve the main construction work of the proposed Edmonton EcoPark development as part of the wider North London Heat and Power Project.

The Laydown Area was divided into Laydown Area West and Laydown Area East. Archaeological monitoring of groundworks required for the Laydown Area East phase of the North London Heat and Power Project was completed and a report of the findings produced in 2019. Both phases of monitoring were carried out under the same site code (ECO19) and the monitoring reports should be read in conjunction with one another.

The programme of archaeological monitoring focused on a single trench excavated for the construction and installation of a culvert attenuation tank.

The results of the archaeological monitoring indicated a low potential for significant archaeological features, deposits and artefacts to survive along the northern boundary of the Site. The general absence of archaeological features and deposits recorded may partially be attributed to the relatively limited impact of the groundworks. Nevertheless, the monitored areas indicated that significant truncation of the Site had previously occurred down to the alluvial sequence observed across the Site.

The deposits observed in the trench represented a clear continuity with the stratigraphic sequence recorded during the monitoring of groundworks during the Laydown Area East phase of works. This sequence consisted of made ground overlying alluvial deposits. The formation level of the groundworks did not impact the Natural gravels recorded during the Laydown Area East phase of works and no archaeological features, deposits or artefacts were observed in the trench.

The Desk-Based Geoarchaeological Deposit Model produced for the Site notes that the gravel surface was not reached during the excavation of the culvert attenuation tank. However, the deposit model indicates that the existing deposit model for the Laydown Area East phase of works shows that the gravel surface lies at similar levels to the south of the Northern Access Area.

In terms of archaeological potential, the deposit model indicates that the gravel surface rises towards the north, with the gravel surface in the northern area of the NLHHP site around 1.0 m higher than in the south. These results indicate that the NLHHP site would at some point in the earlier Prehistoric period have been at the interface between the floodplain and the higher, drier ground to the north. As such, the Prehistoric archaeological potential of the NLHHP site is considered to be higher in the north.

Acknowledgements

This archaeological watching brief was commissioned by Buckingham Group Contracting Ltd, and thanks are due in this regard. Fieldwork was carried out by Peter Vellet. The report and supporting illustrations were prepared Peter Vellet, and checked by Diarmuid O'Seaneachain. The archive was compiled by Peter Vellet.

1 Introduction

Project Background

- 1.1 In June 2020 ADAS carried out an archaeological watching brief for Buckingham Group Contracting Ltd of groundworks required for the construction and installation of surface water and drainage infrastructure preceding the development of temporary office space and car parking (Laydown Area West). The Laydown Area will serve the main construction work of the proposed Edmonton EcoPark development as part of the wider North London Heat and Power Project (NLHPP).
- 1.2 The wider application for the NLHPP extends over twenty-two hectares and comprises the existing waste management site known as the Edmonton EcoPark, part of Ardra Road, land around the existing water pumping station at Ardra Road, Deephams Farm Road, part of Lee Park Way and land to the west of the River Lea Navigation, and land to the north of Advent Way and east of the River Lea Navigation (ADAS, 2020).
- 1.3 The Laydown Area was divided into Laydown Area West (hereafter referred to as 'the Site') and Laydown Area East. Archaeological monitoring of groundworks required for the Laydown Area East phase of the NLHPP was completed and a report of the findings produced in 2019 (ADAS, 2019). Both phases of monitoring were carried out under the same site code (ECO19) and the monitoring reports should be read in conjunction with one another.
- 1.4 The objective of the watching brief was to record all archaeological remains exposed during groundworks within Laydown Area West centred on National Grid Reference (NGR) TQ 35989 92485 (Figure 1).
- 1.5 The works were carried out in order to fulfil the commitments outlined in Schedule 2, Paragraph 6 and 16 of a Development Consent Order (DCO) for the NLHPP and in the Construction Code of Practice (CoCP) regarding Archaeology (Arup, 2016b).
- 1.6 The outlined commitments contained in the DCO and the general archaeological requirements contained in the CoCP were summarized in the Written Scheme of Investigation (WSI) and will not be reproduced here (ADAS, 2020).
- 1.7 Mr Sandy Kidd, the Local Authority Archaeologist for with the Greater London Archaeological Advisory Service (GLAAS), recommended archaeological monitoring should be carried out during the excavation of a culvert attenuation tank located along the northern boundary of the Site in an email brief sent to the Client on the 3rd of February 2020.
- 1.8 It was considered that the excavation of the culvert attenuation tank had the potential to impact upon the alluvial sequence identified during archaeological monitoring of groundworks for the

Laydown Area East phase of the NLHPP. Deeper groundworks carried out during this part of the development had a low to moderate potential to impact upon unknown buried archaeological remains of Prehistoric and Romano-British date (ARUP, 2015). It was also considered that there was a limited potential for material of palaeo-environmental interest to be present in the alluvium and Lea Valley Gravels which will be impacted by the deeper excavations on the Site (Young, 2019).

- 1.9 The archaeological monitoring carried out during the Laydown Area West phase of construction work will form part of a phased programme of archaeological and geo-archaeological work that will be integrated into the wider NLHPP development project. The results of each stage of archaeological fieldwork will contribute towards research objectives encompassing the wider project and a final publication report.
- 1.10 RSK ADAS Ltd were instructed to prepare a WSI to carry out the required archaeological works and record any archaeological remains during the monitoring of the groundworks (ADAS, 2020).
- 1.11 The fieldwork followed the *Standard and guidance for an archaeological watching brief* (ClfA, 2020), *the Management of Archaeological Projects 2* (English Heritage, 1991) and the *Management of Research Projects in the Historic Environment (MORPHE): Project Manager's Guide* (Historic England, 2015) and the RSK Technical Manual (RSK, 2017).
- 1.12 The fieldwork also followed the Historic England and Greater London Archaeological Advisory Service (GLAAS) Guidelines for Archaeological Projects in Greater London and the North London Heat and Power Project: Overarching Archaeological Written Scheme of Investigation (Arup 2019).
- 1.13 In carrying out this work Buckingham Group Contracting Ltd complied with the commitments outlined in the DCO and the general archaeological requirements in the CoCP for the North London Heat and Power Project.

The Site, Location and Geology

- 1.14 The programme of groundworks on the Site comprised access and piling works, cut and fill excavation and the construction and installation of surface water and drainage infrastructure preceding the development of temporary office space and car parking (Laydown Area West). The Laydown Area will serve the main construction work of the proposed Edmonton Eco Park development as part of the wider NLHPP.
- 1.15 Prior to the commencement of the watching brief, it was understood that the following work activities would take place across the Site:

1. *Set-up temporary fencing (no ground impact)*

2. *Install temporary site offices (no new ground impact as using existing hard-standing)*
 3. *Construct temporary haul road (no new ground impact as building up from existing ground level)*
 4. *UXO and Survey works*
 5. *Construct Pilot cable and protection concrete slab (excavate to depth of 0.45 m to expose an existing cable and cover with a concrete protection slab)*
 6. *Excavate and install temporary works for culvert attenuation tank (40 m length X 3.5 m width X 3.5 m depth)*
 7. *Form access ramp approximately 550 m² (minimal ground impact)*
 8. *Topsoil strip 100 m² to a depth of 0.10 m*
 9. *Piling works for new Eastern Access bridge approximately 100m²*
 10. *West Contract Phase boundary topsoil strip 8,000 m² to depth of 0.10 m*
 11. *West Contract Phase boundary cut and fill 14,000 m² to a depth of 1.0 m*
- 1.16 Following discussions via email with Mr Sandy Kidd, it was agreed that archaeological monitoring of groundworks was not required for work activities 1-5 and 7-11. Archaeological monitoring of groundworks was recommended for the excavation and installation of temporary works for the culvert attenuation tank (work activity 6) (Client email 3rd February 2020)
- 1.17 The underlying bedrock geology is recorded as London Clay Formation – Clay, Silt and Sand. This is overlain by superficial deposits of Clay, Silt, Sand and Gravel Alluvium. Kempton Park Gravel Member superficial deposits are recorded immediately east of the Site (BGS, 2020).
- 1.18 Trenches 2 and 20 were monitored and recorded during the Laydown Area East phase of works. Trench 2 was situated to the south of the culvert attenuation tank and exposed between 0.90 m and 2.80 m of made ground overlying an alluvial sequence measuring between 0.30 m and 2.40 m thick and sandy gravel natural geology (ADAS, 2019).
- 1.19 Trench 20 was situated partially within the footprint of the culvert attenuation tank. The trench exposed 3.0 m of made ground overlying 0.20 m of alluvium and sandy gravel natural geology (ADAS, 2019).

2 Objectives

Aims and Scope

- 2.1 The primary aims of the wider North London Heat and Power Project are:
- to identify how Palaeo-environmental and landscape evolution (Theme 1), settlement pattern and boundaries (Theme 2) and the use and management of the Lea Valley River Channels (Theme 3) influenced human history and the development of London as a world city (Arup 2020); and
 - to test and refine the pre-determination deposit model recovering palaeo-environmental sequences where possible.
- 2.2 The specific aims of the Laydown Area West phase of work were:
- to ensure that the commitments outlined in the Construction Code of Practice (CoCP) regarding Archaeology (section 6) were met;
 - to identify and record any unknown buried archaeological deposits or artefacts exposed during groundworks for the culvert attenuation tank;
 - to inform a strategy to avoid or mitigate the impacts of the proposed development on any surviving archaeological remains identified; and
 - to integrate the archaeological mitigation carried out during this stage of the NLHPP with all subsequent stages.

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4 Archaeological and Historical Context

Introduction

- 4.1 An archaeological desk-based assessment was commissioned by the North London Waste Authority in connection with the proposed North London Heat and Power Project (Arup, 2015).
- 4.2 The archaeological and historical context of the wider scheme, including the Site, was investigated by this desk-based assessment. It is not intended to replicate in full the findings of that report here, rather a summary of the results are provided below.

Summary of Archaeological and Historical Background

- 4.3 The desk-based assessment sourced information from Historic England (English Heritage at the time of writing), the Greater London HER (Historic Environment Record), online historical resources and the Archaeological Data Service (ADS). These sources recorded no World Heritage Sites, Scheduled Monuments, Grade I or II* Listed Buildings, Conservation Areas, Designated Wrecks, Designated Battlefields or Registered Parks and Gardens within a 1 km Study Area (Arup, 2015).
- 4.4 A total of three Grade II Listed Buildings were identified to the east of the Site, all of which are related to and include the Chingford Mill Pumping Station (NHLE site number 1250896, 1065574 and 1065575) (Arup, 2015).
- 4.5 The desk-based assessment identified a total of sixty-six non-designated heritage assets within a 1 km Study Area. These included findspots, features and sites from the Palaeolithic to the Medieval periods. No significant remains from the Post-medieval and 20th century were identified within the Study Area (Arup, 2015).
- 4.6 The desk-based assessment did not identify any non-designated heritage assets within the Site boundary (Arup, 2015).

Summary of Previous Archaeological Events

- 4.7 The desk-based assessment identified twenty-four previous archaeological events within the Study Area. These included desk-based assessments, geoarchaeological assessments and modelling and archaeological monitoring and fieldwork (Arup, 2015).
- 4.8 Archaeological monitoring was carried out on the Laydown Area East phase of the scheme in 2019. This monitoring indicated a low potential for significant archaeological features and deposits to survive across Laydown Area East and along the northern boundary of Laydown Area West. The monitored areas indicated that there had been significant truncation to the alluvial sequence across the Laydown Area. The artefacts recovered in-situ during the monitoring were all likely deposited during the Post-medieval to Modern period. Residual material including a single sherd of Roman pottery and fragmented Medieval tile was also recovered. Two timber posts recovered during the monitoring in the alluvium were interpreted as Post-medieval in date (ADAS, 2019).
- 4.9 The results of geo-archaeological fieldwork carried out as part of the Laydown Area East phase of work revealed a sequence of Late Devensian gravel, overlain by Holocene alluvial sediments (including sporadic Peat and Tufa deposits), capped by modern made ground (ADAS, 2019).
- 4.10 In late December 2019, archaeological and geoarchaeological monitoring and recording of fifteen geo-technical trial pits was carried out along Ardra Road as part of the NLWA Northern Access

part of the scheme. The results of the monitoring revealed a sequence of Holocene alluvial deposits sealed by modern made ground (ADAS, 2020a).

- 4.11 This phase of work indicated there was a low potential for significant archaeological features and deposits to survive at that location. The monitoring evidence indicated that there had been significant truncation to the alluvial sequence at that part of the scheme. Artefacts recovered from the made ground and alluvial deposits encountered during the test pit indicated a 19th or 20th century date for these layers down to the depth of impact of the groundworks for this phase (ADAS, 2020a).

Historic Mapping and Aerial Photography Analysis

- 4.12 The desk-based assessment analysed ten historic Ordnance Survey maps and one historic aerial photograph, ranging from the late 19th century through to the early 21st century (Arup, 2015).
- 4.13 Of particular interest is the sinuous course of the River Lea, which is visible running through the Site on historic maps until at least 1938. By the time the historic aerial photograph was taken from between 1945 and 1950, the river had been diverted to the west with the River Lea Navigation and to the east with the River Lea Diversion. The natural course of the Lee has been infilled (Arup, 2015).

Summary of potential

- 4.14 The desk-based assessment concluded that the main scheme has a low potential for prehistoric to Medieval activity and a moderate potential for modern activity. It concluded that there was a high potential for palaeo-environmental deposits to survive in the main scheme under the made ground (Arup, 2015).
- 4.15 The conclusions of the desk-based assessment, along with a more recent search of online sources indicates that there is a low potential for buried archaeological remains of Prehistoric and Romano-British date to be present under the made ground on the Site.
- 4.16 The Site is located within Landscape Zone 3 of the existing deposit model which has been developed for the NLHPP scheme (Arup, 2019). This Landscape zone has the highest palaeo-environmental potential across the NLHPP scheme as a whole.

5 Methodology

Introduction

- 5.1 The fieldwork followed the methodology set out within the Written Scheme of Investigation (ADAS, 2020b). An archaeologist was present during all intrusive groundworks to excavate the culvert attenuation tank located along the northern boundary of the Site.
- 5.2 Where archaeological deposits were encountered written, graphic and photographic records were compiled in accordance with the Chartered Institute for Archaeologists *Standard and guidance for an archaeological watching brief* (ClfA, 2020).
- 5.3 The written, graphic and photographic records compiled during the course of the archaeological monitoring form part of the overall record for the Laydown Area phase of the NLHPP. As such, the records for the Site were recorded as a continuation of the records from the Laydown Area East phase of works.

Artefacts, Human Remains, Treasure and Environmental Sampling

- 5.4 No artefacts or human remains were encountered during the watching brief. No archaeologically significant deposits were disturbed by the groundworks, so no environmental sampling was undertaken.

Post-Excavation Analysis

- 5.5 The results of the monitoring were used to inform specialist desk-based geoarchaeological analysis of the wider NLWA site and to update the deposit model (Young, 2020).
- 5.6 Otherwise no archaeological artefacts or significant deposits were encountered during the watching brief, and therefore no additional specialist post-excavation analysis was required.

Archives and Deposition

- 5.7 The archive is currently held by ADAS at their offices in Milton Park. No artefacts were recovered during the monitoring and therefore no artefacts will need to be deposited with an approved local museum. A paper archive will be deposited with *the Museum of London (MoL)* within six months of the final publication report for the NLHPP scheme under an accession number which will be issued upon deposition. A summary of information from the Laydown Area East and Laydown Area West phases of the scheme, set out within Appendix C, will be entered onto the OASIS database of archaeological projects in Britain. An OASIS form, ID reference adasuklt1-361515 has been provisionally completed and will be submitted at the time of completion.

ADAS Project Team

- 5.8 Fieldwork was undertaken by Peter Vellet. The report was written and the illustrations were prepared by Peter Vellet. The archive was compiled and prepared for deposition by Peter Vellet. The project was managed for ADAS by Diarmuid O’Seaneachain.

6 Results

- 6.1 This section provides an overview of the monitoring results; detailed summaries of the recorded contexts are to be found in Appendix A.
- 6.2 The programme of archaeological monitoring focused on a single trench excavated for the construction and installation of a culvert attenuation tank. The tank will be incorporated into the surface water and drainage infrastructure constructed during the Laydown Area East phase of work (ADAS, 2019).
- 6.3 The groundworks were excavated using a mechanical excavator fitted with a flat bladed bucket. The works were completed over three days from Monday the 8th of June to Wednesday the 10th of June 2020. The weather was variable and consisted of cloudy, wet days and bright sunshine (Plates 1 - 8).
- 6.4 The dimensions of the culvert attenuation trench were altered following the production of the Written Scheme of Investigation for the Site. The trench was excavated to a more shallow depth to mitigate the need for temporary works and to avoid impacting the water table. As a result, the length and width of the trench was increased to maintain the required volume of the culvert attenuation tank.

Trench 23 – Culvert Attenuation Tank

- 6.5 Trench 23 was situated along the northern boundary of the Site (Figures 2 and 3). The trench measured 60 m in length by 6.0 m in width and between 1.23 m and 1.92 m below ground level (bgl). The excavation of the culvert attenuation tank was preceded by groundworks during the Laydown Area East phase of works, which resulted in an undulating working surface and the variation in metres bgl of the trench. The trench was excavated to a depth of 8.61 m bgl.
- 6.6 The stratigraphic sequence observed was 0.89 m to 1.92 m of made ground 1020 overlying a black silty clay alluvial deposit 1021 and a mixed alluvial deposit 1022. Alluvial deposit 1022 was composed of mid grey with mid brownish orange mottles, dark grey with dark orange mottles and light to mid brown orange silty clay. It was not possible to determine the stratigraphic relationship between alluvial deposits 1021 and 1022.

- 6.7** The upper horizon of the alluvial deposits were impacted, where 0.44 m of alluvial deposit 1021 and 0.13 m of alluvial deposit 1022 were mechanically excavated and exposed in the south facing section of the trench (Figure 4).
- 6.8** No archaeological features, deposits or artefacts was observed in Trench 23. The natural geology observed during the archaeological monitoring of groundworks during the Laydown Area East phase of works was not impacted in Trench 23.
- 6.9** No archaeologically significant features or artefacts were observed or recovered from the trench.

7 Discussion and Conclusions

- 7.1 The results of the archaeological monitoring indicated a low potential for significant archaeological features, deposits and artefacts to survive along the northern boundary of the Site. The general absence of archaeological features and deposits recorded may partially be attributed to the relatively limited depth of impact of the groundworks for the culvert attenuation tank. Nevertheless, the monitored areas indicated that significant truncation of the Site had previously occurred down to the alluvial sequence observed across the Site.
- 7.2 The deposits observed in Trench 23 represented a clear continuity with the stratigraphic sequence recorded during the monitoring of groundworks during the Laydown Area East phase of works. The substantial deposit of made ground 1020 can be equated to 1002 (Laydown Area East phase) and showed a similar variation in thickness likely resulting from undulations in the landscape when the made ground was deposited (ADAS, 2019).
- 7.3 Alluvial deposit 1021 can be equated to 1006 (Laydown Area East phase) and represents the principal deposit within the alluvial sequence observed across the Laydown Area. The deposit likely represented a low energy protracted deposition of alluvial material on the flood plain adjacent to the original course of the River Lea. Historic maps from the late 19th century show the Laydown Area as a rural agricultural landscape (Arup, 2015). The dark colour and humic smell of 1021 suggested this deposit either formed during the late Post-medieval period or was heavily impacted upon by later agricultural practice. Pottery and Ceramic Building Material dated from the 18th and 19th centuries found 1.80 m below the upper horizon of alluvium 1006 in Trench 2 (Laydown Area East phase) was not intrusive and may give an indicative date for this deposit (ADAS, 2019).
- 7.4 Alluvial deposit 1022 cannot be accurately equated to any of the alluvial deposits recorded during the Laydown Area East phase of works. Instead, deposit 1022 likely represented an isolated deposit within the alluvial sequence identified across the Laydown Area, although its stratigraphic position within the sequence is uncertain. A number of isolated alluvial deposits (1004, 1005 and 1007) were observed in the vicinity of Trench 23 during the Laydown Area East phase of works (ADAS, 2019).
- 7.5 The Desk-Based Geoarchaeological Deposit Model (Young, 2020) produced for the Site notes that the gravel surface was not reached during the excavation of the culvert attenuation tank. However, the deposit model (Young, 2020) indicates that the existing deposit model for the

Laydown Area East phase of works (Batchelor, Young & Lincoln, 2019) shows that the gravel surface lies at similar levels to the south of the Northern Access Area (ADAS, 2020a).

- 7.6 In terms of archaeological potential, the deposit model (Young, 2020) indicates that the gravel surface rises towards the north, with the gravel surface in the northern area of the NLHHP site around 1.0 m higher than in the south. These results indicate that the NLHHP site would at some point in the earlier Prehistoric period have been at the interface between the floodplain and the higher, drier ground to the north. As such, the Prehistoric archaeological potential of the NLHHP site is considered to be higher in the north.

8 References

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Young D (2020) *North London Waste Authority (NLWA) Northern Access Area & Laydown Area West, London Borough of Enfield: Desk-Bases Geoarchaeological Deposit Model*. QUEST Unpublished Report Project Number 020/19.

Online Resources

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Appendix A: Context Descriptions

No.	Type	Trench	Description	Length (m)	Width (m)	Depth/ Thickness (m)
1020	Deposit	23	Made ground	-	-	0.89 – 1.92
1021	Deposit	23	Black alluvium	-	-	< 0.44
1022	Deposit	23	Mixed (mid grey with mid brownish orange mottles, dark grey with dark orange mottles and light to mid brown orange) alluvium	-	-	< 0.13

Appendix B: Finds Assessment

No artefacts were identified during the course of the archaeological monitoring.

Appendix C: Oasis Report Form

OASIS ID: adasuklt1-361515

Project details

Project name	Edmonton EcoPark, Laydown Area East and Laydown Area West
Short description of the project	Archaeological monitoring of deeper groundworks associated with the Laydown Area East and Laydown Area West phases of the Edmonton EcoPark development as part of the North London Heat and Power Project.
Project dates	Start: 20-05-2019 End: 10-06-2020
Previous/future work	No / Yes
Any associated project reference codes	ECO19 - Sitecode
Type of project	Recording project
Site status	None
Current Land use	Vacant Land 2 - Vacant land not previously developed
Significant Finds	TIMBER POSTS Uncertain
Significant Finds	POTTERY Post Medieval
Investigation type	""Watching Brief""
Prompt	Planning condition

Project location

Country	England
Site location	GREATER LONDON ENFIELD EDMONTON Edmonton EcoPark, Laydown Area East and Laydown Area West

Postcode E4 8JG

Study area 24420 Square metres

Site coordinates TQ 36104 92434 51.613770977399 -0.034030970499 51 36 49 N 000 02
02 W Point

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Appendix D: Desk-Based Geoarchaeological Deposit Model



NORTH LONDON WASTE AUTHORITY (NLWA) NORTHERN ACCESS AREA & LAYDOWN AREA WEST, LONDON BOROUGH OF ENFIELD

Desk-Based Geoarchaeological Deposit Model

NGR: TQ 35640 93025 / TQ 35955 92470

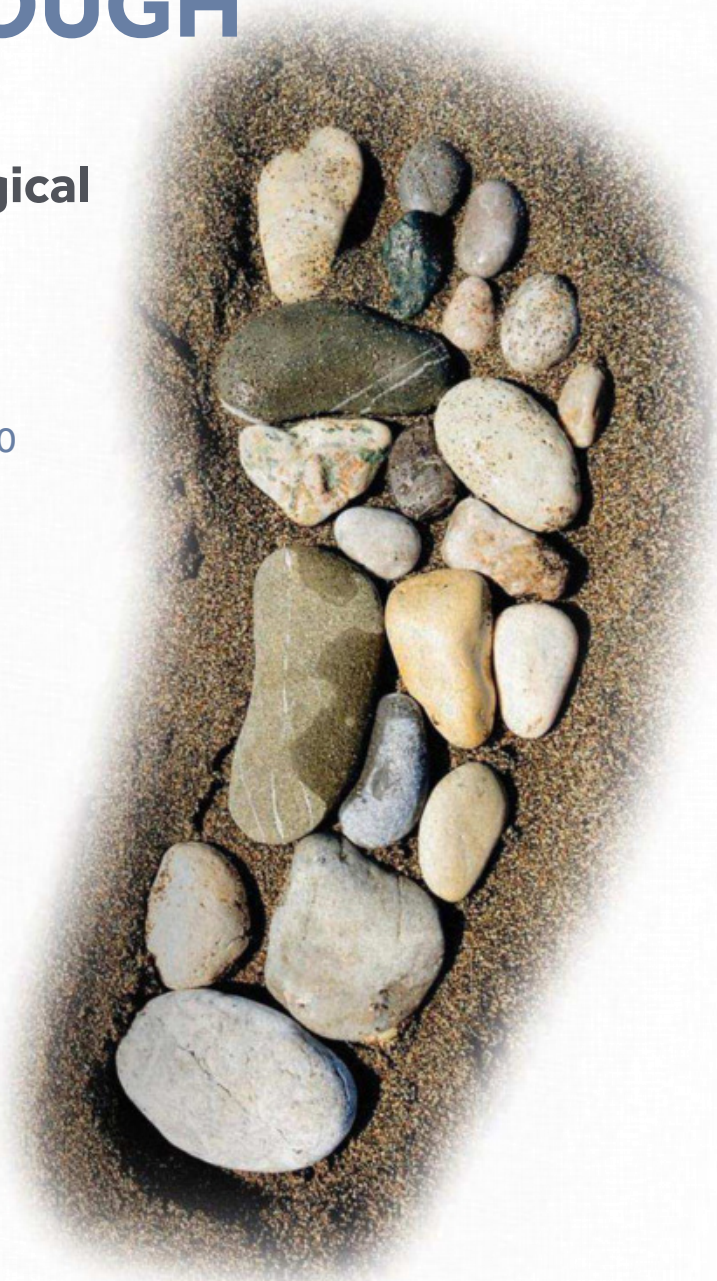
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1. NON-TECHNICAL SUMMARY

A programme of desk-based geoarchaeological deposit modelling was undertaken at the NLWA Northern Access Area & Laydown Area West sites in order to (1) to clarify the nature of the sub-surface stratigraphy; (2) to clarify the nature, depth, extent and possible date of any alluvium and organic/peat or tufa deposits; (3) to review the archaeological and palaeoenvironmental potential of the site; and (4) to make recommendations for any further geoarchaeological or palaeoenvironmental investigations. The new deposit model integrates data from a new archaeological watching brief and geotechnical investigation at the Northern Access Area site (ADAS, 2020a) and Edmonton EcoPark Laydown Area West (ADAS, 2020b), and the existing deposit model from Edmonton EcoPark Laydown Area East (Batchelor *et al.*, 2019).

The results of the deposit modelling have revealed a sequence of Late Devensian Lea Valley Gravel, overlain by Holocene alluvial sediments (including a localised peat deposit), capped by modern Made Ground. The Gravel surface here rises northwards from levels between ca. 7-8m OD in the southern half of the site, to between ca. 8.2 and 8.7m OD in the northern half. Although slightly lower in the southern half of the site, these levels are generally consistent with Corcoran *et al.*'s (2011) Landscape Zone 4.4, where the Gravel surface is described as lying at levels between ca. 8 and 9m OD. Overlying the Gravel in one archaeological trial pit in the southern part of the site was a unit of mineral-rich peat, present at between 9.52 and 9.97m OD and described as a black organic layer or lens. Peat was not recorded within the remainder of the interventions across the site; although only nine of the 25 interventions recorded the full Holocene alluvial sequence, these are relatively well distributed, and indicate that the peat is confined to the south in the area of TP1. This peat deposit is present at a higher elevation than has generally been recorded elsewhere in this area of the River Lea floodplain, where it is often recorded at levels below around 8.5m OD. On the basis of the higher elevation and unknown age of the peat deposit at the site, further investigation of these sediments is required in order to confirm its palaeoenvironmental potential, including its character and age.

In terms of archaeological potential, the deposit models presented here indicate that the Gravel surface rises toward the north, with the Gravel surface in the northern area of the site around 1m higher than in the south. Although not as high as the Gravel island underlying the north-western part of the Stonehill Business Park site (see Young, 2014), the deposit model indicates that the site would at some time during the earlier prehistoric period have been at the interface between the floodplain and the higher, drier ground to the north. As such, the prehistoric archaeological potential of the site is considered to be higher in the north. However, no archaeological deposits or features were identified however during the watching brief undertaken by ADAS (2020a).

2. INTRODUCTION

2.1 Site context

This report summarises the findings arising out of the desk-based geoarchaeological deposit modelling undertaken by Quaternary Scientific (University of Reading) in connection with the proposed redevelopment of land at the North London Waste Authority (NLWA) Northern Access Area & Laydown Area West, London Borough of Enfield (National Grid Reference (NGR): centred on TQ 35640 93025/; Figures 1 & 2). Quaternary Scientific were commissioned by RSK ADAS Ltd (ADAS) to undertake the geoarchaeological investigations. The deposit models presented here update those of previous investigations associated with the Edmonton EcoPark Laydown Area East site (Batchelor *et al.*, 2019), integrating data from a new archaeological watching brief on geotechnical test pits at the Northern Access Area (ADAS, 2020a) and an archaeological trench at Laydown Area West (ADAS, 2020b). Both sites form part of a wider scheme which is being constructed to serve the wider North London Heat and Power Project (NLHPP). The wider site extends over 22 hectares and comprises the existing waste management site known as the Edmonton EcoPark, part of Ardra Road, land around the existing water pumping station at Ardra Road, Deephams Farm Road, part of Lee Park Way and land to the west of the River Lee Navigation, and land to the north of Advent Way and east of the River Lee Navigation (ADAS, 2020a).

The site lies towards the western margin of the historic floodplain of the River Lea, lying in the lower valley of this river and ca. 750m to the west of its modern course; the canalised River Lea Navigation lies 500m to the east of the site. The site is bordered to the west by the Salmon's Brook, a (heavily modified) minor tributary of the River Lea. The mouth of the River Lea (known as Bow Creek), at its confluence with the Thames, lies ca. 10km to the south. The British Geological Survey (1:50,000 Sheet 257 Romford 1996) shows the site underlain by Alluvium, described here as 'Clay, Silt, Sand and Gravel', overlying London Clay bedrock. The Alluvium here is in most cases underlain by the Lea Valley Gravel of Gibbard (1994), equivalent to the Late Devensian Shepperton Gravel of the Thames.

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 (LZ) 4.4 (see Figure 1), just to the north of its boundary with LZ 4.5. Here, Corcoran *et al.* (2011) describe the Lea Valley Gravel surface as lying at about 8-9m OD, although they point out that a slightly higher 'low terrace', following the alignment of Meridian Way, may exist on the western side of the floodplain. Exposures of Lea Valley Arctic Beds (organic deposits within the Lea Valley Gravel) have been recorded on this low terrace (see Corcoran *et al.*, 2011). The areas of relatively low Gravel surface in LZs 4.4 and 4.5 are described by Corcoran *et al.* (2011) as having the 'potential to preserve fine-grained deposits dating to the Late Pleistocene and Early Holocene', including Mesolithic peat horizons. Peat deposits are described as 'most common across a 1km area in LZ4.5 at the boundary with LZ4.4', 'at depths of a maximum of 2m'.

The site is located close to other sites of geoarchaeological investigation located within LZ 4.5 to the south, including 4 Advent Way (Young, 2020), Unit F, Angel Works (Young & Batchelor, 2020),

Laydown Area East (Batchelor *et al.*, 2019), Stonehill Business Park (Young, 2014), Edmonton EcoPark (MoLA, 2015) and Advent Way (Green *et al.*, 2006) (see Figure 1). At the Laydown Area East site the gravel surface was recorded at levels between ca. 7 and 9m OD, similar to those at Stonehill Business site; here, levels of between 6.7 and 7.0m OD were recorded in the east and west, rising to between 9 and 10m OD towards the north and south (see Young, 2014). These levels were slightly higher than at Advent Way to the west, where it lay at between ca. 6 and 7m OD (see Green *et al.*, 2006). Further west, the Gravel surface was recorded at a level of 8.5m OD at the Unit F, Angel Works site (Young, 2020); here, the overlying deposits were considered to represent substantially reworked (by natural processes) Enfield Silt to a level of 10m OD.

Tufa deposits, often associated with peat, are described by Corcoran *et al.* (2011) as common at the edges of the floodplain mixed with gravel. Thin peat and tufaceous deposits were recorded on the eastern part of the Laydown Area East site at levels between ca. 7.2 and 8.0m OD, whilst up to 3m of these deposits are recorded at Advent Way site, dating from the Late Devensian to Bronze Age period (Green *et al.*, 2006). A horizon of peat between 0.15 and 0.45m thick was recorded at Stonehill Business Park, present at levels between 8.65 and 6.32m OD and confined to the central area of that site within the area of lower Gravel surfaces associated with the possible northeast-southwest aligned palaeochannel (Young, 2014).

2.2 Palaeoenvironmental and archaeological significance

The existing records from the site and the wider area indicate some variation in the height of the underlying gravel, and the type, thickness and potential age of the subsequent Holocene alluvial deposits (including peat and tufaceous deposits) within the vicinity of the site. Such variations are significant as they represent different environmental conditions that would have existed in a given location. For example: (1) the varying surface of the gravel may represent the location of former channels and bars; (2) the presence of peat represents former terrestrial or semi-terrestrial land-surfaces, and (3) the alluvium represents periods of channel activity or changing hydrological conditions. Thus by studying the sub-surface stratigraphy across the site and wider area in more detail, it will be possible to build our understanding of the former landscapes and environmental changes that took place across space and time.

Organic-rich sediments (in particular peat) have high potential to provide a detailed reconstruction of past environments on both the wetland and dryland. In particular, they provide the potential to increase knowledge and understanding of the interactions between hydrology, human activity, vegetation succession and climate. Significant vegetation changes include the Mesolithic/Neolithic decline of elm woodland, the Neolithic colonisation and decline of yew woodland; the Late Neolithic/Early Bronze Age growth of elm on peat, and the general decline of wetland and dryland woodland during the Bronze Age. Such investigations are carried out through the assessment/analysis of palaeoecological remains (e.g. pollen, plant macrofossils & insects) and radiocarbon dating. Very close to the present site (within ca. 40m to the south), investigations carried out at Advent Way (Green *et al.*, 2006) revealed thick deposits of marl, peat and tufa dating to the early Holocene (early Mesolithic) and the transition from cold climatic conditions of the Late Devensian to fully temperate conditions of the early Holocene.

Finally, areas of high gravel topography, soils and peat represent potential areas that might have been utilised or even occupied by prehistoric people, evidence of which may be preserved in the archaeological (e.g. features and structures) and palaeoenvironmental record (e.g. changes in vegetation composition).

2.3 Aims and objectives

A programme of desk-based deposit modelling was undertaken in order to enhance our understanding of the sub-surface stratigraphy at the NLWA Northern Access Area & Laydown Area West sites, and to update the previous models associated with geoarchaeological and archaeological investigations at Laydown Area East (Batchelor *et al.*, 2019). Three significant research aims relevant to the geoarchaeological investigations are outlined here:

1. To clarify the nature of the sub-surface stratigraphy across the site;
2. To clarify the nature, depth and extent of any alluvium and organic/peat or tufa deposits;
3. To review the archaeological and palaeoenvironmental potential of the site.

In order to address these aims, the following objectives were undertaken:

1. To review the results of a new archaeological watching brief at the site (see Figure 2);
2. To use the stratigraphic data from the new locations, and existing records to produce a deposit model of the major depositional units across the site;
3. To prepare a report which summarises the results of the desk-based geoarchaeological deposit modelling and reviews the archaeological and palaeoenvironmental potential of the site, making recommendations for any further investigations.

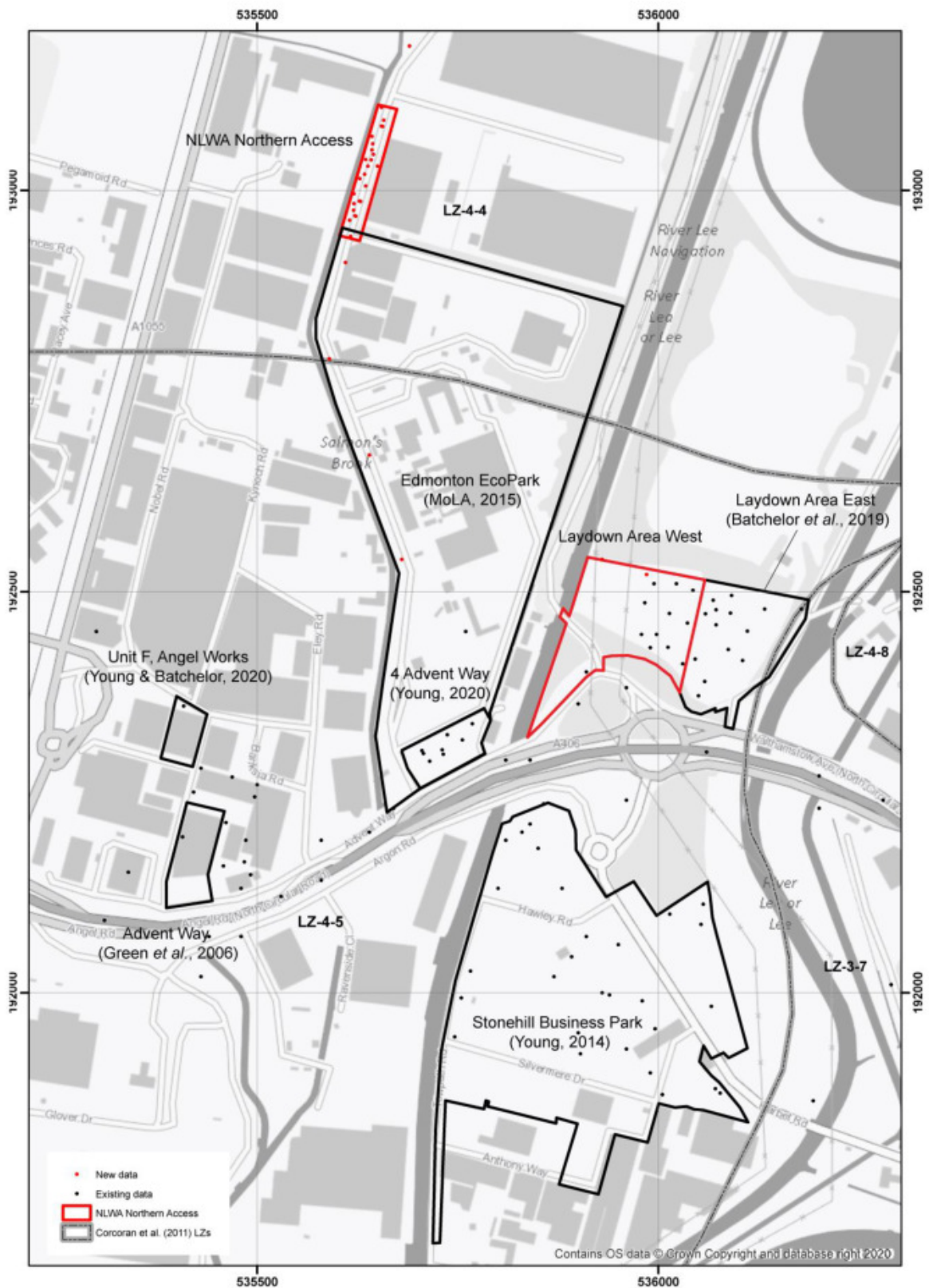


Figure 1: Location of the North London Waste Authority (NLWA) Northern Access Area, London Borough of Enfield, and other nearby sites of geoaerchaeological investigation discussed in the text.

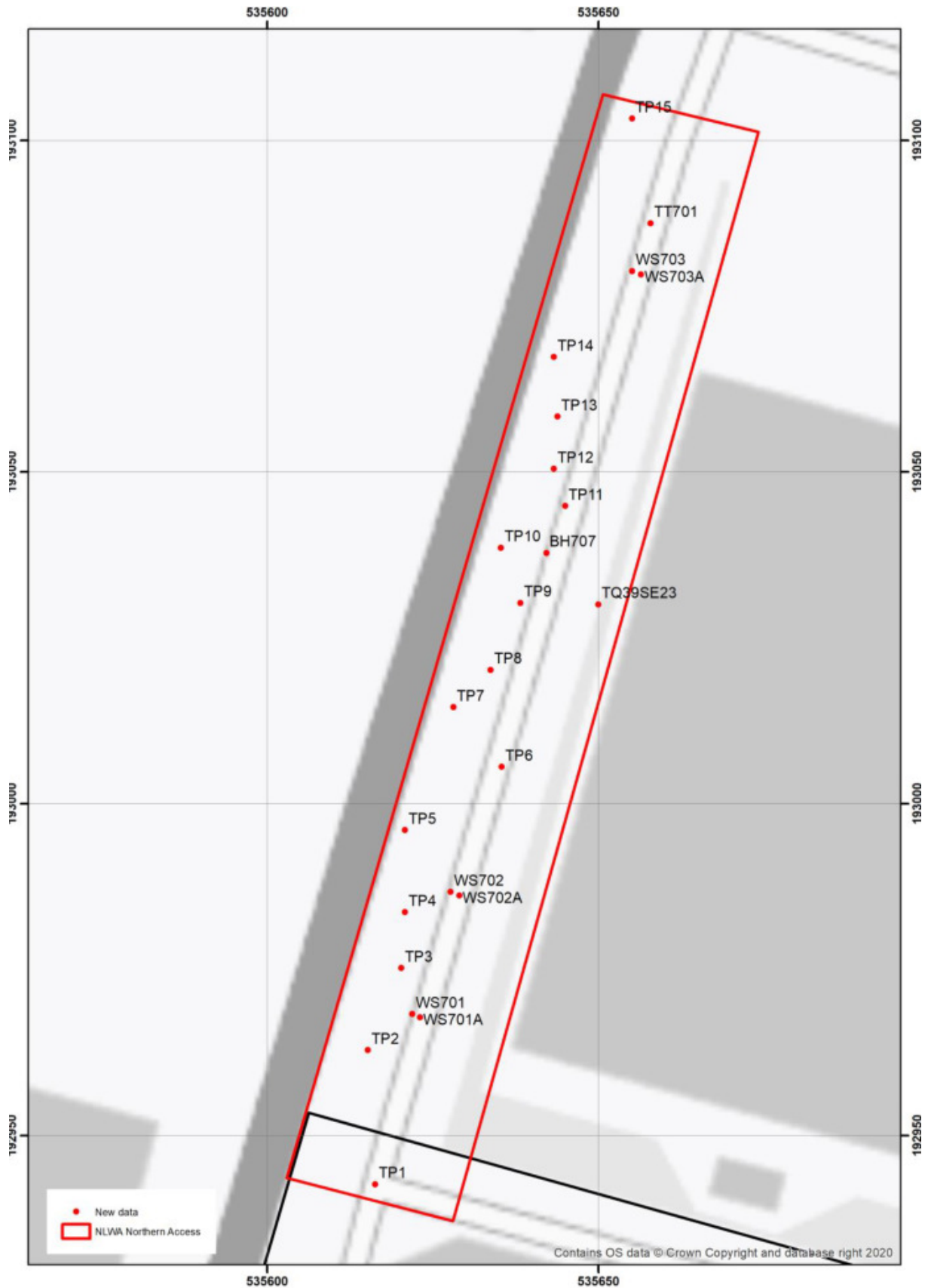


Figure 2: Location of the new interventions at the North London Waste Authority (NLWA) Northern Access Area, London Borough of Enfield.

3. METHODS

3.1 Deposit modelling

The deposit model was based on a review of 15 new archaeological test pits undertaken at the site by ADAS, eight new geotechnical interventions and eight British Geological Survey (BGS) archive boreholes (see Table 1). These data were combined with 122 borehole and test-pit records from the wider area (see Figure 1 and Appendix 1), incorporating data from 4 Advent Way (Young, 2020), Unit F, Angel Works (Young, 2020), Advent Way (Green *et al.*, 2006), Edmonton EcoPark (Batchelor *et al.*, 2019), Stonehill Business Park (Young, 2014) and 52 BGS archive boreholes (<http://mapapps2.bgs.ac.uk/geoindex/home.html>). The borehole data from the MoLA (2015) investigation were not included in the deposit model as these logs were not available at the time of writing.

Deposit modelling was undertaken following the guidelines in Historic England (2020). The deposit modelling was undertaken using RockWorks 16 geological utilities software and ArcMap 10.4. The term 'deposit modelling' describes any method used to depict the sub-surface arrangement of geological deposits, but particularly the use of computer software 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 present site, the sedimentary units were classified into five groupings: (1) Bedrock, (2) Gravel, (3) Peat, (4) Alluvium, and (5) Made Ground. Models of surface height (using an inverse-distance weighted (IDW) algorithm) were generated for the Gravel (Figure 3), Peat (Figure 4) and Alluvium (Figure 6), with thickness models for the Peat (Figure 5), combined alluvial units (Figure 7) and Made Ground (Figure 8). A two-dimensional stratigraphic profile was generated for selected sequences across the site and the wider area along a southwest-northeast transect (Figure 9). A deposit model of the wider Gravel surface (using a 100m cut-off filter) is shown in Figure 10.

How effectively Rockworks portrays the relief features of stratigraphic contacts or the thickness of sediment bodies depends on the number of data points (boreholes/test pits) per unit area, and the extent to which these points are evenly distributed across the area of interest. 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 the value chosen for each data point (borehole) is equivalent to an area of 50m radius for all models (the 'cut-off filter') with the exception of the model of the wider Gravel surface, to which a 100m cut-off is applied in order to aid interpretation of the main topographic features. The new interventions are relatively well distributed over the site, and confidence in the model here can be considered to be high; in terms of the wider model, reliability improves towards the core area of boreholes where mutually supportive data are likely to be available from several adjacent data points. Reliability is also affected by the quality of the stratigraphic records, which in turn are affected by the nature of the sediments and/or their post-depositional disturbance during previous stages of land-use on the site. Finally, 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.

Table 1: Spatial data for the new archaeological test pits at the North London Waste Authority (NLWA) Northern Access Area, and the new archaeological trench at Laydown Area West, London Borough of Enfield.

Name	Easting	Northing	Elevation (m OD)	Total depth (m)
TP1	535616.35	192942.61	11.07	3.73
TP2	535615.23	192962.83	11.30	3.29
TP3	535620.29	192975.19	11.36	3.58
TP4	535620.85	192983.61	11.05	3.35
TP5	535620.85	192995.97	11.31	2.79
TP6	535635.45	193005.51	11.32	3.02
TP7	535628.15	193014.50	11.35	2.92
TP8	535633.76	193020.12	11.32	2.77
TP9	535638.26	193030.23	11.33	2.79
TP10	535635.33	193038.53	11.24	2.76
TP11	535645.00	193044.83	11.14	2.77
TP12	535643.31	193050.44	11.14	2.78
TP13	535643.87	193058.31	11.04	2.72
TP14	535643.31	193067.29	11.13	2.73
TP15	535655.11	193103.24	11.29	1.76
BH707	535642.20	193037.77	11.72	25.00
WS701	535621.97	192968.25	11.69	4.80
WS701A	535623.09	192967.79	11.70	4.80
WS702	535627.70	192986.65	11.72	4.50
WS702A	535629.03	192986.14	11.74	4.00
WS703	535655.12	193080.25	11.41	3.80
WS703A	535656.43	193079.72	11.42	4.90
TT701	535657.91	193087.45	11.39	1.50
Trench 23	535985.13	192521.09	9.84	2.00

4. RESULTS & INTERPRETATION OF THE GEOARCHAEOLOGICAL DEPOSIT MODELLING

The results of the desk-based geoarchaeological deposit modelling are shown in Figures 3 to 9, with surface elevation and thickness models for the main stratigraphic units shown in Figures 3 to 8 and a two-dimensional stratigraphic profile across the site and the wider area shown in Figure 9. A deposit model for the Gravel surface in the wider area is shown in Figure 10. The full sequence of sediments at the NLWA Northern Access Area site includes:

Made Ground (widely present)

Alluvium (widely present; in places described as organic)

Peat (recorded in one test pit)

Gravel (Lea Valley Gravel)

Bedrock (London Clay)

4.1 London Clay

The surface of the London Clay bedrock was reached in one of the new geotechnical boreholes (BH707) at a level of 5.52m OD; two existing BGS archive boreholes within or close to the site show the bedrock surface at 4.36 (TQ39SE24) and 4.60m OD (TQ39SE23). To the north of the site, the bedrock surface is recorded at 4.85m OD in borehole TQ39SE22, whilst to the south it falls to 3.9m OD in TQ39SE25.

4.2 Lea Valley Gravel

The bedrock at the site is overlain by a unit of sandy gravel, interpreted here as the Lea Valley Gravel of Gibbard (1985), deposited during the Late Devensian (10-15,000 years before present (BP)) within a high energy braided river environment. The Gravel was not reached in any of the new archaeological watching brief test pits, but it was recorded in seven of the new geotechnical boreholes and in two BGS archive boreholes within or close to the Northern Access Area site. The Gravel surface here is recorded at levels between 6.99 (WS701) and 8.72 m OD (WS703A); in general it rises northwards (see Figure 3) from levels between 6.99 and 7.94m OD in the southern half of the site, to between 8.22 and 8.72m OD in the northern half. Just to the south of the site in TQ39SE24 the gravel surface is recorded at 8.01m OD, whilst further north in TQ39SE22 it rises to 9.72m OD. The Gravel surface was not reached in the new archaeological trench at Laydown Area West, but the existing model for Laydown Area East shows that it lies at similar levels to the south of the Northern Access Area, at between ca. 7 and 8.5m OD.

The Gravel surfaces recorded here are similar to those described during investigations not far from the present site. The lower Gravel surfaces towards the south are similar to those at Advent Way (Green *et al.*, 2006), towards the southwest (see Figure 10), where it was recorded at levels between ca. 6 and 7m OD. Elsewhere, similarly low Gravel surfaces are recorded just to the south of the Laydown Area East site at 6.5m OD in TQ39SE120, on the eastern part of the Stonehill Business Park site between 6.7 and 7.0m OD (e.g. SHQBH2, SHQBH4) and on the Advent Way site at 6m OD (Green *et al.*, 2006). The higher levels in the northern area of the site consistent with those recorded

at sites to the southeast, including much of Laydown Area East (Batchelor *et al.*, 2019), where the surface of the Gravel was recorded at levels between 7.14 and 9.2m OD, and the north-western part of Stonehill Business Park (Young, 2014).

4.3 Peat

A relatively thin, mineral-rich peat unit was recorded in one archaeological test pit in the far south of the site (TP1) at between 9.52 and 9.97m OD (Figure 4), described as a black organic layer/lens during the archaeological watching brief. Peat was not recorded within the remainder of the interventions across the site. Although only nine of the 25 interventions recorded the full alluvial sequence, these are relatively well distributed across the site, and indicate that the peat is confined to the southern part of the site in the area of TP1. This peat unit is indicative of a localised transition towards semi-terrestrial (marshy) conditions on the floodplain, supporting the growth of sedge fen/reed swamp and/or woodland communities.

Localised peat units have been recorded during geoarchaeological investigations elsewhere in this area of the Lower Lea floodplain; at Laydown Area East/Laydown Area West, a relatively thin complex of Peat and Tufa was recorded in a geoarchaeological borehole measuring 0.32m in thickness (Batchelor *et al.*, 2019). Distinct Peat horizons were also recorded in BGS archive boreholes TQ39SE41 and TQ39SE117, each measuring around 0.6m in thickness, whilst pockets or lenses of peat were also recorded in the lowermost part of the Alluvium in various geotechnical and archaeological watching brief logs (Batchelor *et al.*, 2019). Across the wider area, thin peat units are sporadically recorded in borehole records at the Stonehill Business Park site (e.g. TQ39SE114, TQ39SE112, TQ39SE109, SHCP3, TQ39SE358 and TQ39SE360; see Young, 2014). At 4 Advent Way (Young, 2020) a unit described as 'peat with bands of clay' was recorded in three geotechnical boreholes, directly overlying the Gravel in thicknesses of between 0.5 and 1.2m and to levels of between 8.95 and 9.92m OD. Elsewhere, Thicker Peat units and substantial horizons of Tufa are more commonly recorded further east however, including at the Advent Way site where they were between 1 and 2m in thickness (see Figure 5). At Advent Way, radiocarbon dating indicated that the peat deposits dated to between ca. 11,500 and 4000 cal BP, equating to the beginning of the Mesolithic to Bronze Age (or early to middle Holocene) (Green *et al.*, 2006).

4.4 Alluvium

A unit described as a clayey silt, gravelly silt or gravelly clay was recorded in all 24 of the interventions within the area of the site, the surface of which was recorded at levels between 8.14 (WS702A) and 11.06m OD (TP3) (see Figure 6). The surface of the Alluvium was recorded at 8.84m OD in Trench 23 (Laydown Area West). This unit is interpreted as Holocene Alluvium associated with the floodplain of the River Lea, derived from either low to moderate energy fluvial activity (sandy/gravelly material) or at a distance from any active channels (silty or clayey material). The alluvium is generally mineral rich, and often coarse-grained (in places gravelly). However, in WS701A it is described as 'organic clay with pockets of peat', and as an organic clay in WS703. These organic units are again indicative of localised transitions towards semi-terrestrial conditions, perhaps infilling floodplain hollows or forming in shallow backwaters.

The thickness of the alluvial sequence in the area of the site, based on those interventions which recorded the entire alluvial sequence, is shown in Figure 7. The Alluvium in these records is between 0.2 (WS702A) and 2.5m (WS701) thick.

4.5 Made Ground

A unit of modern Made Ground caps the alluvial sequence, in highly variable thicknesses of between 0.2 (TP1) and 3.6m (WS702A) (Figure 8).

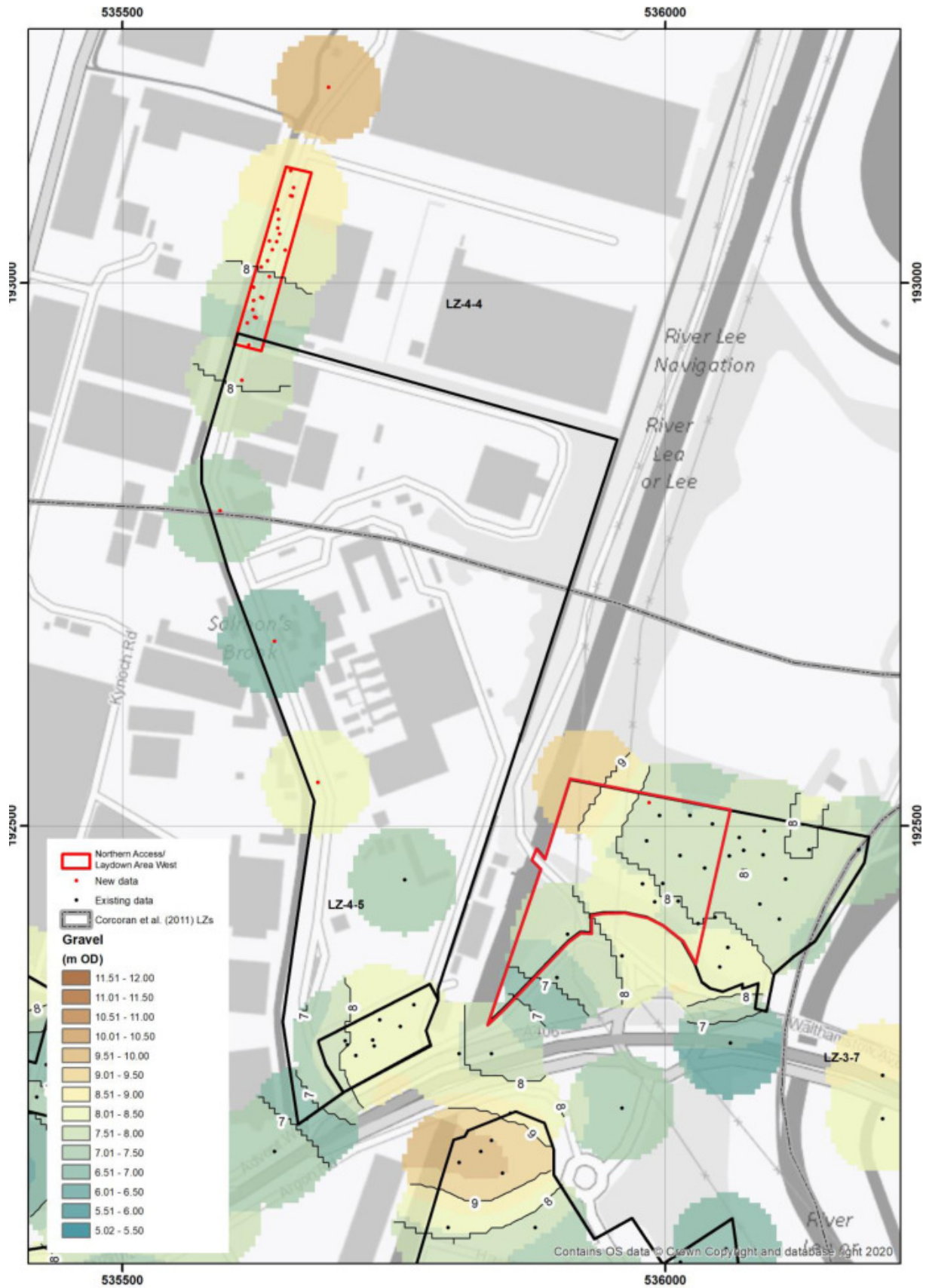


Figure 3: Surface of the Gravel (m OD)

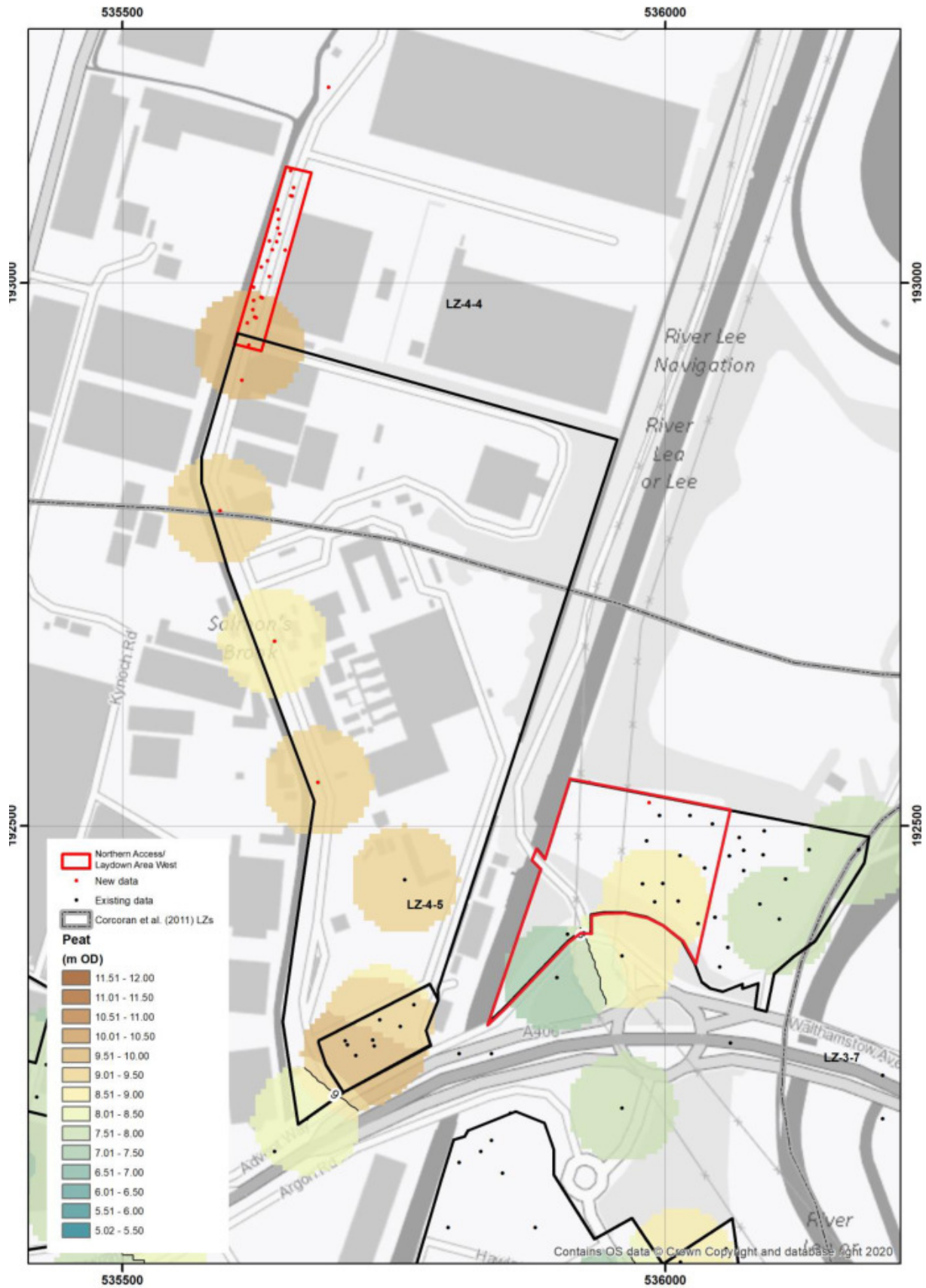


Figure 4: Surface of the Peat (m OD)

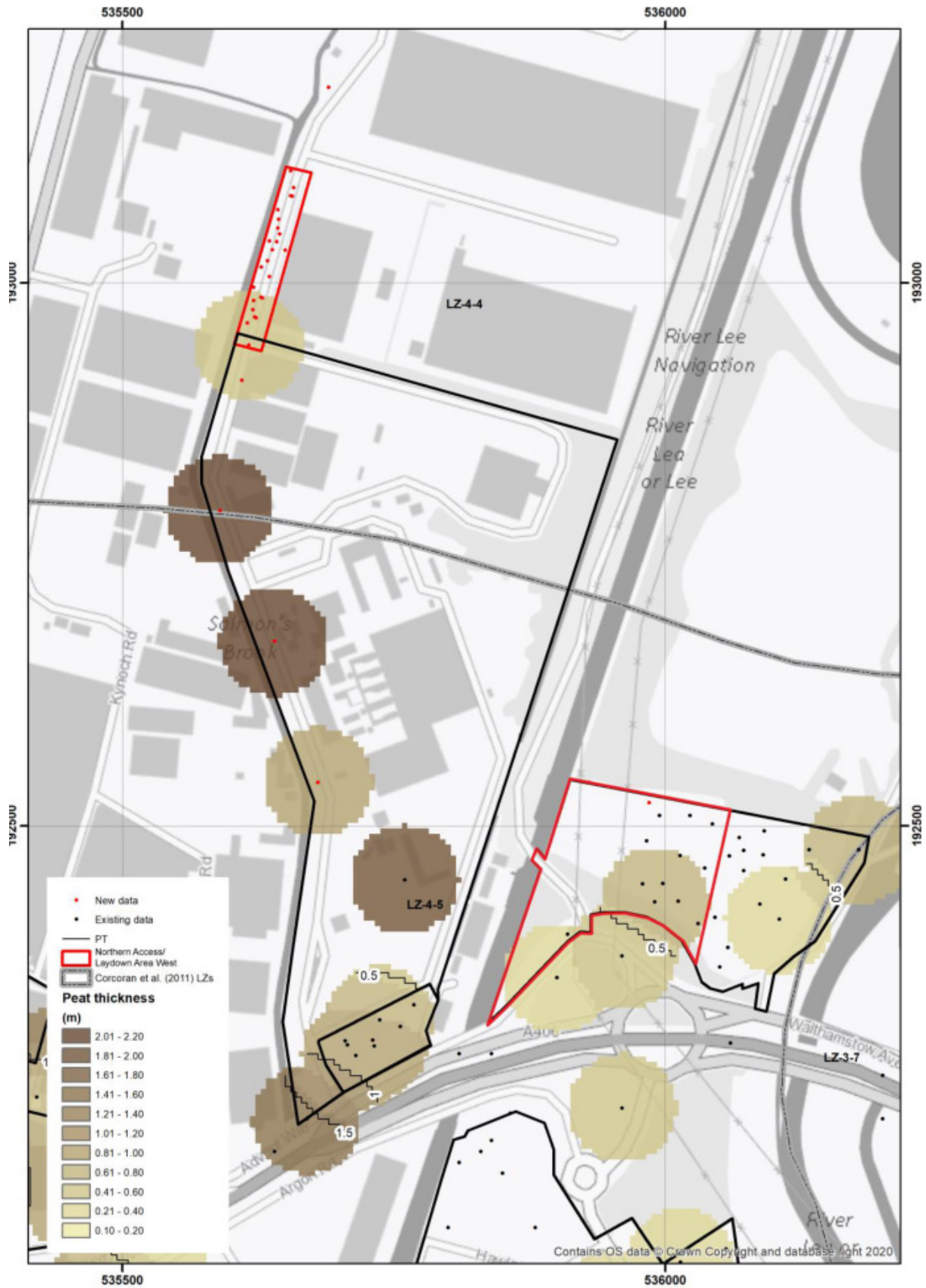


Figure 5: Thickness of the Peat (m)

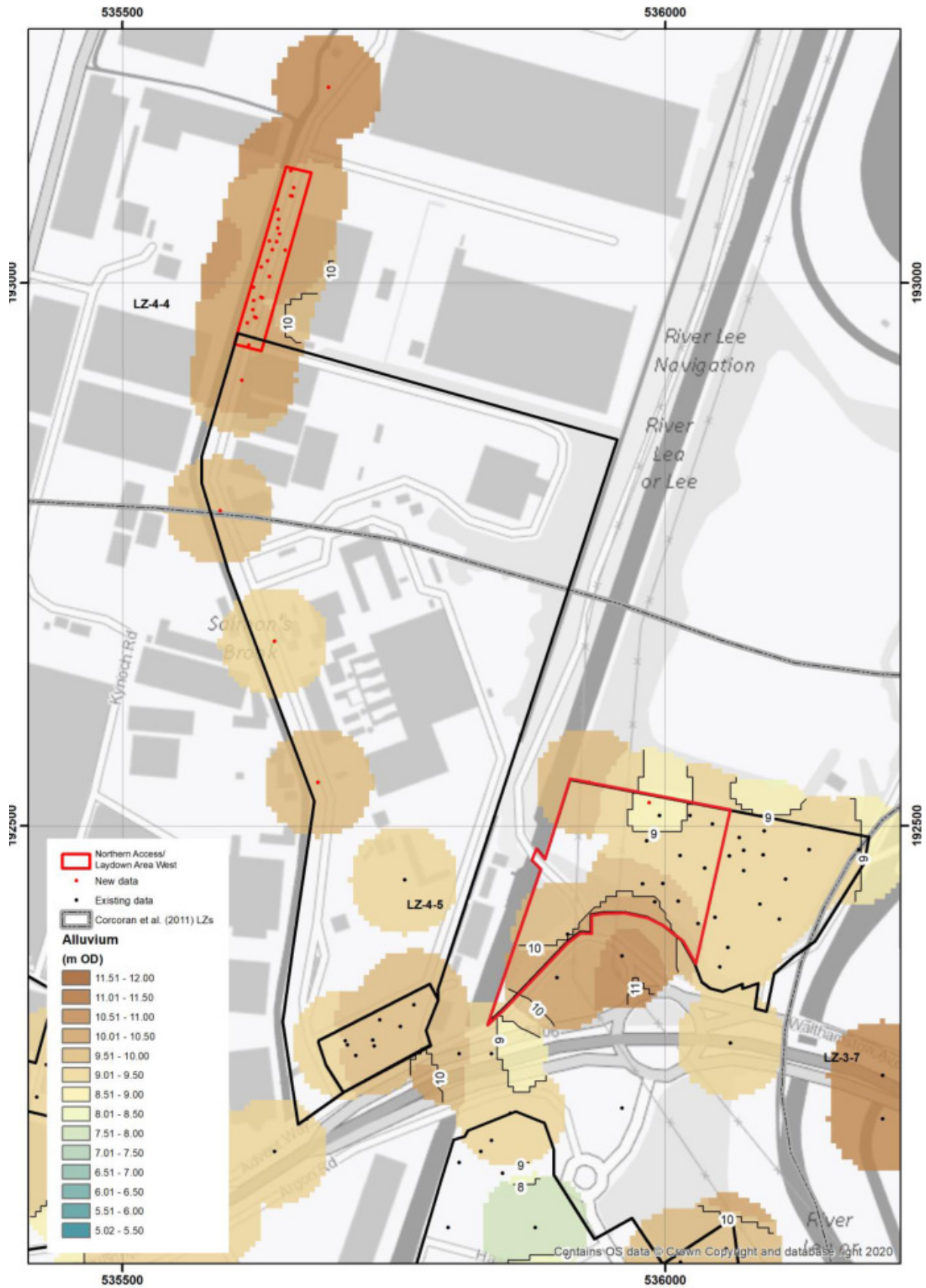


Figure 6: Surface of the Alluvium (m OD)

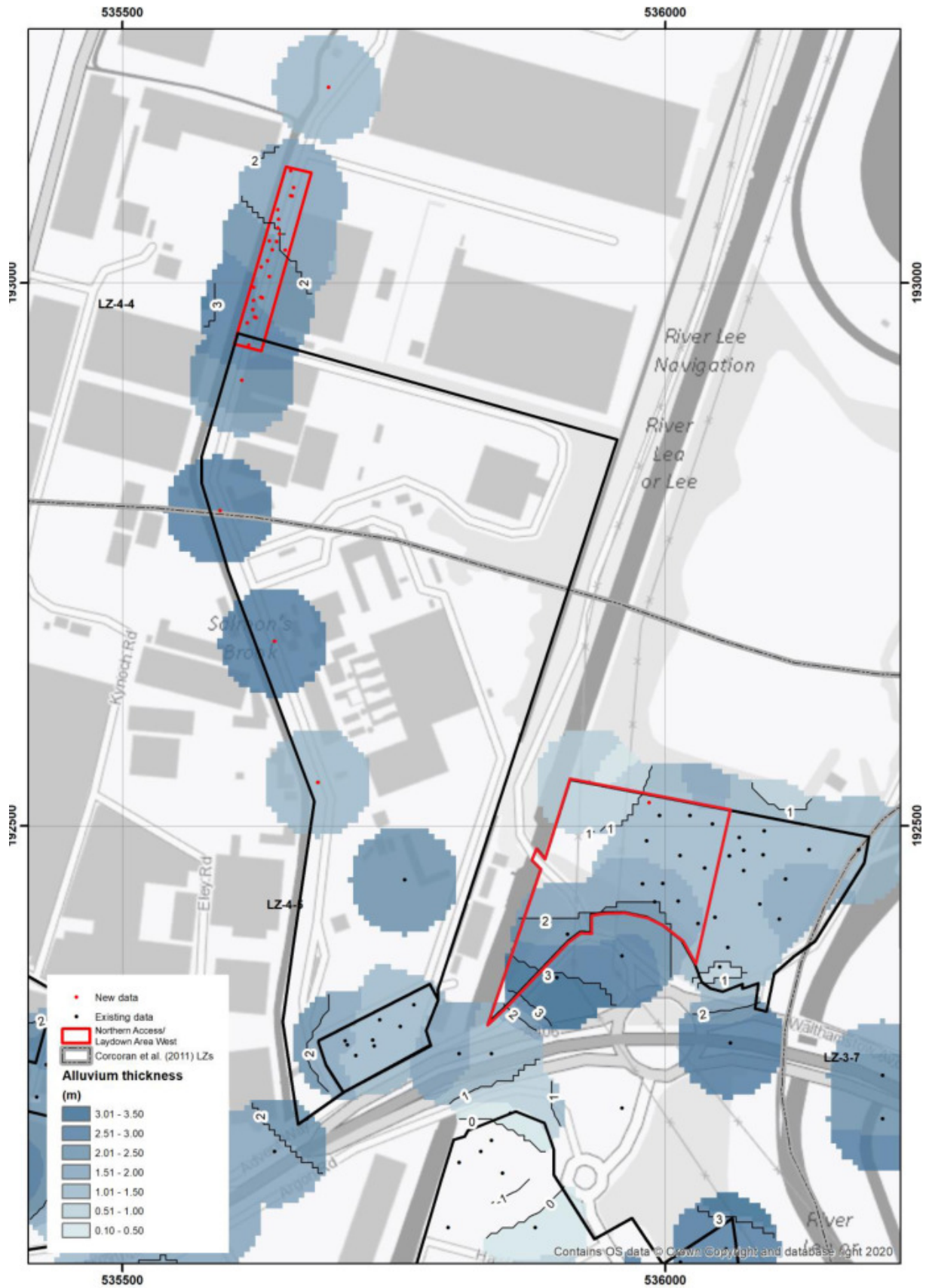


Figure 7: Thickness of the combined alluvial units (m)

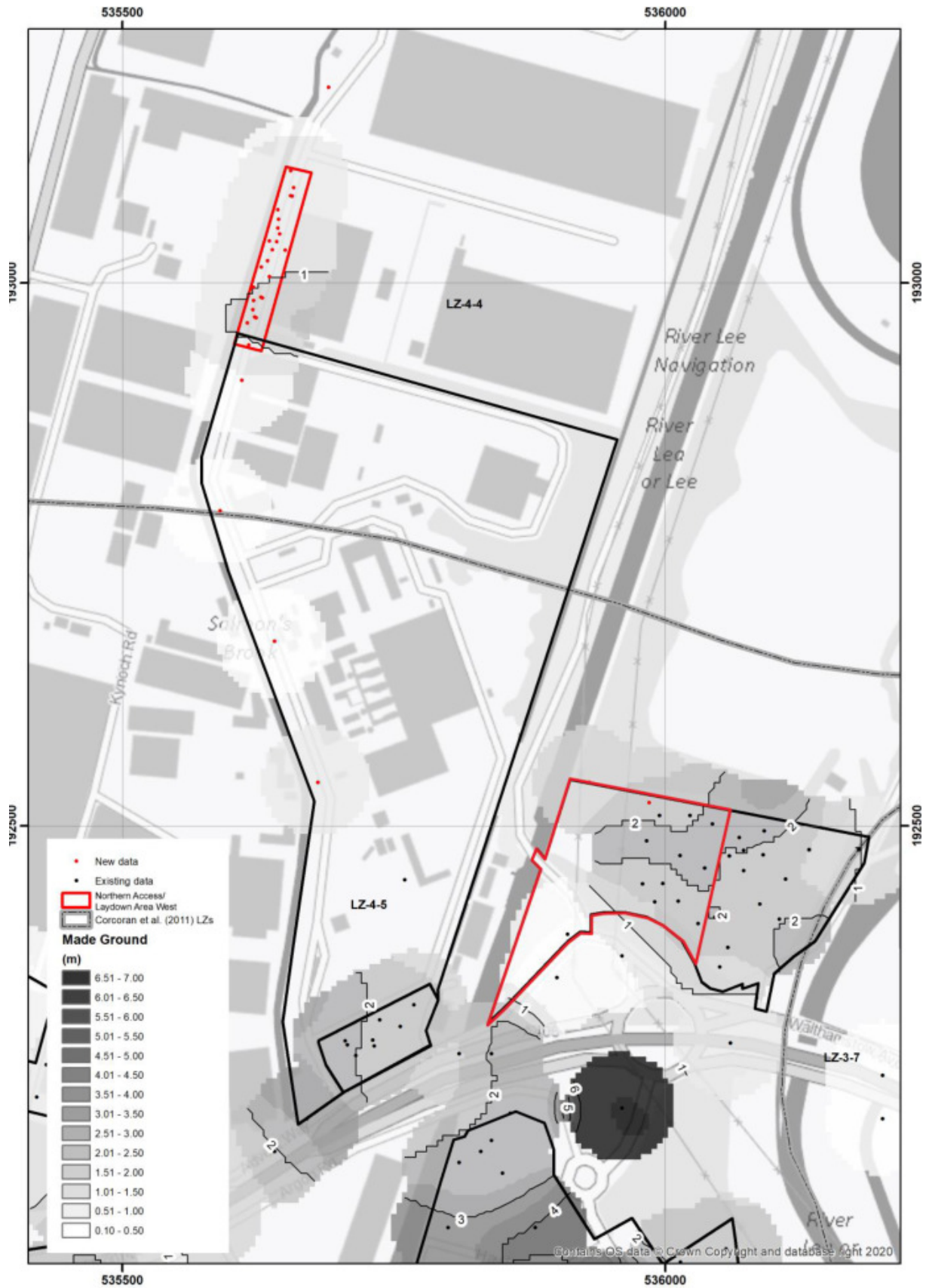


Figure 8: Thickness of the Made Ground (m)

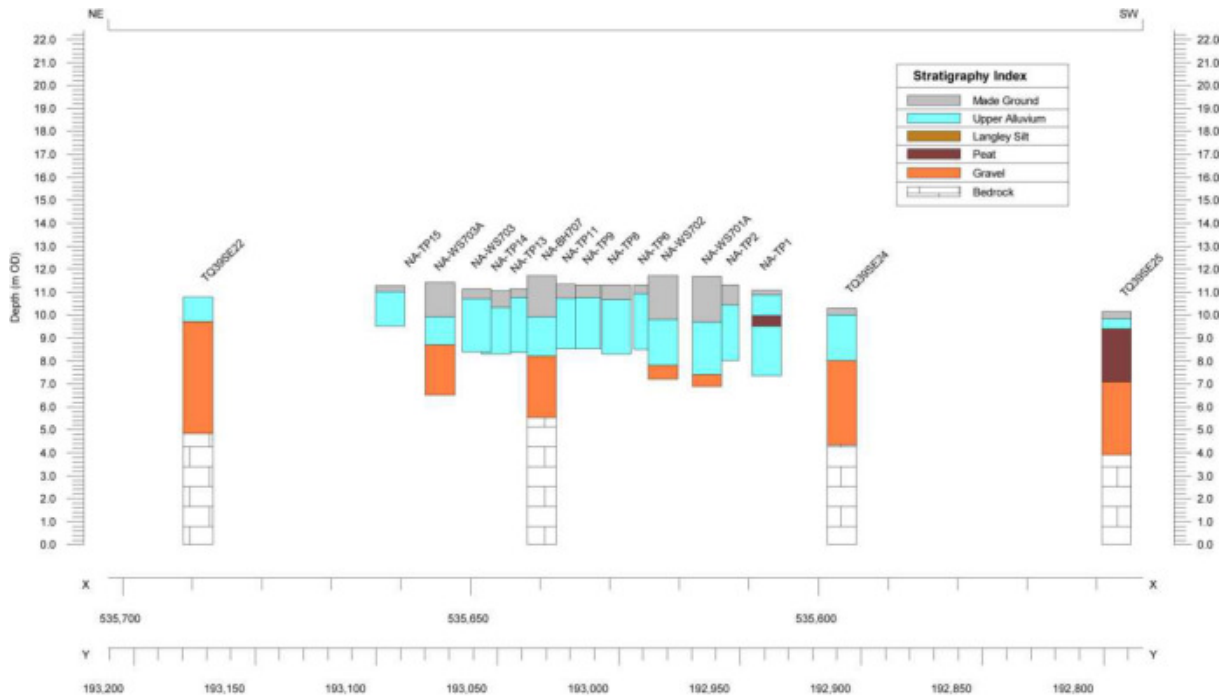


Figure 9: Southwest to northeast transect of selected sequences across the site and the wider area

5. DISCUSSION & CONCLUSIONS

The aims of the desk-based geoarchaeological deposit modelling at the NLWA Northern Access Area & Laydown Area West sites were (1) to clarify the nature of the sub-surface stratigraphy; (2) to clarify the nature, depth, extent and possible date of any alluvium and organic/peat or tufa deposits; (3) to review the archaeological and palaeoenvironmental potential of the site; and (4) to make recommendations for any further geoarchaeological or palaeoenvironmental investigations. In order to achieve these aims, a programme of desk-based geoarchaeological deposit modelling was undertaken, integrating data from a new archaeological watching brief and geotechnical investigation at the Northern Access Area site (ADAS, 2020a) and Edmonton EcoPark Laydown Area West (ADAS, 2020b), and the existing deposit model from Edmonton EcoPark Laydown Area East (Batchelor *et al.*, 2019).

The results of the deposit modelling have revealed a sequence of Late Devensian Lea Valley Gravel, overlain by Holocene alluvial sediments (including a localised peat deposit), capped by modern Made Ground. The Gravel surface here is recorded at levels between 6.99 and 8.72 m OD, rising northwards from levels between ca. 7-8m OD in the southern half of the Northern Access Area site, to between ca. 8.2 and 8.7m OD in the northern half. Although slightly lower in the southern half of the site, these levels are generally consistent with Corcoran *et al.*'s (2011) Landscape Zone 4.4, where the Gravel surface is described as lying at levels between ca. 8 and 9m OD. The Gravel surface was not reached in the new archaeological trench at Laydown Area West, but the existing model for Laydown Area East shows that it lies at similar levels to the south of the Northern Access Area, at between ca. 7 and 8.5m OD.

Overlying the Gravel in one archaeological trial pit in the southern part of the site was a unit of mineral-rich peat, present at between 9.52 and 9.97m OD and described as a black organic layer or lens. Peat was not recorded within the remainder of the interventions across the site; although only nine of the 25 interventions recorded the full Holocene alluvial sequence, these are relatively well distributed across the site, and indicate that the peat is confined to the south in the area of TP1. Elsewhere across the site, the Holocene alluvium is variously silty, clayey and in places gravelly, and derived from either low to moderate energy fluvial activity (sandy/gravelly material) or at a distance from any active channels (silty or clayey material) on the floodplain of the River Lea. The alluvium is described as organic in two interventions, indicative of other localised transitions towards semi-terrestrial conditions on the floodplain.

The peat deposit at the present site is present at a higher elevation than has generally been recorded elsewhere in this area of the River Lea floodplain, where it is often recorded at levels below around 8.5m OD; however, 'peat with bands of clay' was recorded at similar levels at 4 Advent Way (Young, 2020; 8.95-9.92m OD). Given their elevation, it is possible that these deposits of a significantly later date than those at Advent Way (Green *et al.*, 2006), where radiocarbon dating indicated they date to between ca. 11,500 and 4000 cal BP, equating to the beginning of the Mesolithic to Bronze Age (or early to middle Holocene). On the basis of the higher elevation and unknown age of the peat deposit

at the site, further investigation of these sediments is required in order to confirm its palaeoenvironmental potential, including its character and age.

In terms of archaeological potential, the deposit models presented here indicate that the Gravel surface rises toward the north, with the Gravel surface in the northern area of the site around 1m higher than in the south. Although not as high as the Gravel island underlying the north-western part of the Stonehill Business Park site (see Young, 2014), the deposit model indicates that the site would at some time during the earlier prehistoric period have been at the interface between the floodplain and the higher, drier ground to the north. As such, the prehistoric archaeological potential of the site is considered to be higher in the north. However, no archaeological deposits or features were identified however during the watching brief undertaken by ADAS (2020a).

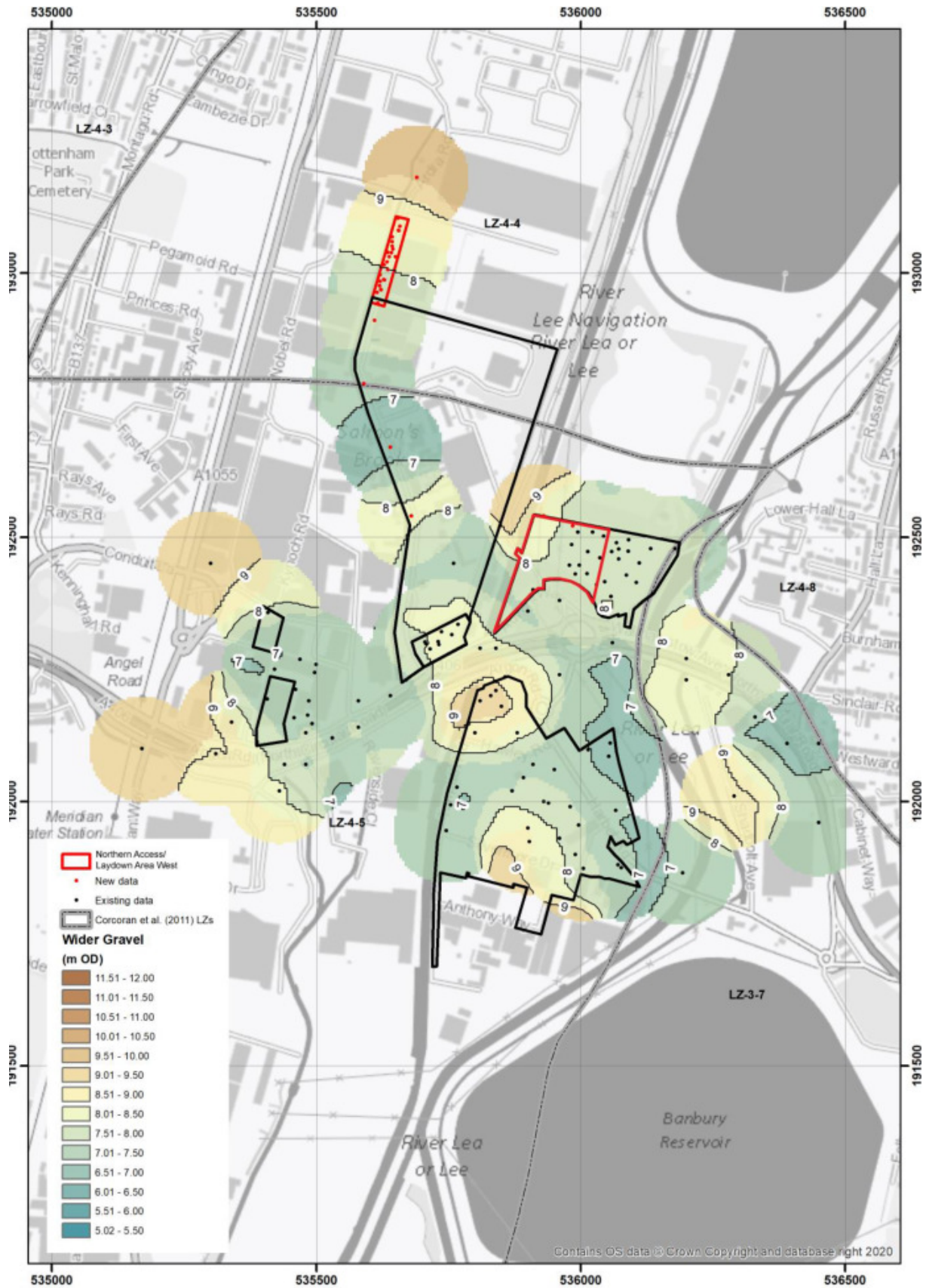


Figure 10: Surface of the Gravel (m OD) in the wider area of the site

6. REFERENCES

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7. APPENDIX 1: DEPOSIT MODEL DATA

Name	Easting	Northing	Elevation (m OD)	Total depth (m)
4 Advent Way (Young, 2020)				
BH1	535755.94	192315.13	11.00	30.45
BH2	535705.32	192301.73	10.70	25.45
TP1	535707.30	192298.04	10.64	3.30
TP2	535730.56	192302.50	11.10	2.00
TP3	535768.29	192335.14	11.04	2.00
WS1	535715.12	192288.28	11.54	5.45
WS2	535731.83	192297.00	11.72	5.45
WS3	535737.08	192321.25	10.95	5.45
Data from Unit F, Angel Works (Young, 2020)				
UF-BH1	535408.76	192357.16	10.50	2.20
Data from Advent Way (Green et al., 2006)				
AW-BH1	535430.00	192280.00	9.74	8.00
AW-BH2	535486.00	192190.00	9.81	8.00
AW-BH3	535407.00	192194.00	9.90	6.00
AW-WS1	535469.00	192269.00	9.78	4.00
AW-WS10	535492.00	192147.00	9.91	5.00
AW-WS2	535421.00	192250.00	9.77	5.00
AW-WS3	535500.00	192259.00	9.89	3.00
AW-WS5	535497.00	192244.00	9.78	5.00
AW-WS7	535461.00	192212.00	9.87	5.00
AW-WS8	535458.00	192158.00	9.91	5.00
AW-WS9	535484.00	192163.00	9.94	5.00
Data from Edmonton EcoPark (Young, 2019)				
NWLA-BH1	536086.82	192427.75	10.69	15.00
NWLA-BH2	536043.18	192501.68	11.16	15.00
NWLA-BH3	536011.89	192430.51	11.14	15.00
NWLA-BH4	535982.82	192486.01	10.96	15.50
NWLA-QBH1	536068.03	192489.22	10.92	4.00
NWLA-QBH2	536104.95	192413.82	10.20	3.00
NWLA-TP1	536110.72	192450.73	10.85	3.50
NWLA-TP10	535997.71	192446.66	11.11	3.80
NWLA-TP11	535979.03	192446.54	11.06	3.80
NWLA-TP12	536013.58	192472.61	11.16	3.80
NWLA-TP13	536022.50	192509.56	10.77	3.80
NWLA-TP14	535994.42	192509.56	10.77	3.80
NWLA-TP15	536057.60	192387.91	10.59	3.60
NWLA-TP2	536132.22	192478.04	11.12	3.80
NWLA-TP3	536090.98	192495.05	11.23	3.80
NWLA-TP4	536089.95	192473.10	10.97	3.70
NWLA-TP5	536072.08	192458.48	10.95	3.20
NWLA-TP6	536045.63	192415.62	10.90	3.80

NWLA-TP7	536058.81	192472.23	10.97	3.80
NWLA-TP8	536072.01	192477.10	10.99	3.30
NWLA-TP9	536036.30	192460.92	11.14	3.80
<i>Data from Stonehill Business Park (Young, 2014)</i>				
SHBH2	535746.00	191945.00	10.80	6.00
SHBH2A	535892.00	192045.00	11.30	5.00
SHBH3	535903.00	191924.00	12.30	6.50
SHBH4	536053.00	192085.00	11.50	7.70
SHCP3	536014.00	192098.00	11.50	5.00
SHCP4	536066.00	191983.00	11.50	5.00
SHG7	535766.00	192027.00	10.80	3.15
SHG8	536005.00	191873.00	12.50	3.00
SHQBH2	536055.98	192110.37	11.63	5.00
SHQBH3	535857.23	192235.35	11.21	4.00
SHQBH4	536070.74	191880.36	10.47	4.00
SHQBH5	535754.43	191993.47	10.76	4.00
SHWSGA	536077.00	191875.00	10.50	5.00
SHWSGB	535996.00	191955.00	12.30	5.00
SHWSGC	535939.00	191997.00	12.20	5.00
TP1	536110.72	192450.73	10.85	3.50
TP10	535997.71	192446.66	11.11	3.80
TP11	535979.03	192446.54	11.06	3.80
TP12	536013.58	192472.61	11.16	3.80
TP13	536022.50	192509.56	10.77	3.80
TP14	535994.42	192509.56	10.77	3.80
TP15	536057.60	192387.91	10.59	3.60
TP2	536132.22	192478.04	11.12	3.80
TP3	536090.98	192495.05	11.23	3.80
TP4	536089.95	192473.10	10.97	3.70
TP6	536045.63	192415.62	10.90	3.80
TP7	536058.81	192472.23	10.97	3.80
TP8	536072.01	192477.10	10.99	3.30
TP9	536036.30	192460.92	11.14	3.80
<i>BGS archive boreholes</i>				
TQ39SE25	535590.00	192790.00	10.15	10.62
TQ39SE24	535610.00	192910.00	10.30	11.07
TQ39SE26	535640.00	192670.00	9.91	10.11
TQ39SE23	535650.00	193030.00	10.70	11.81
TQ39SE27	535680.00	192540.00	10.30	10.46
TQ39SE22	535690.00	193180.00	10.79	12.24
TQ39SE65	535930.00	192540.00	11.03	6.10
TQ39SE66	535930.00	192540.00	10.70	6.10
TQ39SE101	535580.00	192140.00	10.58	25.00
TQ39SE102	535580.00	192190.00	10.35	10.00
TQ39SE103	535640.00	192200.00	10.77	10.00

TQ39SE104	535670.00	192230.00	11.20	25.00
TQ39SE106	535810.00	192290.00	10.98	30.00
TQ39SE108	535840.00	192290.00	11.15	10.00
TQ39SE109	535960.00	192240.00	14.59	7.50
TQ39SE112	535900.00	192360.00	10.60	4.50
TQ39SE113	535910.00	192400.00	10.11	4.00
TQ39SE114	535960.00	192380.00	11.52	4.50
TQ39SE117	535990.00	192430.00	11.59	4.20
TQ39SE118	536030.00	192410.00	10.74	4.50
TQ39SE120	536060.00	192300.00	10.20	30.00
TQ39SE124	536200.00	192270.00	11.18	25.00
TQ39SE125	536200.00	192230.00	11.25	21.50
TQ39SE126	536280.00	192240.00	11.25	10.00
TQ39SE128	536330.00	192160.00	9.39	25.30
TQ39SE129	536390.00	192110.00	11.00	10.00
TQ39SE130	536450.00	192110.00	11.59	9.00
TQ39SE148	536193.00	191865.00	9.96	25.00
TQ39SE149	536450.00	191960.00	9.51	10.00
TQ39SE153	536290.00	192010.00	10.15	1.00
TQ39SE217	535430.00	192020.00	12.19	137.46
TQ39SE231	535300.00	192450.00	11.00	81.00
TQ39SE26	535640.00	192670.00	9.91	10.11
TQ39SE27	535680.00	192540.00	10.30	10.46
TQ39SE28	535760.00	192450.00	9.31	9.17
TQ39SE357	535910.00	192070.00	11.40	10.00
TQ39SE358	535950.00	192060.00	12.28	10.00
TQ39SE359	535870.00	192020.00	11.25	10.00
TQ39SE360	535930.00	192000.00	12.26	10.00
TQ39SE361	535980.00	191990.00	12.53	10.00
TQ39SE362	535900.00	191950.00	12.30	10.00
TQ39SE363	535960.00	191930.00	12.34	10.00
TQ39SE364	535990.00	191900.00	12.56	10.00
TQ39SE41	536178.00	192478.00	9.81	30.48
TQ39SE465	535800.00	192130.00	11.28	12.37
TQ39SE466	535480.00	192130.00	11.61	12.19
TQ39SE467	535880.00	192130.00	12.16	10.00
TQ39SE469	535850.00	192180.00	12.89	12.37
TQ39SE470	535840.00	192210.00	13.41	18.28
TQ39SE471	535830.00	192200.00	13.14	12.19
TQ39SE472	535810.00	192190.00	12.77	18.28
TQ39SE65	535930.00	192540.00	11.03	4.27
TQ39SE66	535930.00	192540.00	10.70	6.10
TQ39SE90	536050.00	192370.00	10.00	93.00
TQ39SE93	535340.00	192150.00	11.26	10.00
TQ39SE94	535170.00	192100.00	11.45	15.00

TQ39SE96	535310.00	192090.00	10.03	22.50
TQ39SE97	535440.00	192070.00	11.30	10.00
TQ39SE98	535480.00	192070.00	10.88	10.00
TQ39SE99	535530.00	192120.00	10.48	10.00

Plates



Plate 1: South facing section 1014 of Trench 23 (1 of 6, west end), looking north



Plate 2: South facing section 1014 of Trench 23 (2 of 6), looking north



Plate 3: South facing section 1014 of Trench 23 (3 of 6), looking north



Plate 4: South facing section 1014 of Trench 23 (4 of 6), looking north



Plate 5: South facing section 1014 of Trench 23 (5 of 6), looking north



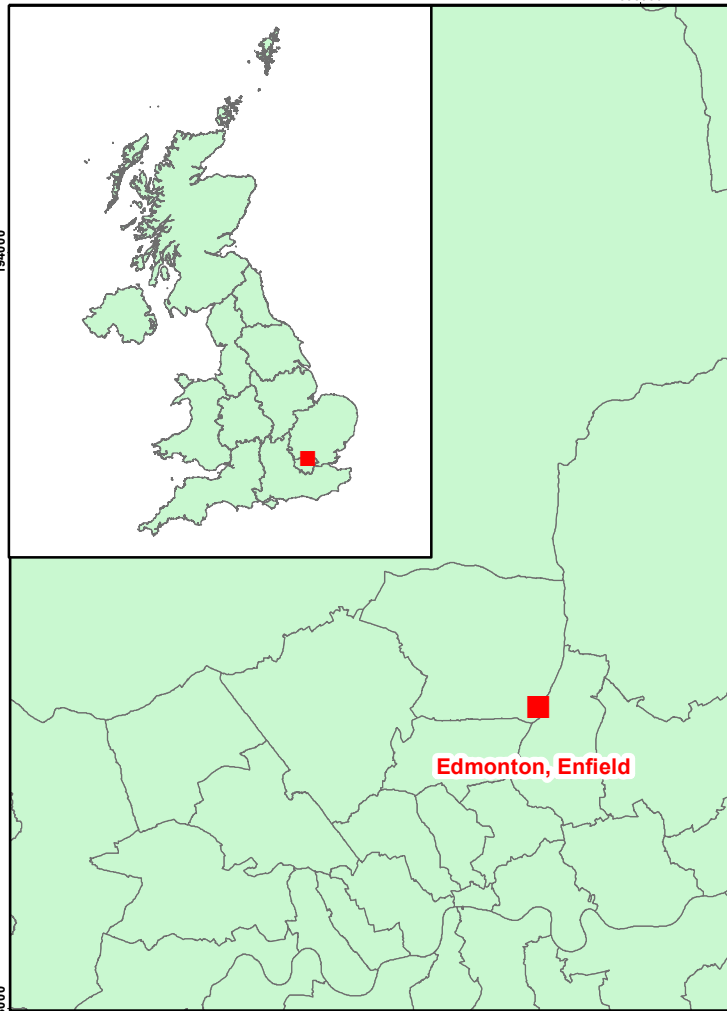
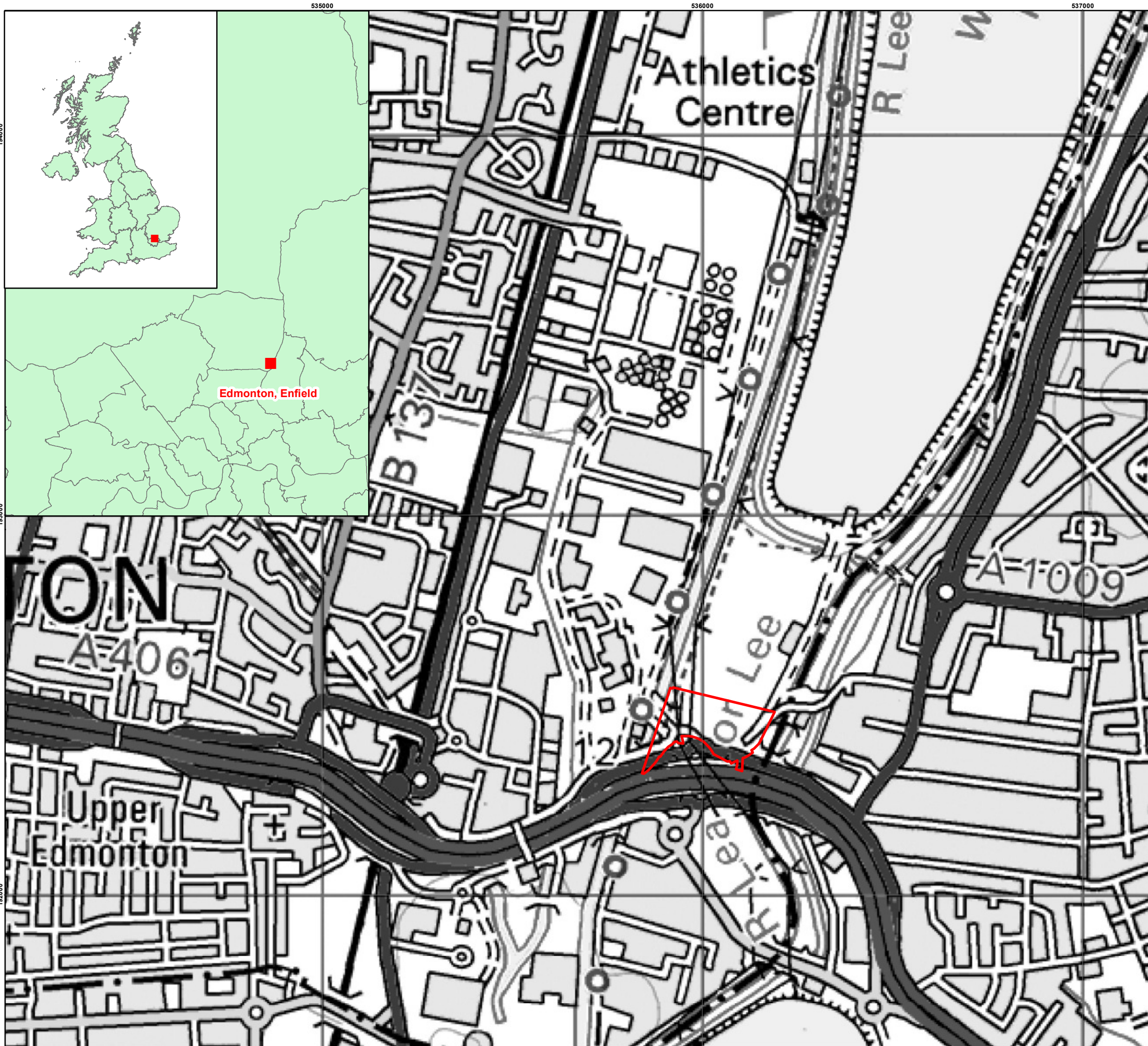
Plate 6: South facing section 1014 of Trench 23 (6 of 6, east end), looking north



Plate 7: View of Trench 23, looking north-west



Plate 8: View of Trench 23, looking east



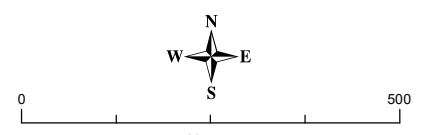
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Edmonton EcoPark, Laydown Area West

Figure 1: Site Location

 Site Boundary

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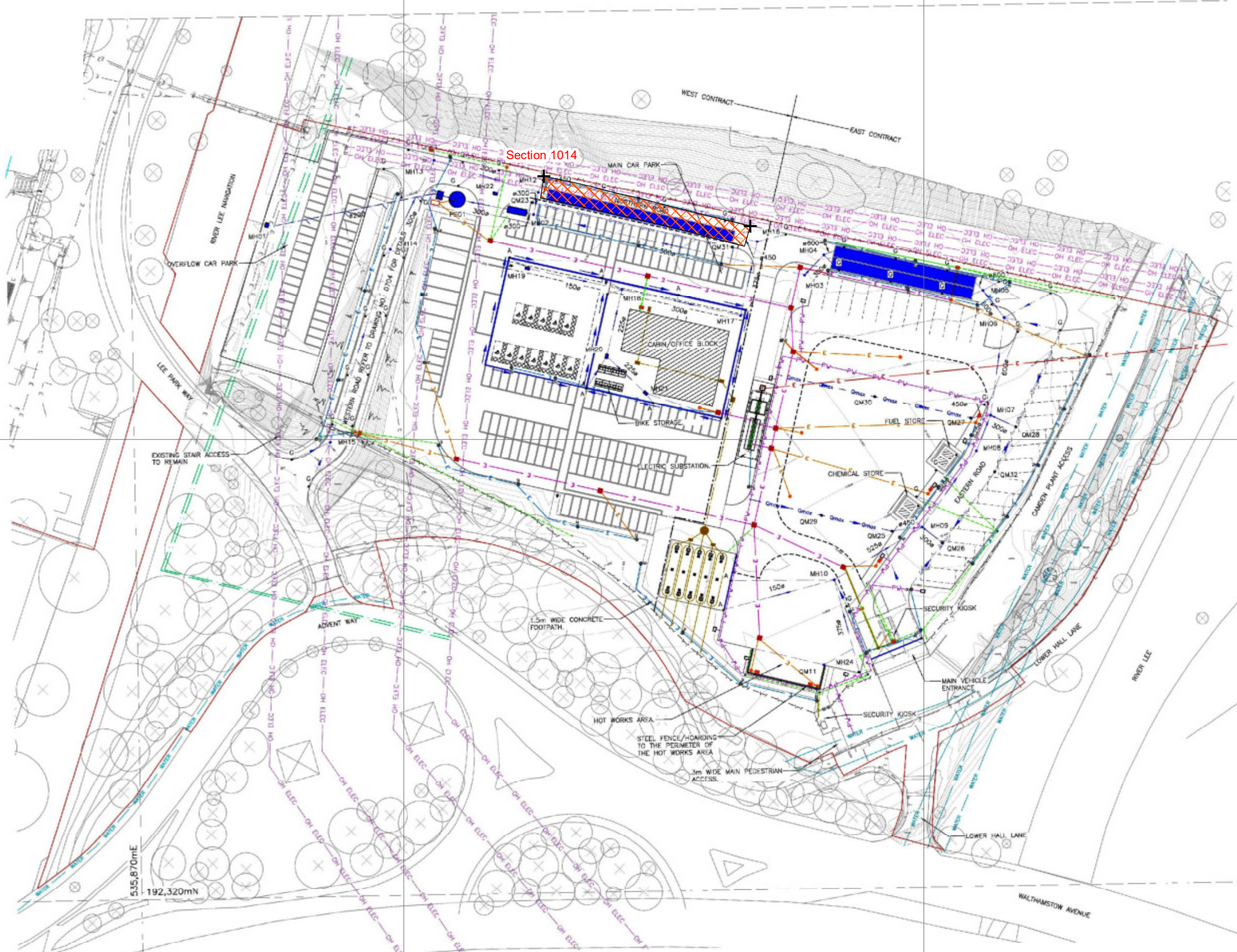


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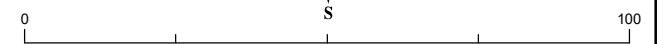
Figure 2: Location of Monitored Groundworks

-  Site Boundary
-  Trench 23 Culvert Attenuation Tank
-  Section Point



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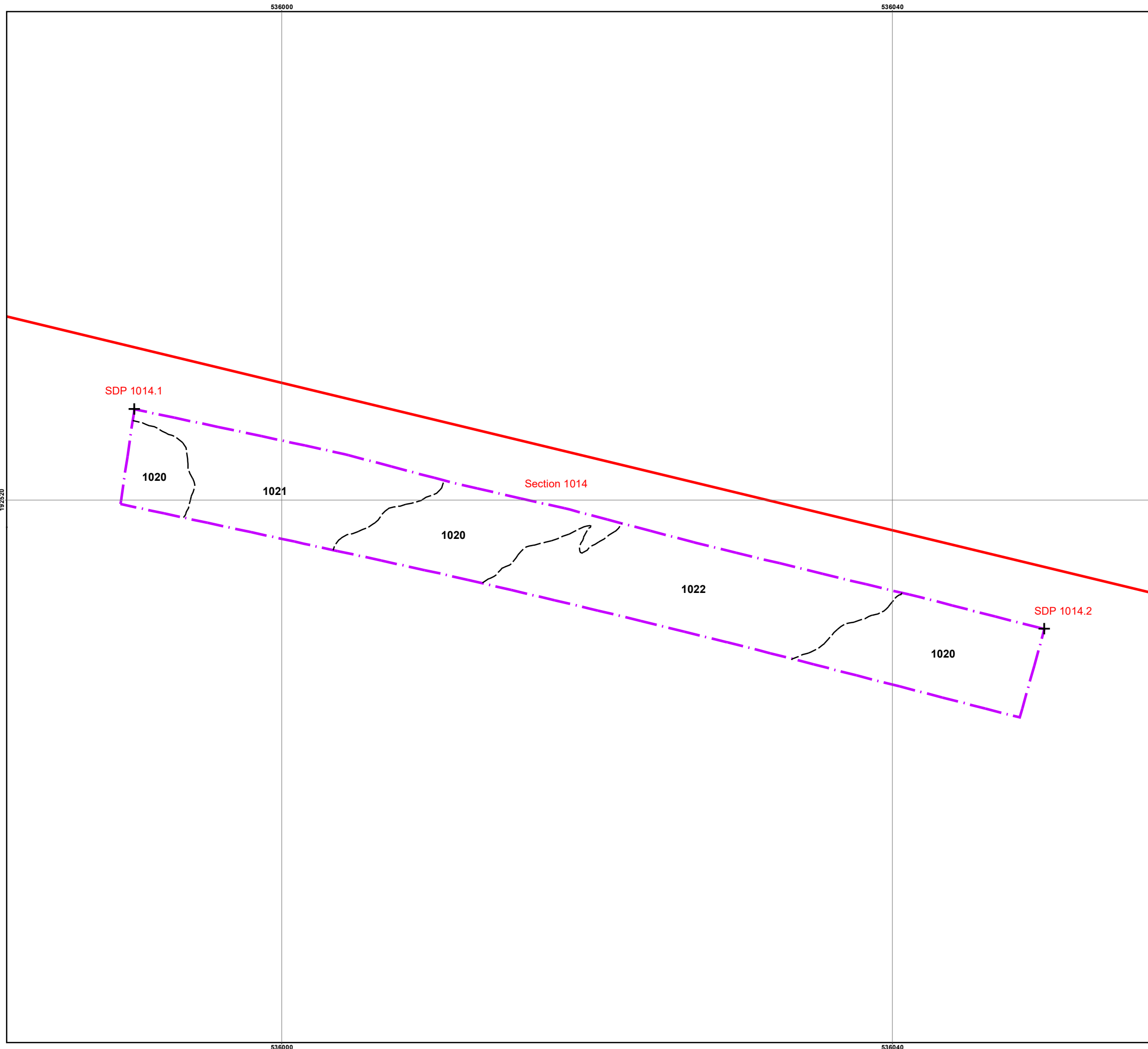
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Edmonton Eco Park, Laydown Area West

Figure 3: Plan of Trench 23

-  Site Boundary
-  Trench 23 Limit of Excavation
-  Section Point



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Metres

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Edmonton EcoPark, Laydown Area West

Figure 4: Section 1014

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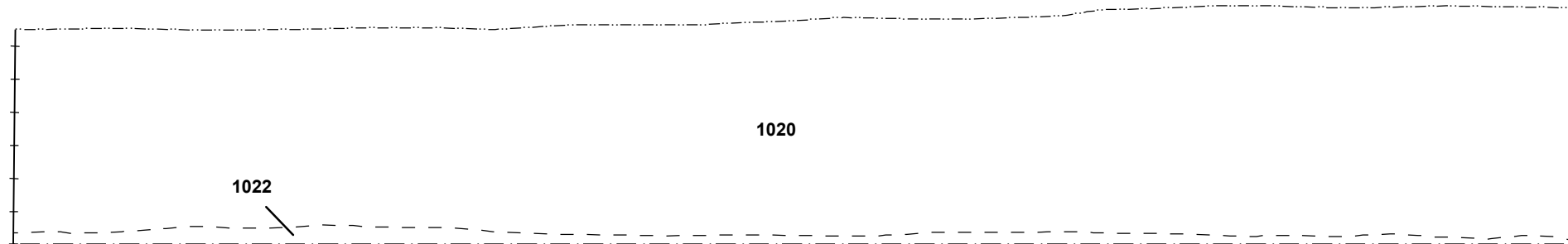
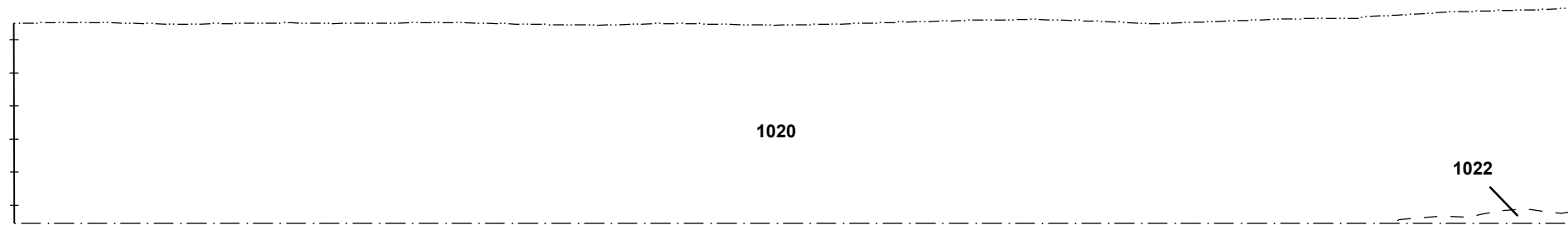
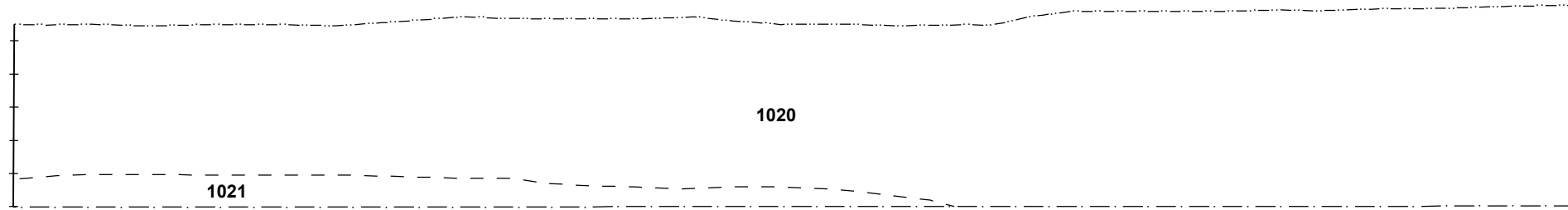
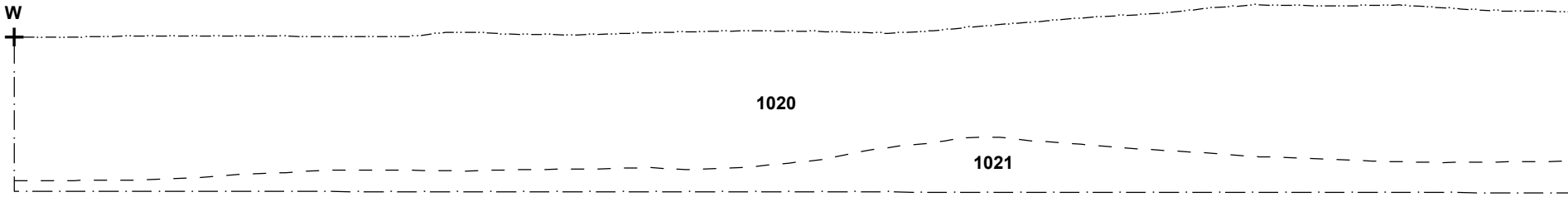
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South Facing Section of Trench 23

9.84 m aOD

W



E

10.53 m aOD

