WHITESTONE
solar farm

WHITESTONE SOLAR FARM

Volume 6: Environmental Statement

6.20.1 Appendix 8.5: Geoarchaeological Desk Based Assessment (Clean)

Application Document ref. EN0110020/APP/6.20.1
Revision 02
August 2026

Planning Act (2008)
Infrastructure Planning
(Applications: Prescribed
Forms and Procedure)
Regulations 2009
Regulations 5(2)(a)

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Document Status					
Version	**Purpose of Document**	**Authored by**	**Reviewed by**	**Approved by**	**Review Date**
Rev01	DCO Submission	ERM	TLT, DWD, Pershing, AECOM, Whitestone Net Zero Ltd	Whitestone Net Zero Ltd	01/06/2026
Rev02	Section 51 / 55 Updates	ERM	DWD,Whitestone Net Zero Ltd	Whitestone Net Zero Ltd	August 2026

Approval for Issue		
Whitestone Net Zero Ltd	[redacted]	August 2026

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Prepared by:

ERM

Prepared for:

Whitestone Net Zero Ltd

Document changes in response to s51/55 advice			
Document reference	**Previous text**	**Changes**	**New text**
Front cover (PDF page 1)	*6.20 Appendix 8.5: Geoarchaeological Desk Based Assessment*	Updated document reference and added (Clean) to document tile on Cover Page	6.20.1 Appendix 8.5: Geoarchaeological Desk Based Assessment (Clean)
Front cover (PDF page 1)	*Application Document ref. EN0110020/APP/6.20 Revision 01 June 2026*	• Amended Revision 01 to Revision 02 on Cover Page • Amended date from June 2026 to August 2026 on Cover Page	Application Document ref. EN0110020/APP/6.20 Revision 02 August 2026
New Document Status and Document Approval page (PDF page 2)	N/A	New table with revision number, purpose of document, authored by, reviewed by, approved by and review date and approval issue table.	Rev02 | Section 51 / 55 Updates | ERM | DWD | Whitestone Net Zero Ltd | August 2026
Quality assurance table (previously PDF page 4, now PDF page 5)	ADB approved by 2x signatures	Additional signature added to Approved by column.	Additional signature added to Approved column so now showing three approved signatures.
Paragraph 3.3.2 (page 3 of the Geoarchaeological Desk-Based Assessment)	*The solar farm Site is divided into three areas for this GDBA (see Error! Reference source not found.)*	Deleted *(see Error! Reference source not found.)* and replaced with *(see **Figures 1 and 2**)*	*The solar farm Site is divided into three areas for this GDBA (see Figures 1 and 2).*

Whitestone Solar Development Consent Order

Geoarchaeological Desk-Based Assessment

Document Ref.: 316530.01
September 2025

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Document Information

Document title	Whitestone Solar Development Consent Order
Document subtitle	Geoarchaeological Desk-Based Assessment
Document reference	316350.01
Client name	Environmental Resources Management Limited
Address	2nd Floor Exchequer Court 33 St Mary's Axe London EC3A 8AA
Site location	Land between Conisbrough and Woodall.
County	South Yorkshire
National grid reference	448100, 387379 (SK 48100 87379) (centre of Site)
Planning authority	TBC
Planning reference	TBC
WA project name	Whitestone Solar
WA project code	316350
Project management by	[redacted]
Document compiled by	
Graphics by	

Quality Assurance

Issue number & date		Status	Author	Approved by
1	07/08/2025	v1	LC [redacted]	ADB [redacted]
2	12/09/2025	v2	LC	ADB
3	15/09/2025	v3	LC	ADB

Contents

List of Figures

List of Tables

Summary

Wessex Archaeology was commissioned by Environmental Resources Management Limited (ERM) to produce a Geoarchaeological Desk-Based Assessment (GDBA) to inform the submission of the Environment Statement for the Whitestone Solar DCO (Development Consent Order), a proposed new solar farm development of 1, 383 hectares of land between Conisbrough and Woodall, South Yorkshire. The Site is centred on National Grid Reference 448100, 387379 (SK 48100 87379).

The solar farm Site is split into three main array areas: W1, W2 and W3. The cable route (CR) is split into three main areas with sub-divisions: CR1 (A to D) CR2 (A to G) and CR3 (A to D).

The GDBA identifies Quaternary sediment sequences that may be present across the Site, including Middle Pleistocene till, Glaciofluvial sands and gravels, alluvium and Head. These sequences are not mapped across the whole Site and, where present, are highly localised. Due to the highly localised distribution of Quaternary sediment, location numbers are provided for each. Till deposits were only present in WS2 (location 6), CR3a (location 7 and 8) and CR3B (location 12), Glaciofluvial sands and gravels are present in W1 (location 1) to the immediately south of Conisbrough. Alluvium is mapped in CR2C (location 2) following the course of the River Rother, W2 (location 3) following the course of the Ulley Brook, and CR3A (location 11) and W3 (location 16) following the course of the Broad Bridge Dyke. Head deposits are mapped W2 (location 4 and 5), CR3A (location 9 and 10), CR3B (location 13 and 15); and W3 (location 17–21).

A total of 63 archive BGS GeoIndex borehole logs were reviewed and coverage of ground investigation (GI) data across the site is poor. Therefore no baseline dataset exists with which to assess potential for the presence of Quaternary deposits. The presence of Palaeolithic and Mesolithic finds in some areas indicates archaeological potential.

The potential of the Quaternary deposits across the site is largely unknown owing to the poor coverage of existing GI data and localised nature of the deposits.

Till deposits generally have a low geoarchaeological potential, laid down directly by ice sheets, but can seal underlying deposits of archaeological potential.

Glaciofluvial sand and gravel is assigned unknown geoarchaeological potential due to the absence of existing GI data for the site. They represent outwash at the edge of ice sheets and may have potential to contain Palaeolithic archaeology reworked from earlier deposits.

Head is a banner term for deposits forming through various slope/creep process, accumulating within and at the base of valleys. Head represents cold-climate slope wash accumulating under alternating freeze-thaw processes. However, deposits mapped as Head may include Holocene colluvium, reflecting soil instability and slope wash as a result of woodland clearance and agricultural activity since the Neolithic period onwards. Colluvium may include archaeology reworked downslope but may seal *in situ* archaeology and deposits (e.g. buried soils or stasis horizons). Further investigation would be required to establish the formation processes and potential of these deposits.

Alluvium is unconsolidated material composed of clay, silt, sand and gravel deposited in a non-marine environment, for example, within rivers and associated floodplains. It is assigned unknown potential as existing GI and archaeological finds data across the Site is not sufficient to indicate presence of organic material or archaeology.

Based on the results of this assessment, geoarchaeological monitoring is recommended for GI works in areas of mapped Quaternary deposits.

Acknowledgements

Wessex Archaeology would like to thank [redacted] of ERM for commissioning the work. The report was written by [redacted]. The report was edited by [redacted]. The project was managed by [redacted] on behalf of Wessex Archaeology.

Whitestone Solar Development Consent Order

Geoarchaeological Desk-Based Assessment

1 INTRODUCTION

1.1 Project and planning background

1.1.1 Wessex Archaeology has been commissioned by Environmental Resources Management Limited (ERM) ('the client') to produce a Geoarchaeological Desk-Based Assessment (GDBA) to inform the Environment Statement (ES) for the Whitestone Solar Development Consent Order (DCO), a proposed new solar farm, and associated cable route, located to the east of Sheffield, South Yorkshire.

1.1.2 Details of the Proposed Development can be found within Volume 1, Chapter 5: The Proposed Development of the Draft ES.

1.1.3 This GBDA is designed as a high-level overview of the Quaternary superficial deposits and their potential within the Site. The results of the GDBA will provide further information on the geoarchaeological and archaeological potential of the deposits and facilitate and informed decision with regards to the requirement for, and methods, of any further archaeological works.

1.2 Scope of document

1.2.1 Quaternary superficial sediments of Pleistocene and Holocene date may have potential to contain archaeology and environmental remains reflective of past human activity, landscapes, and environments. Assessment of archaeological potential is therefore 'deposit-led', with the aim to provide a lithostratigraphic framework and to assess the archaeological potential of different Quaternary deposits.

1.2.2 In format and content, this document conforms to current best practice, including guidance in *Management of Research Projects in the Historic Environment* (MoRPHE, Historic England 2015a) *Geoarchaeology: Using Earth Sciences to Understand the Archaeological Record* (Historic England 2015b).

2 AIMS AND OBJECTIVES

2.1.1 The aims of the GDBA are to:

- characterise the principal geological deposits present underlying the Site through a review of available ground investigation (GI) data, including British Geological Survey borehole data (BGS GeoIndex);
- assess the archaeological and geoarchaeological potential of the Quaternary superficial deposits underlying the Site;
- identify the extent of Quaternary superficial deposits with archaeological potential, and

- make suitable recommendations for further field evaluation, where appropriate.

2.1.2 These aims are addressed by achieving the following objectives:

- collation and review of all GI, BGS GeoIndex and previous published and unpublished ("grey literature") archaeological/geoarchaeological information relevant to assessing the archaeological resource;
- review of existing archive logs on the BGS GeoIndex;
- interpretation of the sediments in their local and regional geoarchaeological context;
- assessment of the likely archaeological potential of the Quaternary deposits present, and
- production of a GDBA reviewing the archaeological and palaeoenvironmental records within the study area; and
- the provision of recommendations for further evaluation, where appropriate.

3 DESK-BASED ASSESSMENT

3.1 Introduction

3.1.1 The section provides a specialist GDBA to inform on the archaeological and potential of Quaternary superficial deposits in the Site, including the potential of deposits to preserve paleoenvironmental evidence and/or dating evidence relevant for contextualising settlement history.

3.2 Chronology

3.2.1 Geoarchaeological investigations are typically undertaken with reference to geological periods (e.g., Quaternary), epochs (e.g., Pleistocene) and sub-epochs (e.g., Devensian) that reflect major climate sea-level and/or environmental changes. Here we adopt British nomenclature correlated to the marine isotope stage (MIS) record to distinguish between different climatic periods, with dates given in Kya BP (thousands of years before present).

3.2.2 Marine isotope stages are deduced from marine palaeoclimatic records and reflect alternating warm (interglacial and interstadial) and cold (glacial and stadial) periods throughout the Quaternary (**Table 1**).

3.2.3 Where age estimates are available these are expressed in millions of years (Mya), Kya and, within the Holocene epoch, as either years before present (BP), before Christ (BC) and Anno Domini (AD). These are linked to the global MIS chronological framework.

Table 1 British Quaternary chronostratigraphy

Geological Period	Chronostratigraphy		Age (Kya)	MIS
Holocene	Holocene interglacial		11.7–present	1
Late Pleistocene	Devensian Glaciation	Loch Lomond Stadial	11.7–12.9	2–5d
		Windermere Interstadial	12.9–15	

Geological Period	Chronostratigraphy		Age (Kya)	MIS
		Dimlington Stadial	15–26	
		Upton Warren Interstadial	40–43	
		Early Devensian	60–110	
	Ipswichian interglacial		115–130	5e
Middle Pleistocene		Unnamed cold stage	130–374	6
		Aveley interglacial		7
		Unnamed cold stage		8
		Purfleet interglacial		9
		Unnamed cold stage		10
	Hoxnian interglacial		374–424	11
	Anglian glaciation		424–478	12
	Cromerian Complex		478–780	13–19

3.3 Location and landscape context

3.3.1 The Site covers 1383 ha and is comprised of three separate 'parcels' (see **Figures 1** and **2**). These run north to south, from south of Conisbrough to south of the A618 near Woodall.

3.3.2 The solar farm Site is divided into three areas for this GDBA (see **Figures 1** and **2**)

3.3.3 W1 is bounded by the A630 to the west and the M18 to the south-east. It is bounded mostly by open fields to the south and north.

3.3.4 The M18 bisects CR1A, C, D and CR1B and bounded by open fields at their northern ends. CR1A, C and D are bounded by Hellaby in the middle and open fields to the south, while CR1B is bounded by Bramley and Bramley Lings.

3.3.5 W2 is bisected by the M1 and bounded by the M18 to the north and the A57 to the south. To the west the majority of W2 is bounded by the A618 and by North Anston to the east. To the north of the main part of W2 lies a parcel bounded by the M18 and open fields. To the west of the main part of W2 lie two parcels either side of the M1. The northern parcel is bounded by junction 33 of the M1 and the southern parcel by Treeton and the A618.

3.3.6 CR2A, B and C are bounded by the M1/M18 to the south and mostly agricultural land to the north.

3.3.7 CR2D is bisected by the A618 and bounded to the west by Ulley Brook and to the east by Upper Whiston.

3.3.8 CR2E is bounded by agricultural land.

3.3.9 CR2G is bisected by the M1 and bounded by agricultural land.

3.3.10 CR2H is bounded by the A57 to the south and agricultural land to the north, east and west.

3.3.11 CR3A and B are bisected by the Sheffield–Leeds Northern rail line and bounded to the north by the A57 and to the south by Hard Lane.

3.3.12 W3 is bisected by the M1 and bounded by Kiveton Waters to the north, Mansfield Road to the west, the A618 to the south and Harthill Reservoir to the east.

3.3.13 CR3C is bisected by Woodall Lane and bounded by agricultural land.

3.3.14 CR3D is bisected by the M1 and bounded by agricultural land.

3.3.15 The modern topography reflects the Sites position east of the Rother Valley, within an undulating landscape, and previous development impacts, including several collieries. The evaluation area lies at elevations of 56.3 m above Ordnance Datum (OD) at the northern end of W1 to 103 m at the southern end of W1; 87.6 m at the north-west of W2 to 96.8 m OD at the south-east of W2; 94 m OD at the northern end of W3 to 127.6 m OD at the southern end of W3.

3.4 Quaternary deposits and archaeological context

Background

3.4.1 The Site is mapped close to the margins of former glacial Lake Humber (Fairburn & Bateman 2016). Glacial Lake Humber, which formed to the south of the Vale of York British-Irish ice sheet (BIIS) ice lobe and to the west of the North Sea BIIS ice lobe, formed when drainage from the ice sheet was blocked by ice. It was relatively short-lived, with multiple lake level stands between *c*. 40 and 5 m OD, related to the switching of lake outlets from the Lincolnshire Gap to the Humber Gap, and to oscillations of the BIIS (Fairburn & Bateman 2016).

3.4.2 The southern extent of this glacial lake was to the north of Doncaster (BRITICE 2017; Catt 2007; Clark *et al* 2004; Sejrup *et al* 2009) with glacial deposits being mapped extensively to the east of the Site, east of the A1(M) (BGS GeoIndex).

BGS log review

3.4.3 63 archive BGS GeoIndex borehole logs were reviewed and are tabulated in **Appendix 2**. Many are over 50 years old and/or have no OD height. For these, descriptions are not detailed, with some records including only location data and no sedimentary logs. In addition, glaciofluvial, till and river terrace deposits can often be difficult to distinguish from one another, especially when taken in an isolated context

3.4.4 In order to assign an archaeological and geoarchaeological potential to areas of the Site the log review is used to determine coverage of the Site. The quantity and quality of these logs is assessed for ability to inform on potential.

BGS solid geology

3.4.5 The solid geology mapped by the British Geological Survey (BGS GeoIndex) in the Site comprises a wide range of bedrock spanning the Carboniferous period (358.9–298.9 Mya) to the Permian period (298.9–251.9 Mya), consisting mainly of Coal Measures.

BGS superficial geology

3.4.6 BGS mapping suggests the following Quaternary deposits are present within the Site, from north to south: (**Figure 2**):

- W1: Glaciofluvial deposits (sand and gravel) (Mid Pleistocene) – **Figure 3**; Location 1
- CR2C: Alluvium (Holocene) – **Figure 4**; Location 2
- W2: Alluvium (Holocene) – **Figure 4**; Location 3
- W2: Head (Holocene) – **Figure 5**; Location 4 and 5
- W2: Till (Mid Pleistocene) – **Figure 5**; Location 6
- CR3A: Till (Mid Pleistocene) – **Figure 6**; Location 7 and 8
- CR3A: Head (Holocene) – **Figure 6**; Location 9 and 10
- CR3A: Alluvium (Holocene) – **Figure 6**; Location11
- CR3B: Till (Mid Pleistocene) – **Figure 6**; Location 12
- CR3B: Head (Holocene) – **Figure 6**; Location 13, 14 and 15
- W3: Alluvium (Holocene) – **Figure 6**; Location 16
- W3: Head (Holocene) – **Figure 6**; Location 17, 18, 19, 20 and 21

3.4.7 Relevant background information on these deposits, including their broad potential to preserve archaeology and palaeoenvironmental datasets, is outlined below.

3.4.8 Archaeological findspots within the study area and recorded on the Palaeolithic and Mesolithic Lithic Artefact (PaMELA) database are listed in **Appendix 1**.

Till

3.4.9 Till is poorly sorted sediment deposited directly by ice sheets, typically comprised of a combination of coarse-grained and fine-grained components, principally including reworked bedrock.

3.4.10 Till is mapped by the BGS GeoIndex in four locations across the Site:

- W2 (location 6);
- CR3A (location 7 and 8); and
- CR3B (location 12).

3.4.11 These are located in an area that has isolated till deposits mapped running from the west of Todwick, between Kiveton Park and South Anston, to Lindrick Dale.

3.4.12 The till mapped by BGS GeoIndex has been attributed an unknown Pleistocene age (BGS GeoIndex) but is expected to be either Anglian or mid-Pleistocene in age. During the Anglian glaciation ice sheets extended south to southern England, removing older Quaternary deposits, but would have deposited widespread till sequences following glacial retreat. While the distribution of the mid-Pleistocene glacial advances is less constrained, there is evidence of an advance into the Midlands (e.g., Gibson *et al*. 2022), which would have resulted in till deposits forming in northern England. The late Devensian glaciations

did not advance into the area of the Site (BRITICE 2017) and, as such, the till is unlikely to be Devensian in age.

3.4.13 While till itself has limited archaeological potential, it can seal and preserve underlying stratigraphy containing archaeological sites and associated environmental remains.

Glaciofluvial sand and gravel

3.4.14 Glaciofluvial deposits are proglacial or subglacial deposits formed by glacial melt, with clast lithology frequently mirroring that of glacial till and river terrace deposits. Glaciofluvial units are generally encountered as sand and gravel deposits in this region. The deposits are, similar to till deposits, located to the south of the margin of the Devensian Ice Sheet an

3.4.15 Glaciofluvial sand and gravel is mapped by the BGS GeoIndex in one location in the Site:

- W1 (location 1), immediately south of Conisbrough.

3.4.16 Glaciofluvial sand and gravel is sparsely mapped within W1, but larger deposits are mapped *c*. 12 km to the east, around Doncaster and south of Rossington.

3.4.17 As with till deposits the provenance of the glaciofluvial deposits is uncertain. Understanding the distribution and clast lithology can provide insights into the source of the glaciofluvial sand and gravel, as well as providing insights into the source of glaciers (Gaunt 1994).

3.4.18 Glaciofluvial sand and gravel is of moderate geoarchaeological potential; forming close to glaciers they are unlikely to preserve evidence for *in situ* human occupation but may have potential to include reworked Palaeolithic archaeology. They may also have acted as palaeo-land surfaces during the Pleistocene and/or Holocene.

Head

3.4.19 Head deposits are sediments formed by slope processes (e.g. solifluction and gelifluction), typically under cold-climate, periglacial process. Head deposits mapped by the BGS GeoIndex may include slope-deposits formed through processes such as downslope creep formed by soil instability during the Holocene (i.e. colluvium). Generally, this instability is brought on by activities such as clearance of woodland, agricultural activity and soil degradation.

3.4.20 Head deposits are mapped by the BGS GeoIndex in 11 locations across the Site:

- W2 (location 4 and 5);
- CR3A (location 9 and 10);
- CR3B (location 13 and 15); and
- W3 (location 17–21).

3.4.21 These deposits are isolated and sparse. They are recorded as occurring as localised deposits across the surrounding area.

3.4.22 Head may contain reworked artefacts or conceal deposits of geoarchaeological potential but is itself of low geoarchaeological interest. Pleistocene slope deposits generally reflect cold climate deposition but may contain evidence of periods of climatic warming represented by soil formation. These soils can preserve significant *in situ* evidence of Palaeolithic activity, including lithic scatters.

Alluvium

3.4.23 Alluvium is unconsolidated material composed of clay, silt, sand and gravel deposited in a non-marine environment, for example, within rivers and associated floodplains.

3.4.24 Alluvium is mapped by the BGS GeoIndex in four locations across the Site:

- CR2C (location 2), following the course of the River Rother;
- W2 (location 3), following the course of the Ulley Brook, a tributary of the River Rother; and
- CR3A (location 11) and W3 (location 16), following the course of the Broad Bridge Dyke, a tributary of the Chesterfield Canal (constructed in 1777).

3.4.25 Alluvial deposits have low geoarchaeological potential as, while they can preserve palaeoenvironmental proxies (e.g., ostracods, foraminifera), they may have undergone some degree of transportation, limiting their potential. However, alluvial deposits can mask *in situ* archaeology, organic-rich sediments (e.g., peat), and/or stabilisation horizons, which would be of high geoarchaeological potential. Given the distribution of alluvium across the Site, i.e. following the courses of rivers, there is potential for the deposits to cover/contain organic material.

3.4.26 Given the limited quality and distribution of data across the Site, it is unclear on whether alluvium mapped at the Site may mask or contain organic-rich or stabilisation deposits. Within the region, the upland peat sequences have received high level of research focus, while the lowland alluvial sequences have been subject to relatively few studies. While poorly studied, peat sequences have been recognised within the River Don and its tributaries (Gaunt 1994).

Archaeology

3.4.27 No archaeology has been found directly associated with the Quaternary deposits in the Site, however, the Spa Farm and Long Lane flints (see **Appendix 1**) are located within 300 m of mapped alluvial deposits in CR2C and W2 respectively. Whilst these findspots may be associated with the alluvium PaMELA data is not sufficient to support this and alluvium is designated as unknown potential.

4 ASSESSMENT OF POTENTIAL

4.1 Introduction

4.1.1 The GDBA has revealed the presence, or likely presence, of Quaternary deposits. These deposits are very localised across the Site, with the vast majority of the scheme not having any Quaternary deposits or geoarchaeological potential.

4.1.2 An archaeological potential rating has been assigned to the Quaternary deposits, representing a measure of probability. This has been determined via the application of professional judgement, informed by the evidence from the site itself and equivalent deposits in the surrounding area. Potential to preserve significant paleoenvironmental remains and material suitable for scientific dating is included within this assessment.

4.1.3 '*Potential'* is expressed on a four-point scale, assigned in accordance with the following criteria:

- **High** Situations where evidence is known or strongly suspected to be present within deposits and which are likely to be well preserved.

- **Moderate** Includes cases where there are grounds for believing that evidence may be present, but for which conclusive evidence is not currently available.

- **Low** Circumstances where the available information indicates that evidence is unlikely to be present, or that their state of preservation is liable to be severely compromised.

- **Unknown** Cases where currently available information does not provide sufficient evidence on which to provide an informed assessment with regard to the potential for material to be present.

4.2 Potential of Quaternary deposits

4.2.1 The geoarchaeological potential of each area and its associated superficial geology has been assessed and is summarised in **Table 2** and discussed below.

Table 2 Quaternary deposits

Area	Contains location number	Quaternary deposit	Associated archaeology	Geoarchaeological potential
W1	1	Glaciofluvial		Unknown
W2	3	Alluvium	Spa Farm flints	Unknown
W2	4, 5	Head		Unknown
W2	6	Till		Unknown
W3	16	Alluvium		Unknown
W3	17, 18, 19, 20, 21	Head		Unknown
CR2C	2	Alluvium	Long Lane flints	Unknown
CR3A	7, 8	Till		Unknown
CR3A	9	Alluvium		Unknown
CR3A	10	Head		Unknown
CR3A	11	Alluvium		Unknown
CR3B	12	Till		Unknown
CR3B	13, 14, 15	Head		Unknown

4.2.2 The paucity of data coverage across the Site means that the potential of the majority of deposits can only be assigned as unknown status presently. The potential is summarised below as follows:

- Till: assigned an unknown geoarchaeological potential as while tills form in environments unlikely to preserve archaeology or palaeoenvironmental proxies, they can mask other deposits. In addition, the understanding of till deposits within the region are poorly constrained.
- Glaciofluvial sands and gravels: assigned an unknown geoarchaeological potential due to the paucity of existing data. Greater understanding into the timing and palaeoenvironmental conditions would allow for a greater understanding on the potential of these deposits.
- Head deposits: assigned an unknown geoarchaeological potential. The head deposits are largely associated with valley slopes, and may preserve *in situ* or minimally reworked archaeology or palaeoenvironmental records. However, BGS-mapped head deposits also include Holocene colluvium deposits, and it is unclear whether head and/or colluvium is present at the Site. Further investigations would be required to understand the potential.

- Alluvium: assigned an unknown to moderate–unknown geoarchaeological potential. Where archaeology has been recovered associated with the alluvial deposits, there is a moderate potential to produce archaeology, although due to the paucity of borehole records it is unclear whether high potential deposits, such as peat or stabilisation horizons, are present in these areas.

5 SUMMARY AND RECOMMENDATIONS

5.1.1 The GDBA has demonstrated that Quaternary deposits are present, or likely to be present in localised settings across the scheme. However, coverage of existing GI data across the site is poor and the nature, age, extent and relationships between these isolated/localised deposits are currently unclear. Therefore, no baseline dataset exists with which to assess the precise potential of the Quaternary deposits.

5.1.2 The presence of Palaeolithic and Mesolithic finds indicates that there is a broader archaeological potential though none of these findspots are in direct associated with Quaternary deposits.

5.1.3 Based on the results of this assessment, further works may be required to characterise the geoarchaeological potential. The most appropriate and effective means of evaluation would be the monitoring of any GI works that will be undertaken in areas where Quaternary deposits are mapped.

REFERENCES

British Geological Survey GeoIndex (onshore) [redacted] accessed 08/2025)

BRITICE 2017 Glacial Map V2.0 [redacted]

Catt, J. A. 2007. The Pleistocene glaciations of eastern Yorkshire: A review. *Proceedings of the Yorkshire Geological Society* 56, 177–207.

Clark, C. D., Evans, D. J., Khatwa, A., Bradwell, T., Jordan, C. J., Marsh, S. H., Mitchell, W. A. and Bateman, M. D. 2004. Map and GIS database of glacial landforms and features related to the last British Ice Sheet. *Boreas* 33, 359–375.

Fairburn, W. and Bateman, M. 2016. A new multi-stage recession model for Proglacial Lake Humber during the retreat of the last British-Irish Ice Sheet. *Boreas* 45 (1), 133–151.

Gaunt, G D. 1994. Geology of the country around Goole, Doncaster and the Isle of Axholme. *Memoir of the British Geological Survey,* sheets 79 and 88 (England and Wales).

Gibson, S.M., Bateman, M.D., Murton, J.B., Barrows, T.T., Fifield, L.K. and Gibbard, P.L. 2022. Timing and dynamics of Late Wolstonian Substage 'Moreton Stadial' (MIS 6) glaciation in the English West Midlands, UK. *Royal Society Open Science* 9: 220312

Historic England 2015a. *Management of Research Projects in the Historic Environment*

Historic England 2015b. *Geoarchaeology: Using Earth Sciences to Understand the Archaeological Record*

Sejrup, H. P., Nygard, A., Hall, A. M. and Haflidason, H. 2009. Middle and Late Weichselian (Devensian) glaciation history of south-western Norway, North Sea and eastern UK. *Quaternary Science Reviews* 28, 370–380.

Wessex Archaeology and Jacobi, R 2014 *Palaeolithic and Mesolithic Lithic Artefact (PaMELA) database* [dataset]. York: Archaeology Data Service https://doi.org/10.5284/1028201

APPENDICES

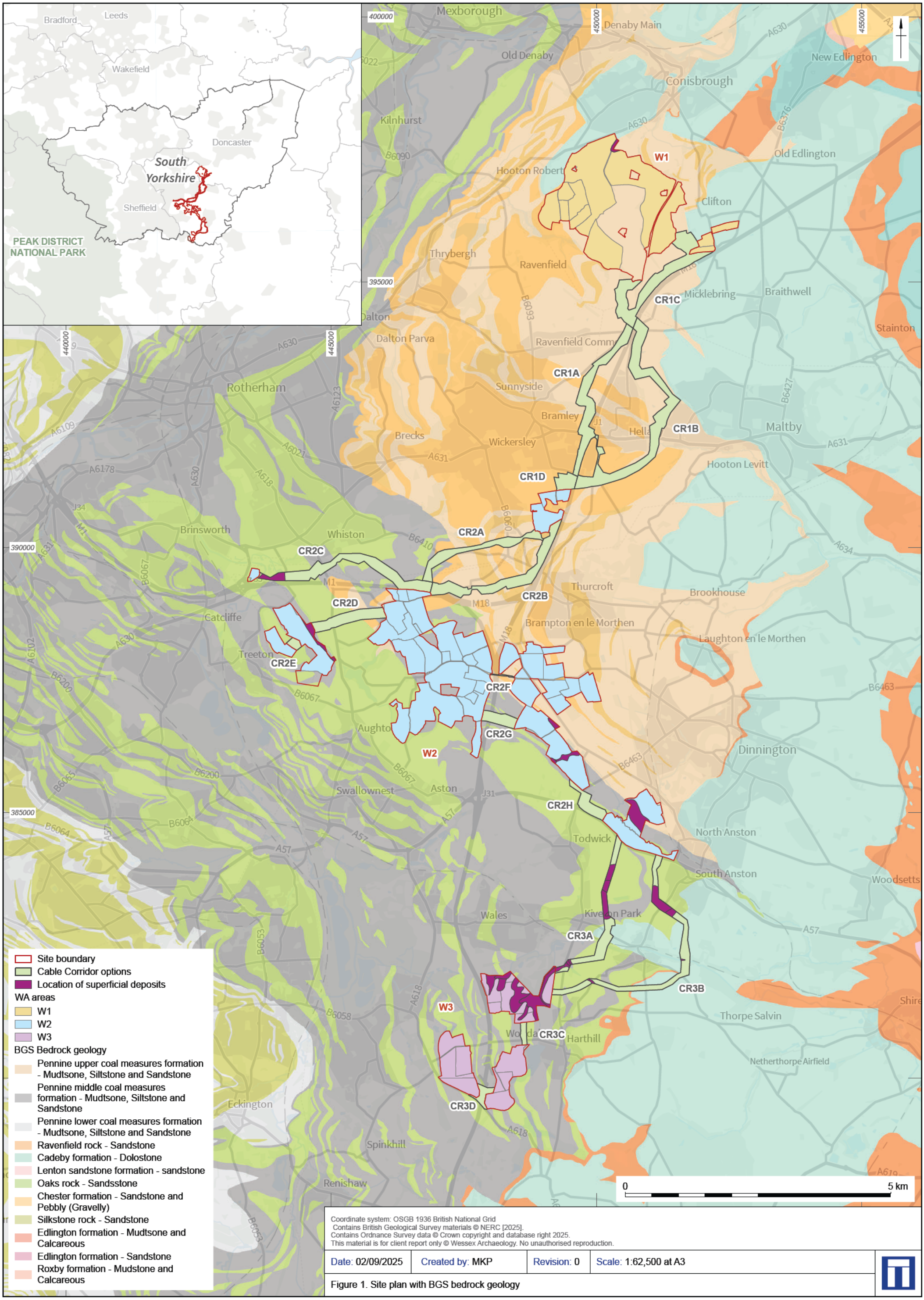
Appendix 1: Archaeological gazetteer

PaMELA ID	Name	Description	Period	Easting	Northing
13767/22924	Spa Farm	Flint core	null	444300	388500
13767/22925	Spa Farm	Flint debitage (blade or flake)	null	444300	388500
13767/22926	Spa Farm	Retouched flint tool (microlith)	Mesolithic	444300	388500
13770/22929	Turnshaw Lane, Ulley	Flint debitage (blade or flake)	null	446400	386500
13771/22931	Long Lane	Flint core	null	444200	389400
13771/22930	Long Lane	Flint debitage (blade or flake)	null	444200	389400
13771/22932	Long Lane	Retouched flint tool (scraper)	null	444200	389400
13771/22933	Long Lane	Retouched flint tool	null	444200	389400
13771/22934	Long Lane	Other	null	444200	389400

Appendix 2 BGS GeoIndex archive borehole data

BH ID	Easting	Northing	Sediment sequence	Comments	Associated area and/or location
SK59NW23	450611	397159		1977, strata deduced from geophys. logs	W1
SK49NE84	449786	395934		SAMPLE REPORT NOT A LOG	W1
SK49NE2/a	449099	396504	17 m OPEN HOLE	NO LOG	W1
SK59SW139	450730	394170	0.3 m topsoil over 2.29 m CLAY over mudstone	1963	CR1
SK59SW123	451100	392070	0.05 m topsoil over 2.85 m clayey SILT over 0.4 m of CLAY over SAND	1974, no OD	CR1
SK49SE175	449810	392100	0.3 m topsoil over 0.46 m SAND over sandstone	1963	CR1
SK49SE176	449850	392090	0.15 m topsoil over 1.07 m SAND over sandstone	1963	CR1
SK49SE177	449850	392180	0.32 m topsoil over 0.69 m SAND over sandstone	1963	CR1
SK49SE178	449880	392170	0.3 m topsoil over sandstone	1963	CR1
SK49SE372	449795	392046	0.34 m topsoil over sandstone	1999, no OD	CR1
SK49SE174	449760	391890	0.3 m topsoil over sandstone	1963	CR1
SK49SE173	449690	391640	0.3 m topsoil over 1.07 m SAND over sandstone	1963	CR1
SK49SE172	449610	391410	0.15 m topsoil over 1.22 m SAND over sandstone	1963	CR1
SK49SE171	449630	391370	0.15 m topsoil over 1.07 m SAND over sandstone	1963	CR1
SK49SE380	449718	391645	0.2 m topsoil over 0.8 m made ground over sandstone	1999, no OD	CR1
SK49SE396	449654	391777	3.8 m made ground over SAND	2003	CR1
SK49SE391	449678	391784	2.8 m topsoil over SAND	2003, no OD	CR1
SK49SE374	449632	391490	0.12 m topsoil over 0.28 m made ground over 0.2 m SAND over sandstone	1999, no OD	CR1
SK48NE230	448950	389621	0.18 m topsoil over 0.62 m made ground over sandstone	1999, no OD	CR2
SK48NE243	447905	389182	0.2 m topsoil over 0.7 m made ground over sandstone	1999, no OD	CR2
SK48NE244	447905	389223	0.05 m topsoil over 1.15 m made ground over sandstone	1999, no OD	CR2
SK48NE12	446931	389816	9.14 m OPEN HOLE	1968, no OD	CR2
SK48NE13	446929	389812	0.71 m siltstone (open hole?)	1968, no OD	CR2
SK48NE89	447280	389160	0.3 m topsoil over sandstone	1964, no OD	CR2
SK48NE92	447060	389170	0.76 m SILT over siltstone	1964, no OD	CR2
SK48NE93	446970	389180	0.15 m topsoil over sandstone	1964, no OD	CR2
SK48NE246	447000	389200	0.7 m made ground over sandstone and siltstone	1999, no OD	CR2
SK48NE245	447000	389150	0.16 m topsoil over 0.44 m made ground over sandstone	1999, no OD	CR2
SK48NE261	446926	389169	0.74 m made ground over siltstone	2012	CR2
SK48NE266	446955	389160	0.2 m made ground over 0.45 m SAND over mudstone	2012	CR2

SK48NE267	446676	389200	1 m made ground over mudstone	2012	CR2
SK48NE268	446694	389247	0.2 m topsoil over 0.2 m CLAY over mudstone	2012	CR2
SK48NE250	446600	389245	0.2 m topsoil over 0.7 m made ground over mudstone	1999, no OD	CR2
SK48NE255	446696	389243	0.8 m made ground over siltstone	2010	CR2
SK48NE258	446479	389255	0.2 m topsoil over 2.2 m made ground over 1.1 m gravelly CLAY over mudstone	2010	CR2
SK48NE285	446518	389252	1.2 m SAND and GRAVEL over 5.5 m CLAY over bedrock	AGS generated file	CR2
SK48NE278	446348	389217	0.3 m topsoil over 0.6 m CLAY over sandstone	2015, AGS generated file	CR2
SK48NE241	446300	389223	0.18 m topsoil over 0.42 m CLAY over siltstone	1999, no OD	CR2
SK48NE242	446300	389264	0.2 m topsoil over 0.7 m CLAY over sandstone	1999, no OD	CR2
SK48NE29	447203	386834	39.85 m OPEN HOLE	1972, no OD	W2
SK48NE262	448681	388198	0.4 m topsoil over 2.6 m CLAY over mudstone	2012, no OD	
SK48SE32	448121	381238	0.3 m topsoil over 5.18 m CLAY over sandstone	1971	
SK48SE263	448270	380300		NOT A LOG	W3
SK47NE258	447861	379519	3.05 m mudstone?	1963, no OD	CR3
SK47NE259	447838	379574	2.44 m mudstone?	1963, no OD	CR3
SK47NE260	447905	379755	1.83 m mudstone?	1963, no OD	CR3
SK48NE264	449750	385880		2002, NOT A LOG	W2
SK49SE76	449311	390928	1.68 m OPEN HOLE over sandstone and siltstone	1989	W2
SK49SE77	449311	390928	6.4 m OPEN HOLE over siltstone and sandstone	1989	W2
SK49SE69	449055	390370		SAMPLE REPORT NOT A LOG	W2
SK49SE74	449187	390361	2.84 m OPEN HOLE over sandstone and siltstone	1989	CR2
SK48NE31	447821	386328	9.45 m OPEN HOLE over mudstone	1971	W2
SK48NE32	447802	386292	376.5 m OPEN HOLE	1971	W2
SK48NE253	448700	387729	0.22 m topsoil over 0.078 m ‘made ground’ over mudstone	1999, no OD	W2
SK48NE235	448964	386627	0.2 m topsoil over 0.9 m ‘made ground’ over 1 m CLAY over 0.8 m GRAVEL over siltstone	1999, no OD	W2
SK48NE17	449256	386583	7.62 m of CLAY? over coal	1967	
SK48NE101	449500	386300	0.4 m ‘fill’ over 2.8 m CLAY over mudstone	1996	
SK58NW43	450997	385347	41.45 m	1953, no OD, NO LOG	W2
SK58SW66	450940	384310		NOT A LOG	W2
SK58SW19	451006	384277	228.9 m OPEN HOLE (162 m sandstone)	1973	W2
SK48SE46	448255	380016	1.3 m ‘seat earth’ over siltstone	1976, difficult to understand	W3
SK48SE11	448611	380082		1966	W3
SK48SE26	448262	380296		LOG MISSING	W3



Coordinate system: OSGB 1936 British National Grid

Date: 02/09/2025	Created by: MKP	Revision: 0	Scale: 1:62,500 at A3

Figure 1. Site plan with BGS bedrock geology

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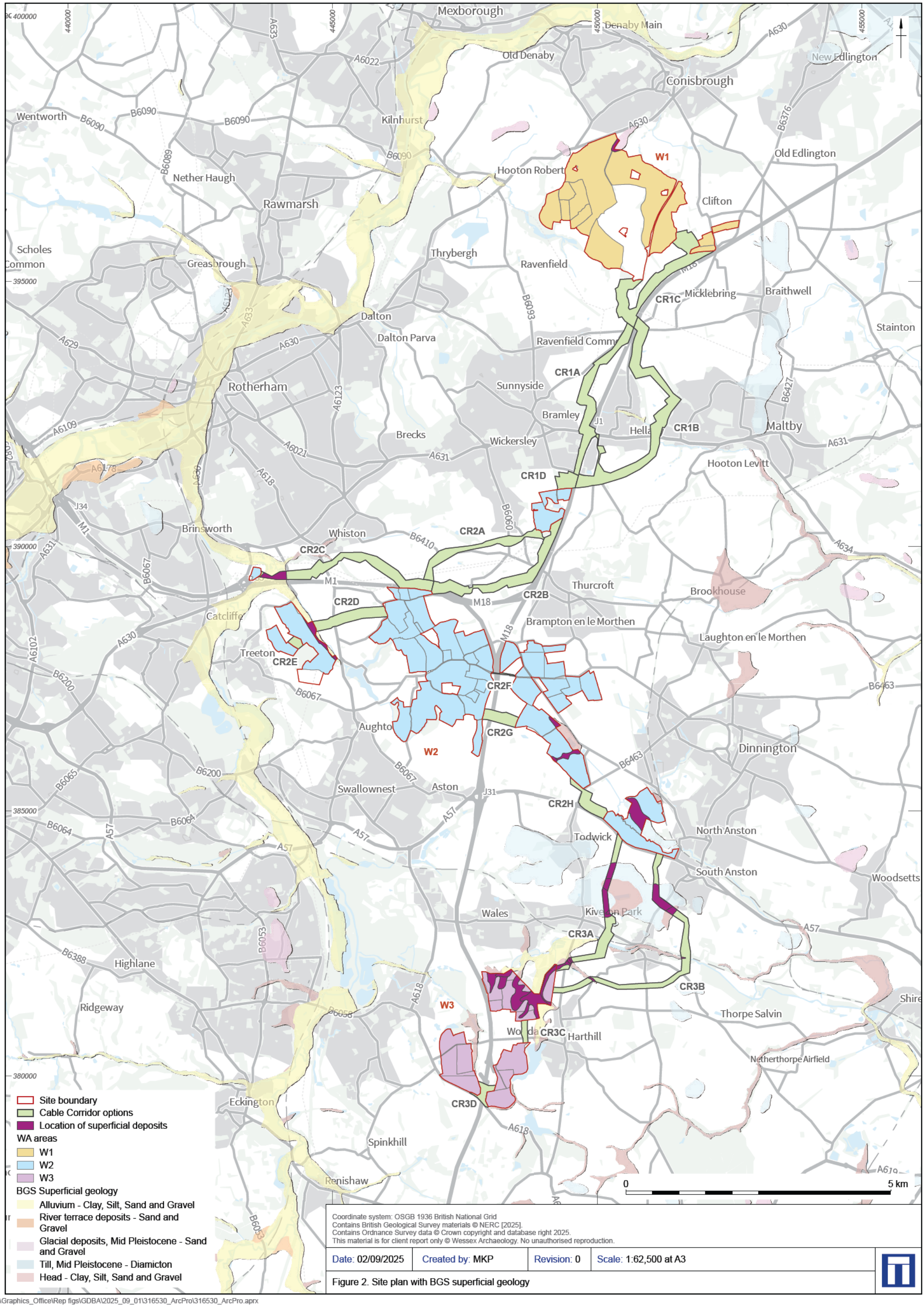

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Figure 2. Site plan with BGS superficial geology

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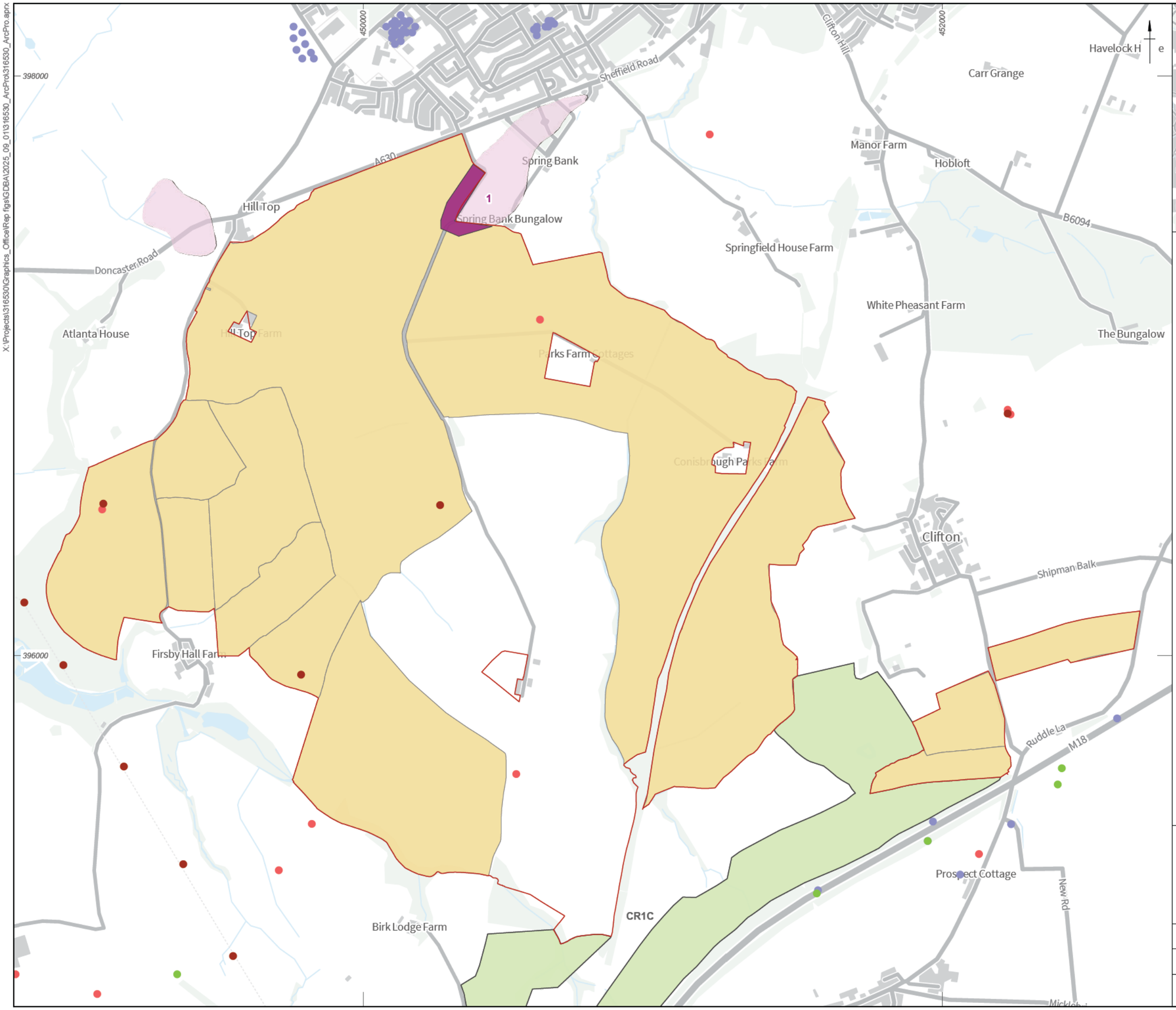

Date: 02/09/2025	Created by: MKP
Scale: 1:12,500 at A3	Revision: 0

Figure 3. W1, location 1 with BGS superficial geology

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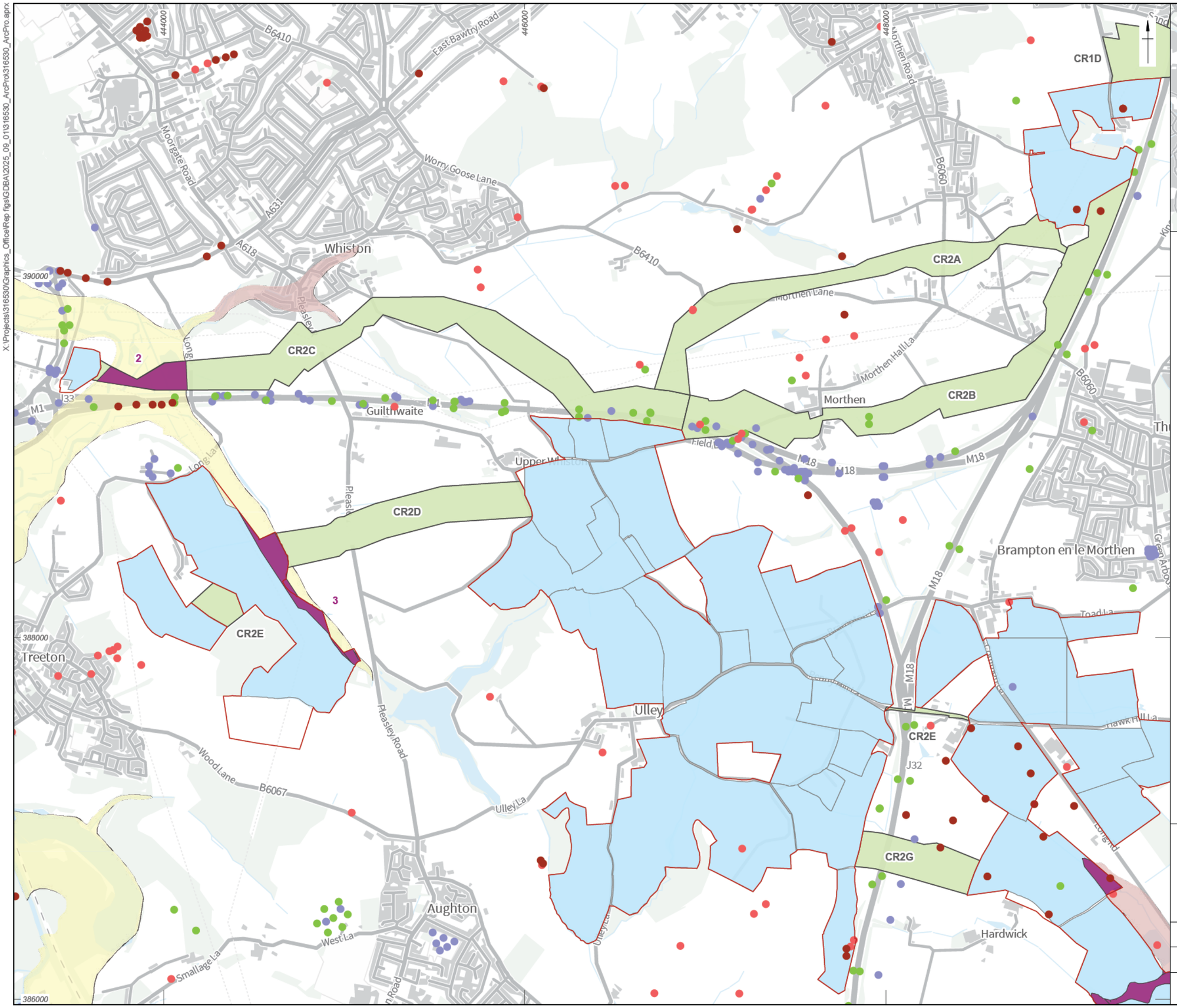

- Site boundary
- Cable Corridor options
- Location of superficial deposits
- W2

BGS Single onshore borehole

- 0 - 10 m
- 11 - 30 m
- 31 m+
- Unknown Length

BGS Superficial geology

- Alluvium - Clay, Silt, Sand and Gravel
- River terrace deposits - Sand and Gravel
- Glacial deposits, Mid Pleistocene - Sand and Gravel
- Till, Mid Pleistocene - Diamicton
- Head - Clay, Silt, Sand and Gravel

0 — 1 km

Coordinate system: OSGB 1936 British National Grid

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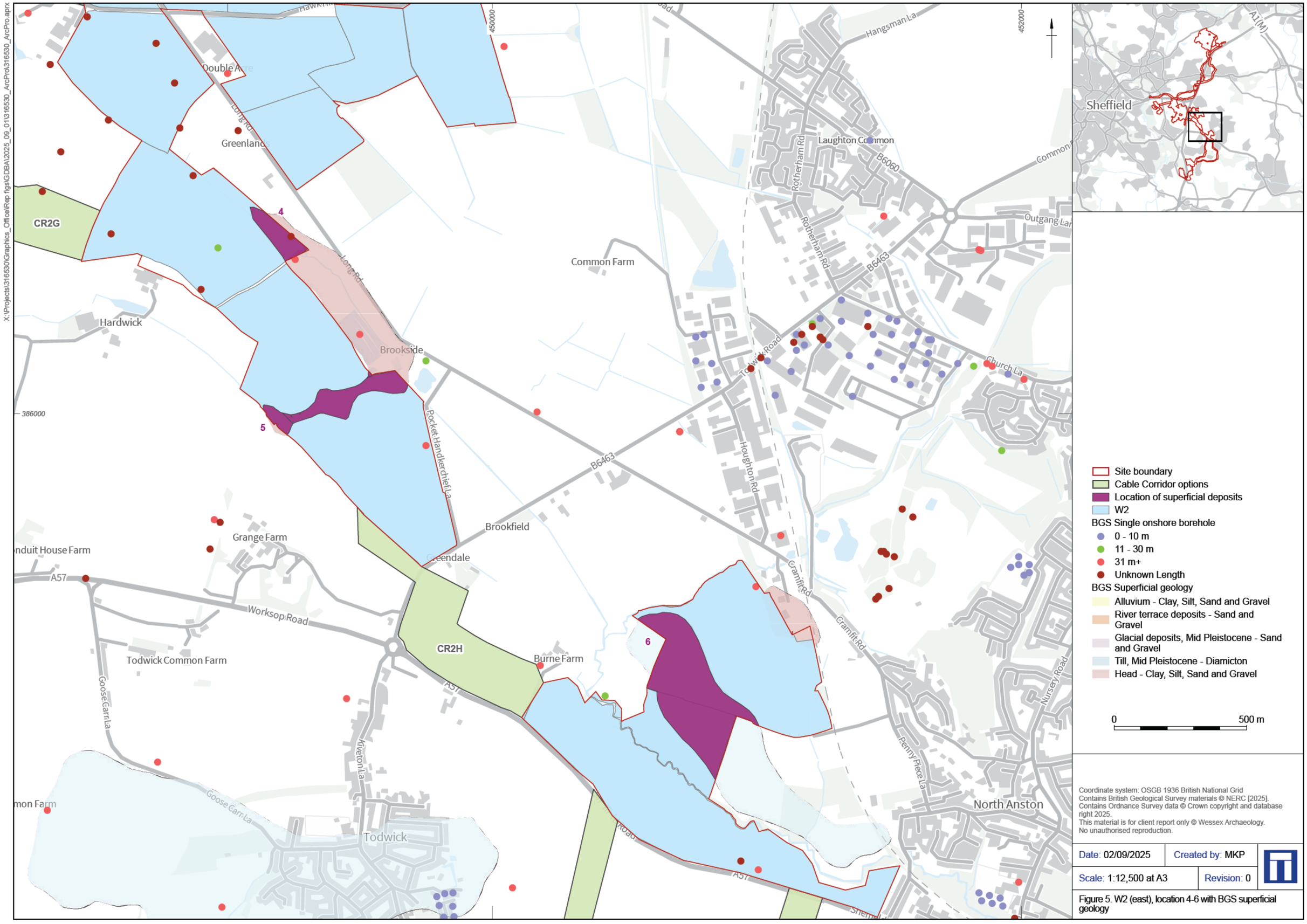
Figure 4. CR2A, location 2; W2 (west), and location 3 with BGS superficial geology



Coordinate system: OSGB 1936 British National Grid

Date: 02/09/2025	Created by: MKP
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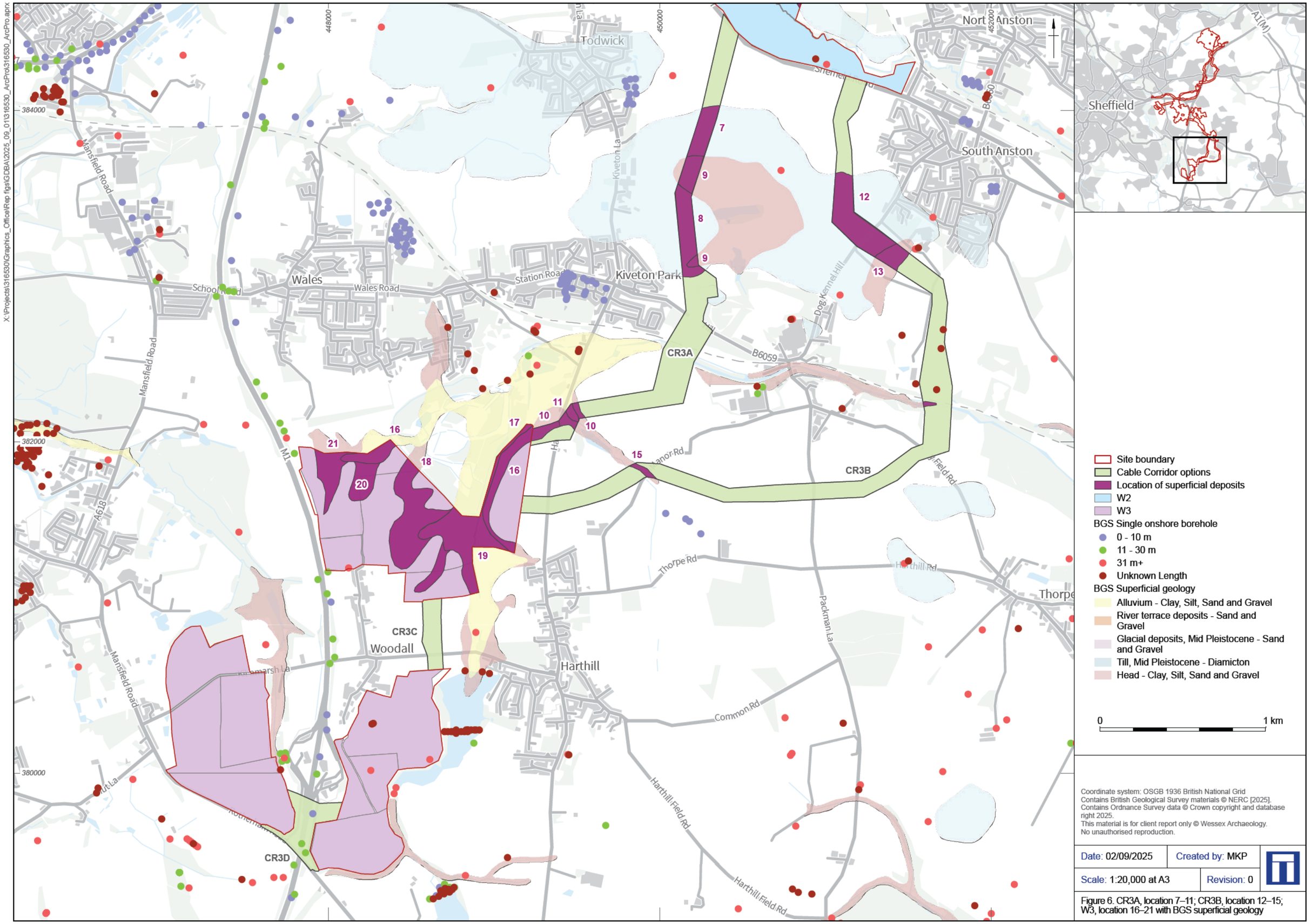
Figure 5. W2 (east), location 4-6 with BGS superficial geology



Date: 02/09/2025 | Created by: MKP

Scale: 1:20,000 at A3 | Revision: 0

Figure 6. CR3A, location 7–11; CR3B, location 12–15; W3, location 16–21 with BGS superficial geology

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