MEC Consulting Group

GEO ENVIRONMENTAL

Land off Longfield Road, Meopham
Phase I Geo-Environmental Desk Study
September 2025

Report Ref: 29473-GEO-0402

Land off Longfield Road, Meopham
Phase I Geo-Environmental Desk Study
September 2025

REPORT REF: 29473-GEO-0402

CLIENT: Richborough

ENGINEER: MEC Consulting Group Ltd
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REGISTRATION OF AMENDMENTS

Date	Rev	Comment	Prepared By	Checked By	Approved By
September 2025	-	First issue	**Jimesh Mistry MSci MSc FGS** Geo-Environmental Engineer	**Christopher Wall MSc BSc (Hons) AMIEnvSc RSoBRA** Associate Geo-Environmental	**David Torrance BSc (Hons) CGeol FGS** Director

CONTENTS

APPENDICES

1.0 INTRODUCTION

1.1 MEC Consulting Group Ltd (MEC), has been commissioned by Richborough (hereafter referred to as 'the Client') to undertake a Phase I Geo-Environmental Desk Study in support of a proposed residential development on Land off Longfield Road, Meopham (hereafter referred to as 'the Site'). A site location plan is provided in **Appendix A**.

Development Proposals

1.2 The development proposals comprise:

Outline application for the erection of up to 120 residential dwellings, public open space and associated works. Approval is sought for the principal means of vehicular access from Longfield Road and all other matters are reserved.

1.3 A development framework plan is included in **Appendix A**.

Objectives

1.4 This desk study has been completed according to the general principles of BS5930:2015 (+A1:2020) 'Code of Practice for Site Investigations', BS10175:2011 (+A2:2017) 'Investigation of Potentially Contaminated Sites, Code of Practice and Environment Agency 'Land Contamination: Risk Management (LC:RM). Soil infiltration rate testing has been undertaken in general accordance with BRE Digest 365.

1.5 The objectives of this report are:

- To establish historical activities, both on site and within the surrounding area, which may have impacted the site environment;
- To characterise the environmental setting of the site, identify migration pathways and receptors vulnerable to contamination;
- To summarise the risks relating to Unexploded Ordnance (UXO);
- To develop a preliminary Conceptual Site Model (CSM);
- To assess potential environmental liabilities associated with the site;
- To determine the soil infiltration rates for soakaway design; and
- To determine preliminary geotechnical considerations.

1.6 This report has been commissioned to support an outline planning application for the proposed development.

Sources of Information

1.7 The following sources of information have been referenced to inform the contents of this report:

- Site walkover observations (Photographs provided in **Appendix B**):
- Historical Ordnance Survey Mapping (**Appendix C**);

- Environmental database report including but not restricted to the following data: environmental and hydrological, waste, hazardous substances register, geological, industrial, and sensitive land uses and pollution incidents (**Appendix D**);
- British Geological Survey (BGS) online GeoIndex and borehole logs;
- Kent Minerals and Waste Local Plan 2024-2039;
- Environment Agency website (www.environment-agency.gov.uk);
- MAGIC maps (www.magic.defra.gov.uk);
- Lidar Mapping (www.lidarfinder.com);
- UXO Risk Mapping (https://zeticauxo.com/);
- Preliminary and detailed UXO risk assessment Ref: PA21699-00 and DA21699-00, dated 21st March and 9th April 2025 respectively (**Appendix E**); and
- Soil infiltration calculations Ref 29473-CALC-0402 (**Appendix F**).

1.8 Reference has also been made to a topographical survey drawing produced by MEC, Ref: 29473_16_170_01.

Limitations

1.9 MEC has completed this report for the benefit of the Client and any relevant statutory authority which may require reference in relation to approvals for the proposed development. Other third parties should not use or rely upon the contents of this report unless explicit written approval has been gained from MEC.

1.10 MEC cannot accept responsibility or liability for:

a) The consequence of this documentation being used for any purpose or project other than that for which it was commissioned;
b) The issue of this document to any third party with whom approval for use has not been agreed.

1.11 This report should be read in its entirety, including all associated drawings and appendices. MEC cannot be held responsible for any misinterpretations arising from the use of extracts of this report that are taken out of context. The findings and opinions conveyed are based on information obtained from a variety of external sources, as detailed in Section 1.6 above, which MEC believes are reliable. All reasonable care and skill have been applied in examining the information obtained, nevertheless, MEC cannot and does not guarantee the authenticity or reliability of the information relied upon from external sources.

1.12 Should additional information become available which may affect the opinions expressed in this report, MEC reserves the right to review this information and, if warranted, to modify the opinions presented in the report accordingly.

1.13 It should be noted that the risks identified in this report are perceived based on the available information at the time of writing. The actual risks can only be established and quantified following intrusive investigation of the site.

2.0 SITE SETTING AND DESCRIPTION

Site and Setting The following details are based on observations made at the time of the site walkover which was completed on 10th April 2024. Reference is made to the photographic record in **Appendix B**.	
Site Address	Longfield Road, Meopham, DA13 0JW
National Grid Coordinates	564012, 166773
Site Description	The site comprises part of an open agricultural field located to the north of the village of Meopham in Kent. The site is located to the south of Longfield Road (Photos 1 and 2) and accessed via an opening in the hedgerow (Photo 3). At the time of the walkover, the field had been planted with oil seed rape (Photos 4 and 5). Topographically, the site generally slopes down from south to the north by 10m across 230m, towards a low point at the centre of the northern boundary. The northern, north-eastern, south-eastern, and north-western boundaries are formed by hedgerows and mature and semi-mature trees (Photos 6, 7, 8, and 9). The south-western boundary is open to the wider adjacent field. A sign for a public footpath, which cuts across the north-eastern corner and follows the edge of the field, is located on the north-eastern boundary, adjacent to Longfield Road. Open fields are located to the south, west, north-west, and south-east. A woodland is located beyond Longfield Road to the north, and residential properties are to the north-east. A school lies adjacent to the south-eastern boundary with residential properties beyond.
Historical Review The site history has been assessed by reviewing 1: 2,500 1:10,560, and 1: 10,000 scale historical Ordnance Survey maps included in **Appendix C** and more recent aerial photography. A summary of the salient information relating to the history of the site and surroundings is provided below.	
On-site Historical Summary	The earliest available mapping reviewed, dated 1864, indicates that the site comprised part of a larger open field extending south and west, with a footpath crossing the eastern corner. The site has remained as undeveloped agricultural land until present day.
Off-site Historical Summary	The earliest available mapping reviewed, dated 1867, indicates that the area surrounding site predominantly comprised undeveloped open land at this time, with an area of woodland to the north. Brick works and associated clay pits and kilns were mapped 100m south, and a chalk pit was recorded 128m south-west. A smithy was mapped 500m north-east and a limekiln was recorded 490m south-west. By 1896, the brick works and associate pit and kilns were no longer mapped and had been replaced by a woodland identified as Brick Fields Shaw. The chalk pit was also no

	longer mapped and had likely been infilled. The woodland to the north was mapped by this time. By 1931, the residential properties to the east had been established and the smithy to the north was no longer recorded. Mapping from 1939 indicates progressive residential development had been completed by this time, expanding further in the 1950's and 1960's. Aerial imagery from 1940 shows potential bomb impact craters 100m south. By 1974, electricity transformers were mapped 130m east and 200m north respectively, and the school adjacent to the south-east had been established. The transformers were labelled as electricity substations on later mapping.

3.0 GEOLOGICAL, GEO-ENVIRONMENTAL AND MINING SETTING

Geo-environmental Setting The geological, geo-environmental and mining setting of the site described in the following table is summarised based on information derived from various database and on-line information sources.	
Geology	British Geological Survey (BGS) mapping indicates that the site is predominantly directly underlain by bedrock of the Seaford Chalk Formation, with the Thanet Formation mapped in the south-eastern corner. Superficial deposits are not mapped on the site. Ground conditions encountered during the soil infiltration rate testing comprised Topsoil overlying a variable thickness of the Thanet Formation, underlain by Chalk bedrock. The Thanet Formation comprised granular horizons of clayey, silty, gravelly sand and silty, sandy gravel, and cohesive horizons of sandy, gravelly, silty clay. The depth to the Chalk varied along the north-eastern boundary, from 3.00m bgl in TP01 up to 1.10m bgl in TP02. Exploratory hole logs and a location plan are included within the soil infiltration testing results in **Appendix F**.
Natural Ground Subsidence Risk	A moderate risk of subsidence due to potential ground dissolution of soluble rocks is recorded across most of the site. The risk decreases to low in the south-east where the Thanet Formation is mapped to outcrop. Such materials often bridge a developing solution feature until the support is insufficient and the soils fail by collapse settlement. The risk of subsidence from other geological hazards is negligible to low. The low risk is allocated due to the potential for running sands, recorded in the south-east associated with the Thanet Formation.
Hydrogeology	The Environment Agency (EA) classifies the Thanet Formation as a Secondary A aquifer, and the Chalk Bedrock as a Principal aquifer. The site is predominantly located in a groundwater Source Protection Zone (SPZ) 2, outer catchment. Groundwater abstractions are not recorded within 500m; however, a potable groundwater abstraction is recorded 1.8km to the west. The site is recorded to be at negligible risk from groundwater flooding.
Hydrology	Surface water features are not recorded within 250m of the site. Active surface water abstractions are not recorded within 500m. The site is generally not located within an area considered to be at risk of surface water flooding and is located within Flood Zone 1. The topographically low point of site, at the north-eastern boundary, has a modelled very low risk of surface water flooding, indicating the potential for 0.1-0.3m of flood water over a 1 in 1000-year return period.

Mining and Mineral Extraction, and Surface Ground Working	The site is not located within a coal mining reporting area as defined by the Mining Remediation Authority. The site is at low risk from sporadic underground Chalk mining, although potentially difficult ground conditions are not likely to be encountered. By reference to historical mapping and the environmental database report, the Meopham Brick Works, which extracted clay, was recorded to the south. A chalk pit was also recorded 128m south-west.
Mineral Safeguarding	The site is not located within a Mineral Safeguarding Area as defined within the Kent Minerals and Waste Local Plan 2024-2039.
Radon	The site lies within an area where between 1% and 3% of properties are estimated to be above the Radon Action Level. Radon protection measures will not therefore be required for the proposed development.

4.0 REGULATORY INFORMATION

Regulatory Information A summary of pertinent information from the environmental data report relating to permits, consents, authorisations, and landfilling is provided below.	
Current and Historical Industrial Uses	Three records of recent industrial land use are referenced within 250m relating to electricity substations 154m east and 186m north-east, and a garage 240m east. An additional record relates to commercial activities registered to a shop which is unlikely to represent a risk to the site. Four records of historical industrial land use are referenced within 250m, relating to the brickworks and associated clay pits and kilns, and chalk pit identified on mapping.
Historical Tanks	An historical tank was recorded 211m north within a residential property.
Fuel Stations and Historical Garages	Fuel stations and historical garages are not recorded within 250m.
Part 2A EPA 1990	Sites determined as Contaminated Land under section 78R of the Environmental Protection Act are not recorded within 250m.
National Grid	National Grid high-pressure gas transmission pipelines or high-voltage underground electricity transmission cables are not recorded within 250m.
Industrial Licenses and Authorisations	The following licenses or authorisations are not recorded within 250m: • COMAH, NIHHS and dangerous substance; • Regulated explosive sites; • Hazardous substance storage and usage; • Historical IPC authorisations; • Licensed industrial activities (Part A (1)); • Licensed pollutant release (Part A(2)/B); • Radioactive substation authorisations; • Licensed discharge to controlled waters; • Red list discharge consents; • Pollutant release to public sewer; • List 1 and 2 dangerous substances; and • Pollution inventory substances, waste transfers and radioactive waste.
Pollution Incidents	Three historical pollution incidents have been recorded within 250m and occurred in September and May 2002. The incident in May 2002 was located 98m south and related to atmospheric pollutants that had a significant impact to air, and minor impact to land. The two incidents from September 2022, also relate to release of atmospheric pollutants 32m east, that had a minor impact to air.

Landfill and Waste	Waste management facilities, and landfill sites are not recorded within 250m. Two waste exemptions are recorded within 250m, relating to burning of waste 59m east.
Unexploded Ordnance	Zetica interactive mapping indicates that the subject site lies within an area at moderate risk of UXO encounter. On this basis UXO Risk Assessments have been commissioned and are included in **Appendix E.** During the Second World War, Meopham was subjected to an overall low-moderate bombing density, attributed to being situated along the flight path to London. Available records indicate numerous incidents of bombing in the surrounding area; however, not directly on site. Aerial imagery from 1940 shows bomb impact craters 100 south-west, with open land between the craters and site. The imagery does not show any noticeable bomb damage or cratering on the site, which remained open agricultural land throughout the war. It was assessed that the presence of vegetation throughout this period, may slightly obscure imagery, and therefore a residual risk of UXO encounter from German bombing remains for the site. There were no indications that the site had any military occupation during the war, and therefore the risk from Allied ordnance is low. Due to the potential residual risk from German bombing in the Second World War, it was recommended to adopt mitigation measures including a UXO Risk Management Plan, and undertake awareness briefings prior to excavations or intrusive works.

5.0 PRELIMINARY GEOTECHNICAL ASSESSMENT

5.1 The information sources noted in Section 1.0 have been reviewed to provide a summary of potential geotechnical considerations for the proposed development presented in the following table. The comments and recommendations provided are based on the qualitative findings of this Geo-environmental Desk Study and may not be representative of actual engineering properties of on-site soils which can only be confirmed by intrusive investigation

Made Ground	Based on site observations and the recorded history, it is unlikely that significant quantities of Made Ground will be encountered near surface across the site.
Topsoil	Topsoil is likely to be present near surface. Subject to appropriate testing, this may be suitable for re-use within proposed garden and landscaped areas.
Chalk Solution Features	A moderate risk of subsidence is recorded across most of the site associated with Chalk bedrock. Solution features can lead to difficult ground conditions, as they are often bridged by overlying, uncompacted weaker material, which can fail due to loading or settlement. Further investigation is required into the potential dissolution risk.
Foundation and Floor Slab Design	An intrusive ground investigation will be required to determine if the underlying geology will provide competent bearing strata for foundation design and to assess the potential impact of dissolution features. Based on available information, it is considered that a traditional shallow foundation solution will be appropriate across a significant proportion of the site, founding within the Seaford Chalk Formation or Thanet Formations. An alternative design such as piling or raft foundations may be required in areas of known or suspected dissolution features and/or localised shallow chalk extraction. Ground bearing floor slabs are likely to be suitable for selected areas of the site; however, suspended ground floor slabs will be required for areas where; the thickness of sub slab fill is greater than 600mm; ground gas protection measures are required; and for the piled foundation option.
Earthworks and Retaining Walls	Given the gently sloping topography of the site, it is anticipated that a limited extent of reprofiling will be required to facilitate to establish suitable development platforms. A cut and fill analysis will be required, considering the results of an intrusive investigation, and proposed finished floor levels. Retaining structures may be also be required locally.
Buried Obstructions	It is not anticipated that buried obstructions will impact the proposed development.
Trees	Mature trees are present within the site and immediate surrounding area and consideration will need to be given to the adjustment of foundation and floor slab designs in accordance with NHBC Standards Chapter 4.2. Such requirements will depend on the relative distribution of cohesive and granular soils within the Thanet

	Formation although the existing information suggests that non-shrinkable soils prevail beneath the site.
Pyritic Geology	Pyritic deposits are not anticipated; however, pH and sulphate testing will be required to confirm concrete classification.
Drainage and Soakaways	Based upon the results of the soil infiltration rate testing provided in **Appendix F**, soakaway drainage will be limited to the area around SA02, in the topographical low point of site and tested within the Thanet Formation, utilising a calculated rate of 6.75 x 10^{-6} m/s for design purposes. Soakaways in the Thanet Formation, in the north and east, will not be feasible. Potentially higher infiltration rates may be available within the Chalk bedrock, which underlies the Thanet Formation at varying depths across the northern boundary. Additional testing would be required, at a greater depth to calculate infiltration rates for deeper pit or borehole soakaways.
Roads and Pavements	Where natural cohesive soils are encountered at formation, a CBR value of the order of 2-4% is likely to be available, and where granular soils are encountered a higher value of greater than 5% may be achievable. Higher CBR values will be available within the underlying bedrock. Consideration should be given to the completion of CBR testing at proposed formation level to confirm the available design values.

6.0 PRELIMINARY ENVIRONMENTAL RISK ASSESSMENT

Background

6.1 This section assesses the significance of the environmental issues that have been identified on site or in the surrounding area in previous sections of this report by developing a preliminary Conceptual Site Model (CSM). The objective of the CSM is to identify contaminant sources, pathways and receptors relating to the site and surrounding area to evaluate the potential for a pollution event to occur using a risk classification tool. The level of risk is assessed by comparing the likelihood of a pollution event to occur, versus the consequence of a pollution occurrence. The consequence is essentially a measurement of the severity of a hazard (or source) and sensitivity of the receptor (controlled waters and human health).

6.2 The risk assessment methodology detailing the classes of significance is detailed after the preliminary CSM below.

Preliminary Contamination Risk Assessment

6.3 Based on the reported history of the site and surrounding area, the following potential sources of contamination have been identified:

- Historical agricultural activities;
- Made Ground associated with the historical brick works and associated kilns and infilled clay pits to the south, and the infilled chalk pit to the south-west;
- Waste Exemptions to the east; and
- Ground gas generation from the infilled pits and ponds in the surrounding area.

6.4 Offsite records relating to the electricity substations/transformers, garage, historical smithy, limekiln, and tank are at a sufficient distance such that the subject site would be unlikely to be impacted. The recorded pollution incidents in the surrounding area are sufficiently distant and the time elapsed since they occurred suggests that impact will likely have been mitigated.

6.5 It is therefore considered that the following potential contaminants may impact the site:

- Heavy metals;
- Polycyclic Aromatic Hydrocarbon (PAH) Compounds;
- Total Petroleum Hydrocarbon (TPH) Compounds; and
- Ground gases including carbon dioxide and methane,

Preliminary Conceptual Site Model

6.6 The pollutant linkages pertaining to the site and the assessed significance are summarised in the CSM table overleaf:

Source	Pathway	Receptor	Pollutant Linkage Risk
Potential contamination in shallow soils on site	Direct contact and accidental ingestion/inhalation of contaminated soils and dust.	Future Site Users.	**Low:** Based on the recorded history, sources of contamination including Made Ground are not anticipated on the site.
		Construction workers	
	Vertical and lateral migration through shallow soils or via surface and groundwater.	Underlying Secondary and Principal Aquifers.	**Low:** Groundwater is anticipated to sit deeper within the Chalk bedrock, and significant sources of contamination are not anticipated on site.
		Third-party property.	
	Direct contact/soil leaching.	Buried utilities	**Low locally Low to Moderate:** Hydrocarbons may be encountered locally within near surface soils associated with historical agricultural activity. The risk should be confirmed through intrusive investigation to confirm the required specification for buried water supply pipes.
	Direct contact/soil leaching.	Buried concrete	**Low:** The underlying Chalk bedrock and Thanet Formation are not anticipated to be pyritic. Design requirements for buried concrete should be confirmed through chemical testing.
Off-site contamination sources	Lateral migration onto site via shallow soils and groundwater	Construction workers.	**Low, locally Low to Moderate:** Potentially contaminative land uses have been identified in the surrounding area, including the brick works and associated kilns and infilled clay pit to the south, and the infilled chalk pit to the south-west. The Chalk bedrock has high permeability which would enable migration of contaminants from off-site. Additionally, the overall topography of the area slopes from south to north, and there is the potential for contaminant runoff from off-site sources.
		Future Site Users.	
		Buried utilities and concrete structures	

Source	Pathway	Receptor	Pollutant Linkage Risk
Ground gas generation on-site	Migration through porous soils and accumulation in confined spaces	Future Site Users	**Low, locally Low to Moderate:** Limited ground gas sources, have been identified in the surrounding area, comprising the infilled pits to the south and south-west. These are not likely to represent significant sources of ground gas generation, although localised protection measures may be required. The risk should be confirmed through a programme of ground gas monitoring. The site lies in an area where 1-3% of properties exceed the Radon action level. Radon protection measures will not be required.
		Construction Workers	

Preliminary CSM and Environmental Risk Assessment

6.7 The significance of the potential source-pathway-receptor linkages identified in the conceptual site model should be assessed using the following criteria:

- **Very High** – There is a high probability that severe harm could arise to a designated receptor from an identified hazard, or there is evidence that severe harm to a designated receptor is currently happening. Investigation and remedial measures are required.
- **High** – Harm is likely to arise to a designated receptor from an identified hazard. Investigation and remedial measures are required.
- **Moderate** – It is possible that harm could arise to a designated receptor from an identified hazard. Investigation and remedial measures may be required.
- **Low** – It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild. Remedial measures are not normally required.

7.0 CONCLUSIONS AND RECOMMENDATIONS

Summary

7.1 Based on the findings of this desk study and the initial conceptual site model, it is considered that the environmental risk at the site is low locally low to moderate with the principal risk drivers relating migration of contamination from historical off-site brick works and associated kilns and infilled pits, and ground gas generated from infilled pits in the surrounding area.

7.2 It is not anticipated at this stage, subject to confirmation, that any remediation will be required for the proposed development.

7.3 It is assessed that the site may locally be affected by ground gases, predominantly along the southern boundary, and protection measures may be required for specific plots.

7.4 It is considered that a shallow foundation design solution will be appropriate for the proposed development, bearing on the anticipated Seaford Chalk Formation or Thanet Formation.

7.5 The site is located in a moderate-risk area of subsidence due to potential ground dissolution associated with the Chalk bedrock, and difficult ground conditions may be encountered, potentially requiring alternative foundation designs such as rafts or piling.

Recommendations

7.6 Given the findings of this Desk Study, it is recommended that a Phase II Intrusive Investigation is undertaken to confirm; the underlying geology and the extent of any contamination, the completion of a ground gas risk assessment, the potential risk associated with subsidence and clarification of civil engineering design requirements. The investigation should be designed considering detailed development proposals and required performance criteria, and targeting identified areas of potential contamination and ground instability.

7.7 Further research is also recommended into the potential for dissolution features, such as provision of Chalk dissolution maps or specialist analysis. Probe drilling may be required to further quantify this risk.

7.8 Additional soil infiltration rate testing is recommended should deeper soakaways within the Chalk Bedrock be considered for the proposed development.

7.9 It is recommended that a copy of this report is submitted to the Local Planning Authority to support the planning application for the site. Review of this report will enable the contaminated land or environmental health officer to comment as consultee to the Local Planning Officer. Future ground investigation will likely be conditioned as part of a planning permission.

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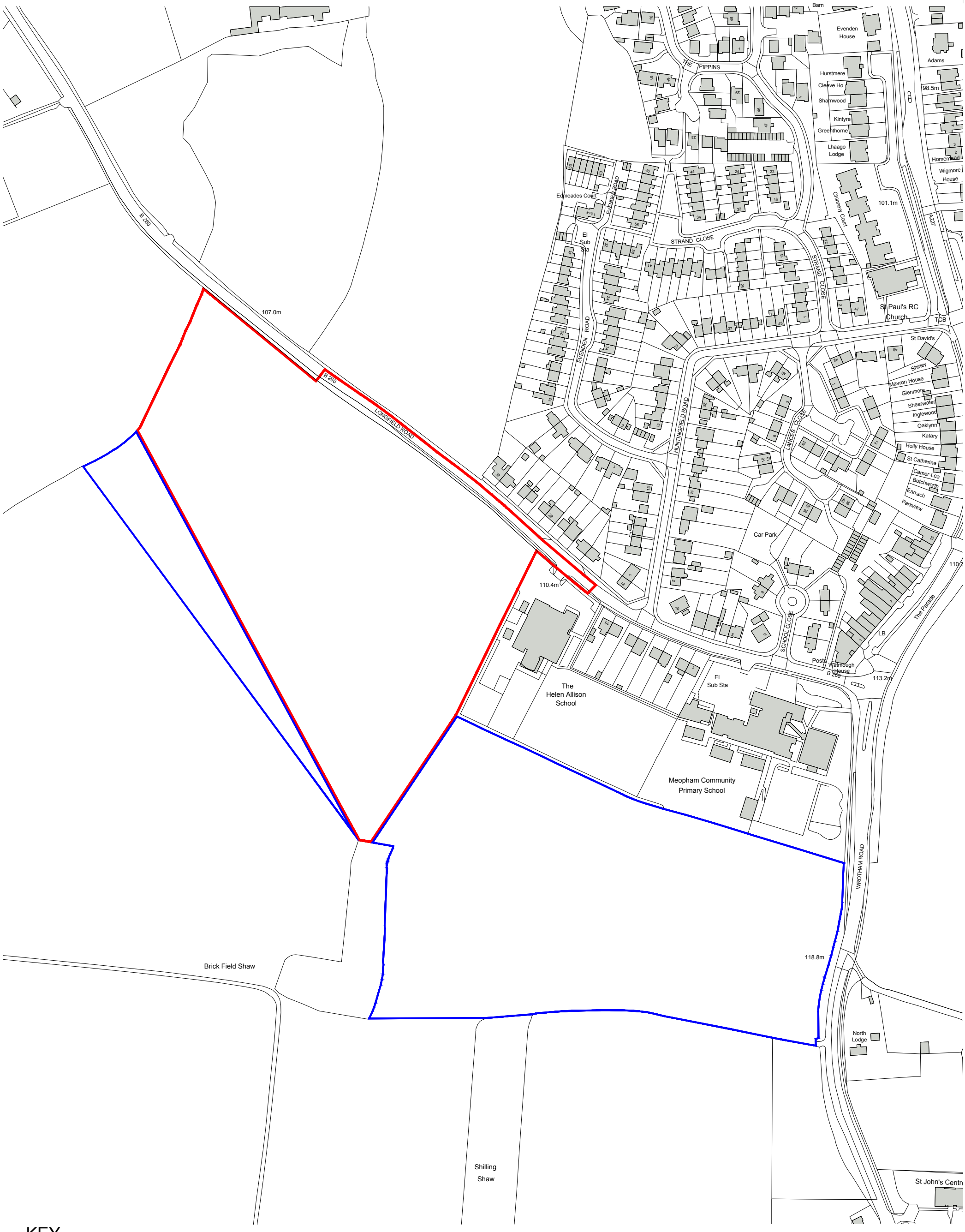
APPENDICES

APPENDIX A



KEY

SITE LOCATION
5.68 HECTARES / 14.04 ACRES

OTHER LAND IN OWNERSHIP
6.1 HECTARES / 15.08 ACRES

N

0 25 50 m

REV A : RLB UPDATED. 01.09.25 (SB)

LONGFIELD ROAD, MEOPHAM - SITE BOUNDARY

PEGASUS GROUP

| PEGASUSGROUP.CO.UK | TEAM/DRAWN BY: SB/EA | APPROVED BY: JW | DATE: 18.07.25 | SCALE: 1:2500@A3 | DRWG: P25-0485_DE_2001_A_1 I CLIENT: RICHBOROUGH I

KEY

- SITE BOUNDARY
- SITE ACCESS VIA LONGFIELD ROAD
- RESIDENTIAL DEVELOPMENT
- PUBLIC OPEN SPACE
- PRIMARY STREET
- SECONDARY STREET
- TERTIARY STREETS
- FOCAL SPACES
- PRIVATE LANES
- EXISTING PUBLIC RIGHTS OF WAY
- ACTIVE TRAVEL / CYCLE ROUTES
- FOOTPATH LINK
- EXISTING TREES
- NEW STRUCTURAL PLANTING
- NEW TREE PLANTING
- PROPOSED PLAY
- SUSTAINABLE DRAINAGE
- POTENTIAL IMPROVEMENTS TO EXISTING HIGHWAY FOR PEDESTRIAN AND CYCLE MOVEMENT
- PROPOSED TACTILE CROSSING AND FOOTWAY LINK
- SCHOOL DROP-OFF AREA

KEY PRINCIPLES

1. KEY ACTIVE TRAVEL ROUTES PROVIDING CONNECTIONS TO NEARBY MOVEMENT INFRASTRUCTURE;
2. KEY COMMONS PROVIDING EQUIPPED AREAS OF PLAY AND NODAL SPACES;
3. DEVELOPMENT EDGE TO RESPECT EXISTING DEVELOPMENT/ PUBLIC RIGHT OF WAY LINE;
4. STRUCTURAL PLANTING ALONG SOUTHERN BOUNDARY TO SCREEN DEVELOPMENT EDGE;
5. OVERFLOW PARKING FOR SCHOOL DROP-OFF;
6. MAXIMUM OUTWARD FACING DEVELOPMENT OVER NEWLY CREATED PUBLIC OPEN SPACE; AND
7. VIEW TO ST JOHNS THE BAPTIST CHURCH FROM PROW EXITING SITE .

PEGASUS GROUP

Expertly Done.

DESIGN | ECONOMICS | ENVIRONMENT | HERITAGE | LAND & PROPERTY | PLANNING | TRANSPORT & INFRASTRUCTURE

LAND OFF LONGFIELD ROAD, MEOPHAM – **ILLUSTRATIVE DEVELOPMENT FRAMEWORK PLAN**

| PEGASUSGROUP.CO.UK | TEAM/DRAWN BY: RL | APPROVED BY: JW | DATE: 30.04.25 | SCALE: 1:1250@A2 | DRWG: P25-0485_DE_2003_E_1 | CLIENT: RICHBOROUGH |

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APPENDICES

APPENDIX B

Appendix B – Photographic Record

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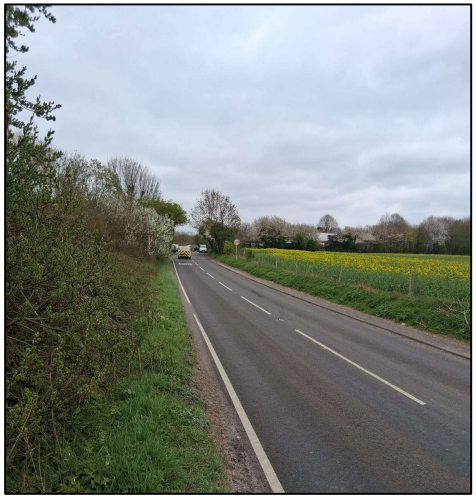
<td>  </td>
<td rowspan="3"><u>Site Name</u>
Land West of Wrotham Road, Meopham

<u>Project No.:</u>
29473

<u>Client:</u>
Richborough

<u>Site Walkover Date:</u>
10th April 2025</td>
</tr>
<tr>
<td>Photo 1: View west along Longfield Road.</td>
<td>Photo 2: View east along Longfield Road.</td>
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<tr>
<td>Photo 3: View south at the site entrance off Longfield Road.</td>
<td>Photo 4: View north across the site.</td>
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</table>

Appendix B – Photographic Record

<table>
<tr><td>  </td><td>  </td><td rowspan="4"><u>Site Name</u>
Land West of Wrotham Road, Meopham

<u>Project No.:</u>
29473

<u>Client:</u>
Richborough

<u>Site Walkover Date:</u>
10th April 2025</td></tr>
<tr><td>Photo 5: View east across the site.</td><td>Photo 6: View east at north-eastern boundary.</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Photo 7: View south along south-eastern boundary.</td><td>Photo 8: View south along north-western boundary.</td></tr>
</table>

Appendix B – Photographic Record

		**Site Name** Land West of Wrotham Road, Meopham **Project No.:** 29473 **Client:** Richborough **Site Walkover Date:** 10th April 2025
Photo 9: View north along north-western boundary.		

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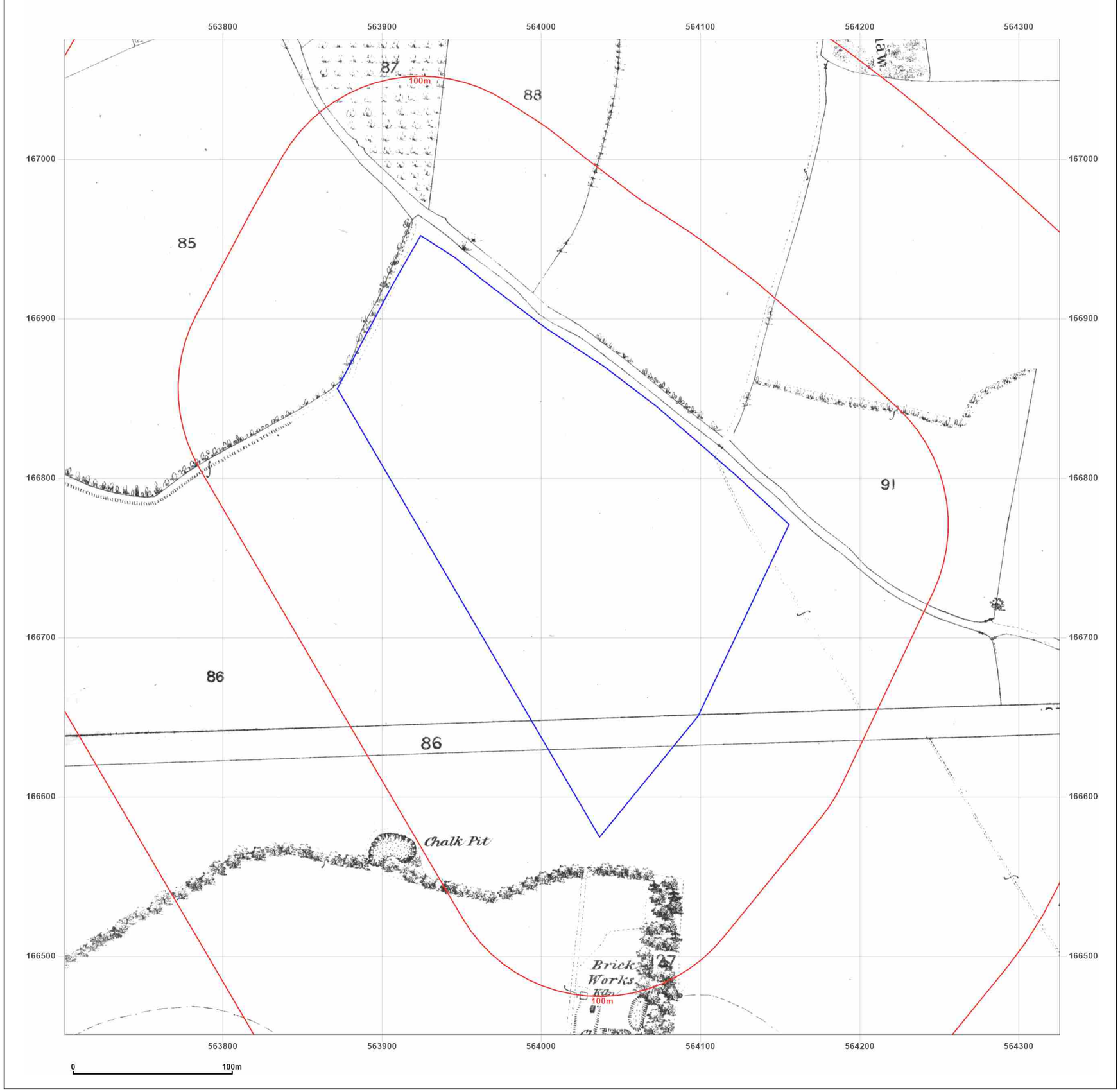
APPENDICES

APPENDIX C



Groundsure INSIGHTS

Site Details:

Wrotham Road, Meopham (west)

Client Ref: 29473 west
Report Ref: GS-CM2-3V9-LRU-YVN_2500
Grid Ref: 564013, 166763

Map Name: County Series

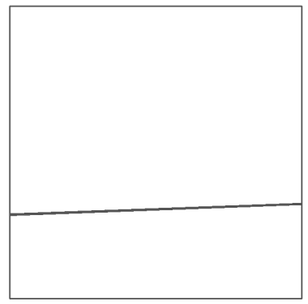
Map date: **1864-1867**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1864
Revised 1864
Edition N/A
Copyright N/A
Levelled N/A



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Revised 1867
Edition N/A
Copyright N/A
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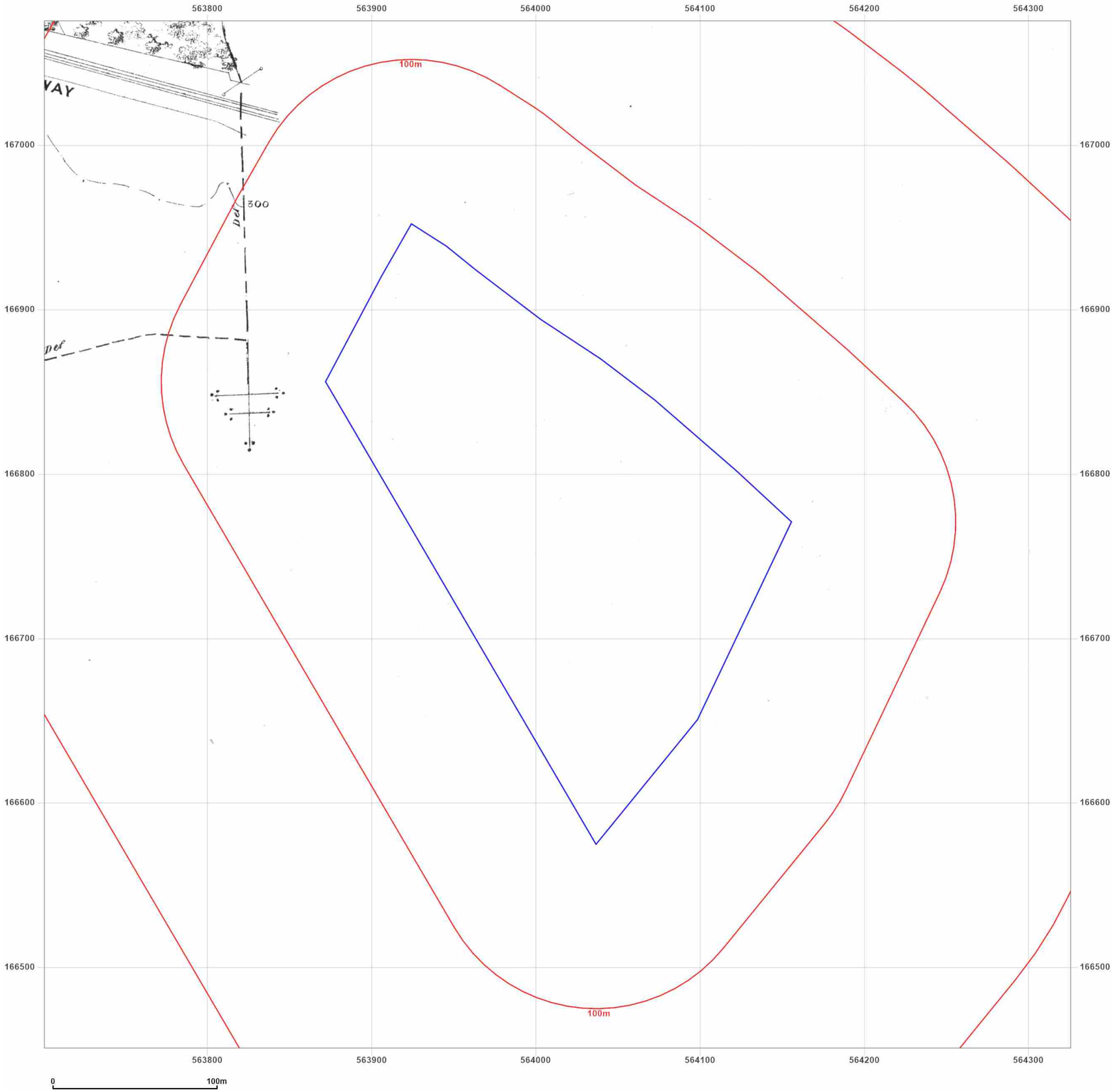

Groundsure INSIGHTS

Site Details:

Wrotham Road, Meopham (west)

Client Ref: 29473 west
Report Ref: GS-CM2-3V9-LRU-YVN_2500
Grid Ref: 564013, 166763

Map Name: County Series

Map date: **1868**

Scale: 1:2,500

Printed at: 1:2,500

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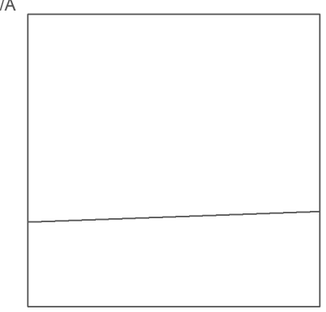
Surveyed 1868
Revised 1868
Edition N/A
Copyright N/A
Levelled N/A



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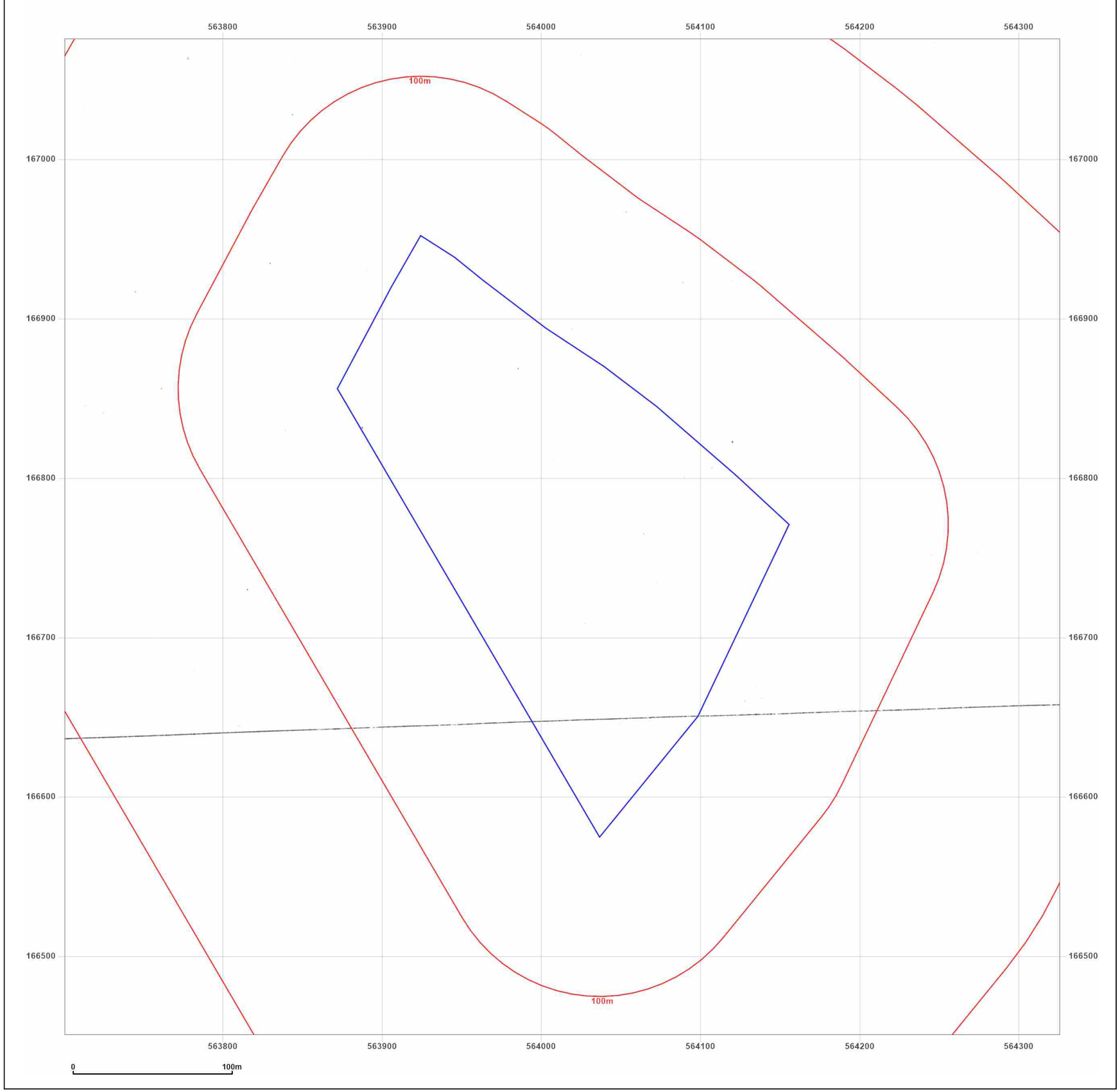

Groundsure INSIGHTS

Site Details:

Wrotham Road, Meopham (west)

Client Ref: 29473 west
Report Ref: GS-CM2-3V9-LRU-YVN_2500
Grid Ref: 564013, 166763

Map Name: County Series

Map date: **1868**

Scale: 1:2,500

Printed at: 1:2,500

N
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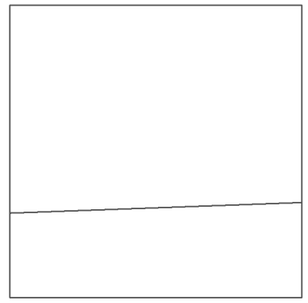
Surveyed 1868
Revised 1868
Edition N/A
Copyright N/A
Levelled N/A



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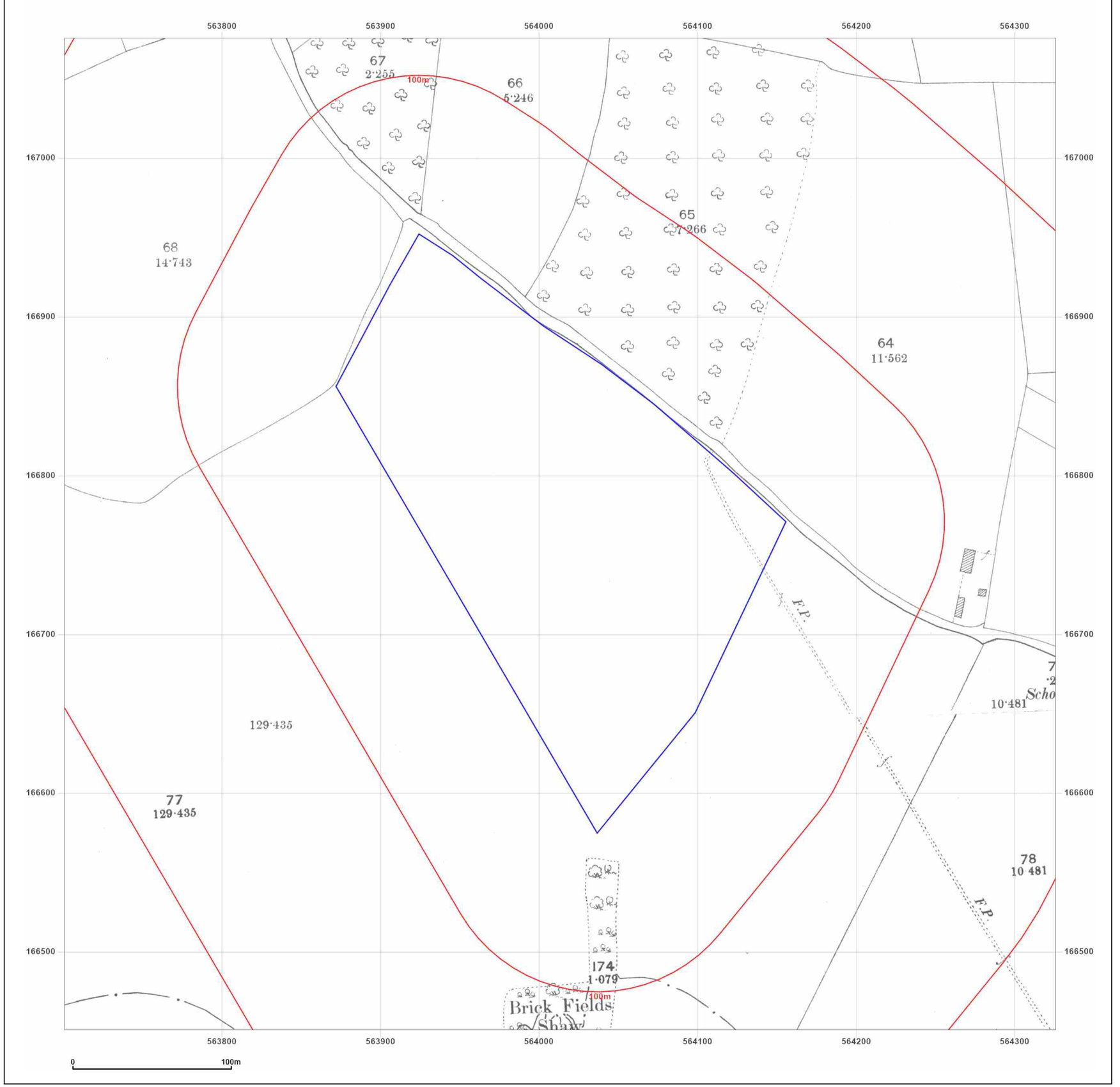

Groundsure INSIGHTS

Site Details:

Wrotham Road, Meopham (west)

Client Ref: 29473 west
Report Ref: GS-CM2-3V9-LRU-YVN_2500
Grid Ref: 564013, 166763

Map Name: County Series

Map date: **1896**

Scale: 1:2,500

Printed at: 1:2,500

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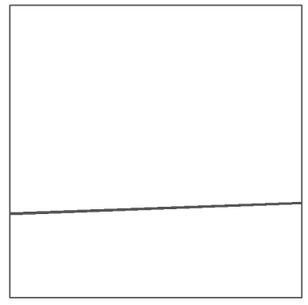
Surveyed 1896
Revised 1896
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1896
Revised 1896
Edition N/A
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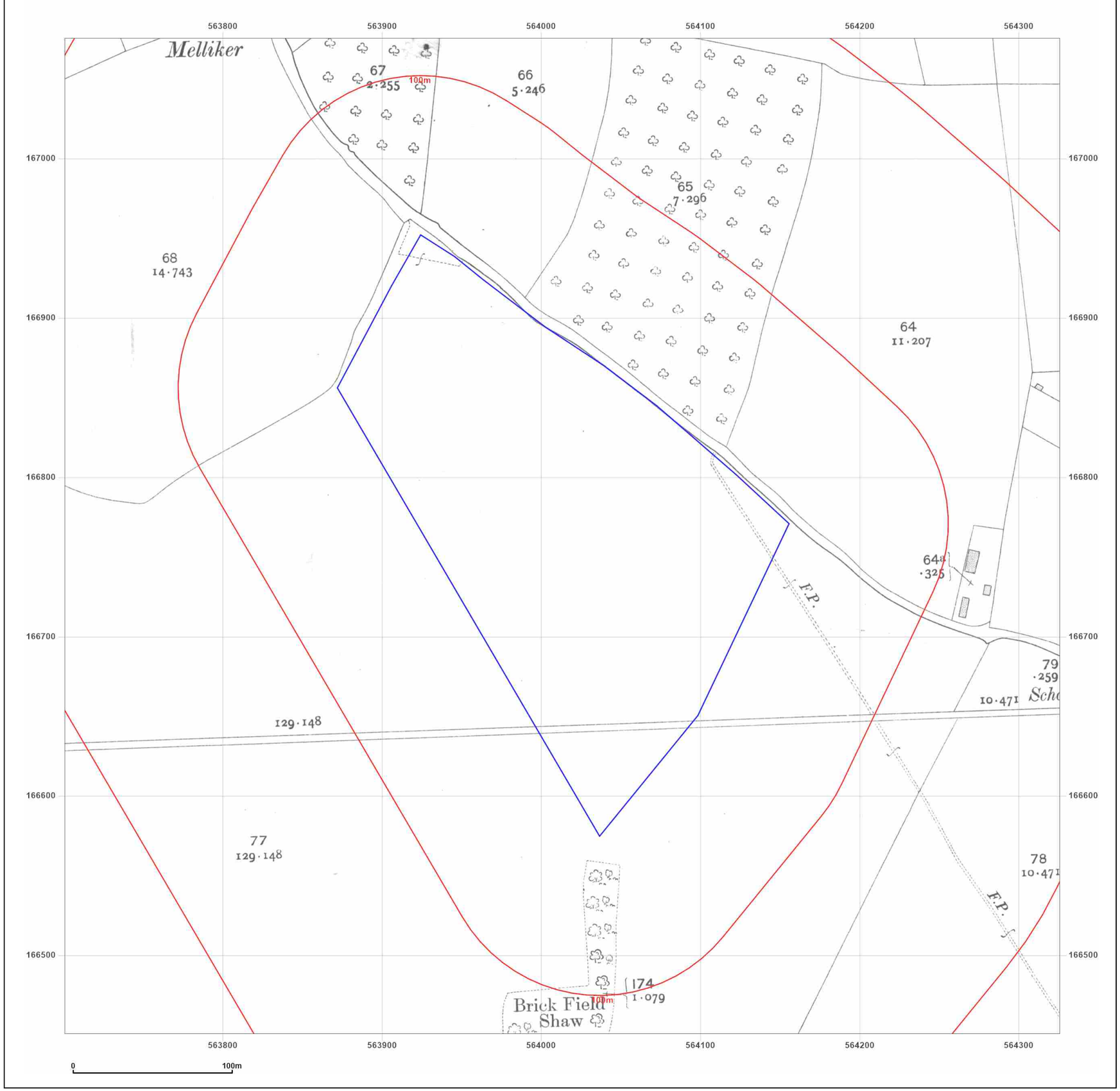

Groundsure INSIGHTS

Site Details:

Wrotham Road, Meopham (west)

Client Ref: 29473 west
Report Ref: GS-CM2-3V9-LRU-YVN_2500
Grid Ref: 564013, 166763

Map Name: County Series

Map date: **1908**

Scale: 1:2,500

Printed at: 1:2,500

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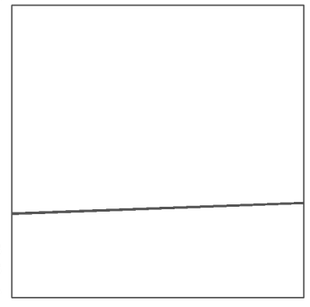
Surveyed 1908
Revised 1908
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1908
Revised 1908
Edition N/A
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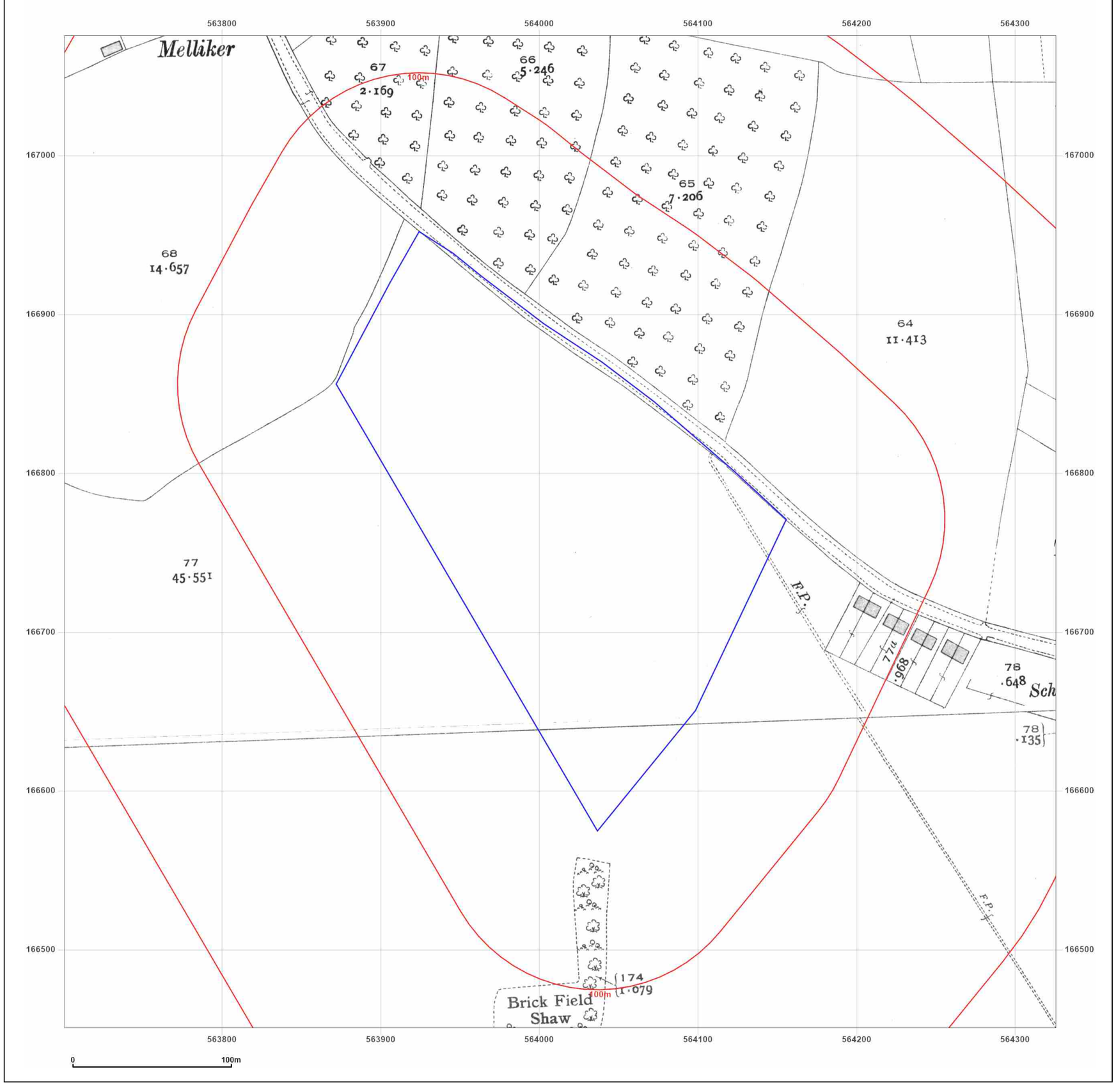

Groundsure INSIGHTS

Site Details:

Wrotham Road, Meopham (west)

Client Ref: 29473 west
Report Ref: GS-CM2-3V9-LRU-YVN_2500
Grid Ref: 564013, 166763

Map Name: County Series

Map date: **1933-1936**

Scale: 1:2,500

Printed at: 1:2,500

N
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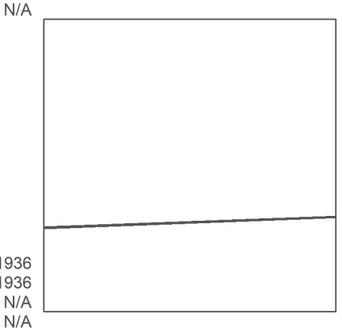
Surveyed 1933
Revised 1933
Edition N/A
Copyright N/A
Levelled N/A



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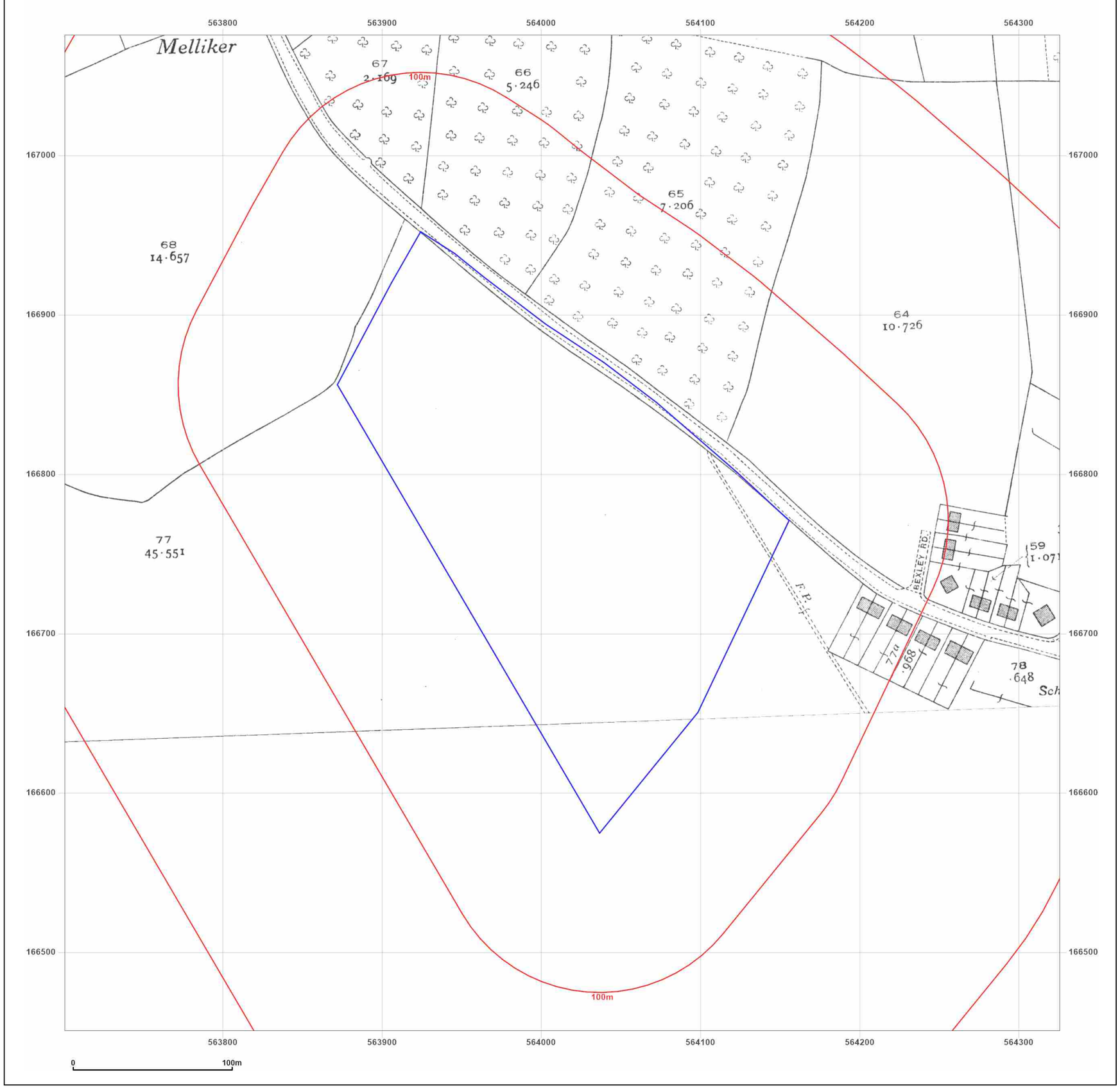

Groundsure INSIGHTS

Site Details:

Wrotham Road, Meopham (west)

Client Ref: 29473 west
Report Ref: GS-CM2-3V9-LRU-YVN_2500
Grid Ref: 564013, 166763

Map Name: County Series

Map date: **1939**

Scale: 1:2,500

Printed at: 1:2,500

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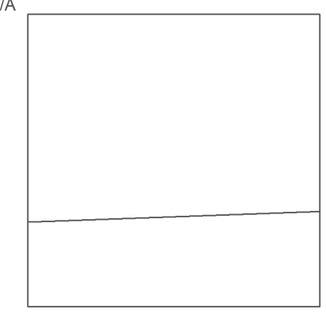
Surveyed 1939
Revised 1939
Edition N/A
Copyright N/A
Levelled N/A



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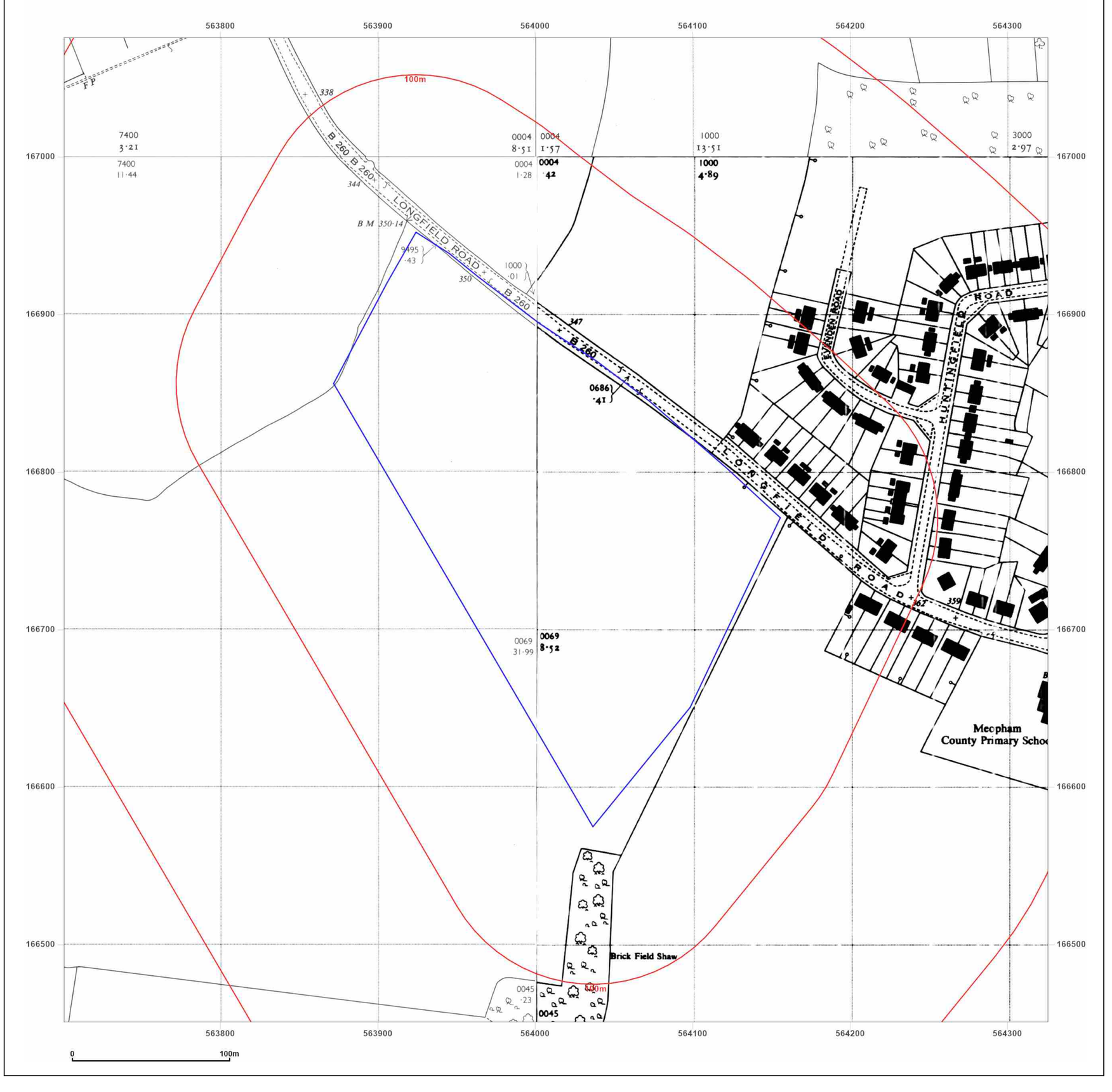

Groundsure INSIGHTS

Site Details:

Wrotham Road, Meopham (west)

Client Ref: 29473 west
Report Ref: GS-CM2-3V9-LRU-YVN_2500
Grid Ref: 564013, 166763

Map Name: National Grid

Map date: **1960-1964**

Scale: 1:2,500

Printed at: 1:2,500

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Surveyed 1960 Revised 1960 Edition N/A Copyright 1960 Levelled 1952	Surveyed 1960 Revised 1960 Edition N/A Copyright 1960 Levelled 1952
Surveyed 1962 Revised 1962 Edition N/A Copyright 1964 Levelled 1952	Surveyed N/A Revised N/A Edition N/A Copyright N/A Levelled N/A

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Groundsure INSIGHTS

Site Details:

Wrotham Road, Meopham (west)

Client Ref: 29473 west
Report Ref: GS-CM2-3V9-LRU-YVN_2500
Grid Ref: 564013, 166763

Map Name: National Grid

Map date: **1961-1964**

Scale: 1:2,500

Printed at: 1:2,500

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Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

Surveyed N/A
Revised N/A
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Revised 1962
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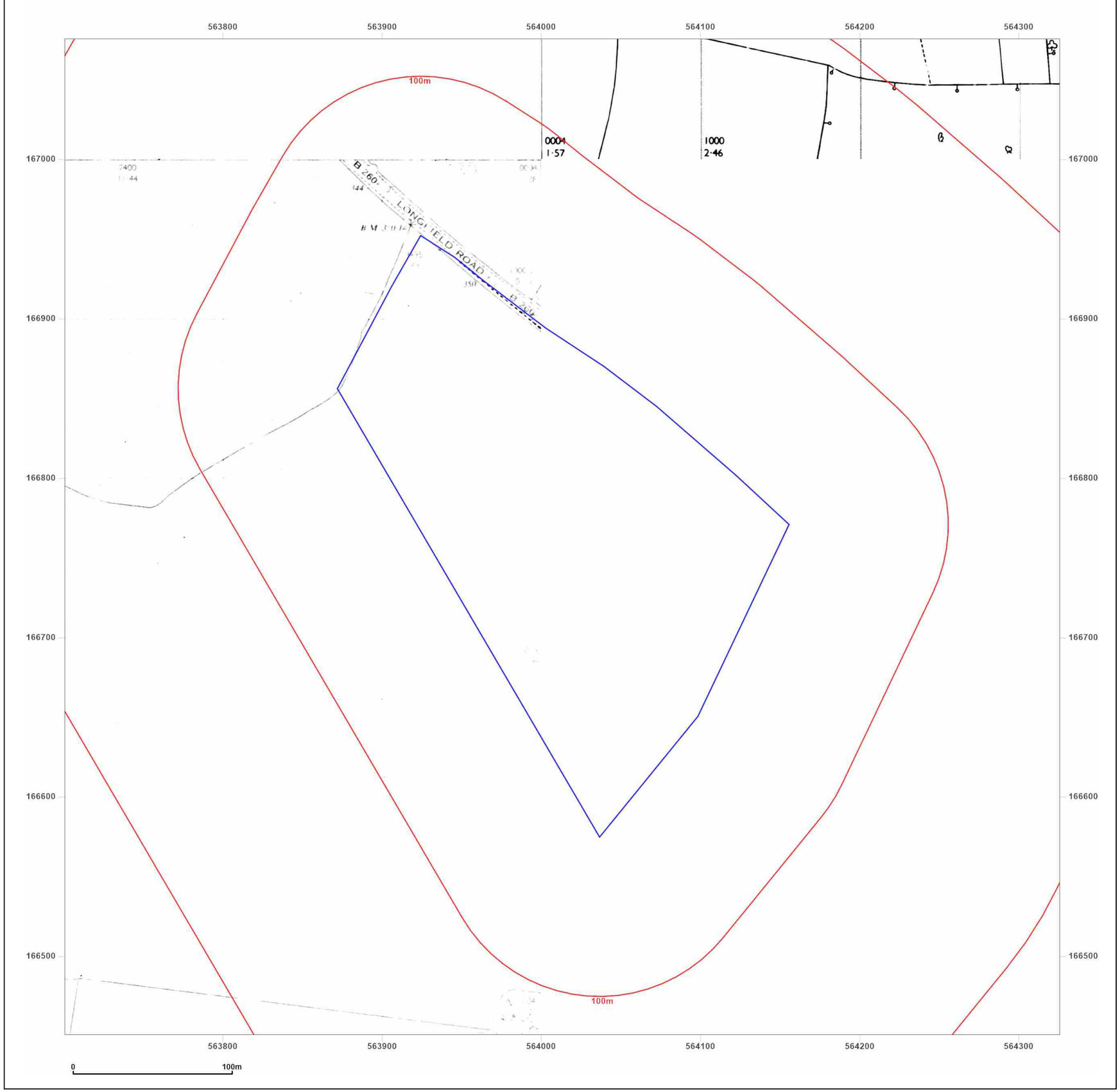

Groundsure INSIGHTS

Site Details:

Wrotham Road, Meopham (west)

Client Ref: 29473 west
Report Ref: GS-CM2-3V9-LRU-YVN_2500
Grid Ref: 564013, 166763

Map Name: National Grid

Map date: **1968-1973**

Scale: 1:2,500

Printed at: 1:2,500

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Revised N/A
Edition N/A
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Levelled N/A

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Revised N/A
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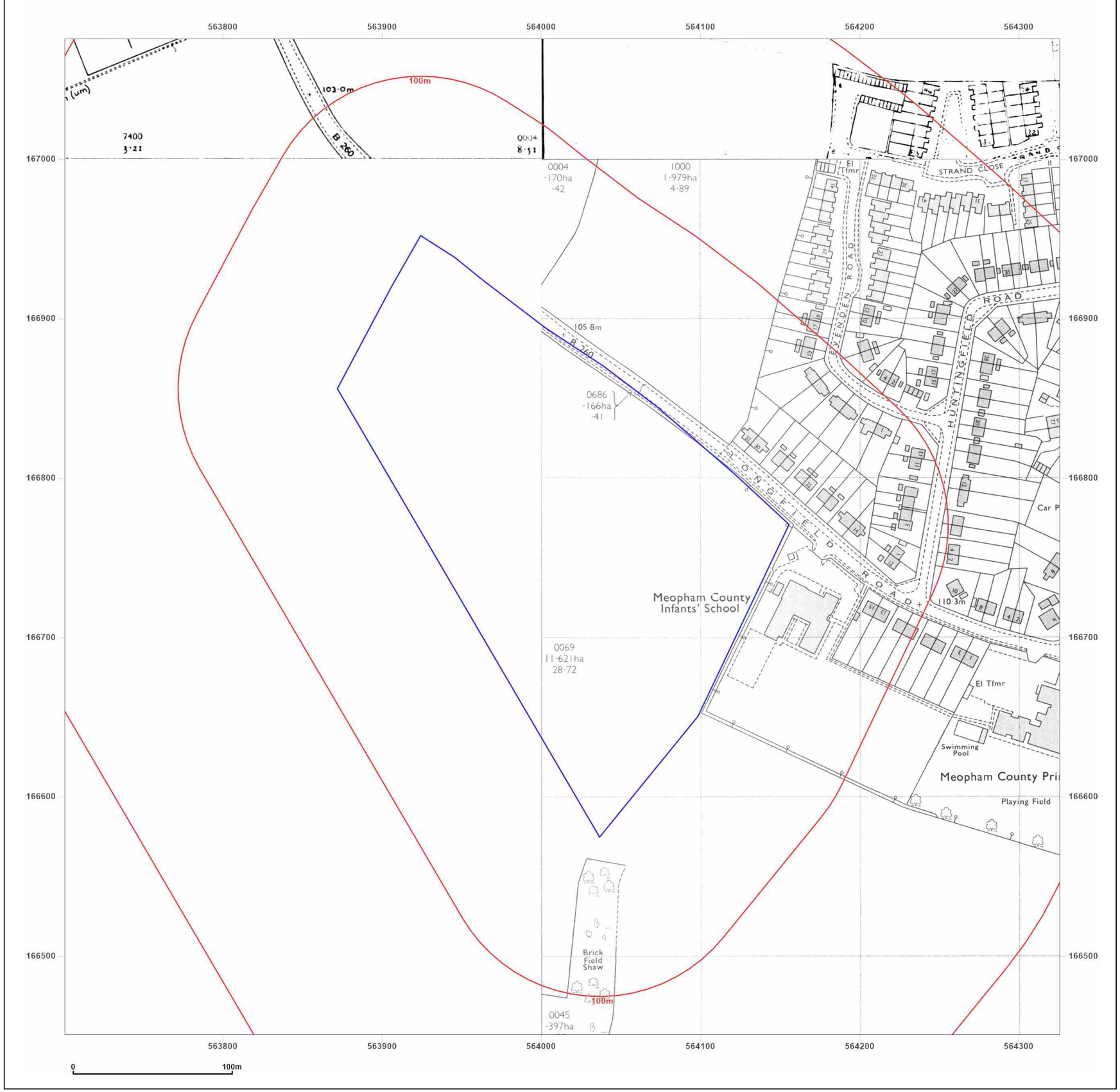

Groundsure INSIGHTS

Site Details:

Wrotham Road, Meopham (west)

Client Ref: 29473 west
Report Ref: GS-CM2-3V9-LRU-YVN_2500
Grid Ref: 564013, 166763

Map Name: National Grid

Map date: **1974-1979**

Scale: 1:2,500

Printed at: 1:2,500

N
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Levelled N/A

Surveyed N/A
Revised N/A
Edition N/A
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Levelled N/A

Surveyed 1973
Revised 1973
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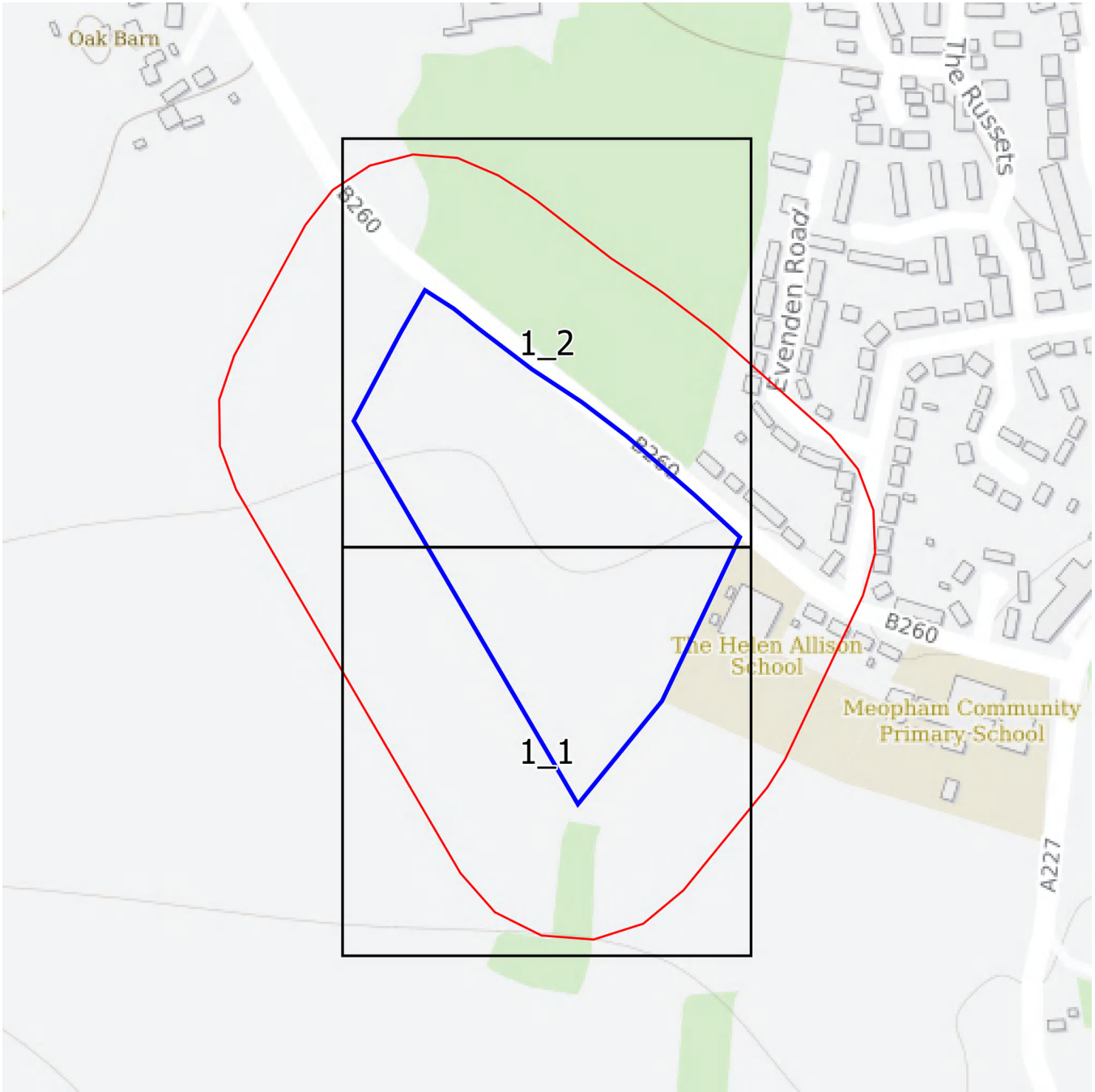
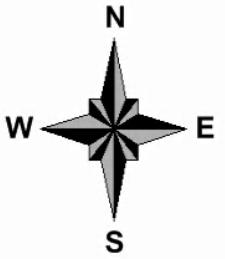
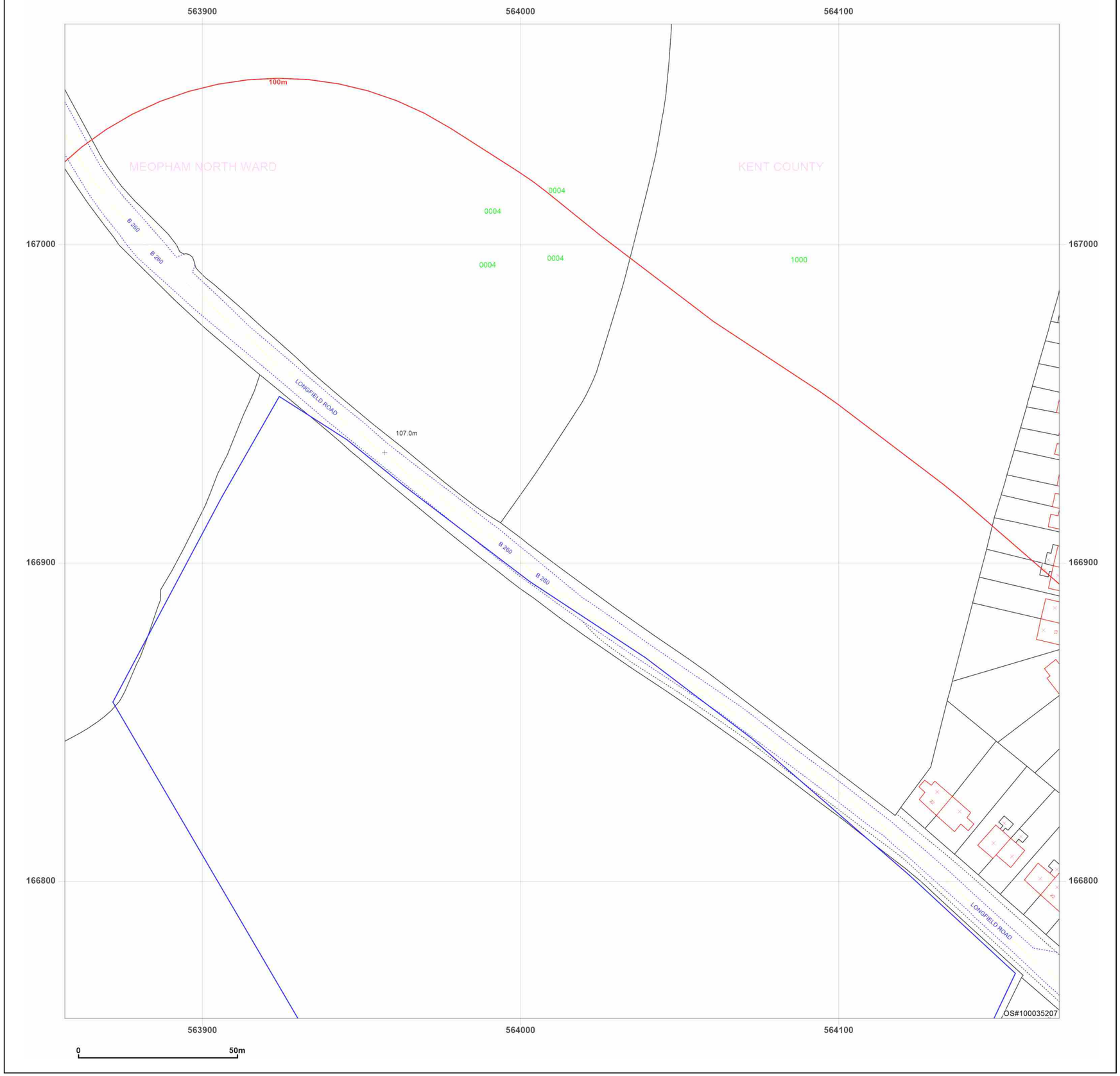


Groundsure INSIGHTS

Landline Scale Grid Index





Groundsure INSIGHTS

Site Details:

Wrotham Road, Meopham (west)

Client Ref: 29473 west
Report Ref: GS-CM2-3V9-LRU-YVN_Landline_1_2
Grid Ref: 564013, 166913

Map Name: LandLine
Map date: **2003**
Scale: 1:1,250
Printed at: 1:1,250

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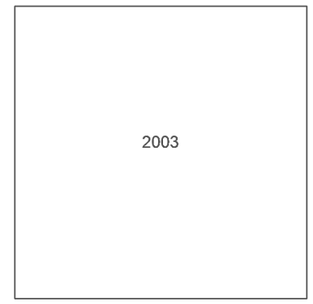

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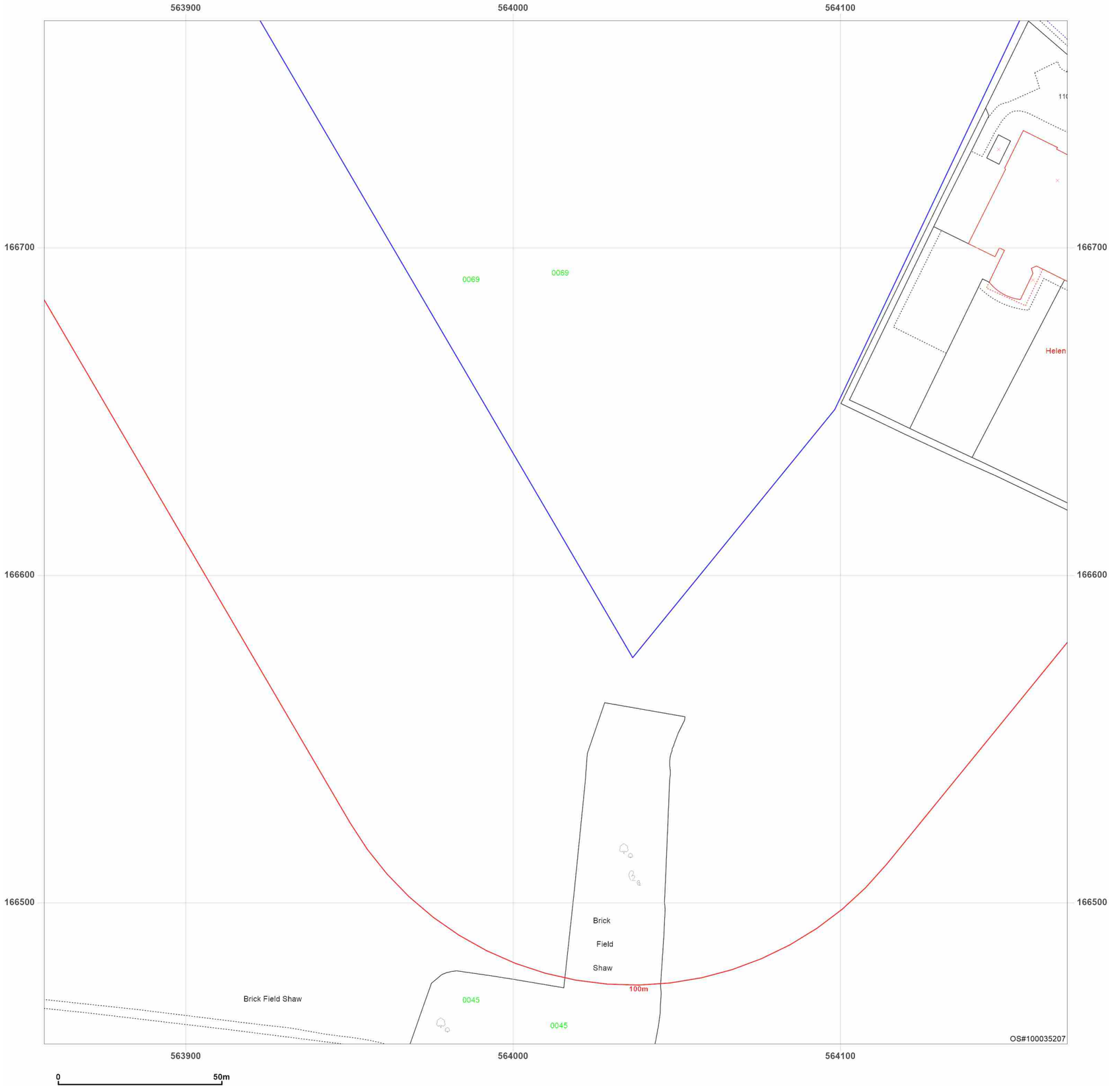

Groundsure INSIGHTS

Site Details:

Wrotham Road, Meopham (west)

Client Ref: 29473 west
Report Ref: GS-CM2-3V9-LRU-YVN_Landline_1_1
Grid Ref: 564013, 166613

Map Name: LandLine
Map date: **2003**
Scale: 1:1,250
Printed at: 1:1,250

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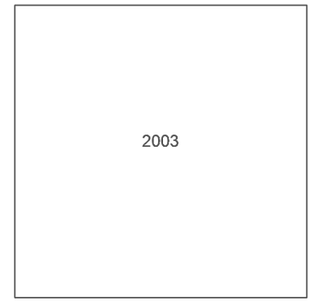

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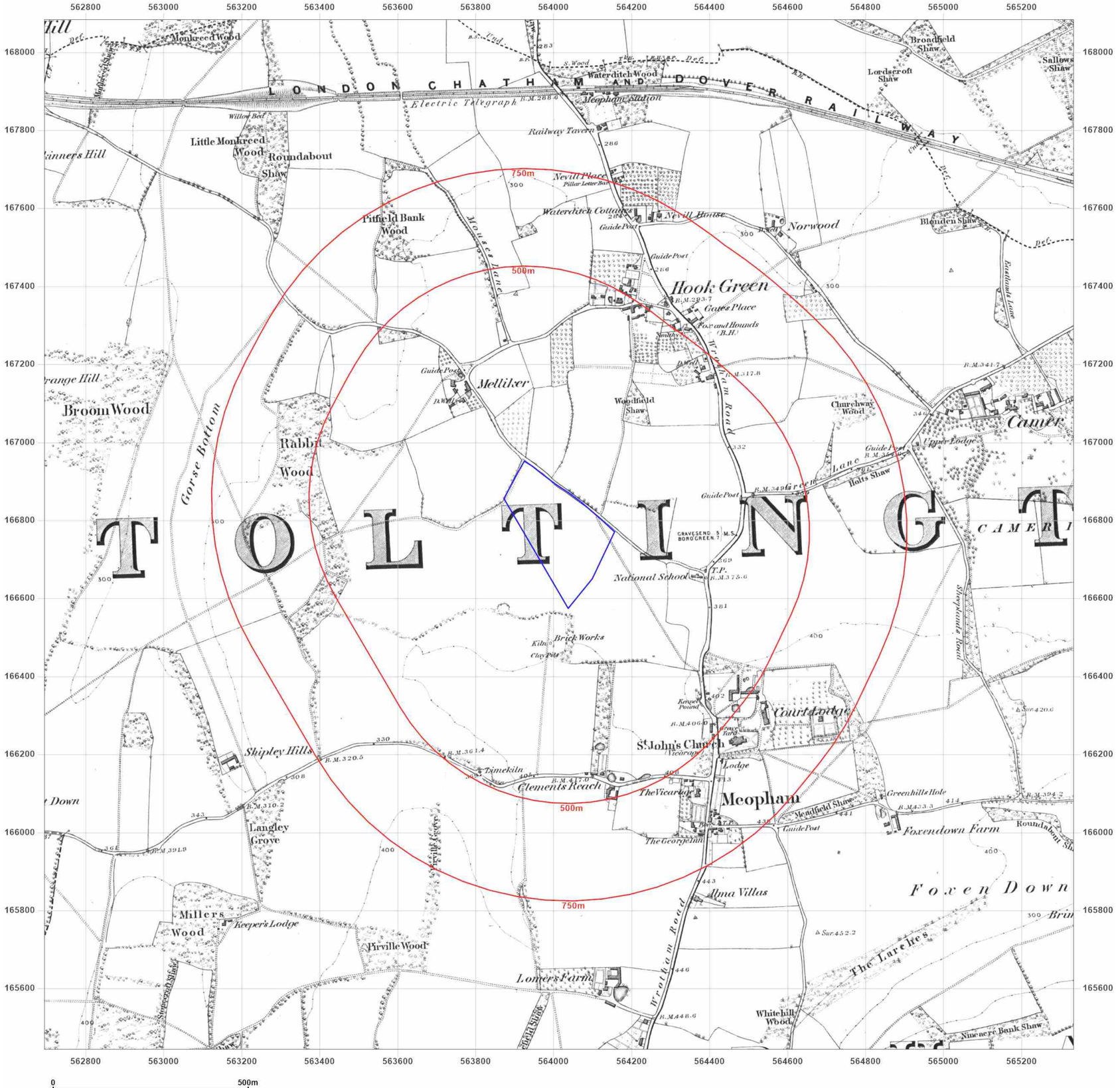

Groundsure INSIGHTS

Site Details:

Wrotham Road, Meopham (west)

Client Ref: 29473 west
Report Ref: GS-CM2-3V9-LRU-YVN
Grid Ref: 564013, 166763

Map Name: County Series

Map date: **1867**

Scale: 1:10,560

Printed at: 1:10,560

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Revised 1867
Edition N/A
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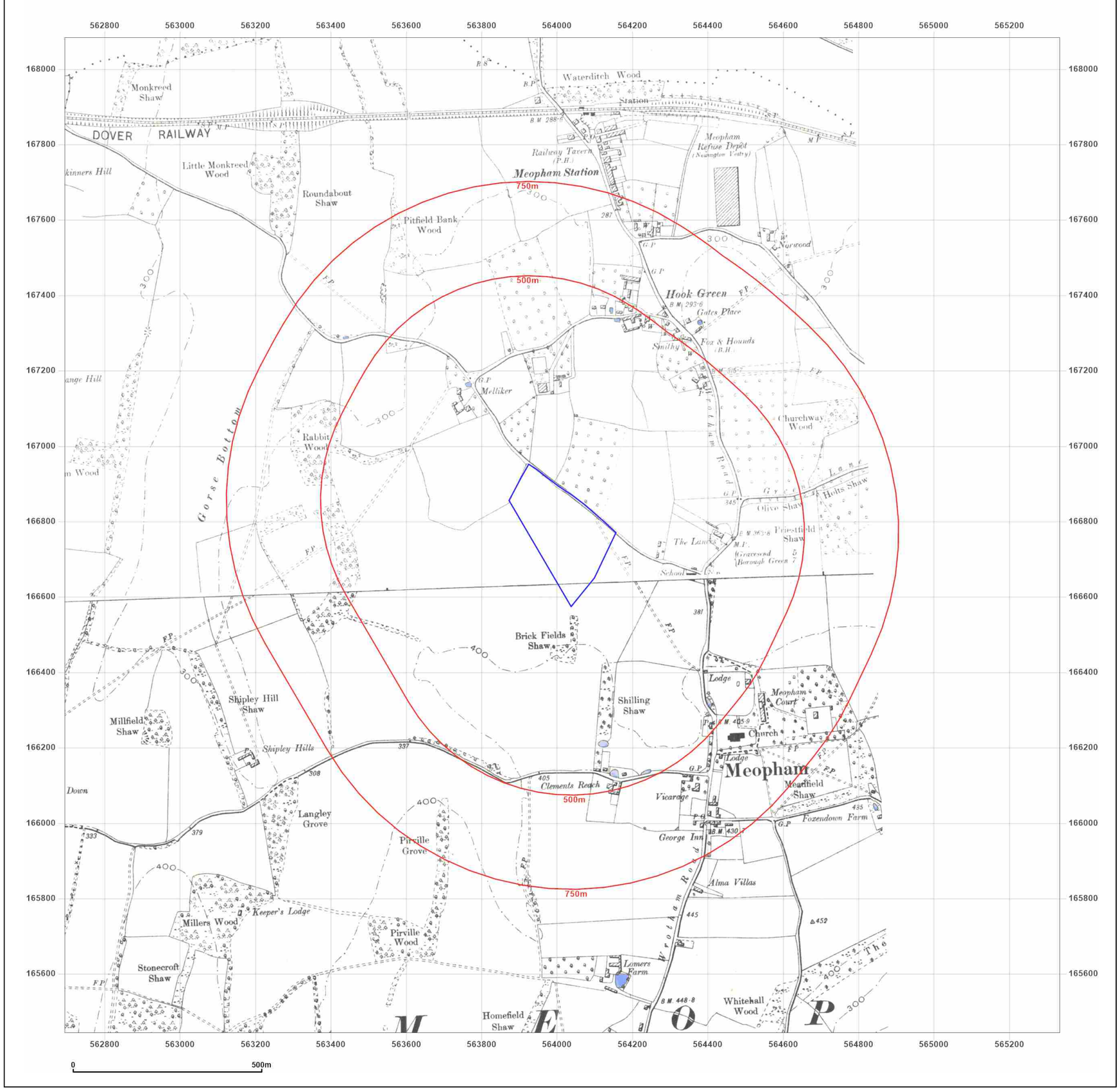

Groundsure INSIGHTS

Site Details:

Wrotham Road, Meopham (west)

Client Ref: 29473 west
Report Ref: GS-CM2-3V9-LRU-YVN
Grid Ref: 564013, 166763

Map Name: County Series

Map date: **1895**

Scale: 1:10,560

Printed at: 1:10,560

N
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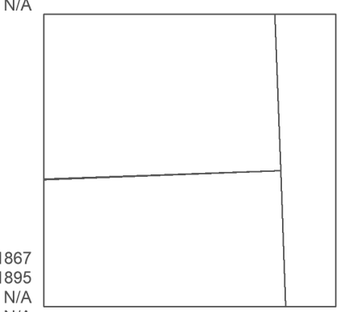
Surveyed 1867
Revised 1895
Edition N/A
Copyright N/A
Levelled N/A



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Revised 1895
Edition N/A
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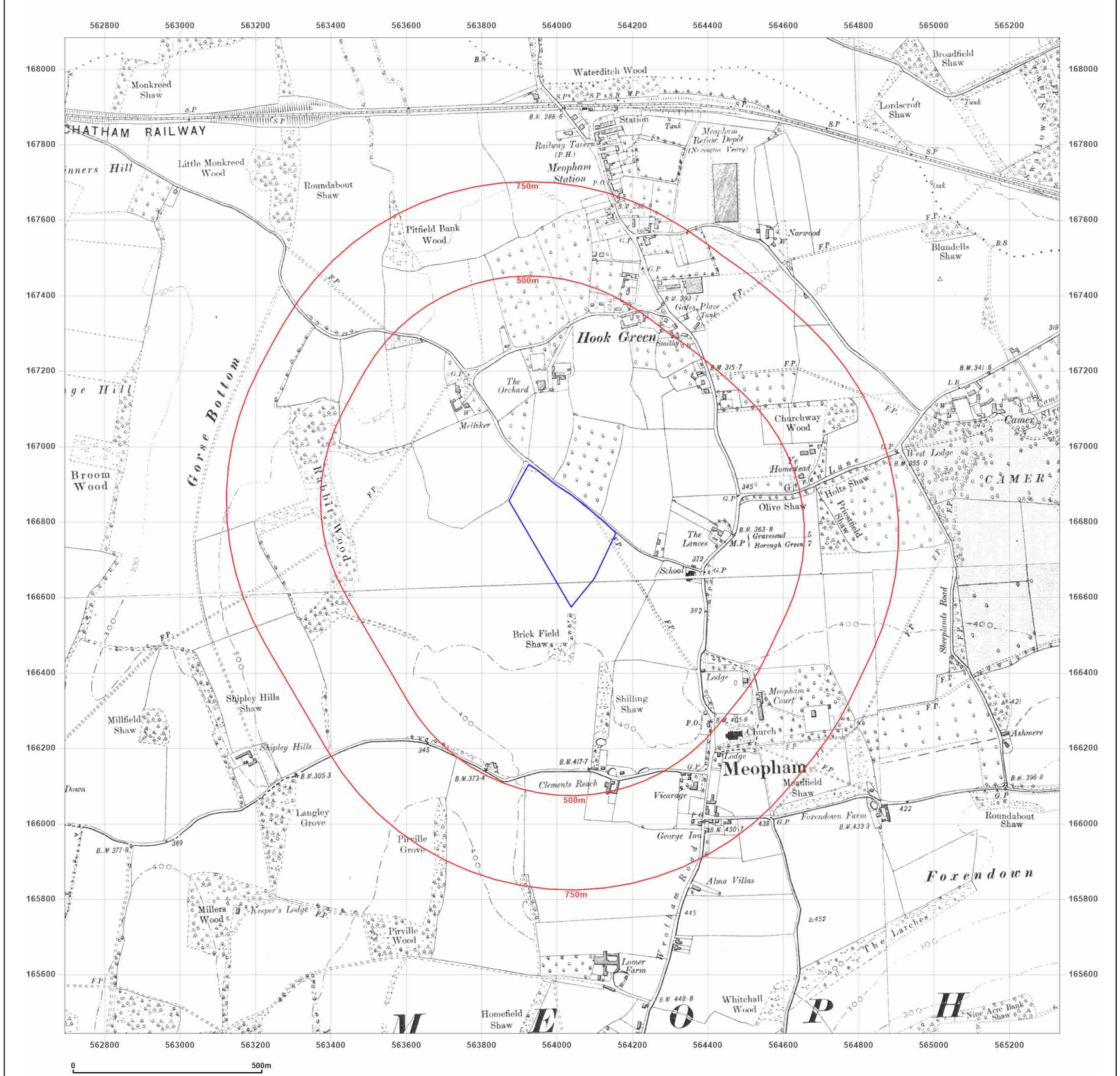

Groundsure INSIGHTS

Site Details:

Wrotham Road, Meopham (west)

Client Ref: 29473 west
Report Ref: GS-CM2-3V9-LRU-YVN
Grid Ref: 564013, 166763

Map Name: County Series

Map date: **1907**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed 1865
Revised 1907
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1862
Revised 1907
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1866
Revised 1907
Edition N/A
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Levelled N/A

Surveyed 1862
Revised 1907
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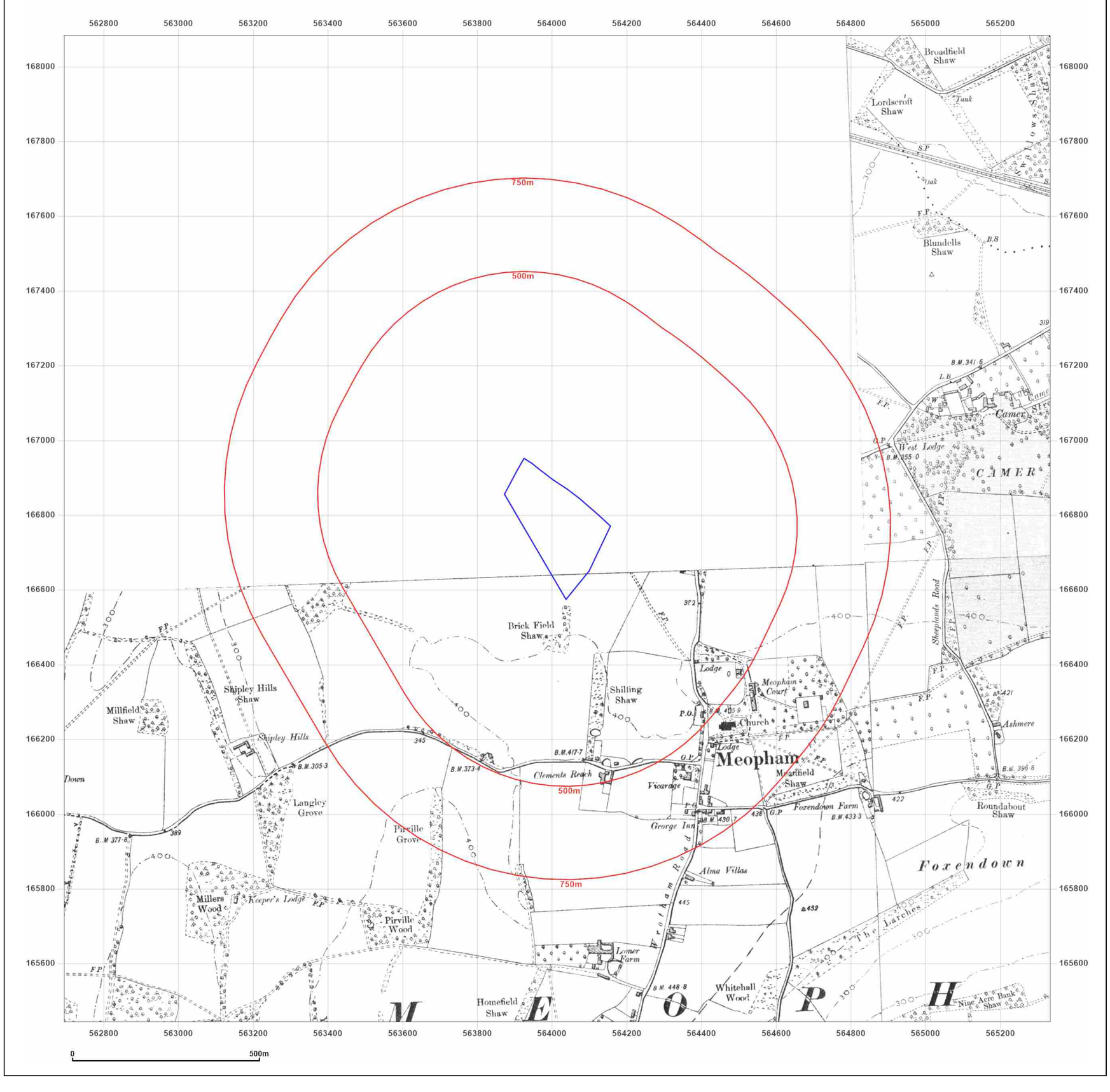

Groundsure INSIGHTS

Site Details:

Wrotham Road, Meopham (west)

Client Ref: 29473 west
Report Ref: GS-CM2-3V9-LRU-YVN
Grid Ref: 564013, 166763

Map Name: County Series

Map date: **1907**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1862
Revised 1907
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1866
Revised 1907
Edition N/A
Copyright N/A
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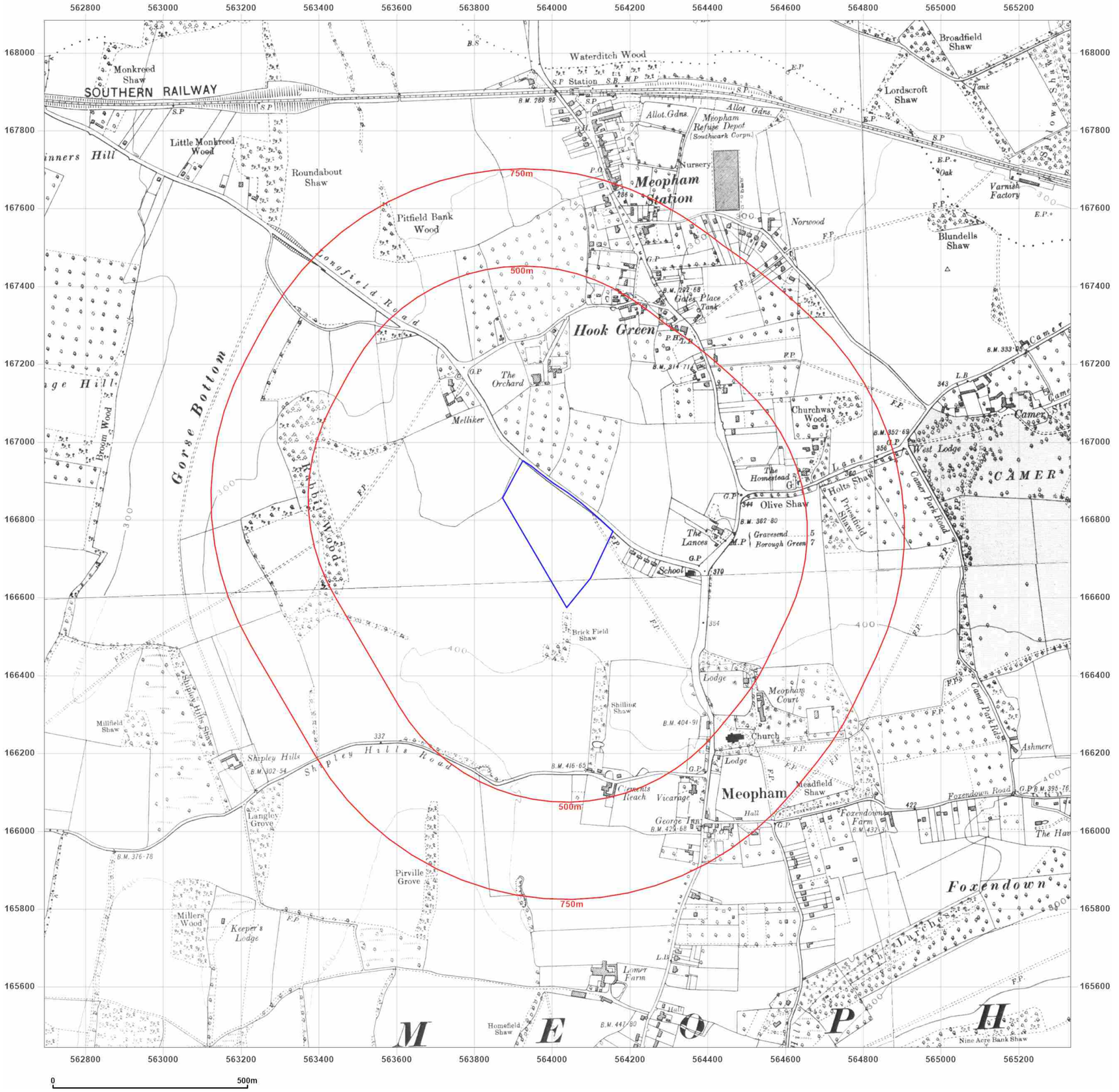

Groundsure INSIGHTS

Site Details:

Wrotham Road, Meopham (west)

Client Ref: 29473 west
Report Ref: GS-CM2-3V9-LRU-YVN
Grid Ref: 564013, 166763

Map Name: County Series

Map date: **1931-1936**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed 1865
Revised 1931
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1862
Revised 1931
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1866
Revised 1936
Edition N/A
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Surveyed 1862
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Edition N/A
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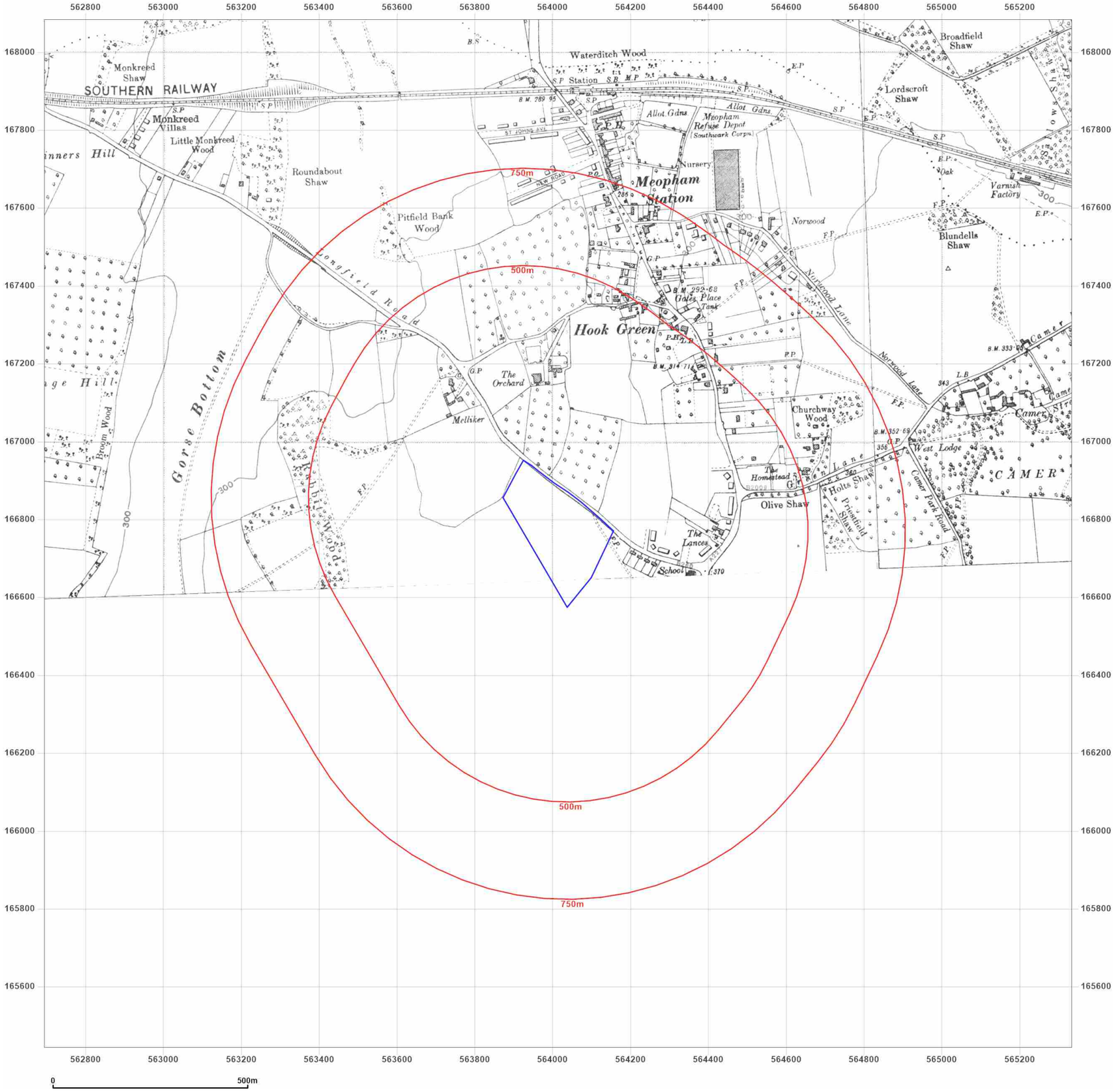
Production date: 18 March 2025

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Groundsure INSIGHTS

Site Details:

Wrotham Road, Meopham (west)

Client Ref: 29473 west
Report Ref: GS-CM2-3V9-LRU-YVN
Grid Ref: 564013, 166763

Map Name: County Series

Map date: **1938-1939**

Scale: 1:10,560

Printed at: 1:10,560

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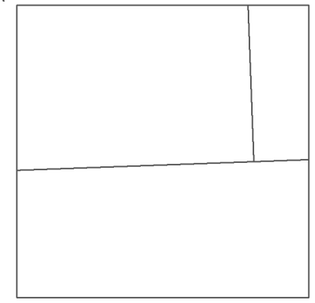
Surveyed 1865
Revised 1938
Edition 1938
Copyright N/A
Levelled N/A

Surveyed 1862
Revised 1939
Edition N/A
Copyright N/A
Levelled N/A



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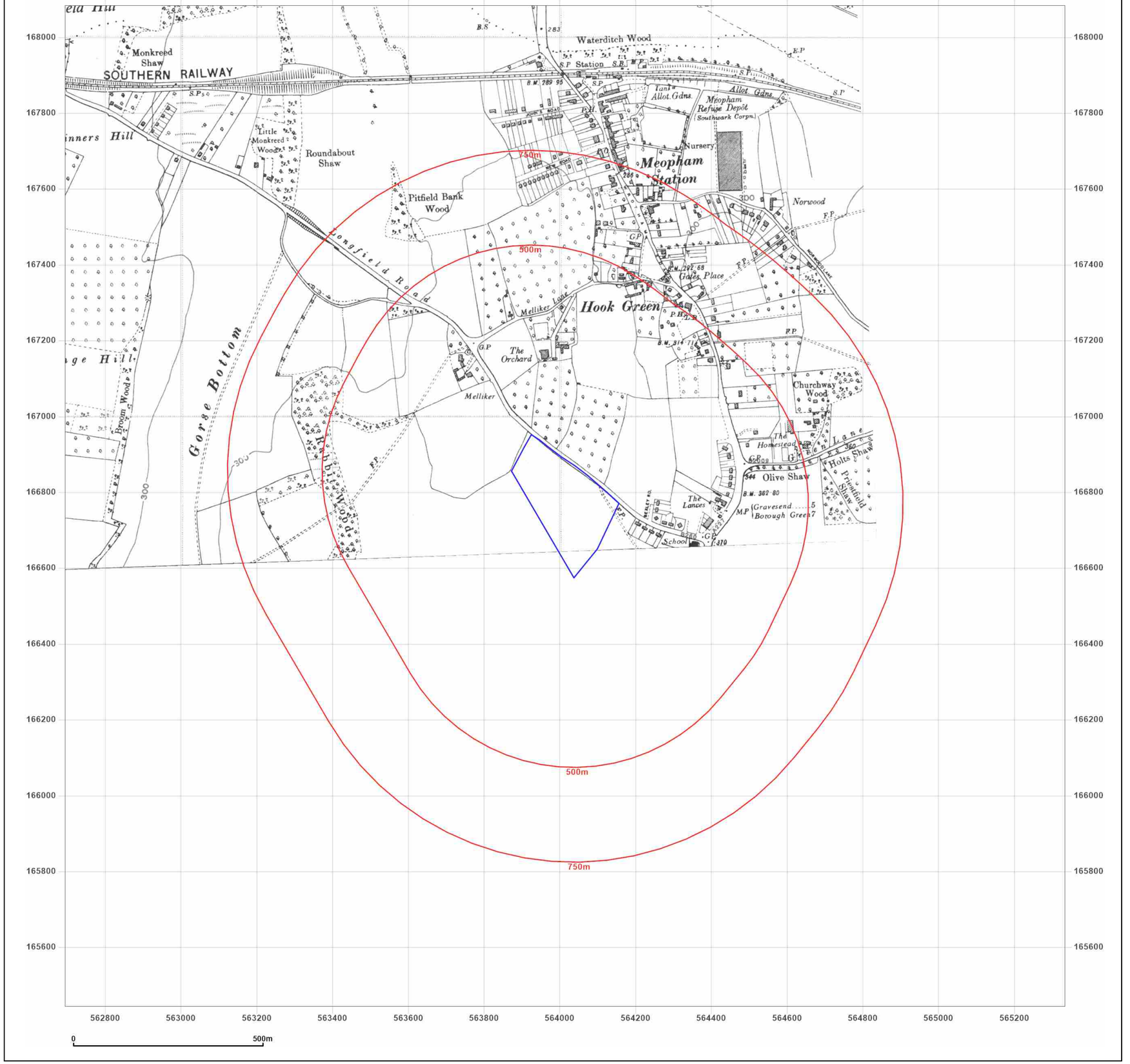

Groundsure INSIGHTS

Site Details:

Wrotham Road, Meopham (west)

Client Ref: 29473 west
Report Ref: GS-CM2-3V9-LRU-YVN
Grid Ref: 564013, 166763

Map Name: County Series

Map date: **1939**

Scale: 1:10,560

Printed at: 1:10,560

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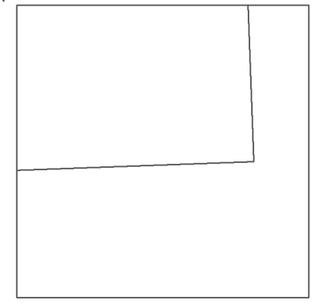
Surveyed 1865
Revised 1939
Edition N/A
Copyright N/A
Levelled N/A



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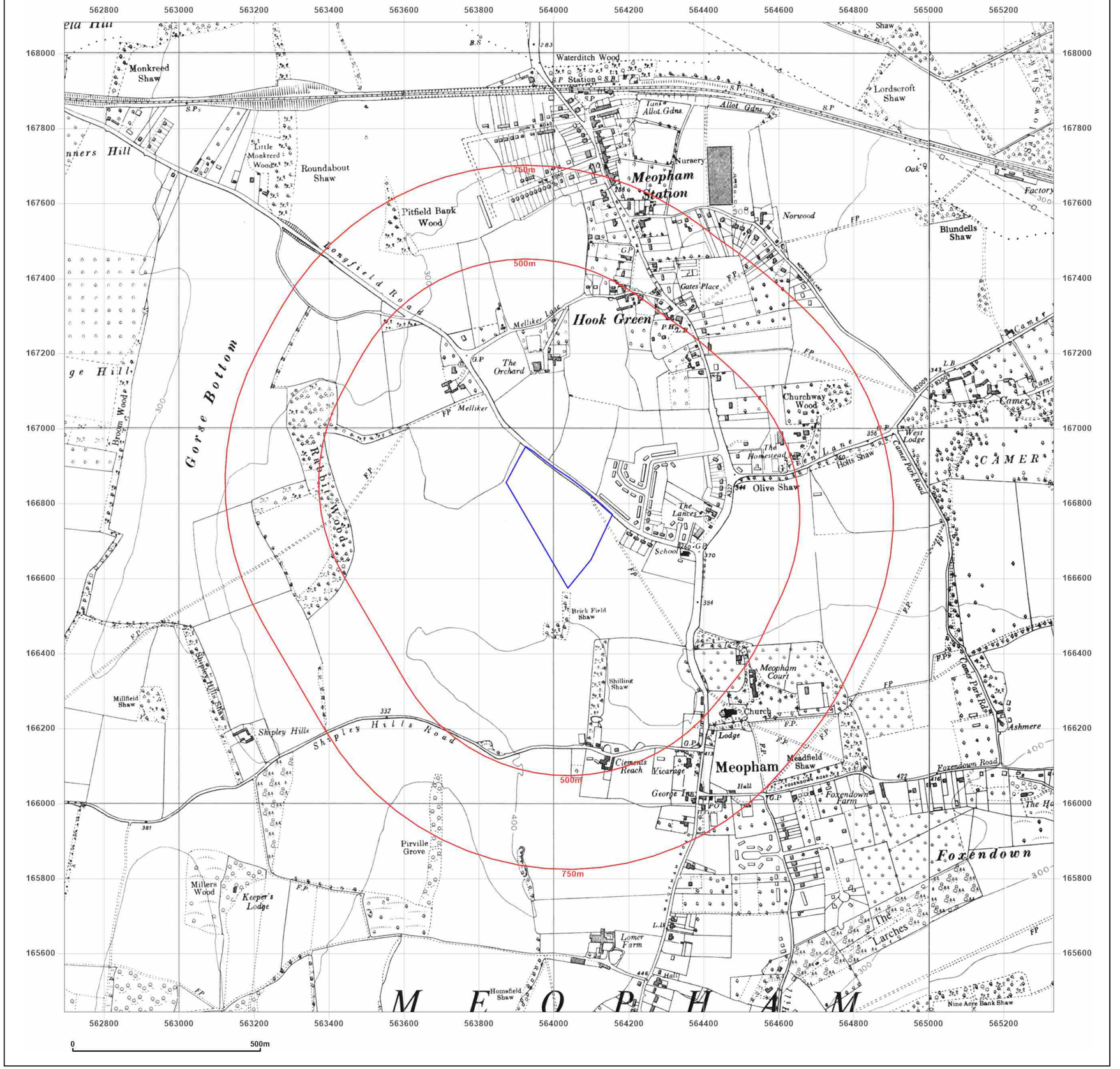

Groundsure INSIGHTS

Site Details:

Wrotham Road, Meopham (west)

Client Ref: 29473 west
Report Ref: GS-CM2-3V9-LRU-YVN
Grid Ref: 564013, 166763

Map Name: Provisional

Map date: **1955**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1955
Revised 1955
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1955
Revised 1955
Edition N/A
Copyright N/A
Levelled N/A

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Map legend available at:
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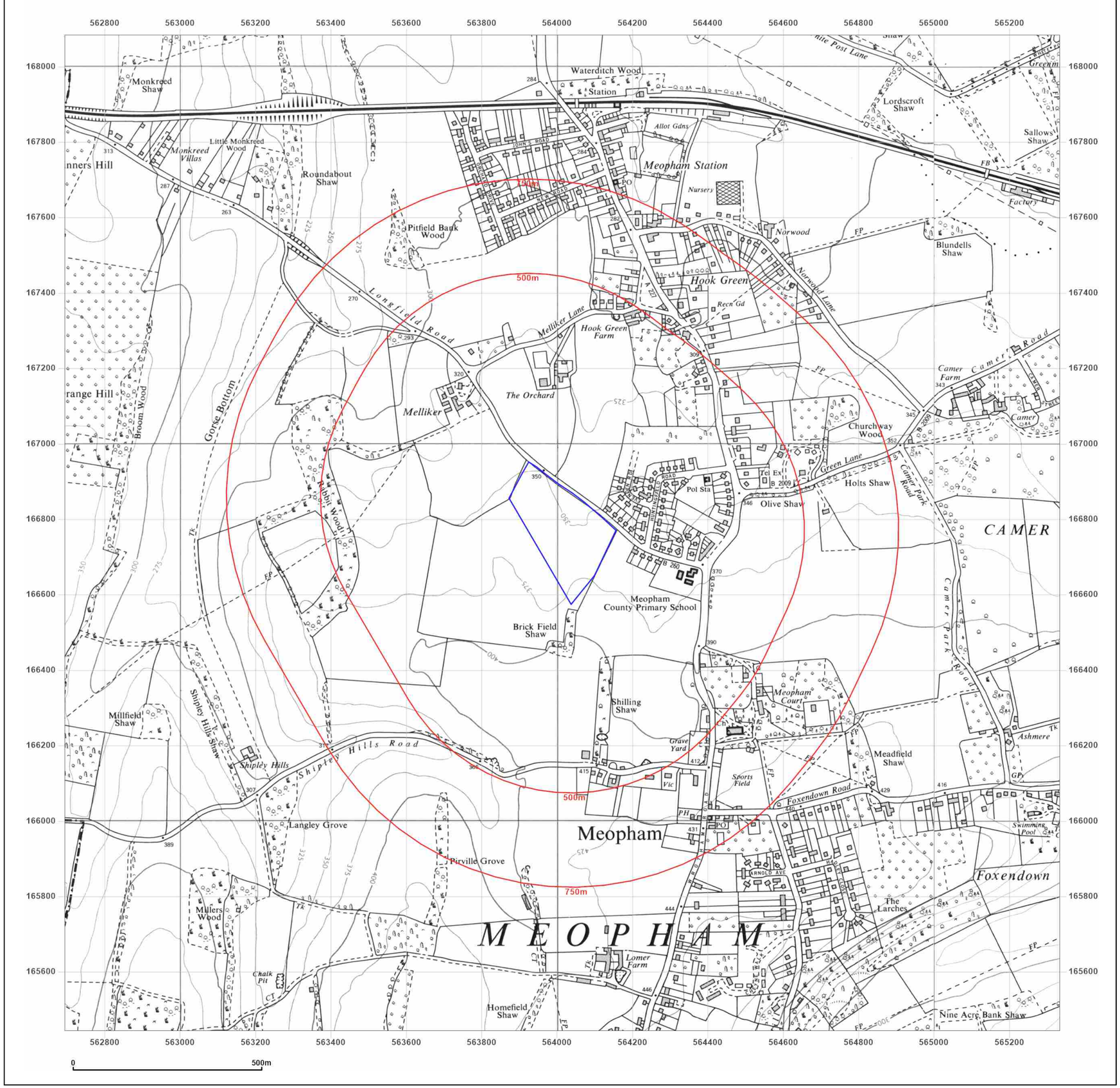

Groundsure INSIGHTS

Site Details:

Wrotham Road, Meopham (west)

Client Ref: 29473 west
Report Ref: GS-CM2-3V9-LRU-YVN
Grid Ref: 564013, 166763

Map Name: Provisional

Map date: **1965-1966**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed 1965
Revised 1965
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1966
Revised 1966
Edition N/A
Copyright N/A
Levelled N/A

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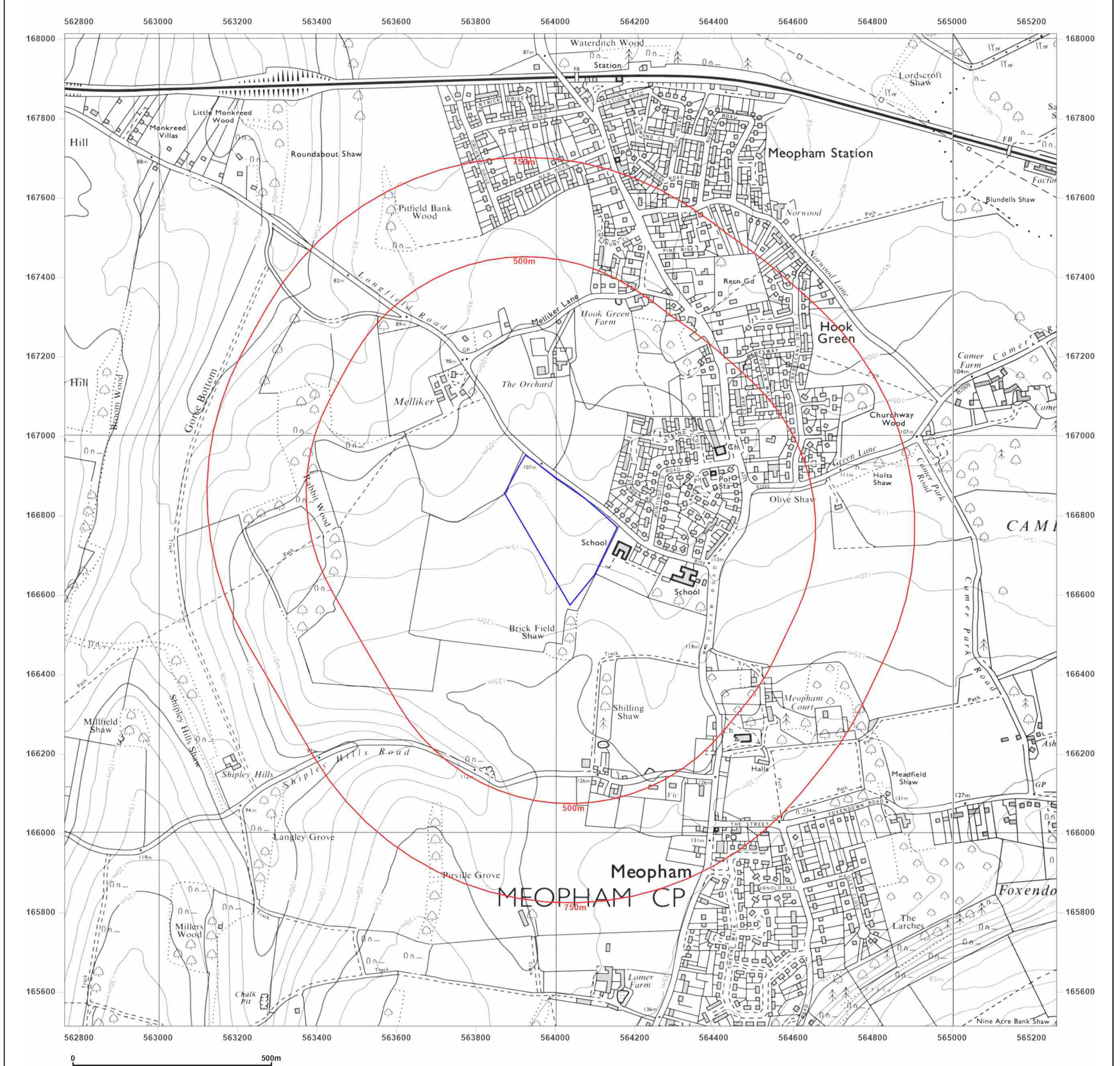

Groundsure INSIGHTS

Site Details:

Wrotham Road, Meopham (west)

Client Ref: 29473 west
Report Ref: GS-CM2-3V9-LRU-YVN
Grid Ref: 564013, 166763

Map Name: National Grid

Map date: **1973-1977**

Scale: 1:10,000

Printed at: 1:10,000

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Surveyed 1973
Revised 1973
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1976
Revised 1977
Edition N/A
Copyright N/A
Levelled N/A

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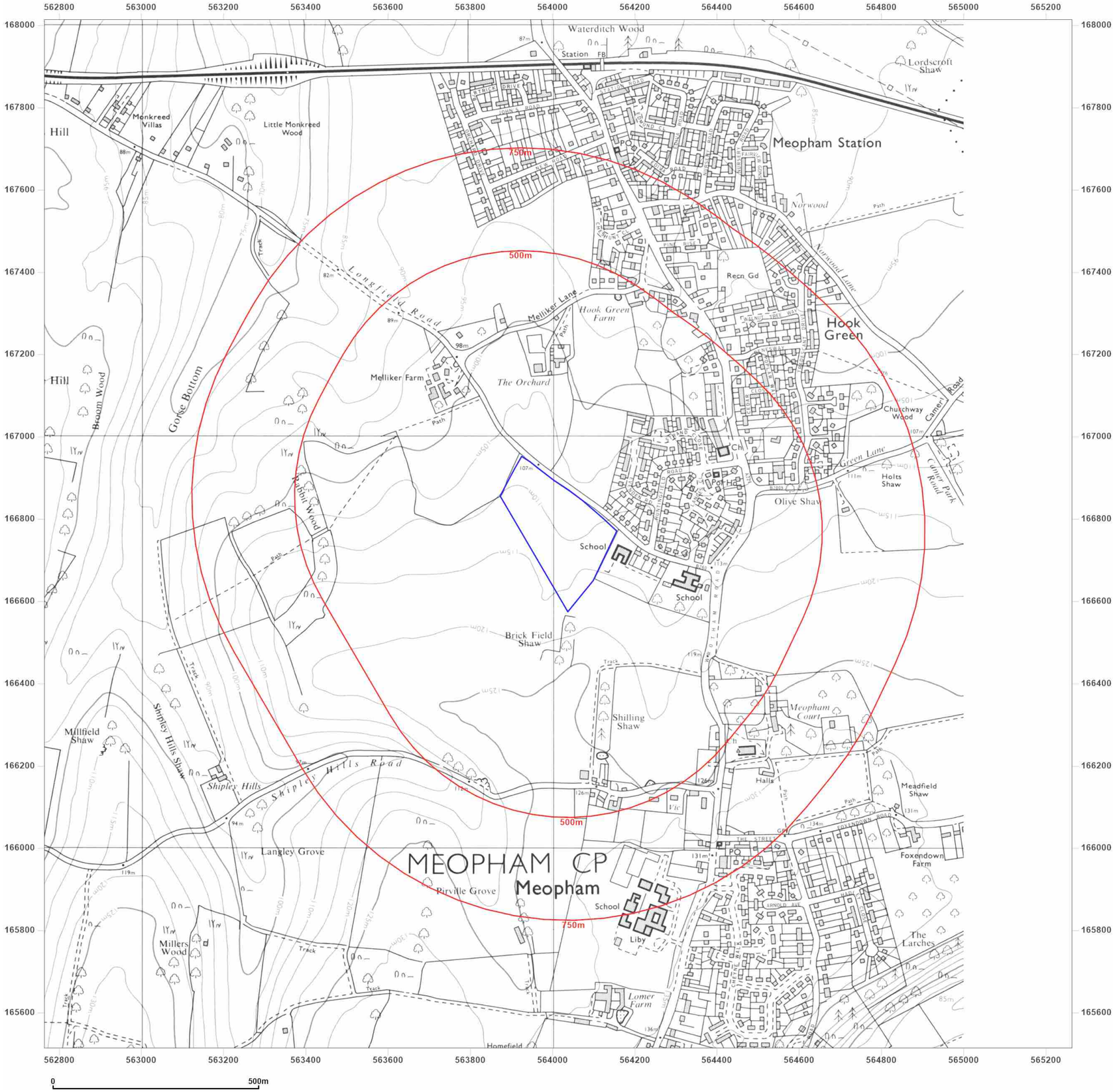
Production date: 18 March 2025

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Groundsure INSIGHTS

Site Details:

Wrotham Road, Meopham (west)

Client Ref: 29473 west
Report Ref: GS-CM2-3V9-LRU-YVN
Grid Ref: 564013, 166763

Map Name: National Grid

Map date: **1979**

Scale: 1:10,000

Printed at: 1:10,000

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Surveyed 1979
Revised 1979
Edition N/A
Copyright N/A
Levelled N/A

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Production date: 18 March 2025

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Groundsure INSIGHTS

Site Details:

Wrotham Road, Meopham (west)

Client Ref: 29473 west
Report Ref: GS-CM2-3V9-LRU-YVN
Grid Ref: 564013, 166763

Map Name: National Grid

Map date: **2001**

Scale: 1:10,000

Printed at: 1:10,000

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2001

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W: www.groundsure.com

Production date: 18 March 2025

Map legend available at:
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Groundsure INSIGHTS

Site Details:

Wrotham Road, Meopham (west)

Client Ref: 29473 west
Report Ref: GS-CM2-3V9-LRU-YVN
Grid Ref: 564013, 166763

Map Name: National Grid

Map date: **2010**

Scale: 1:10,000

Printed at: 1:10,000

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2010

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Produced by
Groundsure Insights
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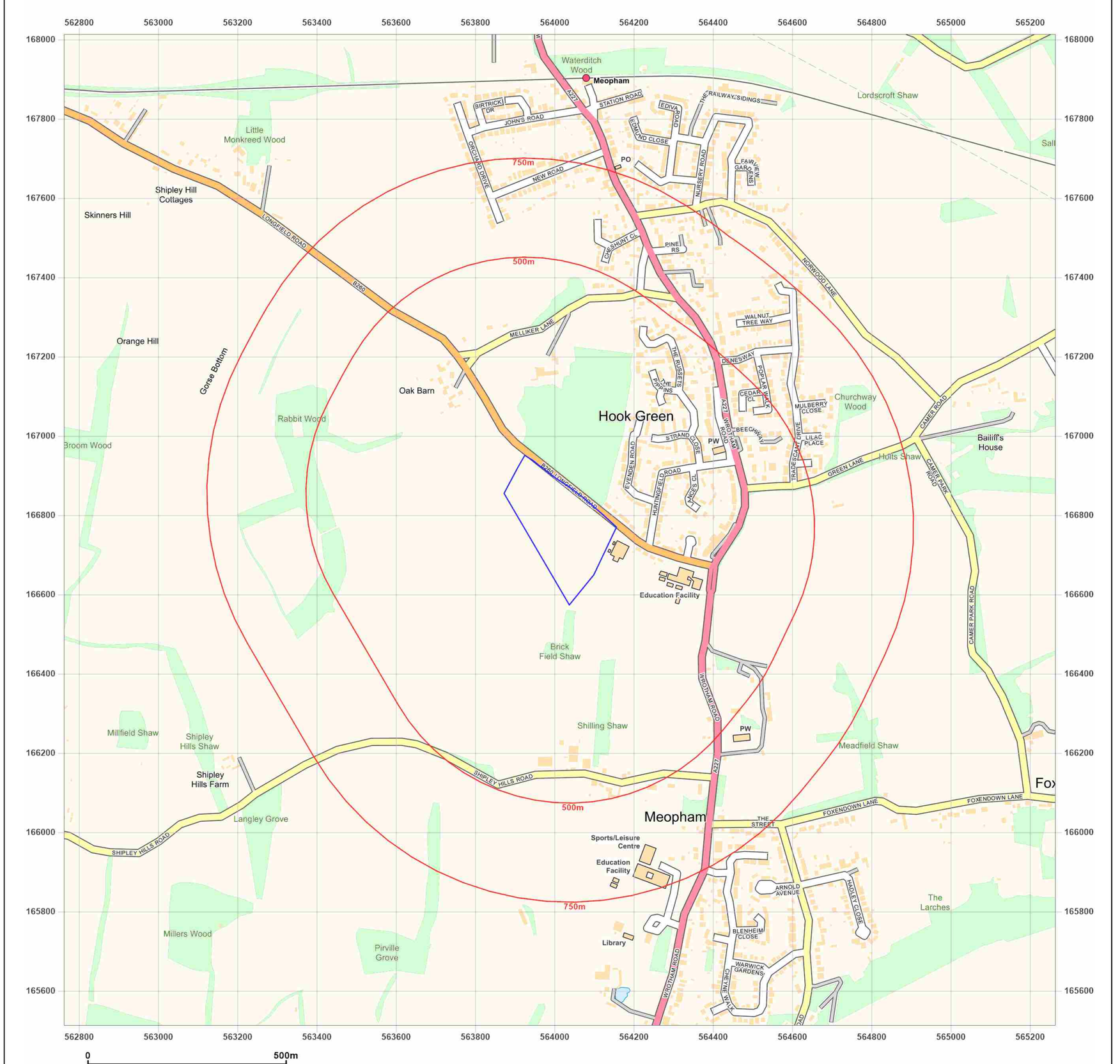
W: www.groundsure.com

Production date: 18 March 2025

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Groundsure INSIGHTS

Site Details:

Wrotham Road, Meopham (west)

Client Ref: 29473 west
Report Ref: GS-CM2-3V9-LRU-YVN
Grid Ref: 564013, 166763

Map Name: National Grid

Map date: **2025**

Scale: 1:10,000

Printed at: 1:10,000

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2025

Powered by OS

Produced by
Groundsure Insights
T: 08444 159000
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W: www.groundsure.com

Production date: 18 March 2025

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf

MEC
Consulting Group

APPENDICES

APPENDIX D

Groundsure LOCATION INTELLIGENCE

Enviro+Geo Insight

Wrotham Road, Meopham (west)

Order Details

Date: 18/03/2025

Your ref: 29473 west

Our Ref: GS-XYD-C9A-578-9WS

Site Details

Location: 564012 166773

Area: 5.15 ha

Authority: Gravesham Borough Council ↗

Contact us with any questions at:
info@groundsure.com ↗
01273 257 755

Certified B Corporation

Summary of findings

Page	Section	Past land use >	On site	0-50m	50-250m	250-500m	500-2000m
15 >	1.1 >	Historical industrial land uses >	0	1	3	8	-
16 >	1.2 >	Historical tanks >	0	0	1	8	-
17 >	1.3 >	Historical energy features >	0	0	2	1	-
17	1.4	Historical petrol stations	0	0	0	0	-
18 >	1.5 >	Historical garages >	0	0	1	0	-
18	1.6	Historical military land	0	0	0	0	-
Page	Section	Past land use - un-grouped >	On site	0-50m	50-250m	250-500m	500-2000m
19 >	2.1 >	Historical industrial land uses >	0	1	3	13	-
20 >	2.2 >	Historical tanks >	0	0	1	17	-
21 >	2.3 >	Historical energy features >	0	0	2	1	-
22	2.4	Historical petrol stations	0	0	0	0	-
22 >	2.5 >	Historical garages >	0	0	2	0	-
Page	Section	Waste and landfill >	On site	0-50m	50-250m	250-500m	500-2000m
23	3.1	Active or recent landfill	0	0	0	0	-
23	3.2	Historical landfill (BGS records)	0	0	0	0	-
24	3.3	Historical landfill (LA/mapping records)	0	0	0	0	-
24	3.4	Historical landfill (EA/NRW records)	0	0	0	0	-
24	3.5	Historical waste sites	0	0	0	0	-
24	3.6	Licensed waste sites	0	0	0	0	-
24 >	3.7 >	Waste exemptions >	0	0	2	103	-
Page	Section	Current industrial land use >	On site	0-50m	50-250m	250-500m	500-2000m
34 >	4.1 >	Recent industrial land uses >	0	0	4	-	-
35	4.2	Current or recent petrol stations	0	0	0	0	-
35	4.3	Electricity cables	0	0	0	0	-
35	4.4	Gas pipelines	0	0	0	0	-
35	4.5	Sites determined as Contaminated Land	0	0	0	0	-

35	4.6	Control of Major Accident Hazards (COMAH)	0	0	0	0	-
36	4.7	Regulated explosive sites	0	0	0	0	-
36	4.8	Hazardous substance storage/usage	0	0	0	0	-
36	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
36	4.10	Licensed industrial activities (Part A(1))	0	0	0	0	-
36	4.11	Licensed pollutant release (Part A(2)/B)	0	0	0	0	-
37	4.12	Radioactive Substance Authorisations	0	0	0	0	-
37	4.13	Licensed Discharges to controlled waters	0	0	0	0	-
37	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
37	4.15	Pollutant release to public sewer	0	0	0	0	-
37	4.16	List 1 Dangerous Substances	0	0	0	0	-
38	4.17	List 2 Dangerous Substances	0	0	0	0	-
38 >	**4.18 >**	**Pollution Incidents (EA/NRW) >**	0	2	1	1	-
39	4.19	Pollution inventory substances	0	0	0	0	-
39	4.20	Pollution inventory waste transfers	0	0	0	0	-
39	4.21	Pollution inventory radioactive waste	0	0	0	0	-

Page	Section	**Hydrogeology >**	On site	0-50m	50-250m	250-500m	500-2000m
40 >	**5.1 >**	**Superficial aquifer >**	Identified (within 500m)				
42 >	**5.2 >**	**Bedrock aquifer >**	Identified (within 500m)				
44 >	**5.3 >**	**Groundwater vulnerability >**	Identified (within 50m)				
45 >	**5.4 >**	**Groundwater vulnerability- soluble rock risk >**	Identified (within 0m)				
46	5.5	Groundwater vulnerability- local information	None (within 0m)				
47 >	**5.6 >**	**Groundwater abstractions >**	0	0	0	0	2
48	5.7	Surface water abstractions	0	0	0	0	0
48 >	**5.8 >**	**Potable abstractions >**	0	0	0	0	2
49 >	**5.9 >**	**Source Protection Zones >**	2	0	0	0	-
49	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-

Page	Section	**Hydrology >**	On site	0-50m	50-250m	250-500m	500-2000m
50	6.1	Water Network (OS MasterMap)	0	0	0	-	-

50	6.2	Surface water features	0	0	0	-	-
51 >	6.3 >	WFD Surface water body catchments >	1	-	-	-	-
51	6.4	WFD Surface water bodies	0	0	0	-	-
51 >	6.5 >	WFD Groundwater bodies >	1	-	-	-	-
Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
53	7.1	Risk of flooding from rivers and the sea	None (within 50m)				
53	7.2	Historical Flood Events	0	0	0	-	-
53	7.3	Flood Defences	0	0	0	-	-
54	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
54	7.5	Flood Storage Areas	0	0	0	-	-
55	7.6	Flood Zone 2	None (within 50m)				
55	7.7	Flood Zone 3	None (within 50m)				
Page	Section	Surface water flooding >					
56 >	8.1 >	Surface water flooding >	1 in 30 year, 0.3m - 1.0m (within 50m)				
Page	Section	Groundwater flooding >					
58 >	9.1 >	Groundwater flooding >	Negligible (within 50m)				
Page	Section	Environmental designations >	On site	0-50m	50-250m	250-500m	500-2000m
59	10.1	Sites of Special Scientific Interest (SSSI)	0	0	0	0	0
60	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
60	10.3	Special Areas of Conservation (SAC)	0	0	0	0	0
60	10.4	Special Protection Areas (SPA)	0	0	0	0	0
60	10.5	National Nature Reserves (NNR)	0	0	0	0	0
61	10.6	Local Nature Reserves (LNR)	0	0	0	0	0
61 >	10.7 >	Designated Ancient Woodland >	0	0	0	2	23
62	10.8	Biosphere Reserves	0	0	0	0	0
62	10.9	Forest Parks	0	0	0	0	0
62	10.10	Marine Conservation Zones	0	0	0	0	0
63 >	10.11 >	Green Belt >	1	0	0	0	2
63	10.12	Proposed Ramsar sites	0	0	0	0	0

63	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
63	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
64	10.15	Nitrate Sensitive Areas	0	0	0	0	0
64 >	**10.16 >**	**Nitrate Vulnerable Zones >**	2	0	0	0	4
65 >	**10.17 >**	**SSSI Impact Risk Zones >**	1	-	-	-	-
66	10.18	SSSI Units	0	0	0	0	0
Page	Section	**Visual and cultural designations >**	On site	0-50m	50-250m	250-500m	500-2000m
67	11.1	World Heritage Sites	0	0	0	-	-
68	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
68	11.3	National Parks	0	0	0	-	-
68 >	**11.4 >**	**Listed Buildings >**	0	0	1	-	-
69	11.5	Conservation Areas	0	0	0	-	-
69	11.6	Scheduled Ancient Monuments	0	0	0	-	-
69	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	**Agricultural designations >**	On site	0-50m	50-250m	250-500m	500-2000m
70 >	**12.1 >**	**Agricultural Land Classification >**	Grade 3 (within 250m)				
71	12.2	Open Access Land	0	0	0	-	-
71	12.3	Tree Felling Licences	0	0	0	-	-
71	12.4	Environmental Stewardship Schemes	0	0	0	-	-
72 >	**12.5 >**	**Countryside Stewardship Schemes >**	1	0	0	-	-
Page	Section	**Habitat designations >**	On site	0-50m	50-250m	250-500m	500-2000m
73 >	**13.1 >**	**Priority Habitat Inventory >**	0	1	1	-	-
74	13.2	Habitat Networks	0	0	0	-	-
74	13.3	Open Mosaic Habitat	0	0	0	-	-
74	13.4	Limestone Pavement Orders	0	0	0	-	-
Page	Section	**Geology 1:10,000 scale >**	On site	0-50m	50-250m	250-500m	500-2000m
75 >	**14.1 >**	**10k Availability >**	Identified (within 500m)				
76	14.2	Artificial and made ground (10k)	0	0	0	0	-
77 >	**14.3 >**	**Superficial geology (10k) >**	0	0	3	1	-

78	14.4	Landslip (10k)	0	0	0	0	-
79 >	14.5 >	Bedrock geology (10k) >	2	1	0	1	-
80	14.6	Bedrock faults and other linear features (10k)	0	0	0	0	-
Page	Section	Geology 1:50,000 scale >	On site	0-50m	50-250m	250-500m	500-2000m
81 >	15.1 >	50k Availability >	Identified (within 500m)				
82	15.2	Artificial and made ground (50k)	0	0	0	0	-
82	15.3	Artificial ground permeability (50k)	0	0	-	-	-
83 >	15.4 >	Superficial geology (50k) >	0	0	1	2	-
84	15.5	Superficial permeability (50k)	None (within 50m)				
84	15.6	Landslip (50k)	0	0	0	0	-
84	15.7	Landslip permeability (50k)	None (within 50m)				
85 >	15.8 >	Bedrock geology (50k) >	2	0	1	1	-
86 >	15.9 >	Bedrock permeability (50k) >	Identified (within 50m)				
86	15.10	Bedrock faults and other linear features (50k)	0	0	0	0	-
Page	Section	Boreholes	On site	0-50m	50-250m	250-500m	500-2000m
87	16.1	BGS Boreholes	0	0	0	-	-
Page	Section	Natural ground subsidence >					
88 >	17.1 >	Shrink swell clays >	Negligible (within 50m)				
89 >	17.2 >	Running sands >	Low (within 50m)				
91 >	17.3 >	Compressible deposits >	Negligible (within 50m)				
92 >	17.4 >	Collapsible deposits >	Very low (within 50m)				
93 >	17.5 >	Landslides >	Very low (within 50m)				
95 >	17.6 >	Ground dissolution of soluble rocks >	Moderate (within 50m)				
Page	Section	Mining and ground workings >	On site	0-50m	50-250m	250-500m	500-2000m
97 >	18.1 >	BritPits >	0	0	1	0	-
98 >	18.2 >	Surface ground workings >	0	1	2	-	-
98	18.3	Underground workings	0	0	0	0	0
98	18.4	Underground mining extents	0	0	0	0	-
99	18.5	Historical Mineral Planning Areas	0	0	0	0	-

99 >	18.6 >	Non-coal mining >	1	0	0	0	1
99	18.7	JPB mining areas	None (within 0m)				
100	18.8	The Coal Authority non-coal mining	0	0	0	0	-
100	18.9	Researched mining	0	0	0	0	-
100	18.10	Mining record office plans	0	0	0	0	-
100	18.11	BGS mine plans	0	0	0	0	-
101	18.12	Coal mining	None (within 0m)				
101	18.13	Brine areas	None (within 0m)				
101	18.14	Gypsum areas	None (within 0m)				
101	18.15	Tin mining	None (within 0m)				
101	18.16	Clay mining	None (within 0m)				
Page	Section	**Ground cavities and sinkholes** >	On site	0-50m	50-250m	250-500m	500-2000m
102 >	19.1 >	Natural cavities >	0	0	1	0	-
103 >	19.2 >	Mining cavities >	0	0	1	1	1
103	19.3	Reported recent incidents	0	0	0	0	-
103	19.4	Historical incidents	0	0	0	0	-
Page	Section	**Radon** >					
104 >	20.1 >	Radon >	Between 1% and 3% (within 0m)				
Page	Section	**Soil chemistry** >	On site	0-50m	50-250m	250-500m	500-2000m
106 >	21.1 >	BGS Estimated Background Soil Chemistry >	3	2	-	-	-
106	21.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
107	21.3	BGS Measured Urban Soil Chemistry	0	0	-	-	-
Page	Section	Railway infrastructure and projects	On site	0-50m	50-250m	250-500m	500-2000m
108	22.1	Underground railways (London)	0	0	0	-	-
108	22.2	Underground railways (Non-London)	0	0	0	-	-
108	22.3	Railway tunnels	0	0	0	-	-
108	22.4	Historical railway and tunnel features	0	0	0	-	-
108	22.5	Royal Mail tunnels	0	0	0	-	-
109	22.6	Historical railways	0	0	0	-	-

109	22.7	Railways	0	0	0	-	-
109	22.8	Crossrail 2	0	0	0	0	-
109	22.9	HS2	0	0	0	0	-

Recent aerial photograph

Capture Date: 31/05/2021

Site Area: 5.15ha

Recent site history - 2018 aerial photograph

Capture Date: 21/10/2018

Site Area: 5.15ha

Recent site history - 2012 aerial photograph

Capture Date: 25/05/2012

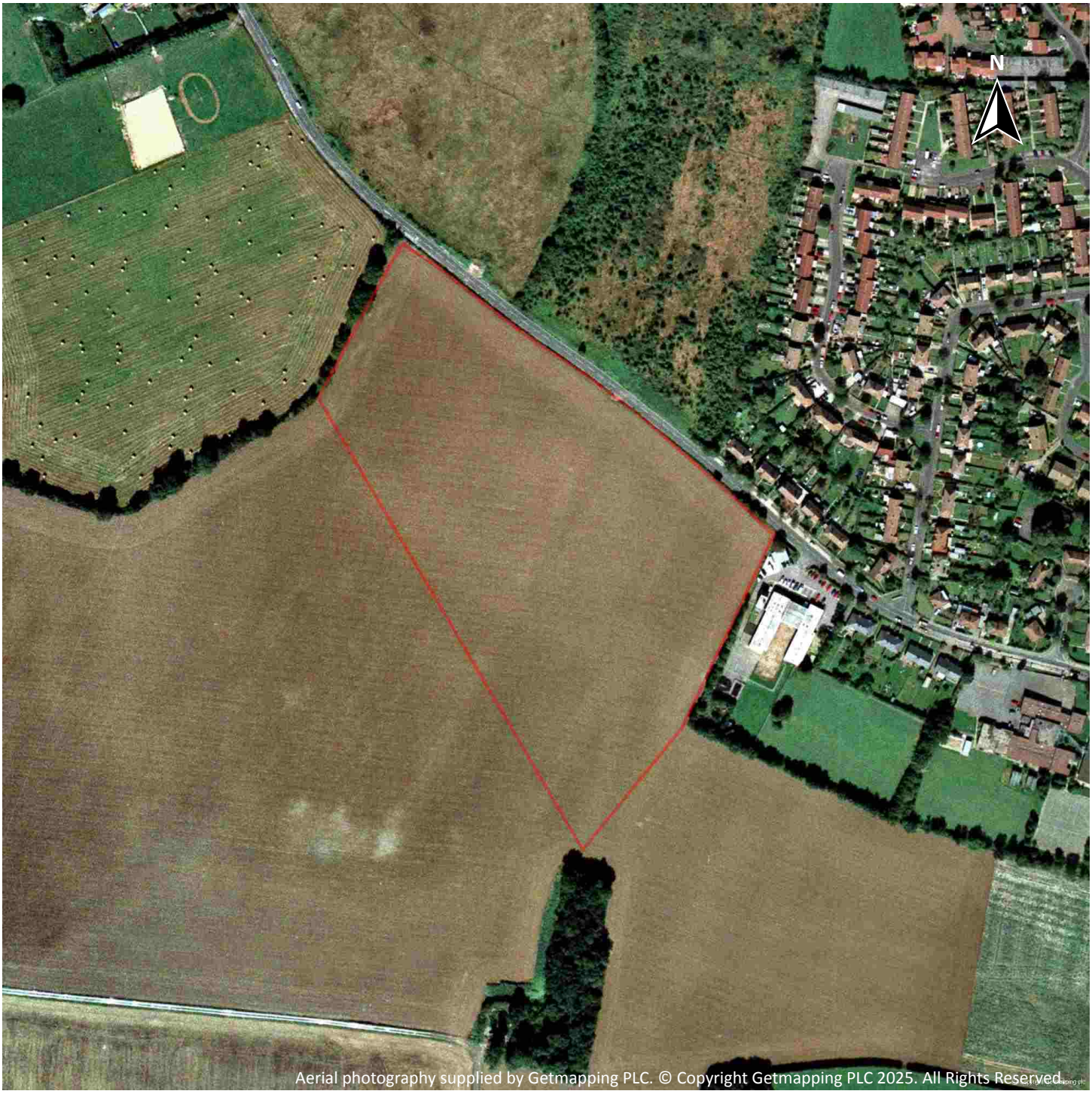
Site Area: 5.15ha

Recent site history - 2009 aerial photograph

Capture Date: 23/08/2009

Site Area: 5.15ha

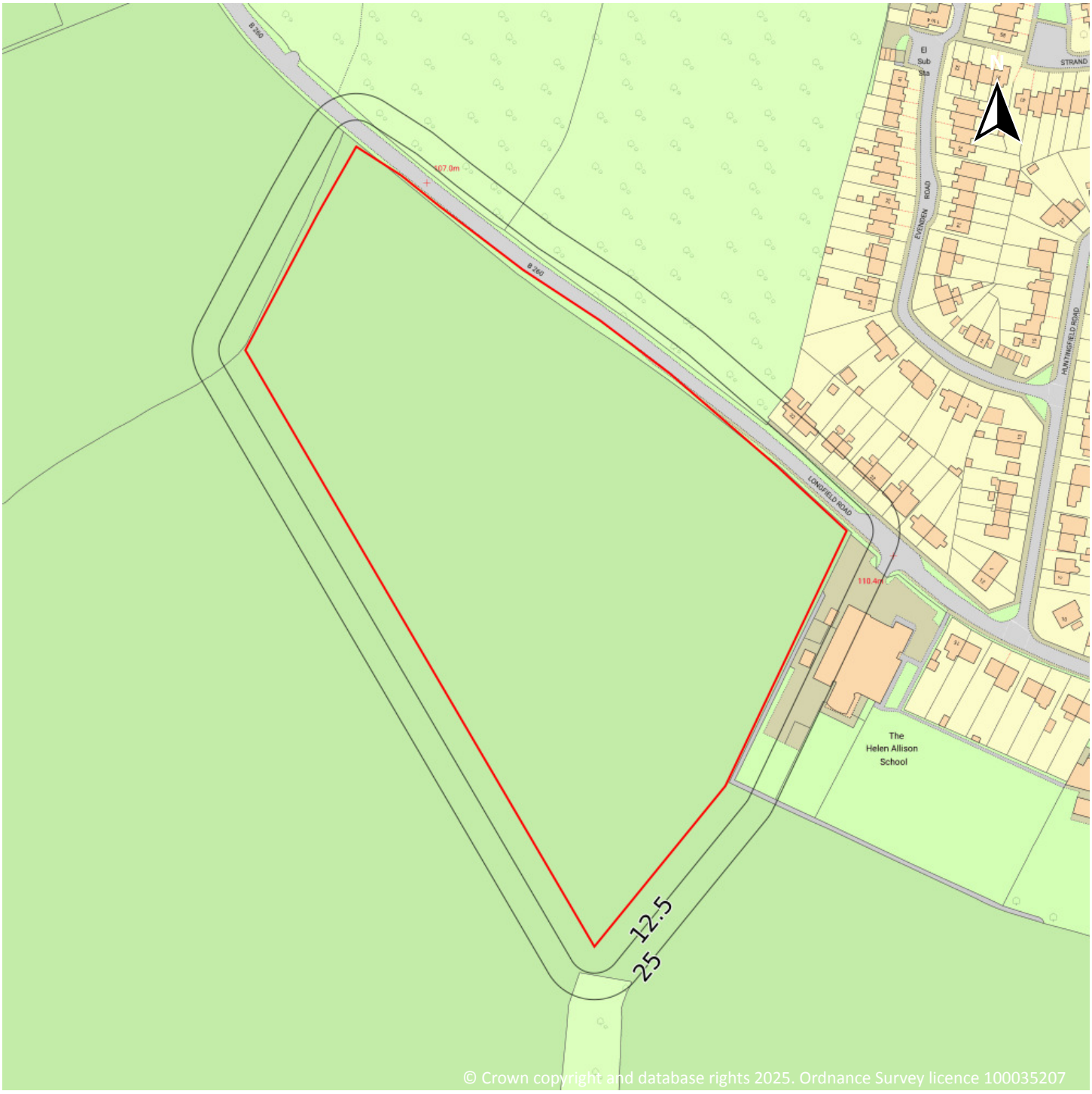
Recent site history - 1999 aerial photograph



Capture Date: 03/09/1999

Site Area: 5.15ha

OS MasterMap site plan



Site Area: 5.15ha

1 Past land use

Site Outline

Search buffers in metres (m)

Historical industrial land uses

Historical tanks

Historical energy features

Historical garages

1.1 Historical industrial land uses

Records within 500m	12

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 1:10,560 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 15 >**

ID	Location	Land use	Dates present	Group ID
A	20m S	Brick Works	1867	2167643

ID	Location	Land use	Dates present	Group ID
A	97m S	Unspecified Kiln	1867	2188721
A	113m S	Clay Pits	1867	2200916
1	128m SW	Unspecified Quarry	1867	2185189
6	262m E	Police Station	1965 - 1973	2243134
8	396m E	Telephone Exchange	1965	2189350
D	459m S	Unspecified Quarry	1955 - 1979	2328356
9	461m SE	Grave Yard	1965	2165819
F	471m NE	Smithy	1895 - 1907	2247914
10	472m SE	Grave Yard	1867	2165818
D	475m S	Lime Kiln	1867	2181783
F	497m NE	Smithy	1867	2181248

This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m	**9**

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 15 >**

ID	Location	Land use	Dates present	Group ID
4	211m N	Unspecified Tank	1896	392593
B	265m NW	Tanks	1979	380783
B	274m NW	Tanks	1960	418656
B	274m NW	Tanks	1979 - 1984	430659
C	436m N	Unspecified Tanks	1939	381015
C	438m N	Tanks	1960 - 1987	415938
E	468m S	Tanks	1908 - 1974	409145

ID	Location	Land use	Dates present	Group ID
E	495m S	Unspecified Tank	1908 - 1974	404170
11	499m N	Unspecified Tank	1939	392613

This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m	**3**

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 15 >**

ID	Location	Land use	Dates present	Group ID
2	145m SE	Electricity Transformer	1974	276976
3	182m NE	Electricity Transformer	1974	276978
7	356m E	Electricity Transformer	1974	276975

This data is sourced from Ordnance Survey / Groundsure.

1.4 Historical petrol stations

Records within 500m	**0**

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

1.5 Historical garages

Records within 500m	1

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 15 >**

ID	Location	Land use	Dates present	Group ID
5	228m E	Garage	1962 - 1974	82666

This data is sourced from Ordnance Survey / Groundsure.

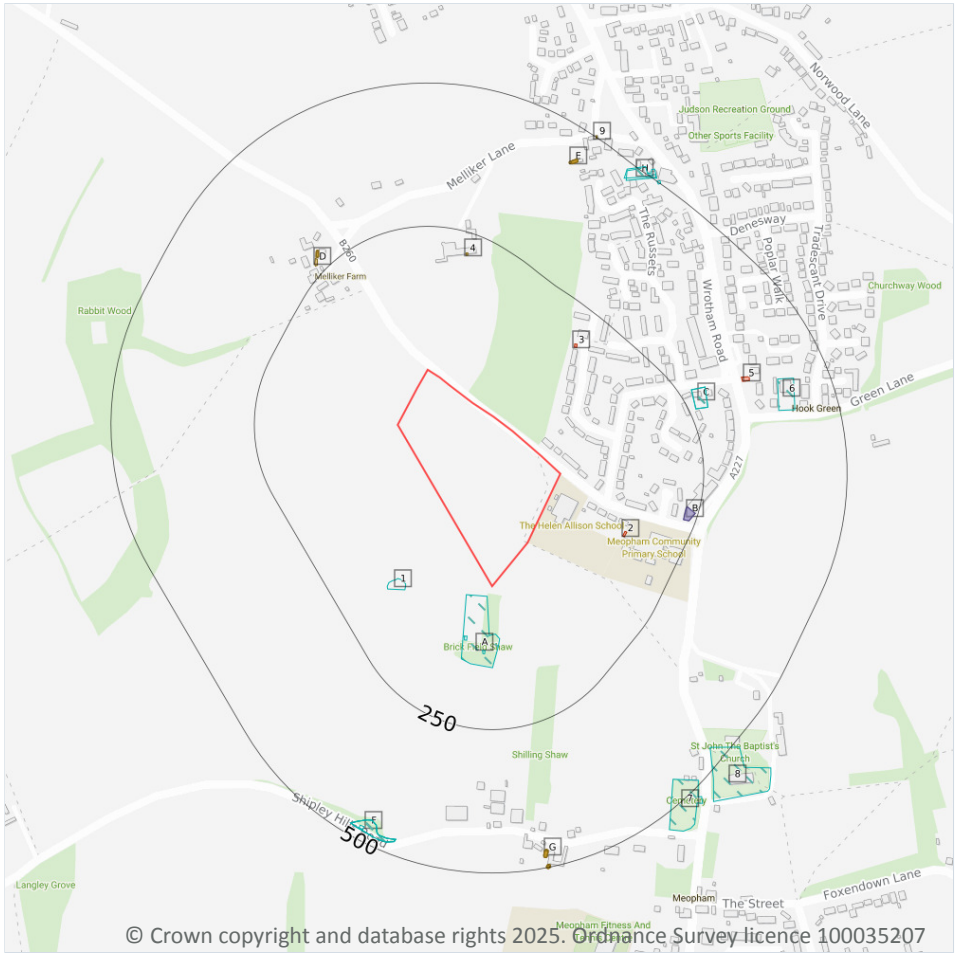
1.6 Historical military land

Records within 500m	0

Areas of military land digitised from multiple sources including the National Archives, local records, MOD records and verified other sources, intelligently grouped into contiguous features.

This data is sourced from Ordnance Survey / Groundsure / other sources.

2 Past land use - un-grouped



2.1 Historical industrial land uses

Records within 500m	17

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 10,560 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 19 >**

ID	Location	Land Use	Date	Group ID
A	20m S	Brick Works	1867	2167643
A	97m S	Unspecified Kiln	1867	2188721
A	113m S	Clay Pits	1867	2200916

ID	Location	Land Use	Date	Group ID
1	128m SW	Unspecified Quarry	1867	2185189
C	262m E	Police Station	1973	2243134
C	262m E	Police Station	1965	2243134
6	396m E	Telephone Exchange	1965	2189350
F	459m S	Unspecified Quarry	1979	2328356
F	459m S	Unspecified Quarry	1973	2328356
F	459m S	Unspecified Quarry	1965	2328356
F	459m S	Unspecified Quarry	1955	2328356
7	461m SE	Grave Yard	1965	2165819
H	471m NE	Smithy	1895	2247914
8	472m SE	Grave Yard	1867	2165818
H	472m NE	Smithy	1907	2247914
F	475m S	Lime Kiln	1867	2181783
H	497m NE	Smithy	1867	2181248

This data is sourced from Ordnance Survey / Groundsure.

2.2 Historical tanks

Records within 500m	**18**

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 19 >**

ID	Location	Land Use	Date	Group ID
4	211m N	Unspecified Tank	1896	392593
D	265m NW	Tanks	1979	380783
D	274m NW	Tanks	1960	418656
D	274m NW	Tanks	1979	430659
D	274m NW	Tanks	1984	430659
E	436m N	Unspecified Tanks	1939	381015

ID	Location	Land Use	Date	Group ID
E	438m N	Tanks	1987	415938
E	439m N	Tanks	1960	415938
E	439m N	Tanks	1975	415938
G	468m S	Tanks	1962	409145
G	468m S	Tanks	1974	409145
G	470m S	Tanks	1908	409145
G	470m S	Tanks	1936	409145
G	495m S	Unspecified Tank	1962	404170
G	495m S	Unspecified Tank	1974	404170
G	496m S	Unspecified Tank	1908	404170
G	496m S	Unspecified Tank	1936	404170
9	499m N	Unspecified Tank	1939	392613

This data is sourced from Ordnance Survey / Groundsure.

2.3 Historical energy features

Records within 500m	**3**

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 19 >**

ID	Location	Land Use	Date	Group ID
2	145m SE	Electricity Transformer	1974	276976
3	182m NE	Electricity Transformer	1974	276978
5	356m E	Electricity Transformer	1974	276975

This data is sourced from Ordnance Survey / Groundsure.

2.4 Historical petrol stations

Records within 500m	0

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

2.5 Historical garages

Records within 500m	2

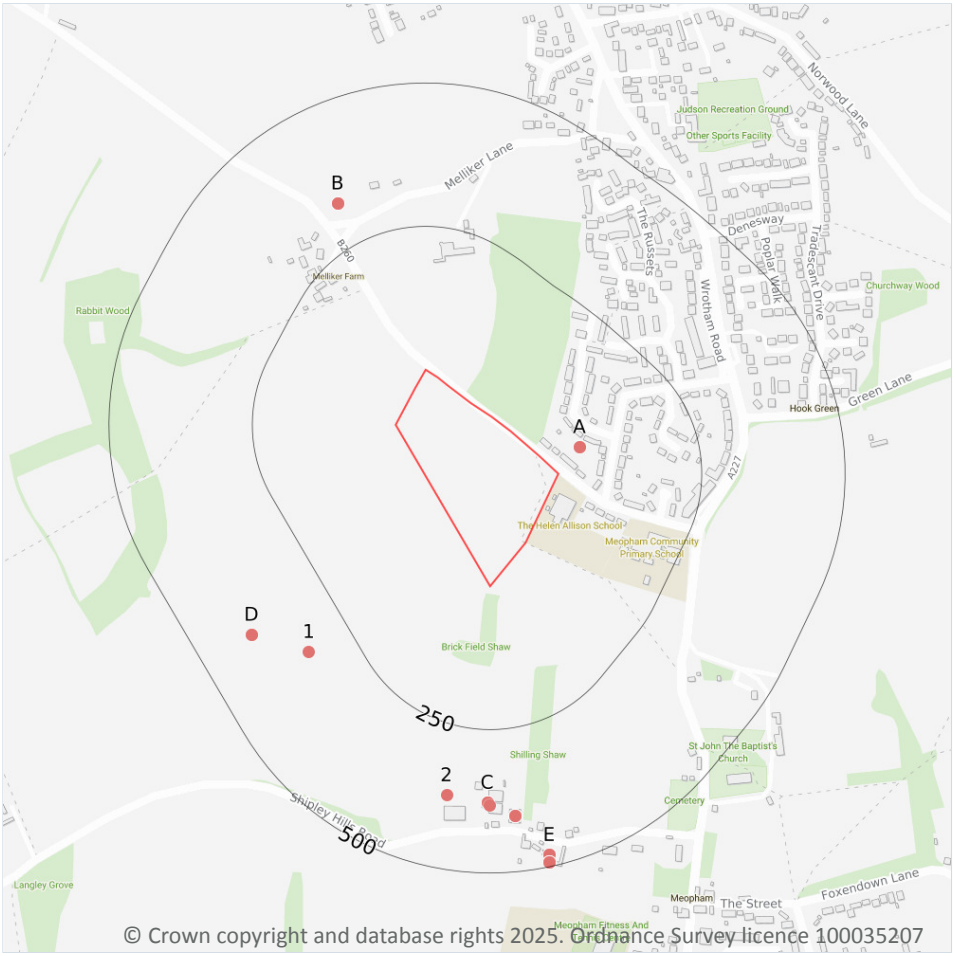
Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 19 >**

ID	Location	Land Use	Date	Group ID
B	228m E	Garage	1962	82666
B	228m E	Garage	1974	82666

This data is sourced from Ordnance Survey / Groundsure.

3 Waste and landfill



Site Outline

Search buffers in metres (m)

Waste exemptions

3.1 Active or recent landfill

Records within 500m	0

Active or recently closed landfill sites under Environment Agency/Natural Resources Wales regulation.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.2 Historical landfill (BGS records)

Records within 500m	0

Landfill sites identified on a survey carried out on behalf of the DoE in 1973. These sites may have been closed or operational at this time.

This data is sourced from the British Geological Survey.

3.3 Historical landfill (LA/mapping records)

Records within 500m	0

Landfill sites identified from Local Authority records and high detail historical mapping.

This data is sourced from the Ordnance Survey/Groundsure and Local Authority records.

3.4 Historical landfill (EA/NRW records)

Records within 500m	0

Known historical (closed) landfill sites (e.g. sites where there is no PPC permit or waste management licence currently in force). This includes sites that existed before the waste licensing regime and sites that have been licensed in the past but where a licence has been revoked, ceased to exist or surrendered and a certificate of completion has been issued.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.5 Historical waste sites

Records within 500m	0

Waste site records derived from Local Authority planning records and high detail historical mapping.

This data is sourced from Ordnance Survey/Groundsure and Local Authority records.

3.6 Licensed waste sites

Records within 500m	0

Active or recently closed waste sites under Environment Agency/Natural Resources Wales regulation.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.7 Waste exemptions

Records within 500m	105

Activities involving the storage, treatment, use or disposal of waste that are exempt from needing a permit. Exemptions have specific limits and conditions that must be adhered to.

Features are displayed on the Waste and landfill map on **page 23 >**

ID	Location	Site	Reference	Category	Sub-Category	Description
A	59m E	-	WEX411487	Disposing of waste exemption	Not on a farm	Burning waste in the open

ID	Location	Site	Reference	Category	Sub-Category	Description
A	59m E	-	WEX282173	Disposing of waste exemption	Not on a farm	Burning waste in the open
B	328m NW	Three Ways, Melliker Lane, Meopham, Gravesend, Da13 0hy	WEX320527	Treating waste exemption	On a farm	Aerobic composting and associated prior treatment
B	328m NW	Three Ways, Melliker Lane, Meopham, Gravesend, Da13 0hy	WEX320527	Treating waste exemption	On a farm	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising
B	328m NW	Three Ways, Melliker Lane, Meopham, Gravesend, Da13 0hy	WEX320527	Using waste exemption	On a farm	Incorporation of ash into soil
B	328m NW	Three Ways, Melliker Lane, Meopham, Gravesend, Da13 0hy	WEX320527	Disposing of waste exemption	On a farm	Burning waste in the open
B	328m NW	Three Ways, Melliker Lane, Meopham, Gravesend, Da13 0hy	WEX320527	Disposing of waste exemption	On a farm	Deposit of agricultural waste consisting of plant tissue under a Plant Health notice
B	328m NW	Three Ways, Melliker Lane, Meopham, Gravesend, Da13 0hy	WEX320527	Using waste exemption	On a farm	Spreading waste on agricultural land to confer benefit
B	328m NW	Three Ways, Melliker Lane, Meopham, Gravesend, Da13 0hy	WEX183173	Using waste exemption	On a farm	Incorporation of ash into soil
B	328m NW	Three Ways, Melliker Lane, Meopham, Gravesend, Da13 0hy	WEX183173	Treating waste exemption	On a farm	Aerobic composting and associated prior treatment
B	328m NW	Three Ways, Melliker Lane, Meopham, Gravesend, Da13 0hy	WEX183173	Treating waste exemption	On a farm	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising
B	328m NW	Three Ways, Melliker Lane, Meopham, Gravesend, Da13 0hy	WEX183173	Disposing of waste exemption	On a farm	Deposit of agricultural waste consisting of plant tissue under a Plant Health notice
B	328m NW	Three Ways, Melliker Lane, Meopham, Gravesend, Da13 0hy	WEX183173	Using waste exemption	On a farm	Spreading waste on agricultural land to confer benefit
B	328m NW	Three Ways, Melliker Lane, Meopham, Gravesend, Da13 0hy	WEX183173	Disposing of waste exemption	On a farm	Burning waste in the open

ID	Location	Site	Reference	Category	Sub-Category	Description
B	328m NW	Three Ways Melliker Lane Gravesend Kent Da13 0hy	EPR/ME5986PS/A001	Treating waste exemption	Agricultural waste only	Aerobic composting and associated prior treatment
B	328m NW	Three Ways Melliker Lane Gravesend Kent Da13 0hy	EPR/ME5986PS/A001	Treating waste exemption	Agricultural waste only	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising
B	328m NW	Three Ways Melliker Lane Gravesend Kent Da13 0hy	EPR/ME5986PS/A001	Using waste exemption	Agricultural waste only	Incorporation of ash into soil
B	328m NW	Three Ways, Melliker Lane, Meopham, Gravesend, Da13 0hy	WEX025037	Disposing of waste exemption	On a farm	Deposit of agricultural waste consisting of plant tissue under a Plant Health notice
B	328m NW	Three Ways, Melliker Lane, Meopham, Gravesend, Da13 0hy	WEX025037	Disposing of waste exemption	On a farm	Burning waste in the open
B	328m NW	Three Ways, Melliker Lane, Meopham, Gravesend, Da13 0hy	WEX025037	Using waste exemption	On a farm	Spreading waste on agricultural land to confer benefit
B	328m NW	Three Ways, Melliker Lane, Meopham, Gravesend, Da13 0hy	WEX025037	Treating waste exemption	On a farm	Aerobic composting and associated prior treatment
B	328m NW	Three Ways, Melliker Lane, Meopham, Gravesend, Da13 0hy	WEX025037	Treating waste exemption	On a farm	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising
B	328m NW	Three Ways, Melliker Lane, Meopham, Gravesend, Da13 0hy	WEX025037	Using waste exemption	On a farm	Incorporation of ash into soil
B	328m NW	Three Ways Melliker Lane Gravesend Kent Da13 0hy	EPR/ME5986PS/A001	Disposing of waste exemption	Agricultural waste only	Deposit of agricultural waste consisting of plant tissue under a Plant Health notice
B	328m NW	Three Ways Melliker Lane Gravesend Kent Da13 0hy	EPR/ME5986PS/A001	Disposing of waste exemption	Agricultural waste only	Burning waste in the open
B	328m NW	Three Ways Melliker Lane Gravesend Kent Da13 0hy	EPR/ME5986PS/A001	Using waste exemption	Agricultural waste only	Spreading waste on agricultural land to confer benefit
1	331m SW	-	WEX292290	Storing waste exemption	On a farm	Storage of sludge
2	373m S	Clements Reach Farm Shipley Hills Road Gravesend Kent Da13 0ad	EPR/HE5783WA/A001	Storing waste exemption	Non-agricultural waste only	Storage of sludge

ID	Location	Site	Reference	Category	Sub-Category	Description
C	378m S	Clements Reach Farm Shipley Hills Road Gravesend Kent Da13 0ad	EPR/CH0978KE/A001	Disposing of waste exemption	Agricultural waste only	Deposit of waste from dredging of inland waters
C	378m S	Clements Reach Farm Shipley Hills Road Gravesend Kent Da13 0ad	EPR/CH0978KE/A001	Storing waste exemption	Agricultural waste only	Storage of waste in secure containers
C	378m S	Clements Reach Farm Shipley Hills Road Gravesend Kent Da13 0ad	EPR/CH0978KE/A001	Storing waste exemption	Agricultural waste only	Storage of waste in a secure place
C	378m S	Clements Reach Farm Shipley Hills Road Gravesend Kent Da13 0ad	EPR/CH0978KE/A001	Treating waste exemption	Agricultural waste only	Cleaning, washing, spraying or coating relevant waste
C	378m S	Clements Reach Farm Shipley Hills Road Gravesend Kent Da13 0ad	EPR/CH0978KE/A001	Treating waste exemption	Agricultural waste only	Preparatory treatments (baling, sorting, shredding etc)
C	378m S	Clements Reach Farm Shipley Hills Road Gravesend Kent Da13 0ad	EPR/CH0978KE/A001	Treating waste exemption	Agricultural waste only	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising
C	378m S	Clements Reach Farm Shipley Hills Road Gravesend Kent Da13 0ad	EPR/CH0978KE/A001	Using waste exemption	Agricultural waste only	Use of waste in construction
C	378m S	Clements Reach Farm Shipley Hills Road Gravesend Kent Da13 0ad	EPR/CH0978KE/A001	Using waste exemption	Agricultural waste only	Spreading of plant matter to confer benefit
C	378m S	Clements Reach Farm Shipley Hills Road Gravesend Kent Da13 0ad	EPR/CH0978KE/A001	Using waste exemption	Agricultural waste only	Use of waste for a specified purpose
C	378m S	Clements Reach Farm Shipley Hills Road Gravesend Kent Da13 0ad	EPR/CH0978KE/A001	Disposing of waste exemption	Agricultural waste only	Deposit of agricultural waste consisting of plant tissue under a Plant Health notice
C	378m S	Clements Reach Farm Shipley Hills Road Gravesend Kent Da13 0ad	EPR/CH0978KE/A001	Disposing of waste exemption	Agricultural waste only	Burning waste in the open
C	378m S	Clements Reach Farm Shipley Hills Road Gravesend Kent Da13 0ad	EPR/CH0978KE/A001	Using waste exemption	Agricultural waste only	Spreading waste on agricultural land to confer benefit
C	384m S	-	WEX395408	Using waste exemption	On a farm	Use of waste in construction
D	402m SW	-	WEX080440	Storing waste exemption	On a farm	Storage of sludge

ID	Location	Site	Reference	Category	Sub-Category	Description
D	402m SW	-	WEX227460	Storing waste exemption	On a farm	Storage of sludge
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX309929	Storing waste exemption	On a farm	Storage of sludge
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX309929	Storing waste exemption	On a farm	Storage of waste in a secure place
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX309929	Storing waste exemption	On a farm	Storage of waste in secure containers
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX309929	Disposing of waste exemption	On a farm	Deposit of waste from dredging of inland waters
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX309929	Treating waste exemption	On a farm	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX309929	Treating waste exemption	On a farm	Preparatory treatments (baling, sorting, shredding etc)
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX309929	Treating waste exemption	On a farm	Cleaning, washing, spraying or coating relevant waste
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX309929	Using waste exemption	On a farm	Spreading of plant matter to confer benefit
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX309929	Using waste exemption	On a farm	Use of waste for a specified purpose
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX309929	Using waste exemption	On a farm	Use of waste in construction

ID	Location	Site	Reference	Category	Sub-Category	Description
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX309929	Disposing of waste exemption	On a farm	Burning waste in the open
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX309929	Disposing of waste exemption	On a farm	Deposit of agricultural waste consisting of plant tissue under a Plant Health notice
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX309929	Treating waste exemption	On a farm	Recovery of scrap metal
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX309929	Using waste exemption	On a farm	Use of mulch
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX309929	Using waste exemption	On a farm	Spreading waste on agricultural land to confer benefit
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX179235	Treating waste exemption	On a farm	Cleaning, washing, spraying or coating relevant waste
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX179235	Using waste exemption	On a farm	Use of waste in construction
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX179235	Using waste exemption	On a farm	Spreading of plant matter to confer benefit
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX179235	Storing waste exemption	On a farm	Storage of waste in a secure place
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX179235	Using waste exemption	On a farm	Use of waste for a specified purpose

ID	Location	Site	Reference	Category	Sub-Category	Description
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX179235	Treating waste exemption	On a farm	Preparatory treatments (baling, sorting, shredding etc)
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX179235	Treating waste exemption	On a farm	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX179235	Storing waste exemption	On a farm	Storage of waste in secure containers
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX179235	Disposing of waste exemption	On a farm	Deposit of waste from dredging of inland waters
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX179235	Storing waste exemption	On a farm	Storage of sludge
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX179235	Using waste exemption	On a farm	Spreading waste on agricultural land to confer benefit
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX179235	Treating waste exemption	On a farm	Recovery of scrap metal
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX179235	Disposing of waste exemption	On a farm	Burning waste in the open
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX179235	Using waste exemption	On a farm	Use of mulch
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX179235	Disposing of waste exemption	On a farm	Deposit of agricultural waste consisting of plant tissue under a Plant Health notice

ID	Location	Site	Reference	Category	Sub-Category	Description
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX017990	Disposing of waste exemption	On a farm	Deposit of waste from dredging of inland waters
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX017990	Using waste exemption	On a farm	Use of waste for a specified purpose
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX017990	Storing waste exemption	On a farm	Storage of waste in secure containers
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX017990	Storing waste exemption	On a farm	Storage of waste in a secure place
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX017990	Treating waste exemption	On a farm	Cleaning, washing, spraying or coating relevant waste
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX017990	Treating waste exemption	On a farm	Preparatory treatments (baling, sorting, shredding etc)
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX017990	Treating waste exemption	On a farm	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX017990	Using waste exemption	On a farm	Use of waste in construction
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX017990	Using waste exemption	On a farm	Spreading of plant matter to confer benefit
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX017990	Disposing of waste exemption	On a farm	Deposit of agricultural waste consisting of plant tissue under a Plant Health notice

ID	Location	Site	Reference	Category	Sub-Category	Description
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX017990	Disposing of waste exemption	On a farm	Burning waste in the open
C	404m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX017990	Using waste exemption	On a farm	Spreading waste on agricultural land to confer benefit
E	480m S	Clements Reach, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX311615	Treating waste exemption	On a farm	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising
E	480m S	Clements Reach, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX311615	Using waste exemption	On a farm	Use of waste in construction
E	480m S	Clements Reach, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX311615	Using waste exemption	On a farm	Spreading waste on agricultural land to confer benefit
E	480m S	Clements Reach, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX311615	Disposing of waste exemption	On a farm	Depositing samples of waste for the purposes of testing or analysing them
E	480m S	Clements Reach, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX311615	Disposing of waste exemption	On a farm	Burning waste in the open
E	480m S	Clements Reach, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX180489	Treating waste exemption	On a farm	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising
E	480m S	Clements Reach, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX180489	Using waste exemption	On a farm	Use of waste in construction
E	480m S	Clements Reach, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX180489	Disposing of waste exemption	On a farm	Burning waste in the open
E	480m S	Clements Reach, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX180489	Using waste exemption	On a farm	Spreading waste on agricultural land to confer benefit
E	480m S	Clements Reach, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX180489	Disposing of waste exemption	On a farm	Deposit of agricultural waste consisting of plant tissue under a Plant Health notice

ID	Location	Site	Reference	Category	Sub-Category	Description
E	494m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX021618	Disposing of waste exemption	On a farm	Deposit of agricultural waste consisting of plant tissue under a Plant Health notice
E	494m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX021618	Disposing of waste exemption	On a farm	Burning waste in the open
E	494m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX021618	Using waste exemption	On a farm	Spreading waste on agricultural land to confer benefit
E	494m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX021618	Treating waste exemption	On a farm	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising
E	494m S	Clements Reach Farm, Shipley Hills Road, Meopham, Gravesend, Da13 0ad	WEX021618	Using waste exemption	On a farm	Use of waste in construction
E	494m S	Clements Reach Farm Shipley Hills Road Gravesend Kent Da13 0ad	EPR/DE5487PT/A001	Treating waste exemption	Agricultural waste only	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising
E	494m S	Clements Reach Farm Shipley Hills Road Gravesend Kent Da13 0ad	EPR/DE5487PT/A001	Using waste exemption	Both agricultural and non-agricultural waste	Use of waste in construction
E	494m S	Clements Reach Farm Shipley Hills Road Gravesend Kent Da13 0ad	EPR/DE5487PT/A001	Disposing of waste exemption	Agricultural waste only	Deposit of agricultural waste consisting of plant tissue under a Plant Health notice
E	494m S	Clements Reach Farm Shipley Hills Road Gravesend Kent Da13 0ad	EPR/DE5487PT/A001	Disposing of waste exemption	Agricultural waste only	Burning waste in the open
E	494m S	Clements Reach Farm Shipley Hills Road Gravesend Kent Da13 0ad	EPR/DE5487PT/A001	Using waste exemption	Both agricultural and non-agricultural waste	Spreading waste on agricultural land to confer benefit

This data is sourced from the Environment Agency and Natural Resources Wales.

4 Current industrial land use

4.1 Recent industrial land uses

Records within 250m	4

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 34 >**

ID	Location	Company	Address	Activity	Category
2	154m E	Electricity Sub Station	Kent, DA13	Electrical Features	Infrastructure and Facilities
3	186m NE	Electricity Sub Station	Kent, DA13	Electrical Features	Infrastructure and Facilities
B	233m E	Street Lights	Watmough House the Parade, Wrotham Road, Meopham, Gravesend, Kent, DA13 0JL	Construction Completion Services	Construction Services

ID	Location	Company	Address	Activity	Category
B	240m E	Big M Motor Spares	1 The Parade, Wrotham Road, Meopham, Gravesend, Kent, DA13 0JL	Vehicle Repair, Testing and Servicing	Repair and Servicing

This data is sourced from Ordnance Survey.

4.2 Current or recent petrol stations

Records within 500m	0

Open, closed, under development and obsolete petrol stations.

This data is sourced from Experian.

4.3 Electricity cables

Records within 500m	0

High voltage underground electricity transmission cables.

This data is sourced from National Grid.

4.4 Gas pipelines

Records within 500m	0

High pressure underground gas transmission pipelines.

This data is sourced from National Grid.

4.5 Sites determined as Contaminated Land

Records within 500m	0

Contaminated Land Register of sites designated under Part 2a of the Environmental Protection Act 1990.

This data is sourced from Local Authority records.

4.6 Control of Major Accident Hazards (COMAH)

Records within 500m	0

Control of Major Accident Hazards (COMAH) sites. This data includes upper and lower tier sites, and includes a historical archive of COMAH sites and Notification of Installations Handling Hazardous Substances (NIHHS) records.

This data is sourced from the Health and Safety Executive.

4.7 Regulated explosive sites

Records within 500m	0

Sites registered and licensed by the Health and Safety Executive under the Manufacture and Storage of Explosives Regulations 2005 (MSER). The last update to this data was in April 2011.

This data is sourced from the Health and Safety Executive.

4.8 Hazardous substance storage/usage

Records within 500m	0

Consents granted for a site to hold certain quantities of hazardous substances at or above defined limits in accordance with the Planning (Hazardous Substances) Regulations 2015.

This data is sourced from Local Authority records.

4.9 Historical licensed industrial activities (IPC)

Records within 500m	0

Integrated Pollution Control (IPC) records of substance releases to air, land and water. This data represents a historical archive as the IPC regime has been superseded.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.10 Licensed industrial activities (Part A(1))

Records within 500m	0

Records of Part A(1) installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.11 Licensed pollutant release (Part A(2)/B)

Records within 500m	0

Records of Part A(2) and Part B installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

This data is sourced from Local Authority records.

4.12 Radioactive Substance Authorisations

Records within 500m	0

Records of the storage, use, accumulation and disposal of radioactive substances regulated under the Radioactive Substances Act 1993.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.13 Licensed Discharges to controlled waters

Records within 500m	0

Discharges of treated or untreated effluent to controlled waters under the Water Resources Act 1991.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.14 Pollutant release to surface waters (Red List)

Records within 500m	0

Discharges of specified substances under the Environmental Protection (Prescribed Processes and Substances) Regulations 1991.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.15 Pollutant release to public sewer

Records within 500m	0

Discharges of Special Category Effluents to the public sewer.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.16 List 1 Dangerous Substances

Records within 500m	0

Discharges of substances identified on List I of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.17 List 2 Dangerous Substances

Records within 500m	0

Discharges of substances identified on List II of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.18 Pollution Incidents (EA/NRW)

Records within 500m	4

Records of substantiated pollution incidents. Since 2006 this data has only included category 1 (major) and 2 (significant) pollution incidents.

Features are displayed on the Current industrial land use map on **page 34 >**

ID	Location	Details	
A	32m E	Incident Date: 10/09/2002 Incident Identification: 106726 Pollutant: Atmospheric Pollutants and Effects Pollutant Description: Effects on Humans	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 3 (Minor)
A	32m E	Incident Date: 10/09/2002 Incident Identification: 106726 Pollutant: Atmospheric Pollutants and Effects Pollutant Description: Effects on Humans	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 3 (Minor)
1	98m S	Incident Date: 24/05/2002 Incident Identification: 80985 Pollutant: Atmospheric Pollutants and Effects Pollutant Description: Other Atmospheric Pollutant or Effect	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 2 (Significant)
4	445m SE	Incident Date: 31/10/2001 Incident Identification: 40269 Pollutant: Inert Materials and Wastes Pollutant Description: Construction and Demolition Materials and Wastes	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)

This data is sourced from the Environment Agency and Natural Resources Wales.

4.19 Pollution inventory substances

Records within 500m	0

The pollution inventory (substances) includes reporting on annual emissions of certain regulated substances to air, controlled waters and land. A reporting threshold for each substance is also included. Where emissions fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

4.20 Pollution inventory waste transfers

Records within 500m	0

The pollution inventory (waste transfers) includes reporting on annual transfers and recovery/disposal of controlled wastes from a site. A reporting threshold for each waste type is also included. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

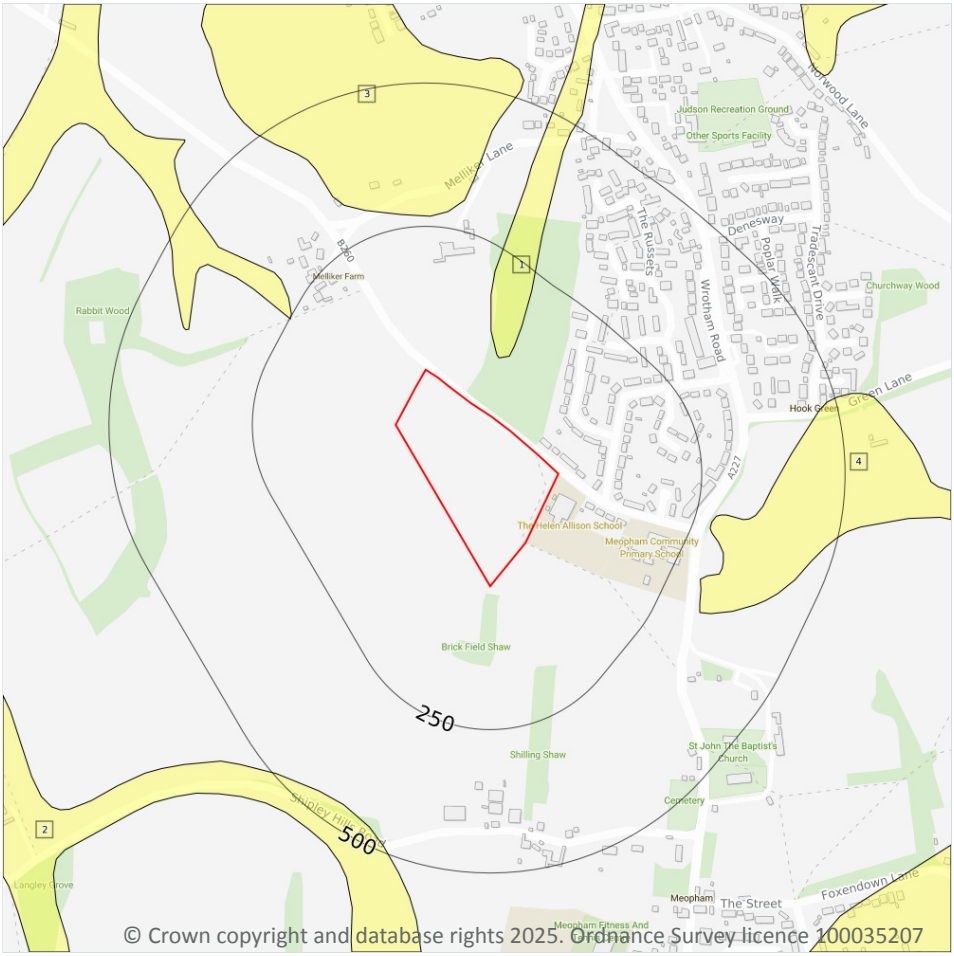
4.21 Pollution inventory radioactive waste

Records within 500m	0

The pollution inventory (radioactive wastes) includes reporting on annual releases of radioactive substances from a site, including the means of release. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

5 Hydrogeology - Superficial aquifer



5.1 Superficial aquifer

Records within 500m	4

Aquifer status of groundwater held within superficial geology.

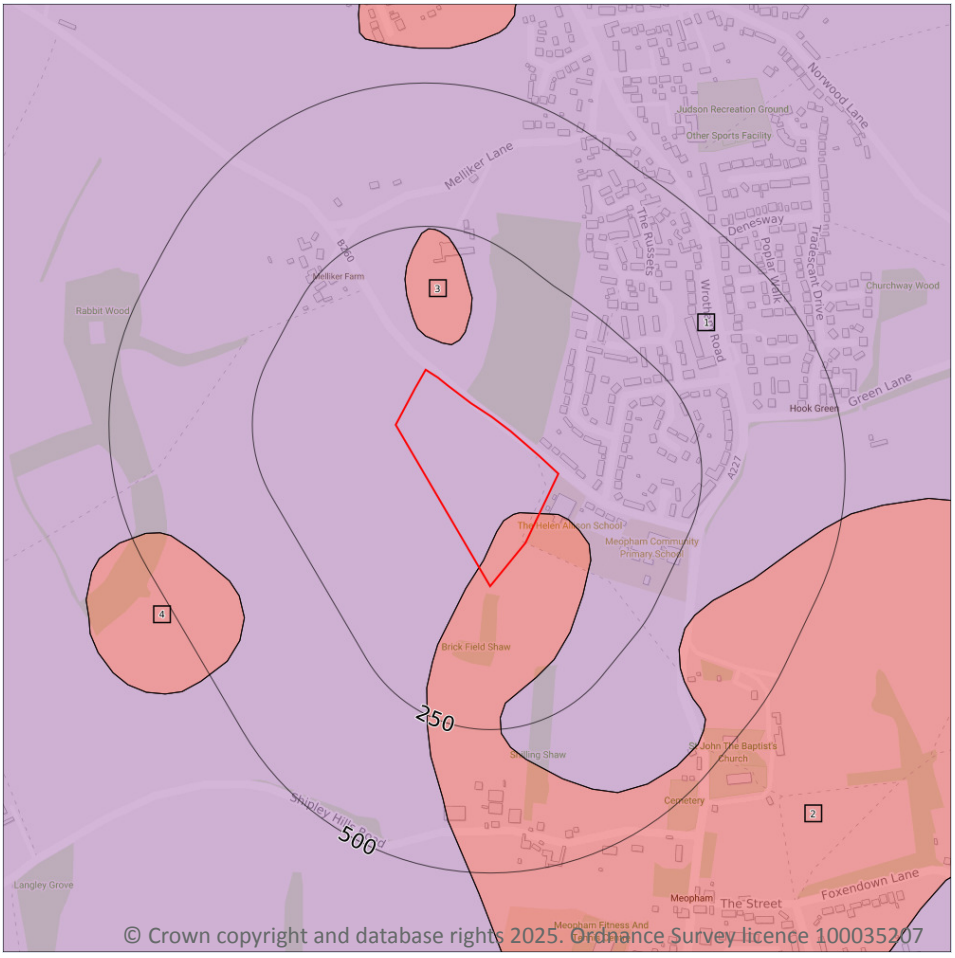
Features are displayed on the Hydrogeology map on **page 40 >**

ID	Location	Designation	Description
1	93m N	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
2	249m NW	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type

ID	Location	Designation	Description
3	268m N	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
4	281m E	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

Bedrock aquifer



5.2 Bedrock aquifer

Records within 500m	4

Aquifer status of groundwater held within bedrock geology.

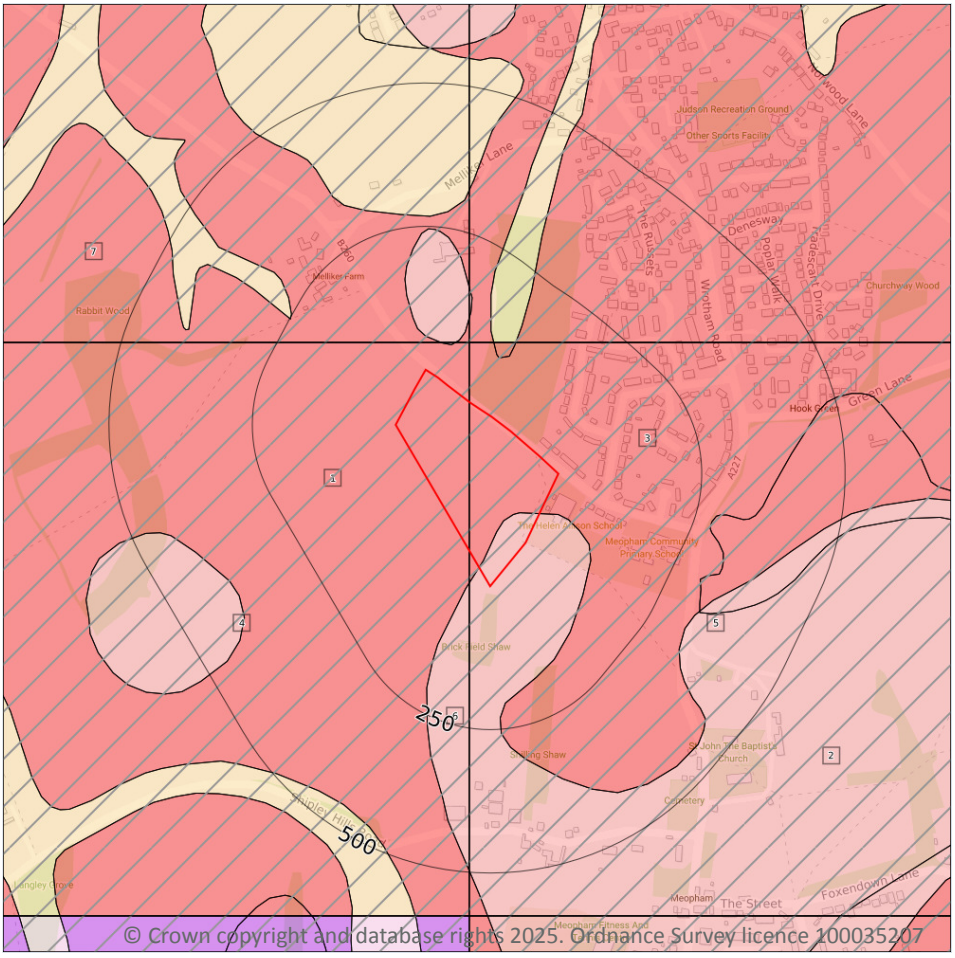
Features are displayed on the Bedrock aquifer map on **page 42 >**

ID	Location	Designation	Description
1	On site	Principal	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers
2	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

ID	Location	Designation	Description
3	54m N	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
4	386m SW	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

Groundwater vulnerability



Site Outline

Search buffers in metres (m)

Superficial vulnerability

- Principal superficial aquifer, high vulnerability
- Secondary superficial aquifer, high vulnerability
- Principal superficial aquifer, medium vulnerability
- Secondary superficial aquifer, medium vulnerability
- Principal superficial aquifer, low vulnerability
- Secondary superficial aquifer, low vulnerability

Bedrock vulnerability

- Principal bedrock aquifer, high vulnerability
- Secondary bedrock aquifer, high vulnerability
- Principal bedrock aquifer, medium vulnerability
- Secondary bedrock aquifer, medium vulnerability
- Principal bedrock aquifer, low vulnerability
- Secondary bedrock aquifer, low vulnerability

Other information

- Unproductive aquifer
- Soluble rock risk
- Local information

5.3 Groundwater vulnerability

Records within 50m	5

An assessment of the vulnerability of groundwater to a pollutant discharged at ground level based on the hydrological, geological, hydrogeological and soil properties within a one kilometre square grid. Groundwater vulnerability is described as High, Medium or Low as follows:

- High - Areas able to easily transmit pollution to groundwater. They are likely to be characterised by high leaching soils and the absence of low permeability superficial deposits.
- Medium - Intermediate between high and low vulnerability.
- Low - Areas that provide the greatest protection from pollution. They are likely to be characterised by low leaching soils and/or the presence of superficial deposits characterised by a low permeability.

Features are displayed on the Groundwater vulnerability map on **page 44 >**

ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	**On site**	**Summary Classification: Principal bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer**	**Leaching class: High Infiltration value: >70% Dilution value: <300mm/year**	**Vulnerability: - Aquifer type: - Thickness: <3m Patchiness value: <90% Recharge potential: No Data**	**Vulnerability: High Aquifer type: Principal Flow mechanism: Well connected fractures**
2	**On site**	**Summary Classification: Secondary bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer**	**Leaching class: Intermediate Infiltration value: 40-70% Dilution value: <300mm/year**	**Vulnerability: - Aquifer type: - Thickness: <3m Patchiness value: <90% Recharge potential: Low**	**Vulnerability: High Aquifer type: Secondary Flow mechanism: Well connected fractures**
3	**On site**	**Summary Classification: Principal bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer**	**Leaching class: Intermediate Infiltration value: 40-70% Dilution value: <300mm/year**	**Vulnerability: - Aquifer type: - Thickness: <3m Patchiness value: <90% Recharge potential: Low**	**Vulnerability: High Aquifer type: Principal Flow mechanism: Well connected fractures**
6	29m S	Summary Classification: Secondary bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: <300mm/year	Vulnerability: - Aquifer type: - Thickness: <3m Patchiness value: <90% Recharge potential: No Data	Vulnerability: High Aquifer type: Secondary Flow mechanism: Well connected fractures
7	48m N	Summary Classification: Principal bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: <300mm/year	Vulnerability: - Aquifer type: - Thickness: <3m Patchiness value: <90% Recharge potential: No Data	Vulnerability: High Aquifer type: Principal Flow mechanism: Well connected fractures

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

5.4 Groundwater vulnerability- soluble rock risk

Records on site	2

This dataset identifies areas where solution features that enable rapid movement of a pollutant may be present within a 1km grid square.

ID	Maximum soluble risk category	Percentage of grid square covered by maximum risk
4	**Very significant soluble rocks are likely to be present with a high possibility of localised subsidence or dissolution-related degradation of bedrock occurring naturally, especially in adverse conditions such as concentrated surface or subsurface water flow.**	**0.0%**
5	**Very significant soluble rocks are likely to be present with a high possibility of localised subsidence or dissolution-related degradation of bedrock occurring naturally, especially in adverse conditions such as concentrated surface or subsurface water flow.**	**7.000000000000001%**

This data is sourced from the British Geological Survey and the Environment Agency.

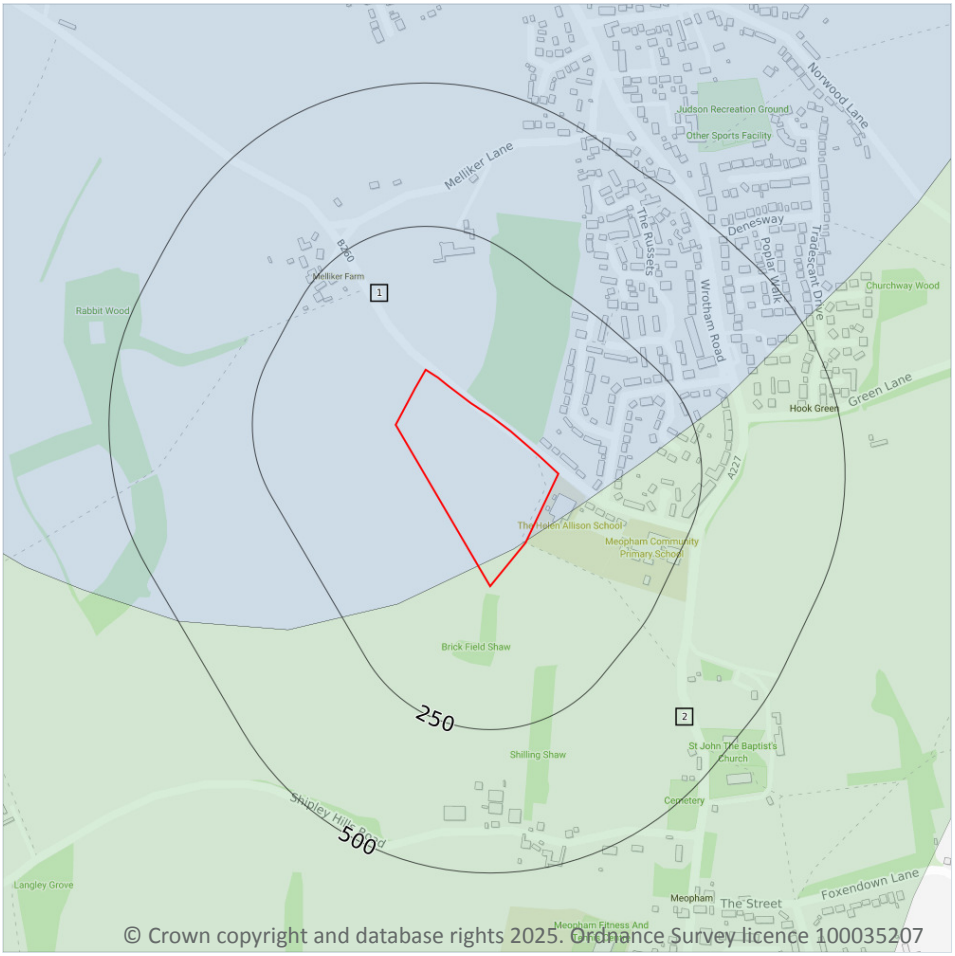
5.5 Groundwater vulnerability- local information

Records on site	**0**

This dataset identifies areas where additional local information affecting vulnerability is held by the Environment Agency. Further information can be obtained by contacting the Environment Agency local Area groundwater team through the Environment Agency National Customer Call Centre on 03798 506 506 or by email on enquiries@environment-agency.gov.uk ↗.

This data is sourced from the British Geological Survey and the Environment Agency.

Abstractions and Source Protection Zones



Site Outline

Search buffers in metres (m)

- Source Protection Zone 1 — Inner catchment
- Source Protection Zone 2 — Outer catchment
- Source Protection Zone 3 — Total catchment
- Source Protection Zone 4 — Zone of Special Interest
- Source Protection Zone 1c — Inner catchment - confined aquifer
- Source Protection Zone 2c — Outer catchment - confined aquifer
- Source Protection Zone 3c — Total catchment - confined aquifer
- Drinking water abstraction licences
- Drinking water abstraction licences — Polygon features
- Drinking water abstraction licences — Linear features
- Groundwater abstraction licence (point)
- Groundwater abstraction licence (area)
- Groundwater abstraction licence (linear)
- Surface Water Abstractions (point)
- Surface Water Abstractions (area)
- Surface Water Abstractions (linear)

5.6 Groundwater abstractions

Records within 2000m	2

Licensed groundwater abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, between two points (line data) or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on **page 47 >**

ID	Location	Details	
-	1805m W	Status: Active Licence No: 9/40/01/0148/A/GR Details: Potable Water Supply - Direct Direct Source: Southern Region Groundwater Point: CHALK BOREHOLES WITHIN TWO AREAS OF LAND AT HARTLEY PS. Data Type: Poly4 Name: South East Water Ltd Easting: 561422 Northing: 166580	Annual Volume (m^3): 1825000 Max Daily Volume (m^3): 6000 Original Application No: NPS/WR/015417 Original Start Date: 05/10/1966 Expiry Date: - Issue No: 103 Version Start Date: 13/02/2013 Version End Date: -
-	1934m W	Status: Historical Licence No: 9/40/01/0148/A/GR Details: Potable Water Supply - Direct Direct Source: Southern Region Groundwater Point: CHALK BOREHOLES WITHIN TWO AREAS OF LAND AT HARTLEY PS. Data Type: Poly4 Name: South East Water Limited Easting: 561510 Northing: 166530	Annual Volume (m^3): 3739100 Max Daily Volume (m^3): 6000 Original Application No: - Original Start Date: - Expiry Date: - Issue No: 102 Version Start Date: 27/10/2010 Version End Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.

5.7 Surface water abstractions

Records within 2000m	**0**

Licensed surface water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

This data is sourced from the Environment Agency and Natural Resources Wales.

5.8 Potable abstractions

Records within 2000m	**2**

Licensed potable water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on **page 47 >**

ID	Location	Details	
-	1805m W	Status: Active Licence No: 9/40/01/0148/A/GR Details: Potable Water Supply - Direct Direct Source: Southern Region Groundwater Point: CHALK BOREHOLES WITHIN TWO AREAS OF LAND AT HARTLEY PS. Data Type: Poly4 Name: South East Water Ltd Easting: 561422 Northing: 166580	Annual Volume (m^3): 1825000 Max Daily Volume (m^3): 6000 Original Application No: NPS/WR/015417 Original Start Date: 05/10/1966 Expiry Date: - Issue No: 103 Version Start Date: 13/02/2013 Version End Date: -
-	1934m W	Status: Historical Licence No: 9/40/01/0148/A/GR Details: Potable Water Supply - Direct Direct Source: Southern Region Groundwater Point: CHALK BOREHOLES WITHIN TWO AREAS OF LAND AT HARTLEY PS. Data Type: Poly4 Name: South East Water Limited Easting: 561510 Northing: 166530	Annual Volume (m^3): 3739100 Max Daily Volume (m^3): 6000 Original Application No: - Original Start Date: - Expiry Date: - Issue No: 102 Version Start Date: 27/10/2010 Version End Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.

5.9 Source Protection Zones

Records within 500m	**2**

Source Protection Zones define the sensitivity of an area around a potable abstraction site to contamination.

Features are displayed on the Abstractions and Source Protection Zones map on **page 47 >**

ID	Location	Type	Description
1	**On site**	**2**	**Outer catchment**
2	**On site**	**3**	**Total catchment**

This data is sourced from the Environment Agency and Natural Resources Wales.

5.10 Source Protection Zones (confined aquifer)

Records within 500m	**0**

Source Protection Zones in the confined aquifer define the sensitivity around a deep groundwater abstraction to contamination. A confined aquifer would normally be protected from contamination by overlying geology and is only considered a sensitive resource if deep excavation/drilling is taking place.

This data is sourced from the Environment Agency and Natural Resources Wales.

6 Hydrology

Site Outline

Search buffers in metres (m)

Water Network (OS MasterMap)

Surface water features (wider than 5m)

Surface water features (narrower than 5m)

WFD River, canal and surface water transfer water bodies

WFD Lake water bodies

WFD Transitional and coastal water bodies

WFD Surface water body catchments boundaries

WFD Groundwater body boundaries

6.1 Water Network (OS MasterMap)

Records within 250m	0

Detailed water network of Great Britain showing the flow and precise central course of every river, stream, lake and canal.

This data is sourced from the Ordnance Survey.

6.2 Surface water features

Records within 250m	0

Covering rivers, streams and lakes (some overlap with OS MasterMap Water Network data in previous section) but additionally covers smaller features such as ponds. Rivers and streams narrower than 5m are represented as a single line. Lakes, ponds and rivers or streams wider than 5m are represented as polygons.

This data is sourced from the Ordnance Survey.

6.3 WFD Surface water body catchments

Records on site	1

The Water Framework Directive is an EU-led framework for the protection of inland surface waters, estuaries, coastal waters and groundwater through river basin-level management planning. In terms of surface water, these basins are broken down into smaller units known as management, operational and water body catchments.

Features are displayed on the Hydrology map on **page 50 >**

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
A	**On site**	**Coastal Catchment**	**Not part of a river WB catchment**	**130**	**Lower Medway**	**Medway**

This data is sourced from the Environment Agency and Natural Resources Wales.

6.4 WFD Surface water bodies

Records identified	0

Surface water bodies under the Directive may be rivers, lakes, estuary or coastal. To achieve the purpose of the Directive, environmental objectives have been set and are reported on for each water body. The progress towards delivery of the objectives is then reported on by the relevant competent authorities at the end of each six-year cycle. The river water body directly associated with the catchment listed in the previous section is detailed below, along with any lake, canal, coastal or artificial water body within 250m of the site. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each water body listed.

This data is sourced from the Environment Agency and Natural Resources Wales.

6.5 WFD Groundwater bodies

Records on site	1

Groundwater bodies are also covered by the Directive and the same regime of objectives and reporting detailed in the previous section is in place. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each groundwater body listed.

Features are displayed on the Hydrology map on **page 50 >**

ID	Location	Name	Water body ID	Overall rating	Chemical rating	Quantitative	Year
A	**On site**	**North Kent Medway Chalk**	**GB40601G500300** ↗	**Poor**	**Poor**	**Poor**	**2019**

This data is sourced from the Environment Agency and Natural Resources Wales.

7 River and coastal flooding

7.1 Risk of flooding from rivers and the sea

Records within 50m	0

The chance of flooding from rivers and/or the sea in any given year, based on cells of 50m within the Risk of Flooding from Rivers and Sea (RoFRaS)/Flood Risk Assessment Wales (FRAW) models. Each cell is allocated one of four flood risk categories, taking into account flood defences and their condition. The risk categories for RoFRaS for rivers and the sea and FRAW for rivers are; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 100 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 100 chance) or High (greater than or equal to 1 in 30 chance). The risk categories for FRAW for the sea are; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 200 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 200 chance) or High (greater than or equal to 1 in 30 chance).

This data is sourced from the Environment Agency and Natural Resources Wales.

7.2 Historical Flood Events

Records within 250m	0

Records of historic flooding from rivers, the sea, groundwater and surface water. Records began in 1946 when predecessor bodies started collecting detailed information about flooding incidents, although limited details may be included on flooding incidents prior to this date. Takes into account the presence of defences, structures, and other infrastructure where they existed at the time of flooding, and includes flood extents that may have been affected by overtopping, breaches or blockages.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.3 Flood Defences

Records within 250m	0

Records of flood defences owned, managed or inspected by the Environment Agency and Natural Resources Wales. Flood defences can be structures, buildings or parts of buildings. Typically these are earth banks, stone and concrete walls, or sheet-piling that is used to prevent or control the extent of flooding.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.4 Areas Benefiting from Flood Defences

Records within 250m	0

Areas that would benefit from the presence of flood defences in a 1 in 100 (1%) chance of flooding each year from rivers or 1 in 200 (0.5%) chance of flooding each year from the sea.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.5 Flood Storage Areas

Records within 250m	0

Areas that act as a balancing reservoir, storage basin or balancing pond to attenuate an incoming flood peak to a flow level that can be accepted by the downstream channel or to delay the timing of a flood peak so that its volume is discharged over a longer period.

This data is sourced from the Environment Agency and Natural Resources Wales.

River and coastal flooding - Flood Zones

7.6 Flood Zone 2

Records within 50m	0

Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land between Flood Zone 3 (see next section) and the extent of the flooding from rivers or the sea with a 1 in 1000 (0.1%) chance of flooding each year.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.7 Flood Zone 3

Records within 50m	0

Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land with a 1 in 100 (1%) or greater chance of flooding each year from rivers or a 1 in 200 (0.5%) or greater chance of flooding each year from the sea.

This data is sourced from the Environment Agency and Natural Resources Wales.

8 Surface water flooding

Site Outline

Search buffers in metres (m)

1 in 1000 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 250 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 100 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 30 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

8.1 Surface water flooding

Highest risk on site	**1 in 1000 year, 0.1m - 0.3m**
Highest risk within 50m	**1 in 30 year, 0.3m - 1.0m**

Ambiental Risk Analytics surface water (pluvial) FloodMap identifies areas likely to flood as a result of extreme rainfall events, i.e. land naturally vulnerable to surface water ponding or flooding. This data set was produced by simulating 1 in 30 year, 1 in 100 year, 1 in 250 year and 1 in 1,000 year rainfall events. Modern urban drainage systems are typically built to cope with rainfall events between 1 in 20 and 1 in 30 years, though some older ones may flood in a 1 in 5 year rainfall event.

Features are displayed on the Surface water flooding map on **page 56 >**

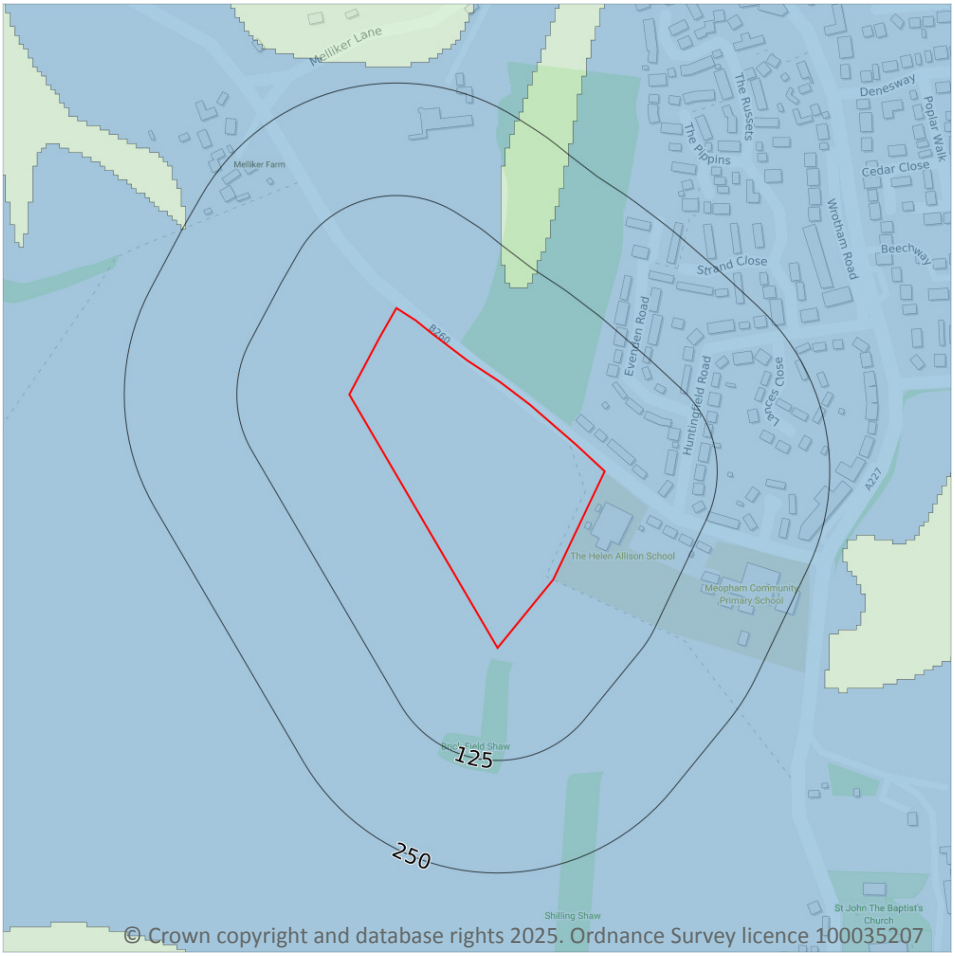
The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site.

The table below shows the maximum flood depths for a range of return periods for the site.

Return period	Maximum modelled depth
1 in 1000 year	Between 0.1m and 0.3m
1 in 250 year	Negligible
1 in 100 year	Negligible
1 in 30 year	Negligible

This data is sourced from Ambiental Risk Analytics.

9 Groundwater flooding



Site Outline

Search buffers in metres (m)

- High
- Moderate - High
- Moderate
- Low
- Negligible

9.1 Groundwater flooding

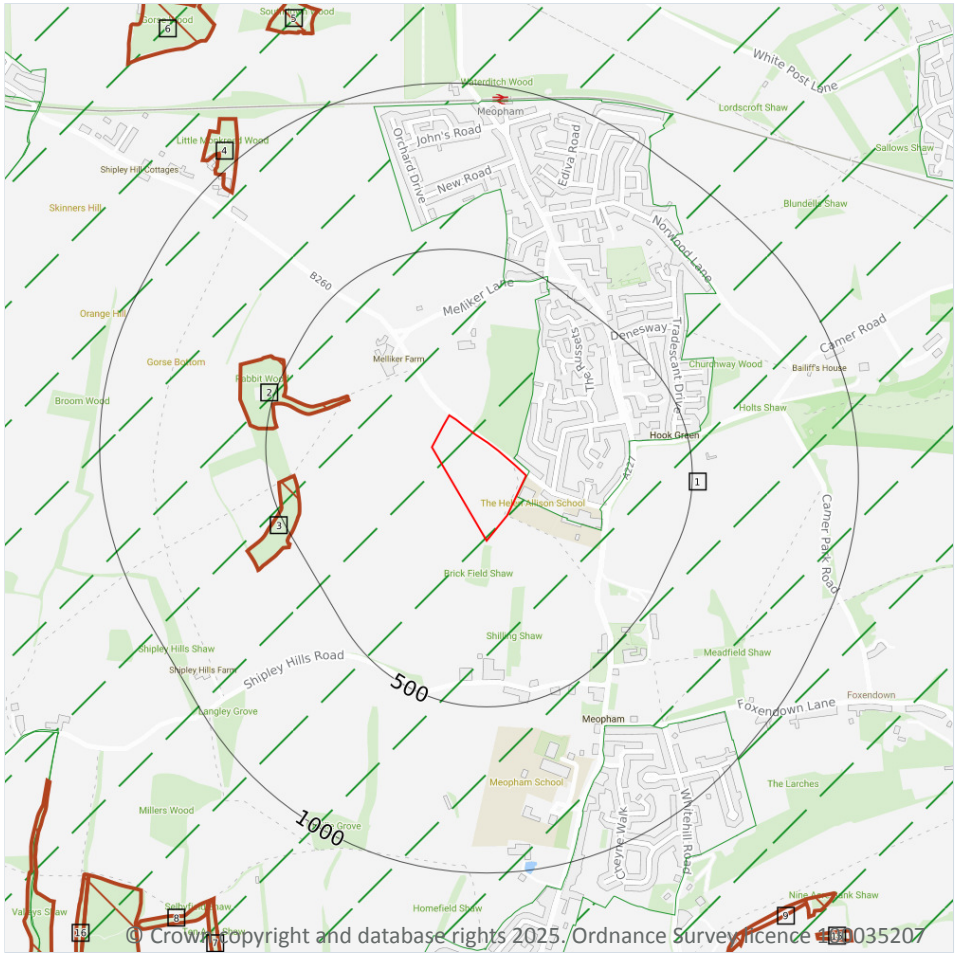
Highest risk on site	**Negligible**
Highest risk within 50m	**Negligible**

Groundwater flooding is caused by unusually high groundwater levels. It occurs when the water table rises above the ground surface or within underground structures such as basements or cellars. Groundwater flooding tends to exhibit a longer duration than surface water flooding, possibly lasting for weeks or months, and as a result it can cause significant damage to property. This risk assessment is based on a 1 in 100 year return period and a 5m Digital Terrain Model (DTM).

Features are displayed on the Groundwater flooding map on **page 58 >**

This data is sourced from Ambiental Risk Analytics.

10 Environmental designations



10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m	0

Sites providing statutory protection for the best examples of UK flora, fauna, or geological or physiographical features. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs were re-notified under the Wildlife and Countryside Act 1981. Improved provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act 2000 (in England and Wales) and (in Scotland) by the Nature Conservation (Scotland) Act 2004 and the Wildlife and Natural Environment (Scotland) Act 2010.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.2 Conserved wetland sites (Ramsar sites)

Records within 2000m	0

Ramsar sites are designated under the Convention on Wetlands of International Importance, agreed in Ramsar, Iran, in 1971. They cover all aspects of wetland conservation and wise use, recognizing wetlands as ecosystems that are extremely important for biodiversity conservation in general and for the well-being of human communities. These sites cover a broad definition of wetland; marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, and even some marine areas.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.3 Special Areas of Conservation (SAC)

Records within 2000m	0

Areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.4 Special Protection Areas (SPA)

Records within 2000m	0

Sites classified by the UK Government under the EC Birds Directive, SPAs are areas of the most important habitat for rare (listed on Annex I to the Directive) and migratory birds within the European Union.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.5 National Nature Reserves (NNR)

Records within 2000m	0

Sites containing examples of some of the most important natural and semi-natural terrestrial and coastal ecosystems in Great Britain. They are managed to conserve their habitats, provide special opportunities for scientific study or to provide public recreation compatible with natural heritage interests.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.6 Local Nature Reserves (LNR)

Records within 2000m	0

Sites managed for nature conservation, and to provide opportunities for research and education, or simply enjoying and having contact with nature. They are declared by local authorities under the National Parks and Access to the Countryside Act 1949 after consultation with the relevant statutory nature conservation agency.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.7 Designated Ancient Woodland

Records within 2000m	25

Ancient woodlands are classified as areas which have been wooded continuously since at least 1600 AD. This includes semi-natural woodland and plantations on ancient woodland sites. 'Wooded continuously' does not mean there is or has previously been continuous tree cover across the whole site, and not all trees within the woodland have to be old.

Features are displayed on the Environmental designations map on **page 59 >**

ID	Location	Name	Woodland Type
2	288m NW	Rabbit Wood North	Ancient & Semi-Natural Woodland
3	422m W	Rabbit Wood South	Ancient & Semi-Natural Woodland
4	937m NW	Unknown	Ancient & Semi-Natural Woodland
5	1221m N	Unknown	Ancient & Semi-Natural Woodland
6	1345m NW	Unknown	Ancient & Semi-Natural Woodland
7	1355m SW	Unknown	Ancient & Semi-Natural Woodland
8	1369m SW	Unknown	Ancient & Semi-Natural Woodland
9	1405m SE	Unknown	Ancient & Semi-Natural Woodland
-	1419m SE	Unknown	Ancient & Semi-Natural Woodland
12	1479m SW	Elbows/ashplat Wood	Ancient & Semi-Natural Woodland
13	1501m SW	Elbows/ashplat Wood	Ancient & Semi-Natural Woodland
15	1547m SE	Unknown	Ancient & Semi-Natural Woodland
16	1564m SW	Unknown	Ancient & Semi-Natural Woodland
-	1565m N	Unknown	Ancient & Semi-Natural Woodland
-	1588m SE	Unknown	Ancient & Semi-Natural Woodland
-	1596m E	Henley Wood	Ancient & Semi-Natural Woodland

ID	Location	Name	Woodland Type
-	1678m SE	Brimstone Wood	Ancient & Semi-Natural Woodland
-	1766m W	Redsteadle Wood	Ancient & Semi-Natural Woodland
-	1770m SE	Brimstone Wood	Ancient & Semi-Natural Woodland
-	1784m SE	Unknown	Ancient & Semi-Natural Woodland
-	1797m W	Dell Woodland	Ancient & Semi-Natural Woodland
-	1839m SE	Unknown	Ancient & Semi-Natural Woodland
-	1880m N	Cozenden Wood	Ancient & Semi-Natural Woodland
-	1889m S	Steeles Wood	Ancient & Semi-Natural Woodland
-	1961m SW	Unknown	Ancient & Semi-Natural Woodland

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.8 Biosphere Reserves

Records within 2000m	0

Biosphere Reserves are internationally recognised by UNESCO as sites of excellence to balance conservation and socioeconomic development between nature and people. They are recognised under the Man and the Biosphere (MAB) Programme with the aim of promoting sustainable development founded on the work of the local community.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.9 Forest Parks

Records within 2000m	0

These are areas managed by the Forestry Commission designated on the basis of recreational, conservation or scenic interest.

This data is sourced from the Forestry Commission.

10.10 Marine Conservation Zones

Records within 2000m	0

A type of marine nature reserve in UK waters established under the Marine and Coastal Access Act (2009). They are designated with the aim to protect nationally important, rare or threatened habitats and species.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.11 Green Belt

Records within 2000m	3

Areas designated to prevent urban sprawl by keeping land permanently open.

Features are displayed on the Environmental designations map on **page 59 >**

ID	Location	Name	Local Authority name
1	**On site**	**London Green Belt**	**Gravesham**
10	1405m SW	London Green Belt	Sevenoaks
14	1544m NW	London Green Belt	Dartford

This data is sourced from the Ministry of Housing, Communities and Local Government.

10.12 Proposed Ramsar sites

Records within 2000m	0

Ramsar sites are areas listed as a Wetland of International Importance under the Convention on Wetlands of International Importance especially as Waterfowl Habitat (the Ramsar Convention) 1971. The sites here supplied have a status of 'Proposed' having been identified for potential adoption under the framework.

This data is sourced from Natural England.

10.13 Possible Special Areas of Conservation (pSAC)

Records within 2000m	0

Special Areas of Conservation are areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive. Those sites supplied here are those with a status of 'Possible' having been identified for potential adoption under the framework.

This data is sourced from Natural England and Natural Resources Wales.

10.14 Potential Special Protection Areas (pSPA)

Records within 2000m	0

Special Protection Areas (SPAs) are areas designated (or ‘classified’) under the European Union Wild Birds Directive for the protection of nationally and internationally important populations of wild birds. Those sites supplied here are those with a status of 'Potential' having been identified for potential adoption under the framework.

This data is sourced from Natural England.

10.15 Nitrate Sensitive Areas

Records within 2000m	0

Areas where nitrate concentrations in drinking water sources exceeded or was at risk of exceeding the limit of 50 mg/l set by the 1980 EC Drinking Water Directive. Voluntary agricultural measures as a means of reducing the levels of nitrate were introduced by DEFRA as MAFF, with payments being made to farmers who complied. The scheme was started as a pilot in 1990 in ten areas, later implemented within 32 areas. The scheme was closed to further new entrants in 1998, although existing agreements continued for their full term. All Nitrate Sensitive Areas fell within the areas designated as Nitrate Vulnerable Zones (NVZs) in 1996 under the EC Nitrate Directive (91/676/EEC).

This data is sourced from Natural England.

10.16 Nitrate Vulnerable Zones

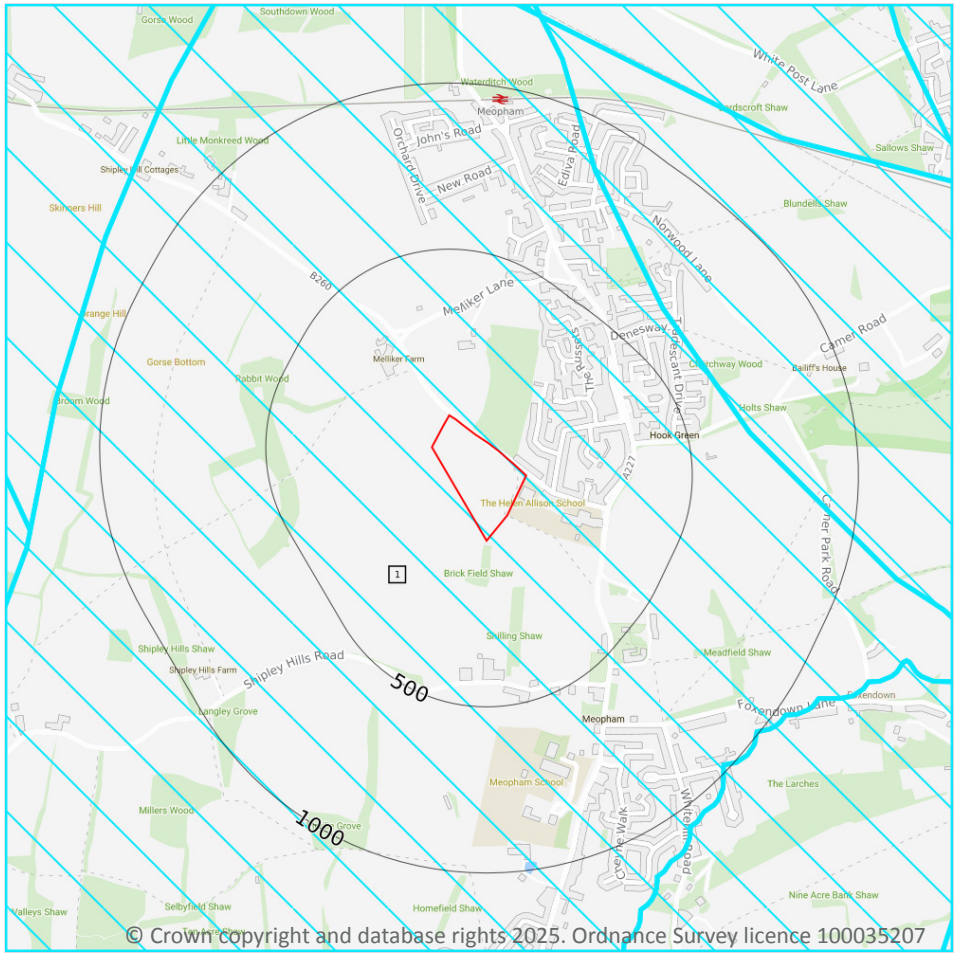
Records within 2000m	6

Areas at risk from agricultural nitrate pollution designated under the EC Nitrate Directive (91/676/EEC). These are areas of land that drain into waters polluted by nitrates. Farmers operating within these areas have to follow mandatory rules to tackle nitrate loss from agriculture.

Location	Name	Type	NVZ ID	Status
On site	**North Kent**	**Groundwater**	**65**	**Existing**
On site	**North Kent**	**Groundwater**	**65**	**Existing**
593m S	North Kent	Groundwater	65	Existing
595m S	North Kent	Groundwater	65	Existing
693m SW	North Kent	Groundwater	65	Existing
1145m S	North Kent	Groundwater	65	Existing

This data is sourced from Natural England and Natural Resources Wales.

SSSI Impact Zones and Units



Site Outline

Search buffers in metres (m)

SSSI Impact Risk Zones

SSSI Units

- Not recorded
- Favourable
- Unfavourable - Recovering
- Unfavourable - No change
- Unfavourable - Declining
- Partially destroyed
- Destroyed

10.17 SSSI Impact Risk Zones

Records on site	1

Developed to allow rapid initial assessment of the potential risks to SSSIs posed by development proposals. They define zones around each SSSI which reflect the particular sensitivities of the features for which it is notified and indicate the types of development proposal which could potentially have adverse impacts.

Features are displayed on the SSSI Impact Zones and Units map on **page 65 >**

ID	Location	Type of developments requiring consultation
1	**On site**	**Infrastructure - Airports, helipads and other aviation proposals.** **Air pollution - Any industrial/agricultural development that could cause AIR POLLUTION (incl: industrial processes, livestock & poultry units with floorspace > 500m², slurry lagoons & digestate stores > 750m², manure stores > 3500t).** **Combustion - General combustion processes >50MW energy input. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.** **Discharges - Any discharge of water or liquid waste of more than 20m³/day to ground (ie to seep away) or to surface water, such as a beck or stream.**

This data is sourced from Natural England.

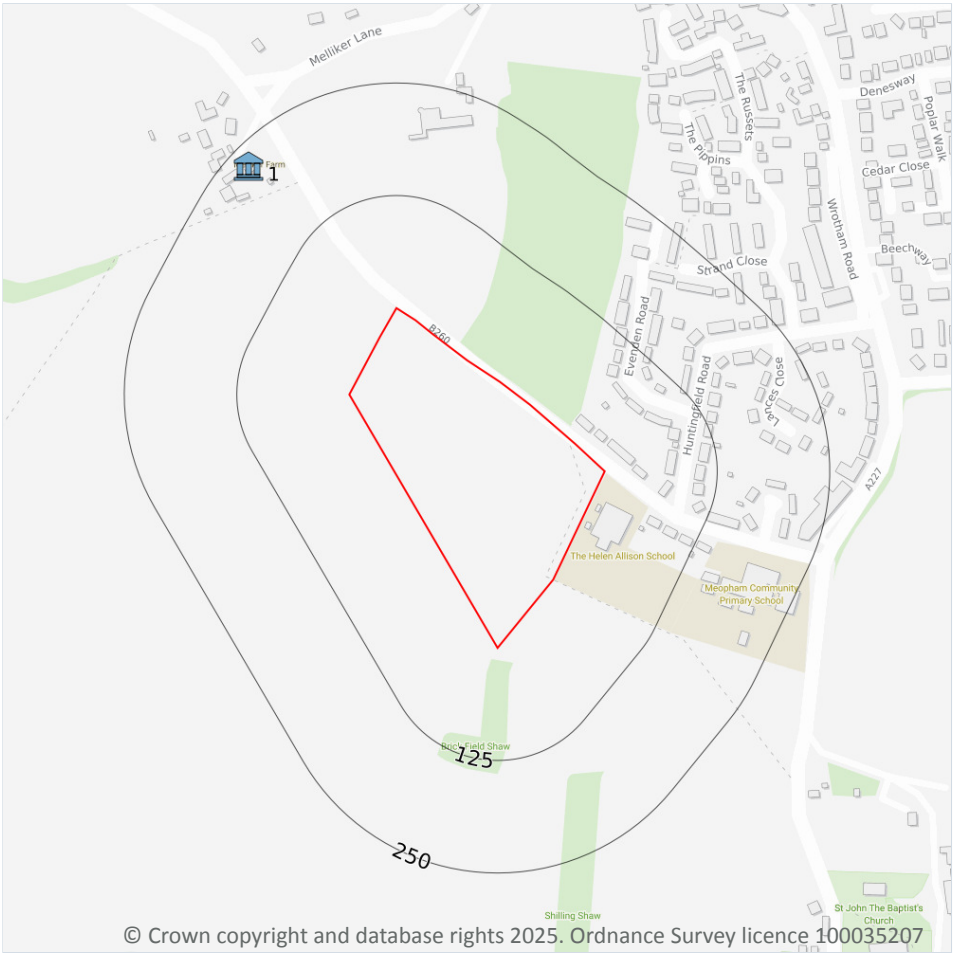
10.18 SSSI Units

Records within 2000m	**0**

Divisions of SSSIs used to record management and condition details. Units are the smallest areas for which Natural England gives a condition assessment, however, the size of units varies greatly depending on the types of management and the conservation interest.

This data is sourced from Natural England and Natural Resources Wales.

11 Visual and cultural designations



Site Outline

Search buffers in metres (m)

Listed buildings

Conservation areas

Conservation areas - no data

National Parks

Areas of Outstanding Natural Beauty

Registered parks and gardens

Scheduled Monuments

World Heritage Sites

11.1 World Heritage Sites

Records within 250m	0

Sites designated for their globally important cultural or natural interest requiring appropriate management and protection measures. World Heritage Sites are designated to meet the UK's commitments under the World Heritage Convention.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.2 Area of Outstanding Natural Beauty

Records within 250m	0

Areas of Outstanding Natural Beauty (AONB) are conservation areas, chosen because they represent 18% of the finest countryside. Each AONB has been designated for special attention because of the quality of their flora, fauna, historical and cultural associations, and/or scenic views. The National Parks and Access to the Countryside Act of 1949 created AONBs and the Countryside and Rights of Way Act, 2000 added further regulation and protection. There are likely to be restrictions to some developments within these areas.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

11.3 National Parks

Records within 250m	0

In England and Wales, the purpose of National Parks is to conserve and enhance landscapes within the countryside whilst promoting public enjoyment of them and having regard for the social and economic well-being of those living within them. In Scotland National Parks have the additional purpose of promoting the sustainable use of the natural resources of the area and the sustainable social and economic development of its communities. The National Parks and Access to the Countryside Act 1949 established the National Park designation in England and Wales, and The National Parks (Scotland) Act 2000 in Scotland.

This data is sourced from Natural England, Natural Resources Wales and the Scottish Government.

11.4 Listed Buildings

Records within 250m	1

Buildings listed for their special architectural or historical interest. Building control in the form of 'listed building consent' is required in order to make any changes to that building which might affect its special interest. Listed buildings are graded to indicate their relative importance, however building controls apply to all buildings equally, irrespective of their grade, and apply to the interior and exterior of the building in its entirety, together with any curtilage structures.

Features are displayed on the Visual and cultural designations map on **page 67 >**

ID	Location	Name	Grade	Reference Number	Listed date
1	228m NW	Melliker Farmhouse	II	1039907	26/07/1983

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.5 Conservation Areas

Records within 250m	0

Local planning authorities are obliged to designate as conservation areas any parts of their own area that are of special architectural or historic interest, the character and appearance of which it is desirable to preserve or enhance. Designation of a conservation area gives broader protection than the listing of individual buildings. All the features within the area, listed or otherwise, are recognised as part of its character. Conservation area designation is the means of recognising the importance of all factors and of ensuring that planning decisions address the quality of the landscape in its broadest sense.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.6 Scheduled Ancient Monuments

Records within 250m	0

A scheduled monument is an historic building or site that is included in the Schedule of Monuments kept by the Secretary of State for Digital, Culture, Media and Sport. The regime is set out in the Ancient Monuments and Archaeological Areas Act 1979. The Schedule of Monuments has c.20,000 entries and includes sites such as Roman remains, burial mounds, castles, bridges, earthworks, the remains of deserted villages and industrial sites. Monuments are not graded, but all are, by definition, considered to be of national importance.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

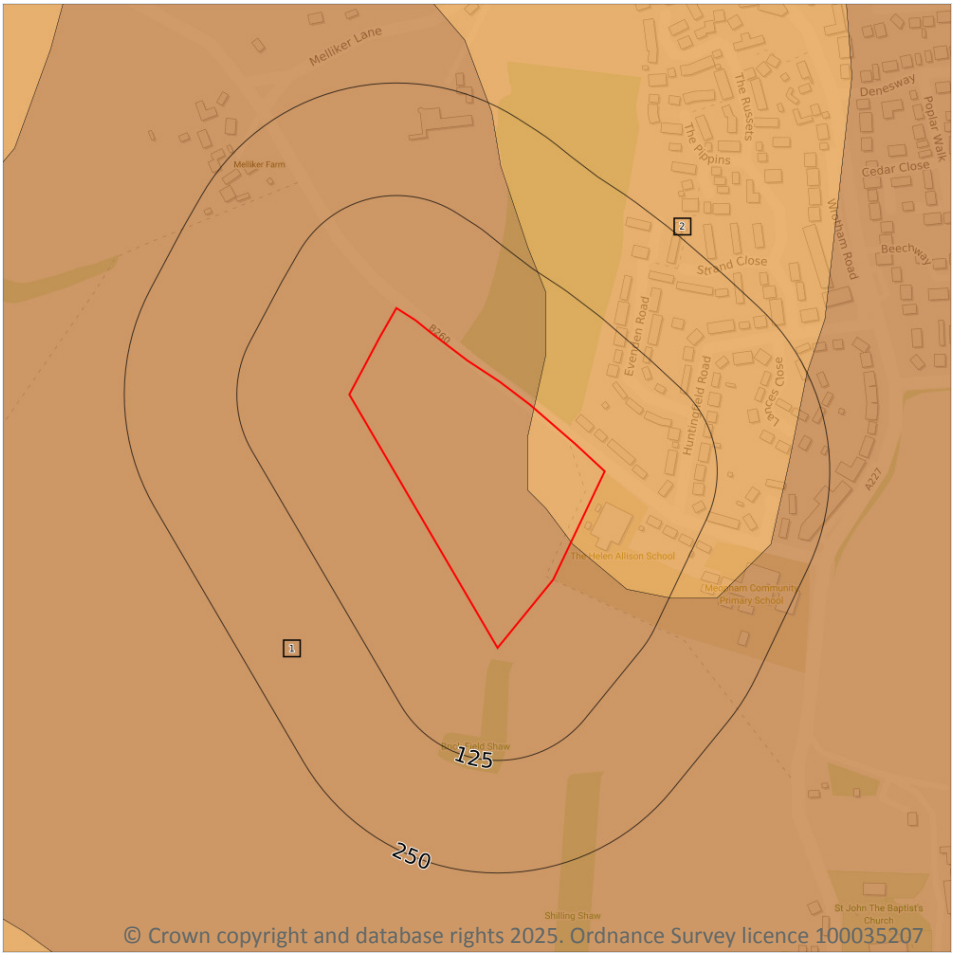
11.7 Registered Parks and Gardens

Records within 250m	0

Parks and gardens assessed to be of particular interest and of special historic interest. The emphasis being on 'designed' landscapes, rather than on planting or botanical importance. Registration is a 'material consideration' in the planning process, meaning that planning authorities must consider the impact of any proposed development on the special character of the landscape.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

12 Agricultural designations



Site Outline

Search buffers in metres (m)

- Grade 1 - excellent quality
- Grade 2 - very good quality
- Grade 3 - good to moderate quality
- Grade 3a - good quality
- Grade 3b - moderate quality
- Grade 4 - poor quality
- Grade 5 - very poor quality
- Non-agricultural land
- Urban land
- Exclusion land
- Tree felling licences
- Open Access land

12.1 Agricultural Land Classification

Records within 250m	2

Classification of the quality of agricultural land taking into consideration multiple factors including climate, physical geography and soil properties. It should be noted that the categories for the grading of agricultural land are not consistent across England, Wales and Scotland.

Features are displayed on the Agricultural designations map on **page 70 >**

ID	Location	Classification	Description
1	On site	Grade 2	Very good quality agricultural land. Land with minor limitations which affect crop yield, cultivations or harvesting. A wide range of agricultural and horticultural crops can usually be grown but on some land in the grade there may be reduced flexibility due to difficulties with the production of the more demanding crops such as winter harvested vegetables and arable root crops. The level of yield is generally high but may be lower or more variable than Grade 1.
2	On site	Grade 3	Good to moderate quality agricultural land. Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where more demanding crops are grown yields are generally lower or more variable than on land in Grades 1 and 2.

This data is sourced from Natural England.

12.2 Open Access Land

Records within 250m	0

The Countryside and Rights of Way Act 2000 (CROW Act) gives a public right of access to land without having to use paths. Access land includes mountains, moors, heaths and downs that are privately owned. It also includes common land registered with the local council and some land around the England Coast Path. Generally permitted activities on access land are walking, running, watching wildlife and climbing.

This data is sourced from Natural England and Natural Resources Wales.

12.3 Tree Felling Licences

Records within 250m	0

Felling Licence Application (FLA) areas approved by Forestry Commission England. Anyone wishing to fell trees must ensure that a licence or permission under a grant scheme has been issued by the Forestry Commission before any felling is carried out or that one of the exceptions apply.

This data is sourced from the Forestry Commission.

12.4 Environmental Stewardship Schemes

Records within 250m	0

Environmental Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. The schemes identified may be historical schemes that have now expired, or may still be active.

This data is sourced from Natural England.

12.5 Countryside Stewardship Schemes

Records within 250m	**1**

Countryside Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. Main objectives are to improve the farmed environment for wildlife and to reduce diffuse water pollution.

Location	Reference	Scheme	Start Date	End Date
On site	**1458249**	**Countryside Stewardship (Middle Tier)**	**01/01/2023**	**31/12/2027**

This data is sourced from Natural England.

13 Habitat designations

Site Outline

Search buffers in metres (m)

Priority Habitat Inventory
Open Mosaic Habitat
Limestone Pavement Orders

Habitat Networks

Primary Habitat
Restorable Habitat
Associated Habitats
Habitat Restoration-Creation
Network Enhancement Zone 1
Network Enhancement Zone 2

13.1 Priority Habitat Inventory

Records within 250m	2

Habitats of principal importance as named under Natural Environment and Rural Communities Act (2006) Section 41.

Features are displayed on the Habitat designations map on **page 73 >**

ID	Location	Main Habitat	Other habitats
1	8m N	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
2	163m S	Deciduous woodland	Main habitat: DWOOD (INV > 50%)

This data is sourced from Natural England.

13.2 Habitat Networks

Records within 250m	0

Habitat networks for 18 priority habitat networks (based primarily, but not exclusively, on the priority habitat inventory) and areas suitable for the expansion of networks through restoration and habitat creation.

This data is sourced from Natural England.

13.3 Open Mosaic Habitat

Records within 250m	0

Sites verified as Open Mosaic Habitat. Mosaic habitats are brownfield sites that are identified under the UK Biodiversity Action Plan as a priority habitat due to the habitat variation within a single site, supporting an array of invertebrates.

This data is sourced from Natural England.

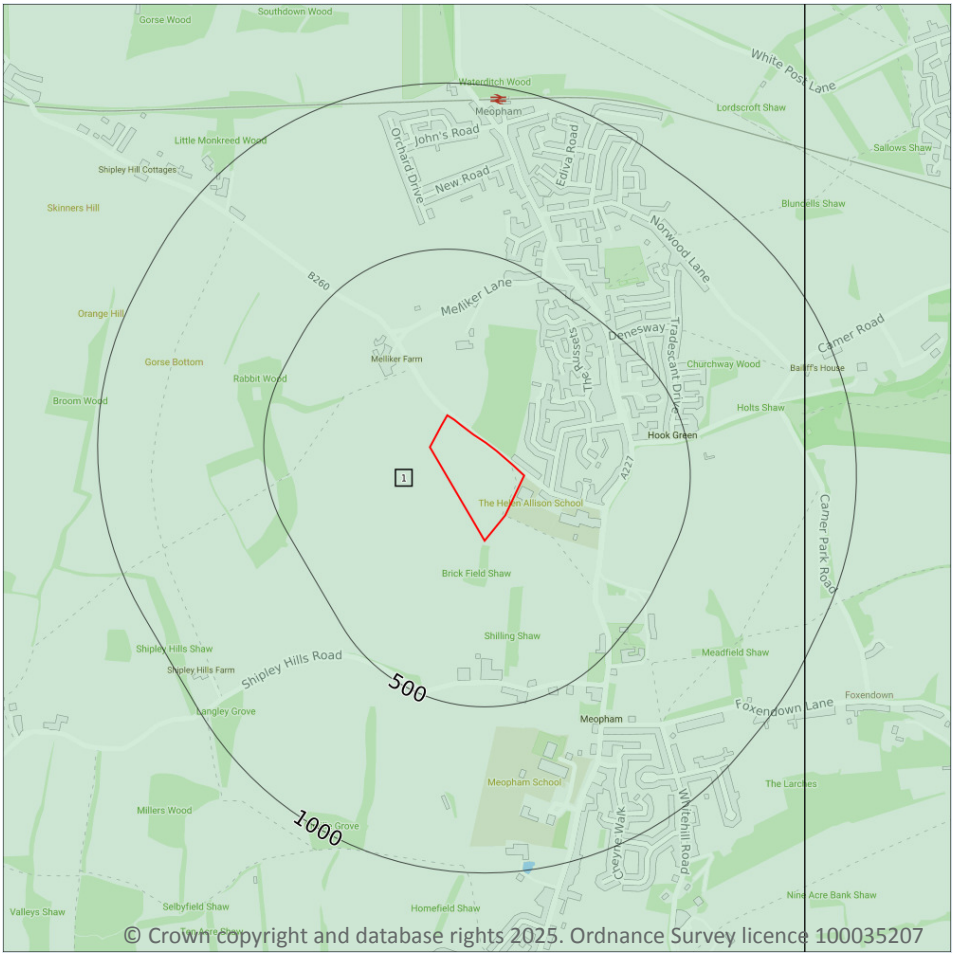
13.4 Limestone Pavement Orders

Records within 250m	0

Limestone pavements are outcrops of limestone where the surface has been worn away by natural means over millennia. These rocks have the appearance of paving blocks, hence their name. Not only do they have geological interest, they also provide valuable habitats for wildlife. These habitats are threatened due to their removal for use in gardens and water features. Many limestone pavements have been designated as SSSIs which affords them some protection. In addition, Section 34 of the Wildlife and Countryside Act 1981 gave them additional protection via the creation of Limestone Pavement Orders, which made it a criminal offence to remove any part of the outcrop. The associated Limestone Pavement Priority Habitat is part of the UK Biodiversity Action Plan priority habitat in England.

This data is sourced from Natural England.

14 Geology 1:10,000 scale - Availability



Site Outline

Search buffers in metres (m)

- Full coverage
- Partial coverage
- No coverage

14.1 10k Availability

Records within 500m	1

An indication on the coverage of 1:10,000 scale geology data for the site, the most detailed dataset provided by the British Geological Survey. Either 'Full', 'Partial' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:10,000 scale - Availability map on **page 75 >**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	**On site**	**Full**	**Full**	**Full**	**No coverage**	**TQ66NW**

This data is sourced from the British Geological Survey.

Geology 1:10,000 scale - Artificial and made ground

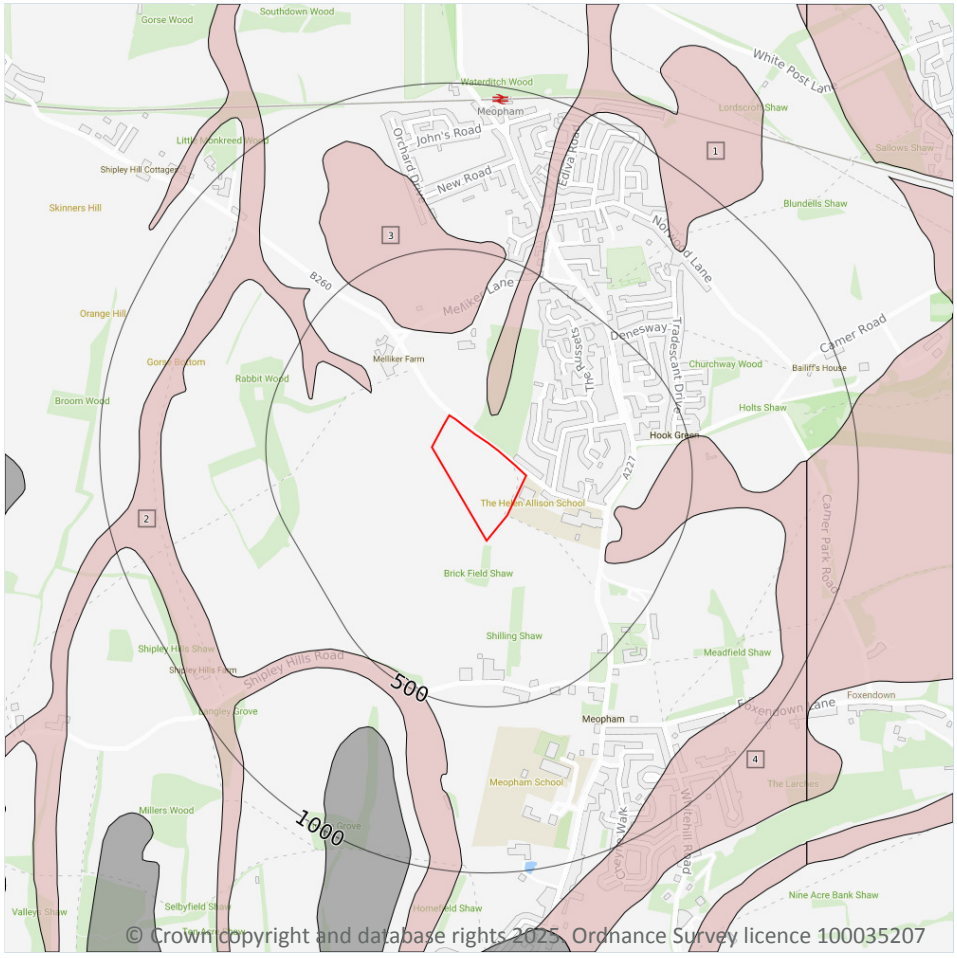
14.2 Artificial and made ground (10k)

Records within 500m	0

Details of made, worked, infilled, disturbed and landscaped ground at 1:10,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

This data is sourced from the British Geological Survey.

Geology 1:10,000 scale - Superficial



Site Outline

Search buffers in metres (m)

Landslip (10k)

Superficial geology (10k)
Please see table for more details.

14.3 Superficial geology (10k)

Records within 500m **4**

Superficial geological deposits at 1:10,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:10,000 scale - Superficial map on **page 77 >**

ID	Location	LEX Code	Description	Rock description
1	75m N	HEAD-XSC	Head - Sand And Clay	Sand And Clay
2	239m NW	HEAD-XSC	Head - Sand And Clay	Sand And Clay
3	247m N	HEAD-XSC	Head - Sand And Clay	Sand And Clay
4	288m E	HEAD-XSC	Head - Sand And Clay	Sand And Clay

This data is sourced from the British Geological Survey.

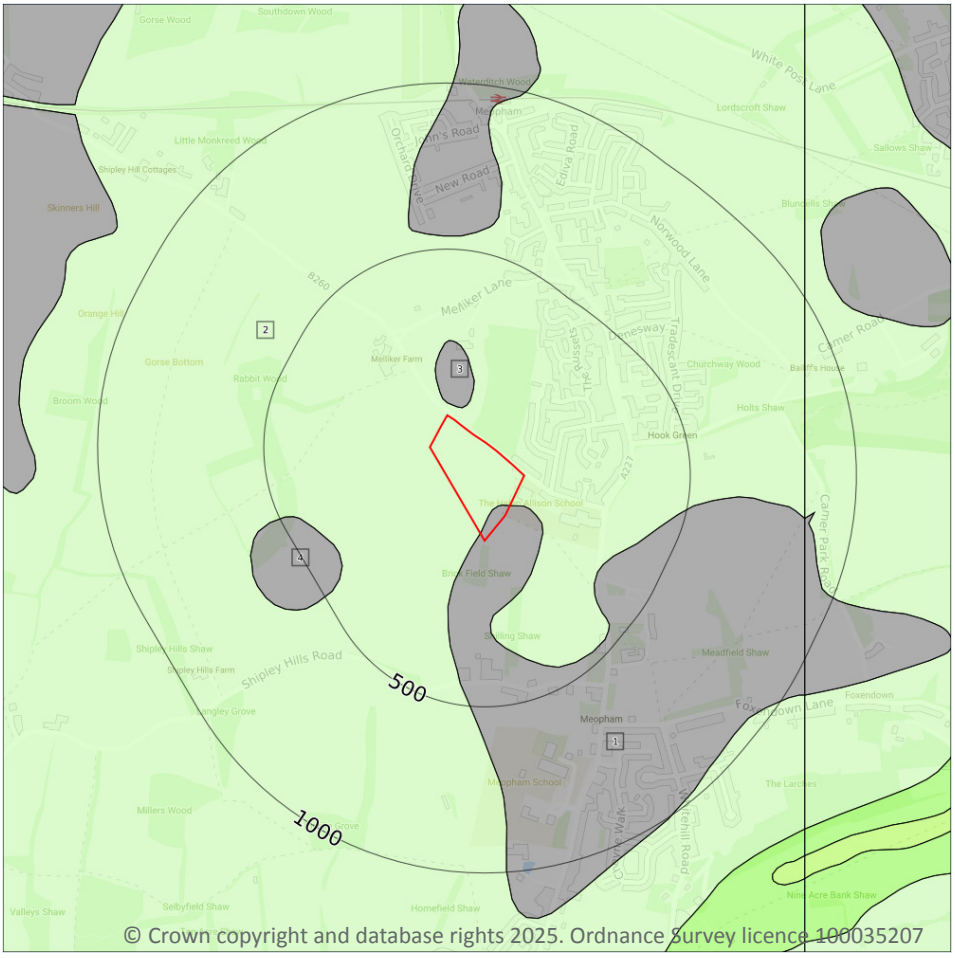
14.4 Landslip (10k)

Records within 500m	0

Mass movement deposits on BGS geological maps at 1:10,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.

Geology 1:10,000 scale - Bedrock



Site Outline

Search buffers in metres (m)

Bedrock faults and other linear features (10k)

Bedrock geology (10k)
Please see table for more details.

14.5 Bedrock geology (10k)

Records within 500m **4**

Bedrock geology at 1:10,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 79 >**

ID	Location	LEX Code	Description	Rock age
1	**On site**	**TAB-SANDU**	**Thanet Sand Formation - Sand**	**Thanetian Age**
2	**On site**	**SECK-CHLK**	**Seaford Chalk Formation - Chalk**	**Santonian Age - Coniacian Age**
3	35m N	TAB-SANDU	Thanet Sand Formation - Sand	Thanetian Age
4	397m SW	TAB-SANDU	Thanet Sand Formation - Sand	Thanetian Age

This data is sourced from the British Geological Survey.

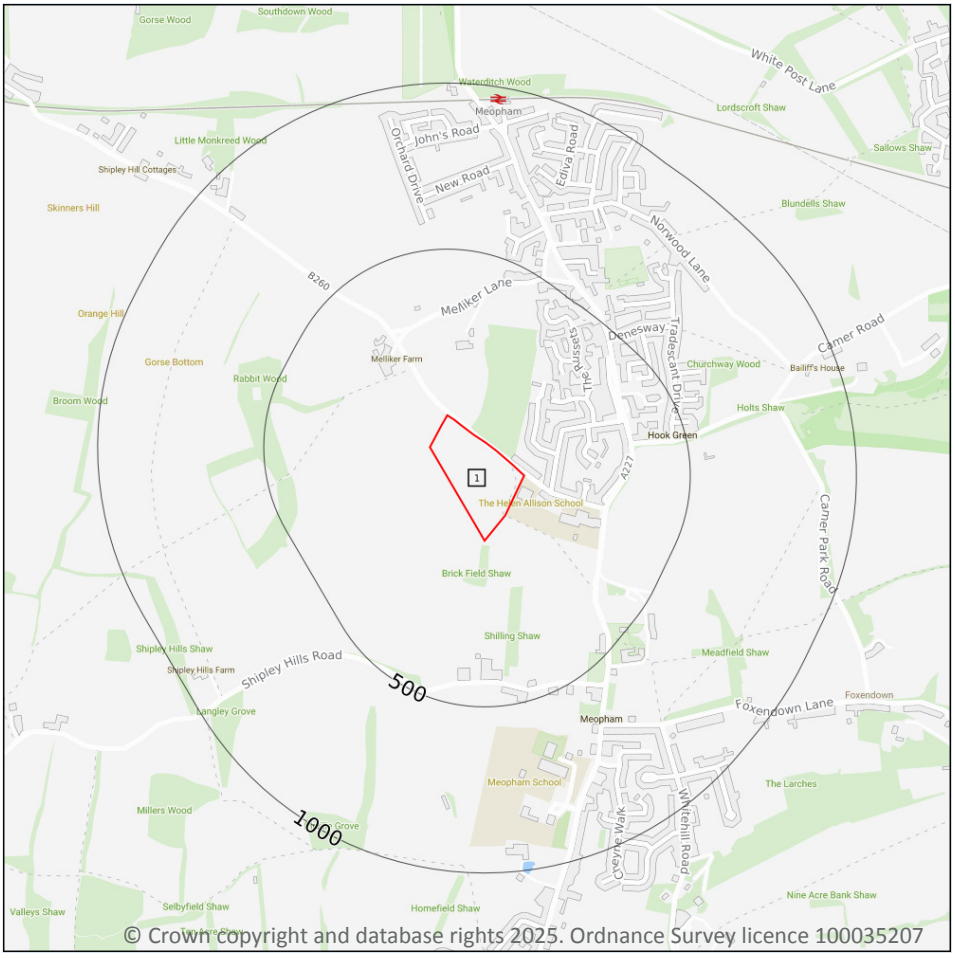
14.6 Bedrock faults and other linear features (10k)

Records within 500m	0

Linear features at the ground or bedrock surface at 1:10,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

This data is sourced from the British Geological Survey.

15 Geology 1:50,000 scale - Availability



Site Outline

Search buffers in metres (m)

Geological map tile

15.1 50k Availability

Records within 500m	1

An indication on the coverage of 1:50,000 scale geology data for the site. Either 'Full' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:50,000 scale - Availability map on **page 81 >**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	**On site**	**Full**	**Full**	**Full**	**Full**	**EW271_dartford_v4**

This data is sourced from the British Geological Survey.

Geology 1:50,000 scale - Artificial and made ground

15.2 Artificial and made ground (50k)

Records within 500m	0

Details of made, worked, infilled, disturbed and landscaped ground at 1:50,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

This data is sourced from the British Geological Survey.

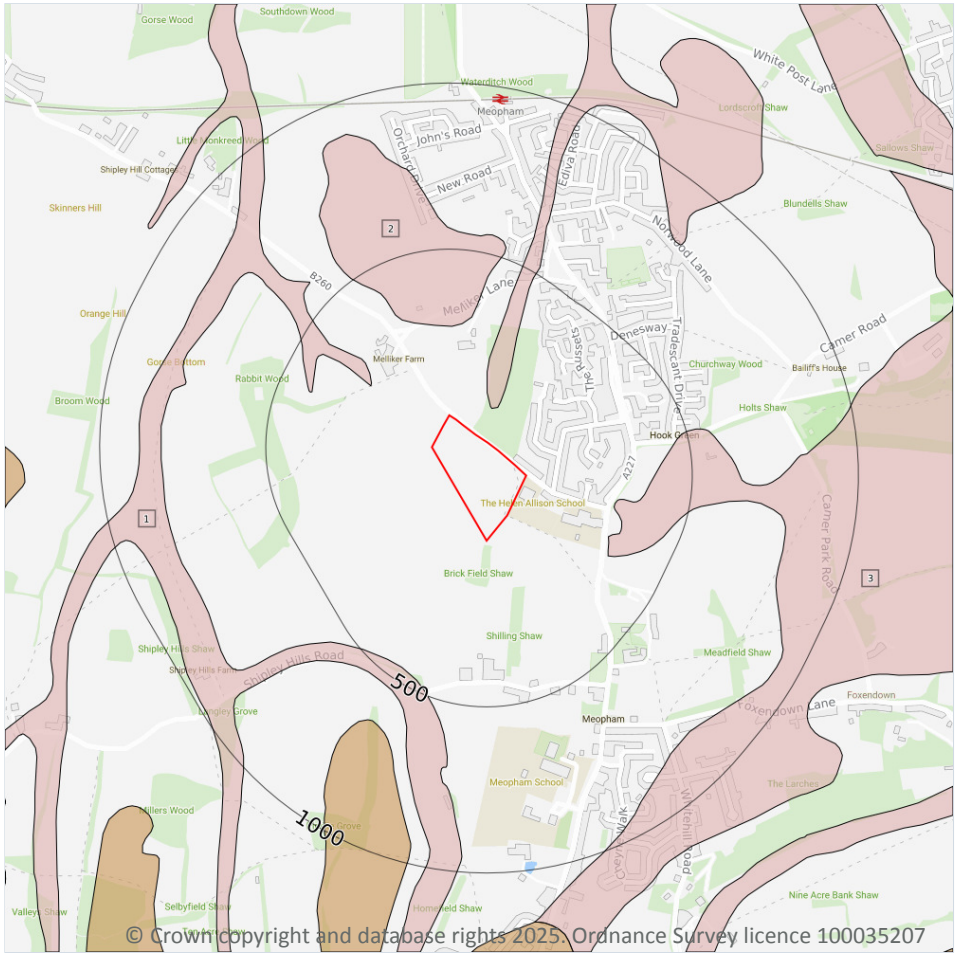
15.3 Artificial ground permeability (50k)

Records within 50m	0

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any artificial deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.

Geology 1:50,000 scale - Superficial



Site Outline

Search buffers in metres (m)

Landslip (50k)

Superficial geology (50k)
Please see table for more details.

15.4 Superficial geology (50k)

Records within 500m	3

Superficial geological deposits at 1:50,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:50,000 scale - Superficial map on **page 83 >**

ID	Location	LEX Code	Description	Rock description
1	93m N	HEAD-XCZSV	HEAD	CLAY, SILT, SAND AND GRAVEL
2	268m N	HEAD-XCZSV	HEAD	CLAY, SILT, SAND AND GRAVEL

ID	Location	LEX Code	Description	Rock description
3	281m E	HEAD-XCZSV	HEAD	CLAY, SILT, SAND AND GRAVEL

This data is sourced from the British Geological Survey.

15.5 Superficial permeability (50k)

Records within 50m	0

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any superficial deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.

15.6 Landslip (50k)

Records within 500m	0

Mass movement deposits on BGS geological maps at 1:50,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.

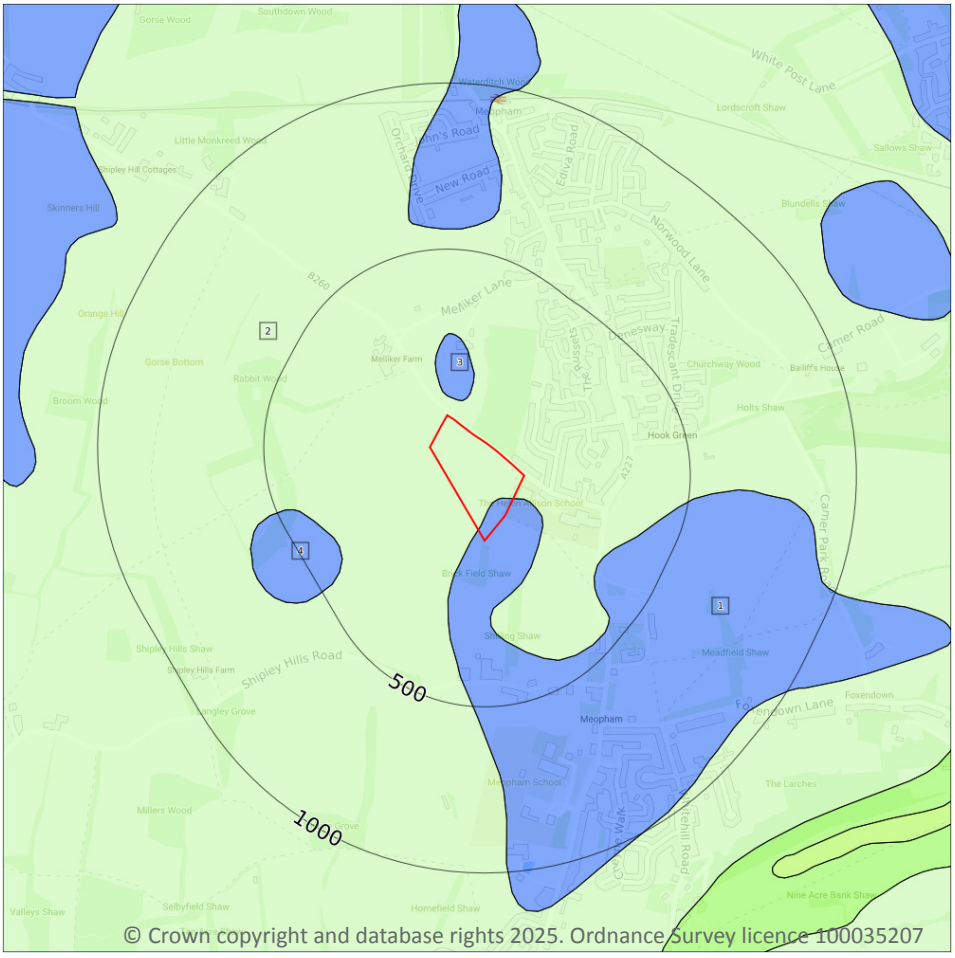
15.7 Landslip permeability (50k)

Records within 50m	0

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any landslip deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.

Geology 1:50,000 scale - Bedrock



Site Outline

Search buffers in metres (m)

Bedrock faults and other linear features (50k)

Bedrock geology (50k)
Please see table for more details.

15.8 Bedrock geology (50k)

Records within 500m **4**

Bedrock geology at 1:50,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 85 >**

ID	Location	LEX Code	Description	Rock age
1	**On site**	**TAB-S**	**THANET FORMATION - SAND**	**THANETIAN**
2	**On site**	**LSNCK-CHLK**	**LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION AND NEWHAVEN CHALK FORMATION (UNDIFFERENTIATED) - CHALK**	**TURONIAN**
3	54m N	TAB-S	THANET FORMATION - SAND	THANETIAN

ID	Location	LEX Code	Description	Rock age
4	386m SW	TAB-S	THANET FORMATION - SAND	THANETIAN

This data is sourced from the British Geological Survey.

15.9 Bedrock permeability (50k)

Records within 50m	**2**

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of bedrock (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	**Fracture**	**Very High**	**Very High**
On site	**Intergranular**	**High**	**High**

This data is sourced from the British Geological Survey.

15.10 Bedrock faults and other linear features (50k)

Records within 500m	**0**

Linear features at the ground or bedrock surface at 1:50,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

This data is sourced from the British Geological Survey.

16 Boreholes

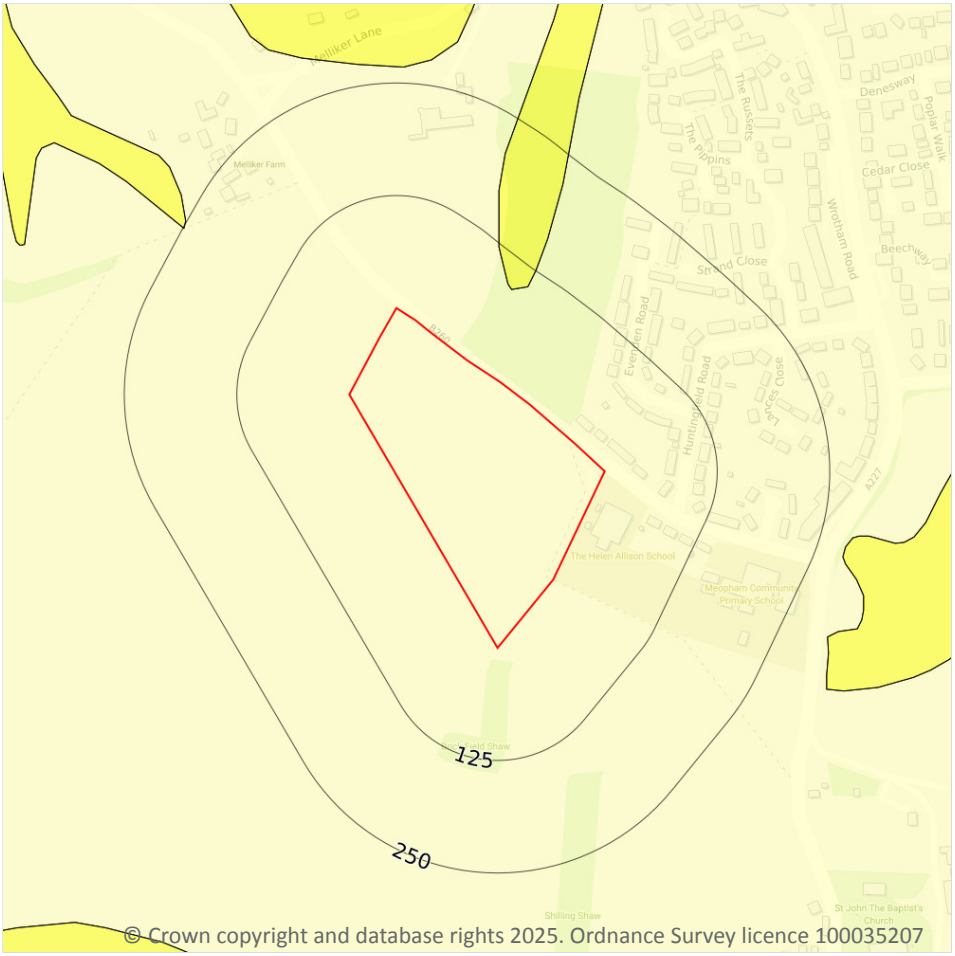
16.1 BGS Boreholes

Records within 250m	0

The Single Onshore Boreholes Index (SOBI); an index of over one million records of boreholes, shafts and wells from all forms of drilling and site investigation work held by the British Geological Survey. Covering onshore and nearshore boreholes dating back to at least 1790 and ranging from one to several thousand metres deep.

This data is sourced from the British Geological Survey.

17 Natural ground subsidence - Shrink swell clays



17.1 Shrink swell clays

Records within 50m	1

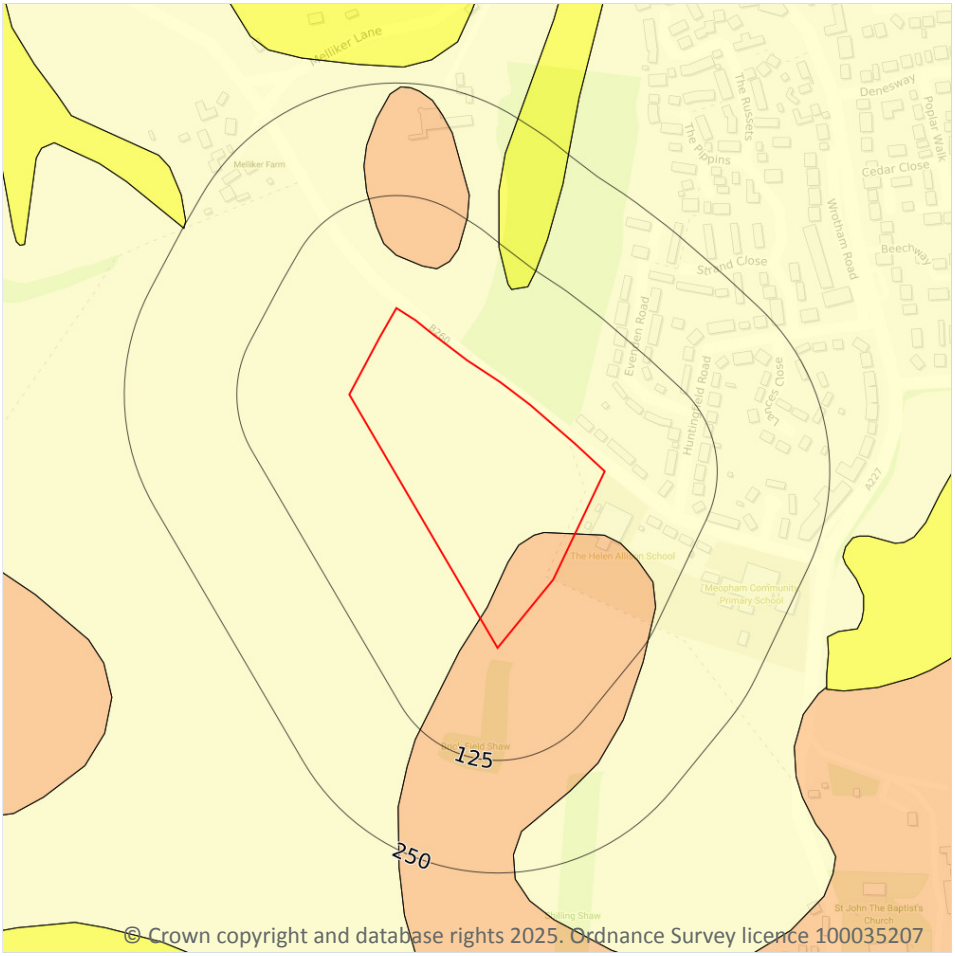
The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and local drainage).

Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 88 >**

Location	Hazard rating	Details
On site	**Negligible**	**Ground conditions predominantly non-plastic.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Running sands



17.2 Running sands

Records within 50m	2

The potential hazard presented by rocks that can contain loosely-packed sandy layers that can become fluidised by water flowing through them. Such sands can 'run', removing support from overlying buildings and causing potential damage.

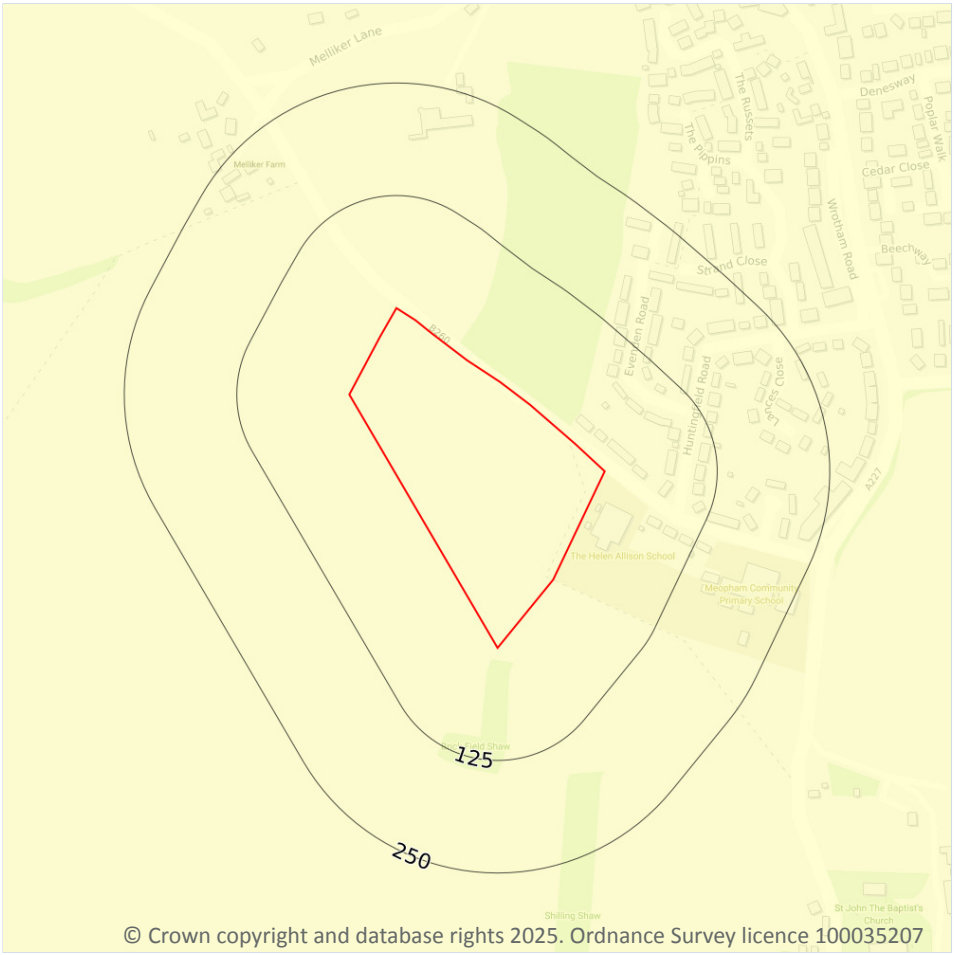
Features are displayed on the Natural ground subsidence - Running sands map on **page 89 >**

Location	Hazard rating	Details
On site	**Negligible**	**Running sand conditions are not thought to occur whatever the position of the water table. No identified constraints on lands use due to running conditions.**

Location	Hazard rating	Details
On site	**Low**	**Running sand conditions may be present. Constraints may apply to land uses involving excavation or the addition or removal of water.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Compressible deposits



Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.3 Compressible deposits

Records within 50m	1

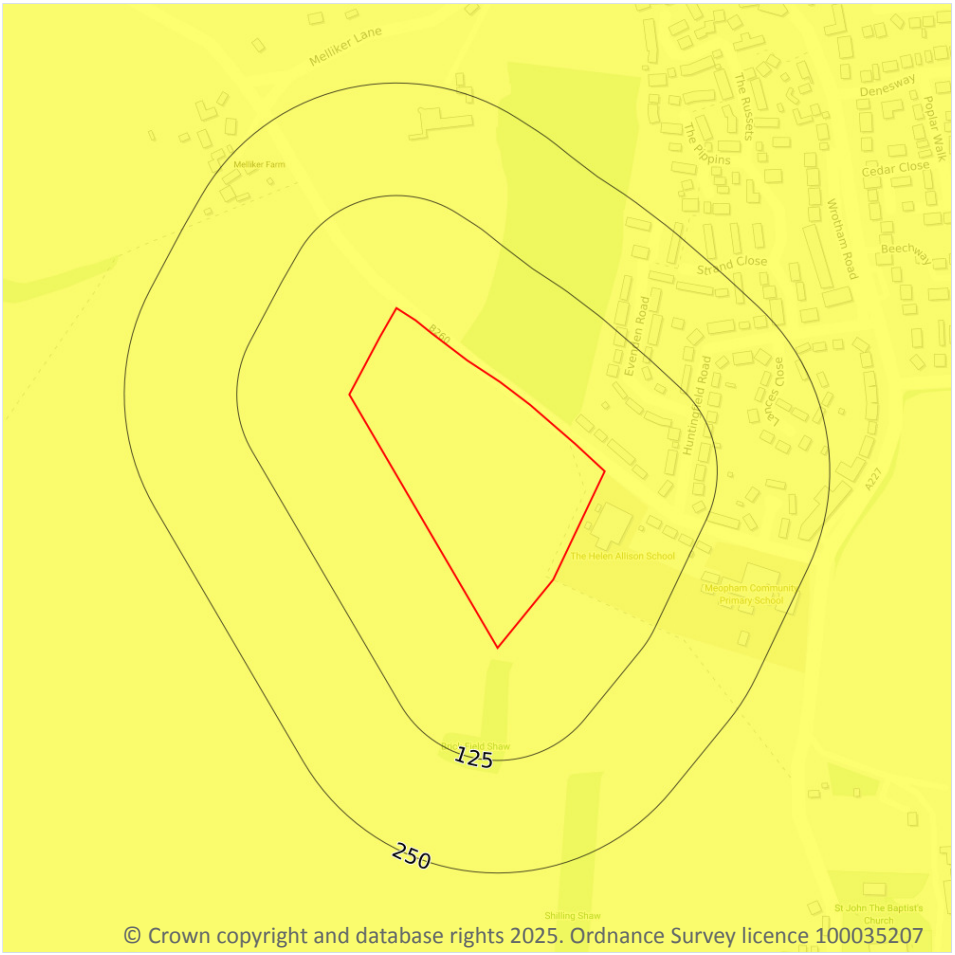
The potential hazard presented by types of ground that may contain layers of very soft materials like clay or peat and may compress if loaded by overlying structures, or if the groundwater level changes, potentially resulting in depression of the ground and disturbance of foundations.

Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 91 >**

Location	Hazard rating	Details
On site	**Negligible**	**Compressible strata are not thought to occur.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Collapsible deposits



Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.4 Collapsible deposits

Records within 50m	1

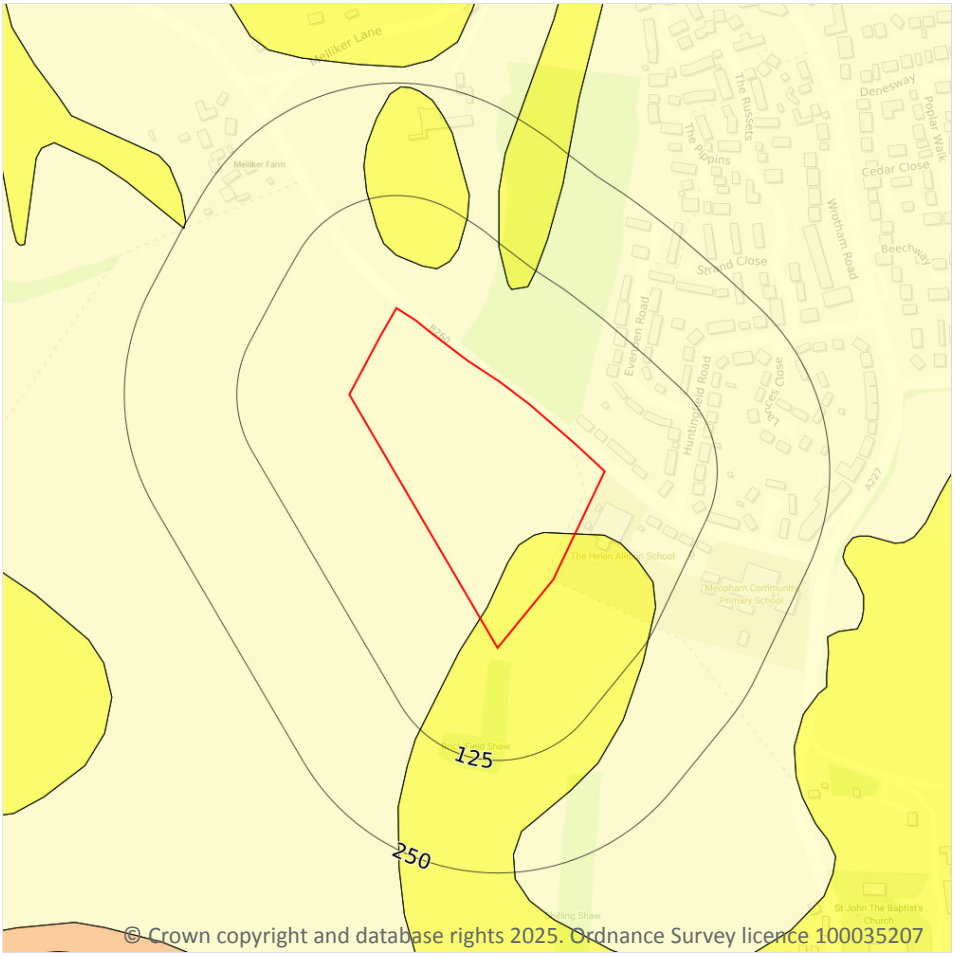
The potential hazard presented by natural deposits that could collapse when a load (such as a building) is placed on them or they become saturated with water.

Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 92 >**

Location	Hazard rating	Details
On site	**Very low**	**Deposits with potential to collapse when loaded and saturated are unlikely to be present.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Landslides



Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.5 Landslides

Records within 50m	2

The potential for landsliding (slope instability) to be a hazard assessed using 1:50,000 scale digital maps of superficial and bedrock deposits, combined with information from the BGS National Landslide Database and scientific and engineering reports.

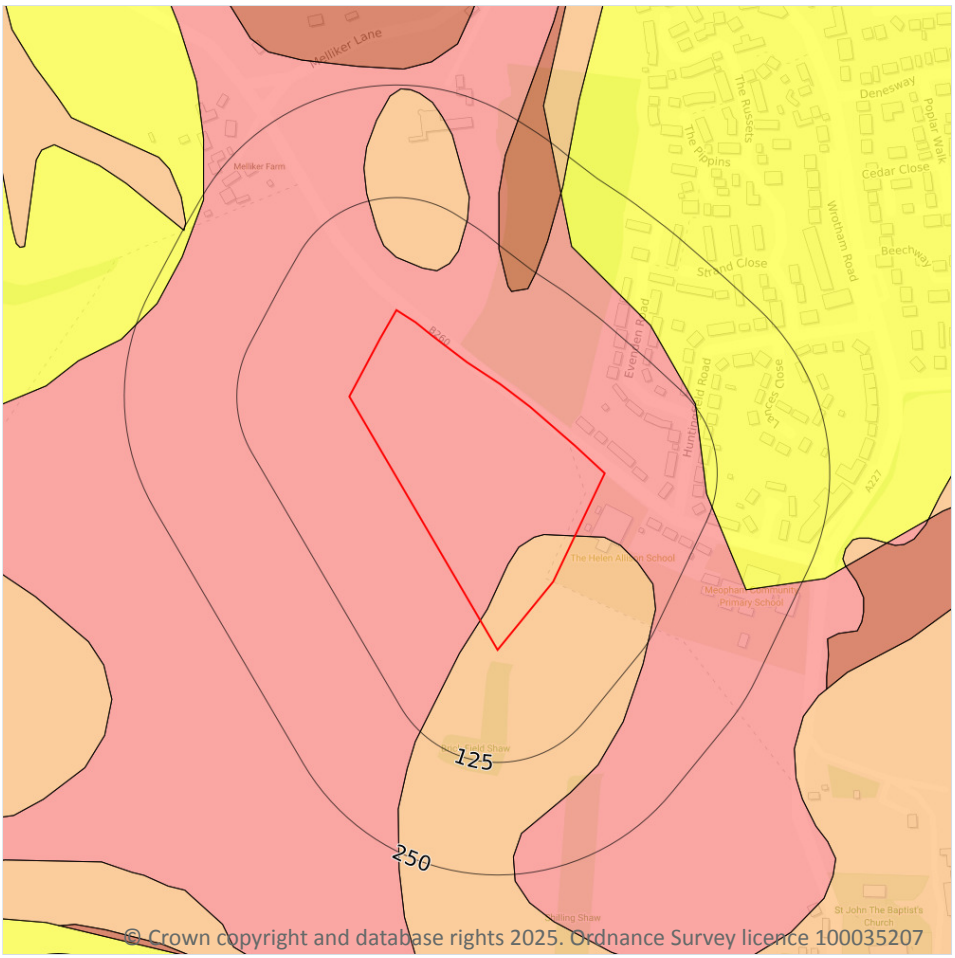
Features are displayed on the Natural ground subsidence - Landslides map on **page 93 >**

Location	Hazard rating	Details
On site	**Negligible**	**Slope instability problems are not thought to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered.**

Location	Hazard rating	Details
On site	**Very low**	**Slope instability problems are not likely to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Ground dissolution of soluble rocks



Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.6 Ground dissolution of soluble rocks

Records within 50m	2

The potential hazard presented by ground dissolution, which occurs when water passing through soluble rocks produces underground cavities and cave systems. These cavities reduce support to the ground above and can cause localised collapse of the overlying rocks and deposits.

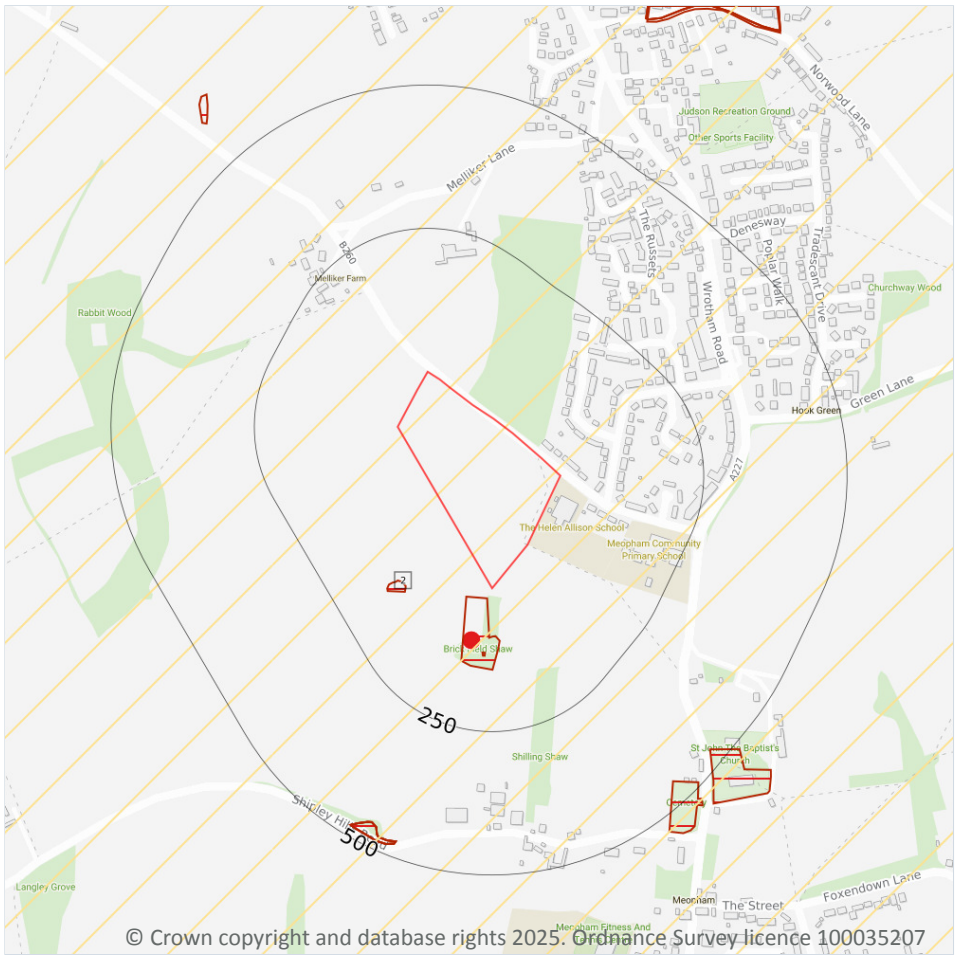
Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 95 >**

Location	Hazard rating	Details
On site	**Low**	**Soluble rocks are present within the ground. Some dissolution features may be present. Potential for difficult ground conditions are at a level where they may be considered, localised subsidence need not be considered except in exceptional circumstances.**

Location	Hazard rating	Details
On site	**Moderate**	**Soluble rocks are present within the ground. Many dissolution features may be present. Potential for difficult ground conditions are at a level where they should be considered. Potential for subsidence is at a level where it may need to be considered.**

This data is sourced from the British Geological Survey.

18 Mining and ground workings



18.1 BritPits

Records within 500m	1

BritPits (an abbreviation of British Pits) is a database maintained by the British Geological Survey of currently active and closed surface and underground mineral workings. Details of major mineral handling sites, such as wharfs and rail depots are also held in the database.

Features are displayed on the Mining and ground workings map on **page 97 >**

ID	Location	Details	Description
A	98m S	Name: Meopham Brick Works Address: Meopham, GRAVESEND, Kent Commodity: Clay & Shale Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority

This data is sourced from the British Geological Survey.

18.2 Surface ground workings

Records within 250m	**3**

Historical land uses identified from Ordnance Survey mapping that involved ground excavation at the surface. These features may or may not have been subsequently backfilled.

Features are displayed on the Mining and ground workings map on **page 97 >**

ID	Location	Land Use	Year of mapping	Mapping scale
A	20m S	Brick Works	1867	1:10560
A	113m S	Clay Pits	1867	1:10560
2	128m SW	Unspecified Quarry	1867	1:10560

This is data is sourced from Ordnance Survey/Groundsure.

18.3 Underground workings

Records within 1000m	**0**

Historical land uses identified from Ordnance Survey mapping that indicate the presence of underground workings e.g. mine shafts.

This is data is sourced from Ordnance Survey/Groundsure.

18.4 Underground mining extents

Records within 500m	**0**

This data identifies underground mine workings that could present a potential risk, including adits and seam workings. These features have been identified from BGS Geological mapping and mine plans sourced from the BGS and various collections and sources.

This data is sourced from Groundsure.

18.5 Historical Mineral Planning Areas

Records within 500m	0

Boundaries of mineral planning permissions for England and Wales. This data was collated between the 1940s (and retrospectively to the 1930s) and the mid 1980s. The data includes permitted, withdrawn and refused permissions.

This data is sourced from the British Geological Survey.

18.6 Non-coal mining

Records within 1000m	2

The potential for historical non-coal mining to have affected an area. The assessment is drawn from expert knowledge and literature in addition to the digital geological map of Britain. Mineral commodities may be divided into seven general categories - vein minerals, chalk, oil shale, building stone, bedded ores, evaporites and 'other' commodities (including ball clay, jet, black marble, graphite and chert).

Features are displayed on the Mining and ground workings map on **page 97 >**

ID	Location	Name	Commodity	Class	Likelihood
1	**On site**	**Not available**	**Chalk**	**A**	**Underground mine workings are uncommon, although the geology is similar to that worked elsewhere. Potential for difficult ground conditions are unlikely and are at a level where they need not be considered.**
-	845m E	Not available	Chalk	A	Underground mine workings are uncommon, although the geology is similar to that worked elsewhere. Potential for difficult ground conditions are unlikely and are at a level where they need not be considered.

This data is sourced from the British Geological Survey.

18.7 JPB mining areas

Records on site	0

Areas which could be affected by former coal and other mining. This data includes some mine plans unavailable to the Coal Authority.

This data is sourced from Johnson Poole and Bloomer.

18.8 The Coal Authority non-coal mining

Records within 500m	0

This data provides an indication of the potential zone of influence of recorded underground non-coal mining workings. Any and all analysis and interpretation of Coal Authority Data in this report is made by Groundsure, and is in no way supported, endorsed or authorised by the Coal Authority. The use of the data is restricted to the terms and provisions contained in this report. Data reproduced in this report may be the copyright of the Coal Authority and permission should be sought from Groundsure prior to any re-use.

This data is sourced from The Coal Authority.

18.9 Researched mining

Records within 500m	0

This data indicates areas of potential mining identified from alternative or archival sources, including; BGS Geological paper maps, Lidar data, aerial photographs (from World War II onwards), archaeological data services, websites, Tithe maps, and various text/plans from collected books and reports. Some of this data is approximate and Groundsure have interpreted the resultant risk area and, where possible, specific areas of risk have been captured.

This data is sourced from Groundsure.

18.10 Mining record office plans

Records within 500m	0

This dataset is representative of Mining Record Office and/or plan extents held by Groundsure and should be considered approximate. Where possible, plans have been located and any specific areas of risk they depict have been captured.

This data is sourced from Groundsure.

18.11 BGS mine plans

Records within 500m	0

This dataset is representative of BGS mine plans held by Groundsure and should be considered approximate. Where possible, plans have been located and any specific areas of risk they depict have been captured.

This data is sourced from Groundsure.

18.12 Coal mining

Records on site	0

Areas which could be affected by past, current or future coal mining.

This data is sourced from the Coal Authority.

18.13 Brine areas

Records on site	0

The Cheshire Brine Compensation District indicates areas that may be affected by salt and brine extraction in Cheshire and where compensation would be available where damage from this mining has occurred. Damage from salt and brine mining can still occur outside this district, but no compensation will be available.

This data is sourced from the Cheshire Brine Subsidence Compensation Board.

18.14 Gypsum areas

Records on site	0

Generalised areas that may be affected by gypsum extraction.

This data is sourced from British Gypsum.

18.15 Tin mining

Records on site	0

Generalised areas that may be affected by historical tin mining.

This data is sourced from Groundsure.

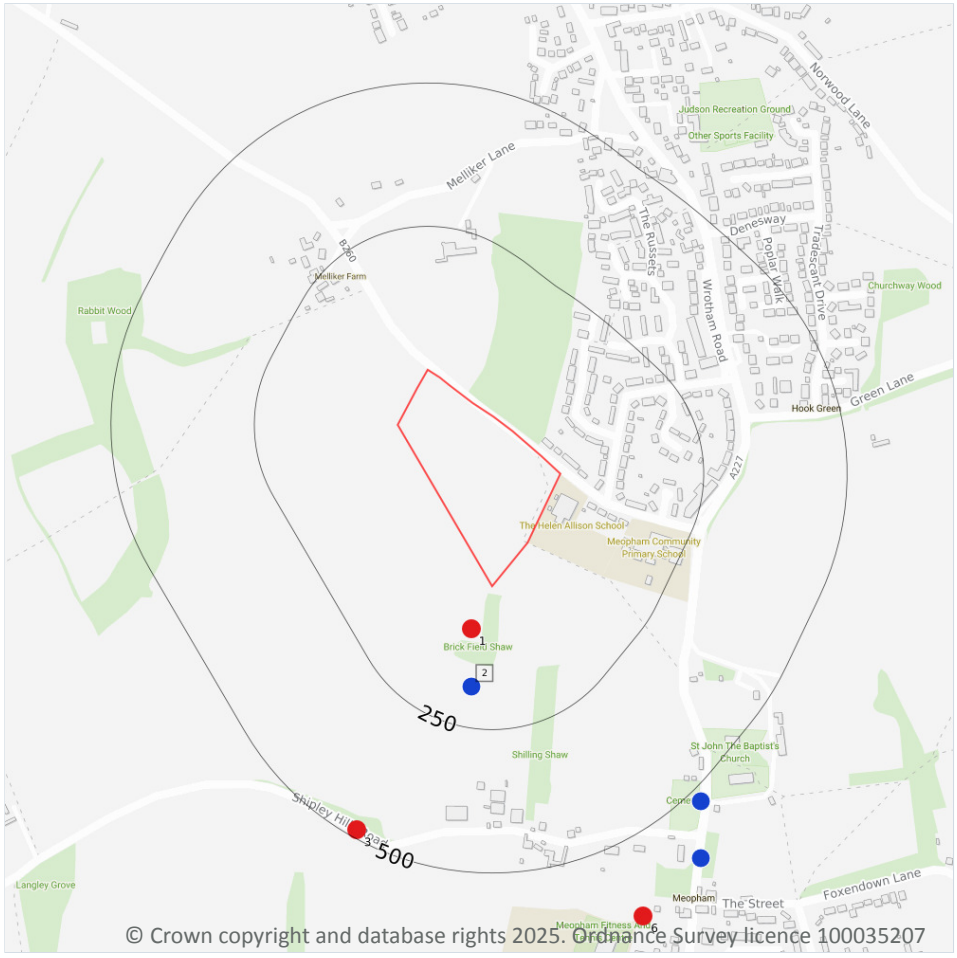
18.16 Clay mining

Records on site	0

Generalised areas that may be affected by kaolin and ball clay extraction.

This data is sourced from the Kaolin and Ball Clay Association (UK).

19 Ground cavities and sinkholes



19.1 Natural cavities

Records within 500m	1

Industry recognised national database of natural cavities. Sinkholes and caves are formed by the dissolution of soluble rock, such as chalk and limestone, gulls and fissures by cambering. Ground instability can result from movement of loose material contained within these cavities, often triggered by water.

Features are displayed on the Ground cavities and sinkholes map on **page 102 >**

ID	Location	Details	Source
2	179m S	Type: Solution Pipe x 3 Superficial Geology: None Bedrock Geology: Chalk Group, Thanet Sand Formation	Simple Bibliography: - Full Bibliography: - Confidentiality: -

This data is sourced from Stantec UK Ltd.

19.2 Mining cavities

Records within 1000m	3

Industry recognised national database of mining cavities. Degraded mines may result in hazardous subsidence (crown holes). Climatic conditions and water escape can also trigger subsidence over mine entrances and workings.

Features are displayed on the Ground cavities and sinkholes map on **page 102 >**

ID	Location	Mine Address	Mineral	Data source	Publisher
1	83m S	Meopham, Kent	Chalk	-	-
3	486m S	Meopham, Kent	Chalk	-	-
6	632m S	Meopham, Kent	Chalk	-	-

This data is sourced from Stantec UK Ltd.

19.3 Reported recent incidents

Records within 500m	0

This data identifies sinkhole information gathered from media reports and Groundsure's own records. This data goes back to 2014 and includes relative accuracy ratings for each event and links to the original data sources. The data is updated on a regular basis and should not be considered a comprehensive catalogue of all sinkhole events. The absence of data in this database does not mean a sinkhole definitely has not occurred during this time.

This data is sourced from Groundsure.

19.4 Historical incidents

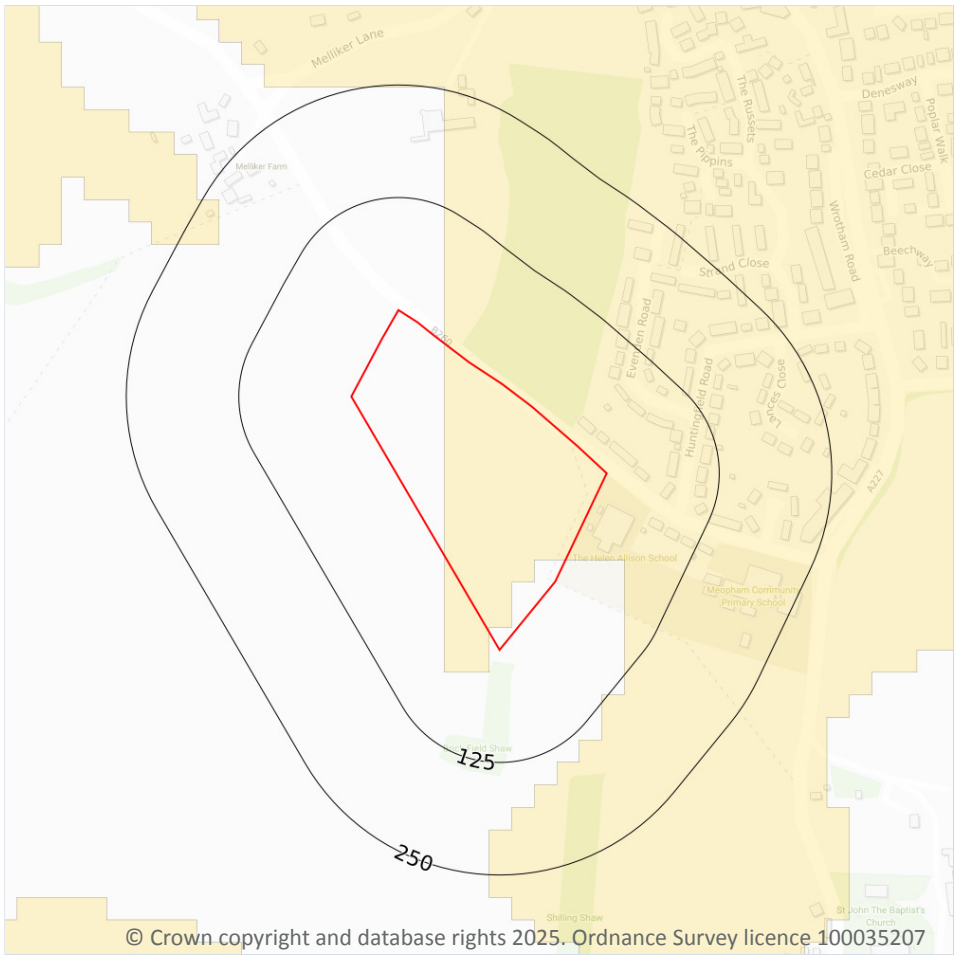
Records within 500m	0

This dataset comprises an extract of 1:10,560, 1:10,000, 1:2,500 and 1:1,250 scale historical Ordnance Survey maps held by Groundsure, dating back to the 1840s. It shows shakeholes, deneholes and other 'holes' as noted on these maps. Dene holes are medieval chalk extraction pits, usually comprising a narrow shaft with a number of chambers at the base of the shaft. Shakeholes are an alternative name for suffusion sinkholes, most commonly found in the limestone landscapes of North Yorkshire but also extensively noted around the Brecon Beacons National Park.

Not all 'holes' noted on Ordnance Survey mapping will necessarily be present within this dataset.

This data is sourced from Groundsure.

20 Radon



Site Outline

Search buffers in metres (m)

- Greater than 30%
- Between 10% and 30%
- Between 5% and 10%
- Between 3% and 5%
- Between 1% and 3%
- Less than 1%

20.1 Radon

Records on site	2

The Radon Potential data classifies areas based on their likelihood of a property having a radon level at or above the Action Level in Great Britain. The dataset is intended for use at 1:50,000 scale and was derived from both geological assessments and indoor radon measurements (more than 560,000 records). A minimum 50m buffer should be considered when searching the maps, as the smallest detectable feature at this scale is 50m. The findings of this section should supersede any estimations derived from the Indicative Atlas of Radon in Great Britain (1:100,000 scale).

Features are displayed on the Radon map on **page 104 >**

Location	Estimated properties affected	Radon Protection Measures required
On site	**Less than 1%**	**None**

Location	Estimated properties affected	Radon Protection Measures required
On site	**Between 1% and 3%**	**None**

This data is sourced from the British Geological Survey and UK Health Security Agency.

21 Soil chemistry

21.1 BGS Estimated Background Soil Chemistry

Records within 50m	5

The estimated values provide the likely background concentration of the potentially harmful elements Arsenic, Cadmium, Chromium, Lead and Nickel in topsoil. The values are estimated primarily from rural topsoil data collected at a sample density of approximately 1 per 2 km^2. In areas where rural soil samples are not available, estimation is based on stream sediment data collected from small streams at a sampling density of 1 per 2.5 km^2; this is the case for most of Scotland, Wales and southern England. The stream sediment data are converted to soil-equivalent concentrations prior to the estimation.

Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
On site	**15 - 25 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 - 30 mg/kg**
On site	**15 - 25 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 - 30 mg/kg**
On site	**15 - 25 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 - 30 mg/kg**
29m S	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
48m N	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg

This data is sourced from the British Geological Survey.

21.2 BGS Estimated Urban Soil Chemistry

Records within 50m	0

Estimated topsoil chemistry of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc and bioaccessible Arsenic and Lead in 23 urban centres across Great Britain. These estimates are derived from interpolation of the measured urban topsoil data referred to above and provide information across each city between the measured sample locations (4 per km^2).

This data is sourced from the British Geological Survey.

21.3 BGS Measured Urban Soil Chemistry

Records within 50m	0

The locations and measured total concentrations (mg/kg) of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc in urban topsoil samples from 23 urban centres across Great Britain. These are collected at a sample density of 4 per km^2.

This data is sourced from the British Geological Survey.

22 Railway infrastructure and projects

22.1 Underground railways (London)

Records within 250m	0

Details of all active London Underground lines, including approximate tunnel roof depth and operational hours.

This data is sourced from publicly available information by Groundsure.

22.2 Underground railways (Non-London)

Records within 250m	0

Details of the Merseyrail system, the Tyne and Wear Metro and the Glasgow Subway. Not all parts of all systems are located underground. The data contains location information only and does not include a depth assessment.

This data is sourced from publicly available information by Groundsure.

22.3 Railway tunnels

Records within 250m	0

Railway tunnels taken from contemporary Ordnance Survey mapping.

This data is sourced from the Ordnance Survey.

22.4 Historical railway and tunnel features

Records within 250m	0

Railways and tunnels digitised from historical Ordnance Survey mapping as scales of 1:1,250, 1:2,500, 1:10,000 and 1:10,560.

This data is sourced from Ordnance Survey/Groundsure.

22.5 Royal Mail tunnels

Records within 250m	0

The Post Office Railway, otherwise known as the Mail Rail, is an underground railway running through Central London from Paddington Head District Sorting Office to Whitechapel Eastern Head Sorting Office. The line is 10.5km long. The data includes details of the full extent of the tunnels, the depth of the tunnel, and the depth to track level.

This data is sourced from Groundsure/the Postal Museum.

22.6 Historical railways

Records within 250m	0

Former railway lines, including dismantled lines, abandoned lines, disused lines, historic railways and razed lines.

This data is sourced from OpenStreetMap.

22.7 Railways

Records within 250m	0

Currently existing railway lines, including standard railways, narrow gauge, funicular, trams and light railways.

This data is sourced from Ordnance Survey and OpenStreetMap.

22.8 Crossrail 2

Records within 500m	0

Crossrail 2 is a proposed railway linking the national rail networks in Surrey and Hertfordshire via an underground tunnel through London.

This data is sourced from publicly available information by Groundsure.

22.9 HS2

Records within 500m	0

HS2 is a proposed high speed rail network running from London to Manchester and Leeds via Birmingham. Main civils construction on Phase 1 (London to Birmingham) of the project began in 2019, and it is currently anticipated that this phase will be fully operational by 2026. Construction on Phase 2a (Birmingham to Crewe) is anticipated to commence in 2021, with the service fully operational by 2027. Construction on Phase 2b (Crewe to Manchester and Birmingham to Leeds) is scheduled to begin in 2023 and be operational by 2033.

This data is sourced from HS2 ltd.

Data providers

Groundsure works with respected data providers to bring you the most relevant and accurate information. To find out who they are and their areas of expertise see https://www.groundsure.com/sources-reference ↗.

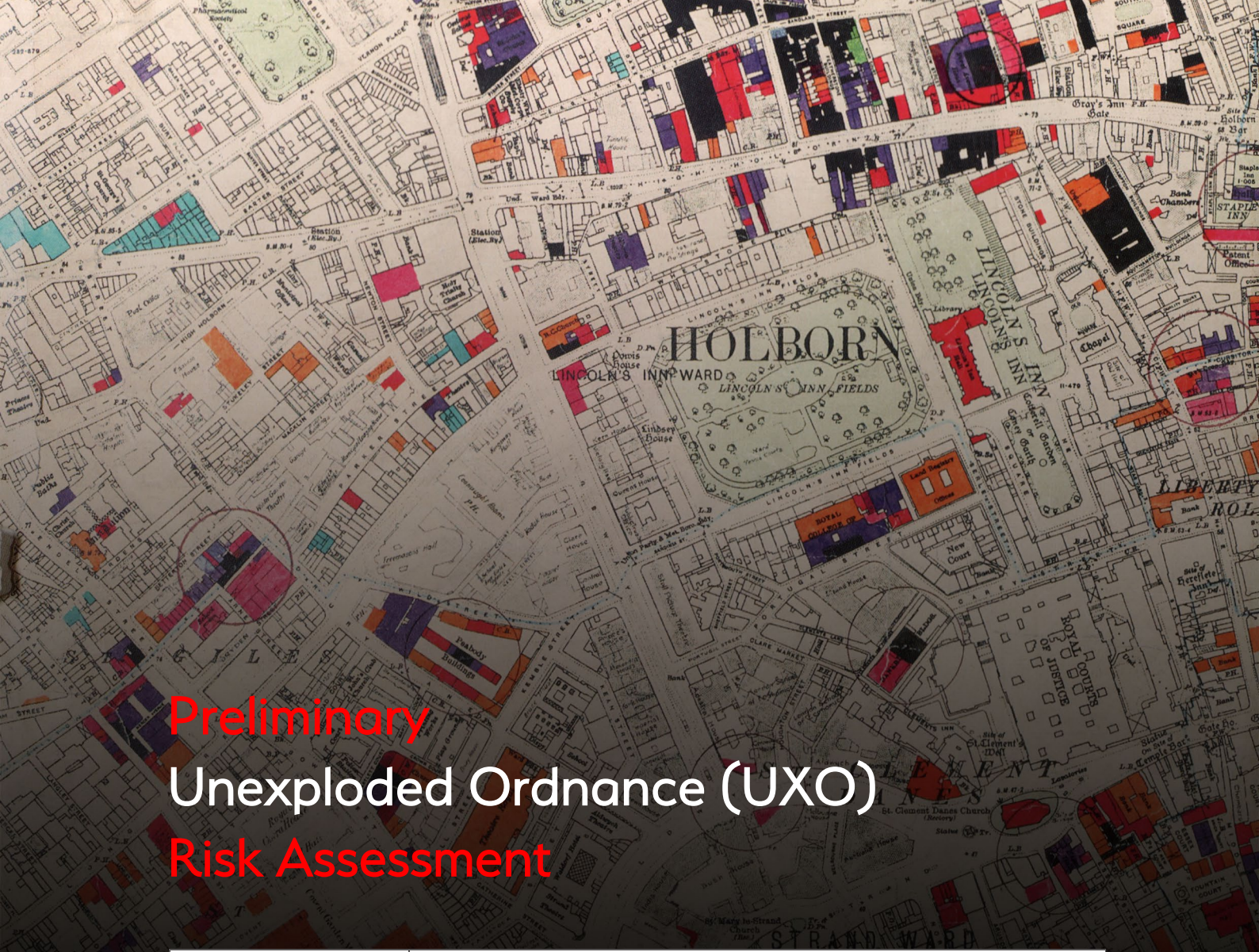
Terms and conditions

Groundsure's Terms and Conditions can be accessed at this link: www.groundsure.com/terms-and-conditions-april-2023/ ↗.

MEC
Consulting Group

APPENDICES

APPENDIX E



Preliminary
Unexploded Ordnance (UXO)
Risk Assessment

Project Name	Wrotham Road (West), Meopham
Client	MEC Consulting Group
Site Address	Wrotham Road (West), Meopham, DA13 0EW
Report Reference	PA21699-00
Date	21st March 2025
Author	AL
Quality Assurance	AT

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1ST LINE DEFENCE

Assessment Objective

This preliminary unexploded ordnance (UXO) risk assessment is a qualitative screening exercise to assess the likely potential of encountering UXO at the Wrotham Road (West), Meopham site. The assessment involves the consideration of the basic factors that affect the potential for UXO to be present at a site as outlined in Stage One of the UXO risk management process.

Background

This assessment uses the sources of information available in-house to 1st Line Defence Ltd to enable the placement of a development site in context with events that may have led to the presence of German air-delivered or Allied military UXO. The report will identify any immediate necessity for risk mitigation or additional research in the form of a Detailed UXO Risk Assessment. It makes use of 1st Line Defence's extensive historical archives, library and unique geo-databases, as well as internet resources, and is researched and compiled by UXO specialists and graduate researchers.

The assessment directly follows CIRIA C681 guidelines "Unexploded Ordnance, a Guide for the Construction Industry". The document will therefore assess the following factors:

- Basic Site Data
- Previous Military Use
- Indicators of potential aerial delivered UXO threat
- Consideration of any Mitigating Factors
- Extent of Proposed Intrusive Works
- Any requirement for Further Work

It should be noted that the vast majority of construction sites in the UK will have a low or negligible risk of encountering UXO and should be able to be screened out at this preliminary stage. The report is meant as a common sense 'first step' in the UXO risk management process. The content of the report and conclusions drawn are based on basic, preliminary research using the information available to 1st Line Defence at the time this report was produced. It should be noted that the only way to entirely negate risk from UXO to a project would be to support the works proposed with appropriate UXO risk mitigation measures. It is rarely possible to state that there is absolutely 'no' risk from UXO to a project.

Site Boundary

Risk Assessment Considerations	
Site location and description/current use	The site is located in Meopham, Kent. Recent aerial imagery shows the site to comprise open vegetated land. It was bound to the north by Longfield Road (the B260), to the east by open vegetation, numerous structures, and a car park associated with the National Autistic Society - Helen Allison School, and to the south and west by further vegetation. The site is approximately centred on the OS grid reference: **TQ 64023 66819.**
Are there any indicators of current/historical military activity on/close to the site?	In-house records do not indicate the site footprint had any former military use. No features, such as WWII defensive positions, encampments, or firing ranges, are recorded to have been located at the site. In addition, no information on ordnance being stored, produced, or disposed of within the proposed site boundary could be found. The closest reference to any form of Allied activity involved the discovery of an item of UXO approximately 560m to the northwest. The closest recorded Heavy Anti-Aircraft (HAA) battery was situated approximately 3.9km to the northeast, in the vicinity of Lodge Lane. The conditions in which unexploded anti-aircraft ordnance may have fallen unrecorded within the proposed site are generally analogous to that of German aerial delivered ordnance - see below for further information.
What was the pre- and post-WWII history of the site?	Pre-war OS mapping, dated 1892-1914, showed the site comprised undeveloped, vegetated land. It was bound to the north by Longfield Road (the B260) and to the east, south, and west by further vegetated land. Post-war OS mapping, dated 1948-1973, depicted the site as analogous to the previous mapping edition.
Was the area subject to bombing during WWII?	During WWII, the site was located in the Rural District of Strood. According to official Home Office bombing statistics, this district sustained an overall low-moderate bombing density, with an average of 42.2 items of ordnance recorded per 1,000 acres. This included 1,804 high explosive (HE) bombs, 24 parachute mines, 55 oil bombs, 117 phosphorus bombs, 14 'fire pots', 37 V-1 pilotless aircraft, and nine V-2 long-range rockets, comprising 2,060 items across 48,811 acres. Small-scale Kent Daily Bomb mapping recorded multiple bombing incidents in and around the site - notably in late 1940 and in 1941. These were corroborated by bomb mapping for the Medway Group area -where a 'stick' of incidents was recorded in the site area.
Is there any evidence of bomb damage on/close to the site?	Considering the recorded bombing in and around the site area, high-quality aerial imagery will be required to determine the site conditions and whether any damage was sustained.
To what degree would the site have been subject to access?	Considering the site's vegetated composition, it is anticipated that the majority of the site area did not experience a frequent and regular access level during WWII, with any access likely caused by roadways further to the north; however, any observation would have been reliant on the vigilance of passers by's.
To what degree has the site been developed post-WWII?	There appears to have been minimal development on-site since the previous mapping edition; it remains occupied by open, vegetated land
What is the nature and extent of the intrusive works proposed?	According to communications with MEC Consulting Group, investigation works comprising trial pitting and soil infiltration testing will occur in 2025.

Summary and Conclusions

During WWII, the site was located in the Rural District of Strood. According to official Home Office bombing statistics, this district sustained an overall low-moderate bombing density, with an average of 42.2 items of ordnance recorded per 1,000 acres.

Small-scale Kent Daily Bomb mapping recorded multiple bombing incidents in and around the site between 1940 and 1941. These corroborated bomb mapping for the Medway Group area - where a 'stick' of incidents was depicted in the site area. Further research will be required to determine the exact location of these incidents and whether they would have impacted the site specifically.

Recommendations

Given the findings of this preliminary report, it is recommended that **further research** is undertaken in the form of a **Detailed UXO Risk Assessment** by CIRIA guidelines. Further research determines the exact location of nearby bombing incidents and whether they would have impacted the site directly. It would require acquiring additional archival information such as written records and high-quality aerial imagery. This will allow for a more confident assessment of wartime conditions and subsequent risk of UXO contamination on site.

Before or instead of a Detailed Assessment, it is recommended that appropriate UXO Risk Mitigation Measures are provided for intrusive works proposed. **If the client has any anecdotal or empirical evidence of UXO risk on site, please contact 1st Line Defence.**

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Front cover image credit: London County Council Bomb Damage Mapping (London Metropolitan Archives)

Detailed
Unexploded Ordnance (UXO)
Risk Assessment

Project Name	Wrotham Road (West), Meopham, Kent
Client	MEC Consulting Group
Site Address	Wrotham Road (West), Meopham, Kent, DA13 0EW
Report Reference	DA21699-00
Date	9th April 2025
Author	AL
Quality Assurance	AB
Final Check	PB

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1ST LINE DEFENCE

Executive Summary

Site Location and Description

The site is located in Meopham, Kent. Recent aerial imagery shows the site to comprise open vegetated land. It is bound to the north by Longfield Road (the B260), to the east by open vegetation, numerous structures, and a car park associated with the National Autistic Society – Helen Allison School, and to the south and west by further vegetation.

The site is approximately centred on the OS grid reference: **TQ 64023 66819.**

Proposed Works

According to communications with MEC Consulting Group, investigation works comprising trial pitting and soil infiltration testing will occur in 2025.

Geology and Bomb Penetration Depth

Chalk Formation, Seaford Chalk Formation, and Newhaven Chalk Formation - all comprising chalk of the Cretaceous period.

Site-specific geotechnical information was not available to 1st Line Defence at the time of the production of this report. An assessment of maximum bomb penetration depth can be made once such data becomes available, or by a UXO specialist during on-site support.

It should be noted that the maximum depth that a bomb could reach may vary across a site and will be largely dependent on the specific underlying geological strata and its density.

UXO Risk Assessment

1st Line Defence has assessed that there is an overall **Low-Medium Risk** from German and anti-aircraft unexploded ordnance at the site of proposed works. There is an assessed **Low Risk** from Allied unexploded ordnance.

The Risk from German Air-Delivered UXO

- During WWII, the site was located within the Rural District of Strood. According to official Home Office bombing statistics, this district was subject to an overall low-moderate bombing density, with an average of 42.2 items of ordnance recorded per 1,000 acres. Bombing in the area can primarily be attributed to Meopham's location along the flight path to London. It was not uncommon for Luftwaffe aircraft to jettison surplus munitions in opportunistic 'tip and run raids' near confirmed targets (see Luftwaffe Reconnaissance imagery, **Annex H**).
- According to historic OS mapping, the site was occupied by open, vegetated land.
- Kent Daily Bomb mapping (see **Annex I**) recorded numerous incidents of HE and incendiary bombing within the immediate site surroundings, with others in the wider surrounding area, across multiple air raids between August 1940 and April 1941; it has not been possible to determine the exact location of specific incidents in relation to the site via this source however due to the scale of the mapping / lack of detail provided.
- Additional bomb mapping for the Medway Group area corroborated the presence of bombing in the immediate surrounds, with a stick of four bombs recorded to the immediate south and a cluster of eight bombs noted further north of Longfield Road; nevertheless, this source recorded no bombing directly on site. Available written records appear to corroborate with the findings of the Medway bomb mapping, with the Medway war diaries recording four HE bombs in the immediate site vicinity in April 1941 and a further eight HE bombs at Hooks Green approximately 190m north of the site in November 1940.
- WWII-era aerial photography appears to confirm that the closest incidents occurred in the area just south of the site, showing several bomb craters approximately 100m-110m to the south, separated from the site by further open land / vegetation. No direct evidence of damage or cratering can be seen within the site itself.
- Considering the site was occupied by areas of open land, ground conditions would not have been particularly conducive to the detection of UXO indicators. This is because typical indicators of bombing, such as bomb entry holes, scattered earth, or indentations to the ground, could have been obscured by vegetation/crops. Furthermore, considering the site was rural in nature, it is likely that it did not sustain a frequent level of access. This may have increased the likelihood that UXO could have gone unnoticed and unrecorded within the general site area. The proximity of roadways and small areas of development may have provided the site was some additional level of observation, though this may have been somewhat limited and dependent on local residents.
- In summary, the site has been assessed to hold an overall **Low-Medium** risk from UXO contamination. Although available evidence suggests that several bombs fell in the immediate surrounds of the site, post-war aerial photography appears to show no visible evidence of damage to the site itself, instead showing several craters approximately 100m south of the site, corroborating with bomb mapping which plotted the closest incidents as having occurred in this area. Subsequently,

proactive risk mitigation measures are not thought to be necessary on this occasion. As the possibility of UXO falling unnoticed within the site area cannot be entirely dismissed (due to the open nature of the site and the recorded bombing in the immediate surroundings), caution is nevertheless recommended when undertaking works in the area. UXO Safety Awareness Briefings are strongly recommended for all staff on site, and a UXO Risk Management Plan should be put in place.

The Risk from Allied UXO

- No evidence could be found to indicate that the site formerly had any military occupation or usage that could have led to contamination with items of Allied ordnance, such as LSA and SAA.
- The conditions in which HAA or LAA projectiles may have fallen unnoticed within the site boundary are however analogous to those regarding air delivered ordnance.

Post-WWII Redevelopment

- There does not appear to have been any development on-site, and the site remains occupied by open, vegetated land.
- The risk of UXO remaining is considered to be mitigated at the location of and down to the depth of any post-war redevelopment on site. For example, the risk from deep buried UXO will only have been mitigated within the volumes of any post-war pile foundations or deep excavations for basement levels. The risk will however remain within virgin geology below and amongst these post-war works, down to the maximum bomb penetration depth.

Recommended Risk Mitigation Measures

The following risk mitigation measures are recommended to support the proposed works at the Wrotham Road (West), Meopham, Kent site:

Activity	Recommended Risk Mitigation Measure
All Works	• UXO Risk Management Plan • Site Specific UXO Awareness Briefings to all personnel conducting intrusive works.

Note – proactive on-site UXO support/survey should not be necessary for any works taking place at the location of and down to the depths of significantly worked post-war made ground/post-war fill.

Glossary

Abbreviation	Definition
AA	Anti-Aircraft
AFS	Auxiliary Fire Service
AP	Anti-Personnel
ARP	Air Raid Precautions
DA	Delay-action
EOC	Explosive Ordnance Clearance
EOD	Explosive Ordnance Disposal
FP	Fire Pot
GM	G Mine (Parachute mine)
HAA	Heavy Anti-Aircraft
HE	High Explosive
IB	Incendiary Bomb
JSEODOC	Joint Services Explosive Ordnance Disposal Operation Centre
LAA	Light Anti-Aircraft
LCC	London County Council
LRRB	Long Range Rocket Bomb (V-2)
LSA	Land Service Ammunition
NFF	National Filling Factory
OB	Oil Bomb
PAC	Pilotless Aircraft (V-1)
PB	Phosphorous Bomb
PM	Parachute Mine
POW	Prisoner Of War
RAF	Royal Air Force
RCAF	Royal Canadian Air Force
RFC	Royal Flying Corps
RNAS	Royal Naval Air Service
ROF	Royal Ordnance Factory
SA	Small Arms
SAA	Small Arms Ammunition
SD2	Anti-personnel "Butterfly Bomb"
SIP	Self-Igniting Phosphorous
U/C	Unclassified bomb
UP	Unrotated Projectile (rocket)
USAAF	United States Army Air Force
UX	Unexploded
UXAA	Unexploded Anti-Aircraft
UXB	Unexploded Bomb
UXO	Unexploded Ordnance
V-1	Flying Bomb (Doodlebug)
V-2	Long Range Rocket
WAAF	Women's Auxiliary Air Force
X	Exploded

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1st Line Defence Limited®
Detailed Unexploded Ordnance (UXO) Risk Assessment

Site: Wrotham Road (West), Meopham, Kent
Client: MEC Consulting Group

1. Introduction

1.1. Background

1st Line Defence has been commissioned by MEC Consulting Group to conduct a Detailed Unexploded Ordnance (UXO) Risk Assessment for the works proposed at Wrotham Road (West), Meopham, Kent.

Buried UXO can present a significant risk to construction works and development projects. The discovery of a suspect device during works can cause considerable disruption to operations as well as cause unwanted delays and expense.

UXO in the UK can originate from three principal sources:

1. Munitions resulting from wartime activities including German bombing in WWI and WWII, long range shelling, and defensive activities.
2. Munitions deposited as a result of military training and exercises.
3. Munitions lost, burnt, buried or otherwise discarded either deliberately, accidentally, or ineffectively.

This report will assess the potential factors that may contribute to the risk of UXO contamination. If an elevated risk is identified at the site, this report will recommend appropriate mitigation measures, in order to reduce the risk to as low as is reasonably practicable. Detailed analysis and evidence will be provided to ensure an understanding of the basis for the assessed risk level and any recommendations.

This report complies with the guidelines outlined in CIRIA C681, 'Unexploded Ordnance (UXO) A Guide for the Construction Industry.'

2. Method Statement

2.1. Report Objectives

The aim of this report is to conduct a comprehensive assessment of the potential risk from UXO at Wrotham Road (West), Meopham, Kent. The report will also recommend appropriate site and work-specific risk mitigation measures to reduce the risk from explosive ordnance during the envisaged works to a level that is as low as reasonably practicable.

2.2. Risk Assessment Process

1st Line Defence has undertaken a five-step process for assessing the risk of UXO contamination:

1. The likelihood that the site was contaminated with UXO.
2. The likelihood that UXO remains on the site.
3. The likelihood that UXO may be encountered during the proposed works.
4. The likelihood that UXO may be initiated.
5. The consequences of initiating or encountering UXO.

In order to address the above, 1st Line Defence has taken into consideration the following factors:

- Evidence of WWI and WWII German air delivered bombing as well as the legacy of Allied occupation.
- The nature and conditions of the site during WWII.
- The extent of post-war development and UXO clearance operations on site.
- The scope and nature of the proposed works and the maximum assessed bomb penetration depth.
- The nature of ordnance that may have contaminated the proposed site area.

2.3. Sources of Information

Every reasonable effort has been made to ensure that relevant evidence has been consulted and presented in order to produce a thorough and comprehensible report for the client. To achieve this the following, which includes military records and archive material held in the public domain, have been accessed:

- The National Archives and the Kent Archives.
- Historical mapping datasets.
- Historic England National Monuments Record.
- Relevant information supplied by MEC Consulting Group.
- Available material from 33 Engineer Regiment (EOD) Archive (part of 29 Explosive Ordnance and Disposal and Search Group).
- 1st Line Defence's extensive historical archives, library and UXO geo-datasets.
- Open sources such as published books and internet resources.

3. Background to Bombing Records

3.1. General Considerations of Historical Research

This desktop assessment is based largely upon analysis of historical evidence. Every reasonable effort has been made to locate and present significant and pertinent information. 1st Line Defence cannot be held accountable for any changes to the assessed risk level or risk mitigation measures, based on documentation or other data that may come to light at a later date, or which was not available to 1st Line Defence during the production of this report.

It is often problematic and sometimes impossible to verify the completeness and accuracy of WWII-era records. As a consequence, conclusions as to the exact location and nature of a UXO risk can rarely be quantified and are, to a degree, subjective. To counter this, a range of sources have been consulted, presented and analysed. The same methodology is applied to each report during the risk assessment process. 1st Line Defence cannot be held responsible for any inaccuracies or the incompleteness in available historical information.

3.2. German Bombing Records

During WWII, bombing records were generally gathered locally by the police, Air Raid Precaution (ARP) wardens and military personnel. These records typically contained information such as the date, the location, the amount of damage caused and the types of bombs that had fallen during an air raid. This information was made either through direct observation or post-raid surveys. The Ministry of Home Security Bomb Census Organisation would then receive this information, which was plotted onto maps, charts, and tracing sheets by regional technical officers. The collective record set (regional bomb census mapping and locally gathered incidents records) would then be processed and summarised into reports by the Ministry of Home Security Research and Experiments Branch. The latter were tasked with providing the government 'a complete picture of air raid patterns, types of weapons used and damage caused- in particular to strategic services and installations such as railways, shipyards, factories and public utilities.'

The quality, detail and nature of record keeping could vary considerably between provincial towns, boroughs and cities. No two areas identically collated or recorded data. While some local authorities maintained records with a methodical approach, sources in certain areas can be considerably more vague, dispersed, and narrower in scope. In addition, the immediate priority was mostly focused on assisting casualties and minimising damage at the time. As a result, some records can be incomplete and contradictory. Furthermore, many records were even damaged or destroyed in subsequent air raids. Records of raids that took place on sparsely or uninhabited areas were often based upon third party or hearsay information and are therefore not always reliable. Whereas records of attacks on military or strategic targets were often maintained separately and have not always survived.

3.3. Allied Records

During WWII, considerable areas of land were requisitioned by the War Office for the purpose of defence, training, munitions production and the construction of airfields. Records relating to military features vary and some may remain censored. Within urban environments datasets will be consulted detailing the location of munition production as well as wartime air and land defences. In rural locations it may be possible to obtain plans of military establishments, such as airfields, as well as training logs, record books, plans and personal memoirs. As with bombing records, every reasonable effort will be made to access records of, and ascertain any evidence of, military land use. However, there are occasions where such evidence is not available, as records may not be accessible, have been lost/destroyed, or simply were not kept in the first place.

4. UK Regulatory Environment and Guidelines

4.1. General

There is no formal obligation requiring a UXO risk assessment to be undertaken for construction projects in the UK, nor is there any specific legislation stipulating the management or mitigation of UXO risk. However, it is implicit in the legislation outlined below that those responsible for intrusive works (archaeology, site investigation, drilling, piling, excavation etc.) should undertake a comprehensive and robust assessment of the potential risks to employees and that mitigation measures are implemented to address any identified hazards.

4.2. CDM Regulations 2015

The Construction (Design and Management) Regulations 2015 (CDM 2015) define the responsibilities of parties involved in the construction of temporary or permanent structures.

The CDM 2015 establishes a duty of care extending from clients, principle designers, and contractors to those working on, or affected by, a project. Those responsible for construction projects may therefore be accountable for the personal or proprietary loss of third parties, if correct health and safety procedure has not been applied.

Although the CDM does not specifically reference UXO, the risk presented by such items is both within the scope and purpose of the legislation. It is therefore implied that there is an obligation for parties to:

- Provide an appropriate assessment of potential UXO risks at the site (or ensure such an assessment is completed by others).
- Put in place appropriate risk mitigation measures if necessary.
- Supply all parties with information relevant to the risks presented by the project.
- Ensure the preparation of a suitably robust emergency response plan.

4.3. The 1974 Health and Safety at Work etc. Act

All employers have a responsibility under the Health and Safety at Work etc. Act 1974 and the Management of Health and Safety at Work Regulations 1999, to ensure the health and safety of their employees and third parties, so far as is reasonably practicable and conduct suitable and sufficient risk assessments.

4.4. CIRIA C681

In 2009, the Construction Industry Research and Information Association (CIRIA) produced a guide to the risk posed by UXO to the UK construction industry (CIRIA C681). CIRIA is a neutral, independent and not-for-profit body, linking organisations with common interests and facilitating a range of collaborative activities that help improve the industry.

The publication provides the UK construction industry with a defined process for the management of risks associated with UXO from WWI and WWII air bombardment. It is also broadly applicable to the risks from other forms of UXO that might be encountered. It focuses on construction professionals' needs, particularly if there is a suspected item of UXO on site, and covers issues such as what to expect from a UXO specialist. The guidance also helps clients to fulfil their legal duty under CDM 2015 to provide designers and contractors with project specific health and safety information needed to identify hazards and risks associated with the design and construction work. This report conforms to this CIRIA guidance and to the various recommendations for good practice referenced therein. It is recommended that this document is acquired and studied where possible to allow a better understanding of the background to both the risk assessment process and the UXO issue in the UK in general.

4.5. Additional Legislation

In the event of a casualty resulting from the failure of an employer/client to address the risks relating to UXO, the organisation may be criminally liable under the Corporate Manslaughter and Corporate Homicide Act 2007.

5. The Role of Commercial UXO Contractors and The Authorities

5.1. Commercial UXO Specialists

The role of a UXO Specialist (often referred to as UXO Consultant or UXO Contractor) such as 1st Line Defence, is defined in CIRIA C681 as the provision of expert knowledge and guidance to the client on the most appropriate and cost-effective approach to UXO risk management at a site.

The principal role of UXO Specialists is to provide the client with an appropriate assessment of the risk posed by UXO for a specific project, and identify and carry out suitable methodology for the mitigation of any identified risks to reduce them to an acceptable level.

The requirement for a UXO Specialist should ideally be identified in the initial stages of a project, and it is recommended that this occur prior to the start of any detailed design. This will enable the client to budget for expenditure that may be required to address the risks from UXO, and may enable the project team to identify appropriate techniques to eliminate or reduce potential risks through considered design, without the need for UXO specific mitigation measures. The UXO Specialist should have suitable qualifications, levels of competency and insurances.

Please note 1st Line Defence has the capability to provide a complete range of required UXO risk mitigation services, in order to reduce a risk to as low as reasonably practicable. This can involve the provision of both ground investigation, and where appropriate, UXO clearance services.

5.2. The Authorities

The police have a responsibility to co-ordinate the emergency services in the event of an ordnance-related incident at a construction site. Upon inspection they may impose a safety cordon, order an evacuation, and call the military authorities Joint Services Explosive Ordnance Disposal Operation Centre (JSEODOC) to arrange for investigation and/or disposal. Within the Metropolitan Police Operational Area, SO15 EOD will be tasked to any discovery of suspected UXO. The request for Explosive Officer (Expo) support is well understood and practiced by all Metropolitan Boroughs. The requirement for any additional assets will then be coordinated by the Expo if required.

In the absence of a UXO specialist, police officers will usually employ such precautionary safety measures, thereby causing works to cease, and possibly requiring the evacuation of neighbouring businesses and properties.

The priority given to the police request will depend on the EOD teams' judgement of the nature of the UXO risk, the location, people and assets at risk, as well as the availability of resources. The speed of response varies; authorities may respond immediately or in some cases it may take several days for the item of ordnance to be dealt with. Depending on the on-site risk assessment the item of ordnance may be removed from the site and/or destroyed by a controlled explosion.

Following the removal of an item of UXO, the military authorities will only undertake further investigations or clearances in high-risk situations. If there are regular UXO finds on a site the JSEODOC may not treat each occurrence as an emergency and will recommend the construction company puts in place alternative procedures, such as the appointment of a commercial contractor to manage the situation.

6. The Site

6.1. Site Location

The site is located in Meopham, Kent.

It is bound to the north by Longfield Road (the B260), to the east by open vegetation, numerous structures, and a car park associated with the National Autistic Society – Helen Allison School, and to the south and west by further vegetation.

The site is approximately centred on the OS grid reference: **TQ 64023 66819**.

Site location maps are presented in **Annex A**.

6.2. Site Description

Recent aerial imagery shows the site to comprise open vegetated land.

A recent aerial photograph and site plan are presented in **Annex B** and **Annex C** respectively.

7. Scope of the Proposed Works

7.1. General

According to communications with MEC Consulting Group, investigation works comprising trial pitting and soil infiltration testing will occur in 2025.

8. Ground Conditions

8.1. General Geology

The British Geological Survey (BGS) map shows the site to be underlain by the Thanet Formation – sand of the Palaeogene period and the Lewes Nodular Chalk Formation, Seaford Chalk Formation, and Newhaven Chalk Formation - all comprising chalk of the Cretaceous period

8.2. Site-Specific Geology

Site-specific geotechnical data was not provided by the client during the production of this report.

9. Site History

9.1. Introduction

The purpose of this section is to identify the composition of the site pre and post-WWII. It is important to establish the historical use of the site, as this may indicate the site's relation to potential sources of UXO as well as help with determining factors such as the land use, groundcover, likely frequency of access and signs of bomb damage.

9.2. Ordnance Survey Historical Maps

Relevant historical maps were obtained for this report and are presented in **Annex D**. See below for a summary of the site history shown on acquired mapping.

Pre-WWII		
Date	Scale	Description
1933-1936	1:2,500	Pre-war OS mapping, dated 1933-1936, showed the site to comprise undeveloped, vegetated land. It was bound to the north by Longfield Road (the B260) and to the east, south, and west by further vegetated land.

Post-WWII		
Date	Scale	Description
1960-1964	1:2,500	Post-war OS mapping, dated 1960-1964, depicted the site as analogous to the previous mapping edition; it still comprised open, vegetated land. Some residential development has occurred to the north-east and east, adjacent to Longfield Road.

10. Introduction to German Air Delivered Ordnance

10.1. General

During WWI and WWII, the UK was subjected to bombing which often resulted in extensive damage to city centres, docks, rail infrastructure and industrial areas. The poor accuracy of WWII targeting technology and the nature of bombing techniques often resulted in neighbouring areas to targets sustaining collateral damage.

In addition to raids which concentrated on specific targets, indiscriminate bombing of large areas also took place. This occurred most prominently in the London 'Blitz', though affected many other towns and cities. As discussed in the following sections, a proportion of the bombs dropped on the UK did not detonate as designed. Although extensive efforts were made to locate and deal with these UXBs at the time, many still remain buried and can present a potential risk to construction projects.

The main focus of research for this section of the report will concern German air delivered ordnance dropped during WWII, although WWI bombing will also be considered.

10.2. Generic Types of WWII German Air Delivered Ordnance

To provide an informed assessment of the hazards posed by any items of unexploded ordnance that may remain in situ on site, the table below provides information on the types of German air delivered ordnance most commonly used by the Luftwaffe during WWII. Images and brief summaries of the characteristics of these items of ordnance are listed in **Appendices i-iii**.

Generic Types of WWII German Air Delivered Ordnance		
Type	**Frequency**	**Likelihood of Detection**
High Explosive (HE) bombs	In terms of weight of ordnance dropped, HE bombs were the most frequently deployed by the Luftwaffe during WWII.	Although efforts were made to identify the presence of unexploded ordnance following an air raid, often the damage and destruction caused by detonated bombs made observation of UXB entry holes impossible. The entry hole of an unexploded bomb can be as little as 20cm in diameter and was easily overlooked in certain ground conditions (see **Annex E**). Furthermore, ARP documents describe the danger of assuming that damage, actually caused by a large UXB, was due to an exploded smaller bomb. UXBs therefore present the greatest risk to present–day intrusive works.
1kg Incendiary bombs (IB)	In terms of the number of weapons dropped, small IBs were the most numerous. Millions of these were dropped throughout WWII.	IBs had very limited penetration capability and in urban areas would often have been located in post-raid surveys. If they failed to initiate and fell in water, on soft vegetated ground, or bombed rubble, they could easily go unnoticed.
Large Incendiary bombs (IB)	These were not as common as the 1kg IBs, although they were more frequently deployed than PMs and AP bomblets.	If large IBs did penetrate the ground, complete combustion did not always occur and in such cases they could remain a risk to intrusive works.
Aerial or Parachute mines (PM)	These were deployed less frequently than HE and IBs due to size, cost and the difficulty of deployment.	If functioning correctly, PMs would generally have had a slow rate of descent and were very unlikely to have penetrated the ground. Where the parachute failed, mines would have simply shattered on impact if the main charge failed to explode. There have been extreme cases when these items have been found unexploded. However, in these scenarios, the ground was either extremely soft or the munition fell into water.
Anti-personnel (AP) bomblets	These were not commonly used and are generally considered to pose a low risk to most works in the UK.	SD2 bomblets were packed into containers holding between 6 and 108 submunitions. They had little ground penetration ability and should have been located by the post-raid survey unless they fell into water, dense vegetation or bomb rubble.

10.3. Failure Rate of German Air Delivered Ordnance

It has been estimated that 10% of WWII German air delivered HE bombs failed to explode as designed. Reasons for why such weapons might have failed to function as designed include:

- Malfunction of the fuze or gain mechanism (manufacturing fault, sabotage by forced labour or faulty installation).
- Many were fitted with a clockwork mechanism that could become immobilised on impact.
- Failure of the bomber aircraft to arm the bombs due to human error or an equipment defect.
- Jettisoning the bomb before it was armed or from a very low altitude. This most likely occurred if the bomber aircraft was under attack or crashing.

From 1940 to 1945, bomb disposal teams reportedly dealt with a total of 50,000 explosive items of 50kg, over 7,000 anti-aircraft projectiles and 300,000 beach mines. Unexploded ordnance is still regularly encountered across the UK, see press articles in **Annex F**.

10.4. UXB Ground Penetration

An important consideration when assessing the risk from a UXB is the likely maximum depth of burial. There are several factors which determine the depth that an unexploded bomb will penetrate:

- Mass and shape of bomb.
- Height of release.
- Velocity and angle of bomb.
- Nature of the ground cover.
- Underlying geology.

Geology is perhaps the most important variable. If the ground is soft, there is a greater potential of deeper penetration. For example, peat and alluvium are easier to penetrate than gravel and sand, whereas layers of hard strata will significantly retard and may stop the trajectory of a UXB.

10.4.1. The J-Curve Principle

J-curve is the term used to describe the characteristic curve commonly followed by an air delivered bomb dropped from height after it penetrates the ground. Typically, as the bomb is slowed by its passage through underlying soils, its trajectory curves towards the surface. Many UXBs are found with their nose cone pointing upwards as a result of this effect. More importantly, however, is the resulting horizontal offset from the point of entry. This is typically a distance of about one third of the bomb's penetration depth, but can be higher in certain conditions (see **Annex E**).

10.4.2. WWII UXB Ground Penetration Studies

During WWII the Ministry of Home Security undertook a major study on actual bomb penetration depths, carrying out statistical analysis on the measured depths of 1,328 bombs as reported by bomb disposal (BD) teams. Conclusions were drawn predicting the likely average and maximum depths of penetration of different sized bombs in different geological strata.

For example, the largest common German bomb (500kg) had a likely concluded penetration depth of 6m in sand or gravel but 11m in clay. The maximum observed depth for a 500kg bomb was 11.4m and for a 1,000kg bomb 12.8m. Theoretical calculations suggested that significantly greater penetration depths were probable.

10.4.3. Site Specific Bomb Penetration Considerations

When considering an assessment of the bomb penetration at the site of proposed works the following parameters should be used:

- WWII geology – Various.
- Impact angle and velocity – 10-15° from vertical and 270 metres per second.
- Bomb mass and configuration – The 500kg SC HE bomb, without retarder units or armour piercing nose (this was the largest of the common bombs used against Britain).

It has not been possible to determine maximum bomb penetration capabilities at this stage due to the limitations of site-specific geotechnical information provided for the purpose of this report. An assessment can be made once further information becomes available or by an UXO Specialist on-site.

10.5. V-Weapons

Hitler's 'V-weapon' campaign began from mid-1944. It used newly developed unmanned cruise missiles and rockets. The V-1, known as the flying bomb or pilotless aircraft, and the V-2, a long range rocket, were launched from bases in Germany and occupied Europe. A total of 9,251 V-1s and 1,115 V-2s were recorded in the United Kingdom.

Although these weapons caused considerable damage, their relatively low numbers allowed accurate records of strikes to be maintained. These records have mostly survived. There is a negligible risk from unexploded V-weapons on land today. Even if the 1,000kg warhead failed to explode, the weapons are so large that they would have been observed and dealt with at the time. Therefore, any V-weapons referenced in this report are referenced not as a viable risk factor, but primarily in order to help account for evidence of damage and clearance reported.

11. The Likelihood of Contamination from German Air Delivered UXBs

11.1. World War I

During WWI Britain was targeted and bombed by Zeppelin Airships as well as Gotha and Giant fixed-wing aircraft. The objective of these raids was to unnerve the British public, to destroy strategic targets and to ultimately attempt to coerce Britain's capitulation from the war. A WWI map of air raids and naval bombardments across the UK was consulted, see **Annex G**.

On the night of the 28th of September 1917, a large-scale German air raid saw Gotha bombers and two Riesenflugzeug (giant aircraft) approach the southern coast.[1] As the raid progressed, bombs were dropped across northern Kent. One area of note was near Meopham when an incendiary bomb fell near the railway line; also, Luddesdown – due south of Meopham, was hit by three HE bombs and an incendiary within a quarter-mile of St. Peter & St. Paul's Church.[2] Nevertheless, despite the confirmed bombing within the general area, there was no positive evidence found to suggest that these incidents directly impacted the site specifically.

WWI bombs were generally smaller and dropped from a lower altitude than those used in WWII. This resulted in limited UXB penetration depths. Aerial bombing was often such a novelty at the time that it attracted public interest and even spectators to watch the raids in progress. For these reasons there is a limited risk that UXBs passed undiscovered in the urban environment. When combined with the relative infrequency of attacks and an overall low bombing density, the risk from WWI UXBs is considered low and will not be further addressed in this report.

11.2. World War II Bombing of Rural District of Strood

The Luftwaffe's main objective for the attacks on Britain was to inhibit the country's economic and military capability. To achieve this they targeted airfields, depots, docks, warehouses, wharves, railway lines, factories, and power stations. As the war progressed the Luftwaffe bombing campaign expanded to include the indiscriminate bombing of civilian areas in an attempt to subvert public morale.

During WWII the site was located within the Rural District of Strood, which sustained an overall low-moderate density of bombing, as represented by bomb density data figures, see Section 11.3. Any bombing likely occurred due to Strood's (and Meopham's) proximity to London and the River Thames; as such, it was susceptible to opportunistic 'tip and run' raids – whereby Luftwaffe fighters would indiscriminately drop surplus ordnance on the way to and from confirmed targets. These targets included RAF Gravesend, and associated industrial works located approximately 4.2km to the north-east (see **Annex H** for more details).

Records of bombing incidents in the civilian areas of the district were typically collected by Air Raid Precautions wardens and collated by Civil Defence personnel. Some other organisations, such as port and railway authorities, maintained separate records. Records would be in the form of typed or hand written incident notes, maps and statistics. Bombing data was carefully analysed, not only due to the requirement to identify those parts of the country most needing assistance, but also in an attempt to find patterns in the Germans' bombing strategy in order to predict where future raids might take place.

Records of bombing incidents are presented in the following sections.

[1] Castle, I. (2021b). *28 Sept 1917 Booked: Kent, Essex & Suffolk.* ZEPPELINS, GOTHAS & "GIANTS" THE STORY OF BRITAIN'S FORGOTTEN BLITZ 1914-1918. https://www.iancastlezeppelin.co.uk/25-sep-1917

[2] (Castle, 2021)

11.3. WWII Home Office Bombing Statistics

The following table summarises the quantity of German air delivered bombs (excluding 1kg incendiaries and anti-personnel bombs) dropped on the Rural District of Strood between 1940 and 1945.

Record of German Ordnance Dropped on the Rural District of Strood		
Area Acreage		48,811
Weapons	High Explosive bombs (all types)	1,804
	Parachute mines	24
	Oil bombs	55
	Phosphorus bombs	117
	Fire pots	14
	Pilotless aircraft (V-1)	37
	Long range rocket bombs (V-2)	9
Total		2,060
Number of Items per 1,000 acres		42.2
Source: Home Office Statistics This table does not include UXO found during or after WWII.		

Detailed records of the quantity and locations of the 1kg incendiary and anti-personnel bombs were not routinely maintained by the authorities as they were frequently too numerous to record. Although the risk relating to IBs is lesser than that relating to larger HE bombs, they were similarly designed to inflict damage and injury. Anti-personnel bombs were used in much smaller quantities and are rarely found today but are potentially more dangerous. Although Home Office statistics did not record these types of ordnance, both should not be overlooked when assessing the general risk to personnel and equipment.

11.4. Kent Daily Bomb Maps

Kent Daily bomb mapping showing HE bombs, incendiary bomb strikes, parachute mines and plane crashes were obtained from Kent History & Library Centre. It should be noted that this mapping was recorded on small scale maps, and depicted the whole county. As a result, it is not possible to definitively determine the exact location of individual strikes beyond establishing the approximate locality of the incident. Furthermore, available evidence obtained from written ARP incident records indicate that single plotted incidents can actually denote multiple HE bomb strikes within that depicted area. As such, the presence of bombing within an area increases the likelihood that additional items of ordnance were deployed unobserved and unnoticed within the area. The section showing the area of the site is described in the table below, and presented in **Annex I.**

Kent Daily Bomb Maps – **Annex I1**	
Date Range	Comments
August 17th, 1940	An HE bomb strike was recorded in the wider area south of the site.
September 2nd, 1940	A British fighter jet crashed in the general vicinity of the site.
September 8th, 1940	An incendiary bomb strike was recorded in close proximity to the south of the site.
September 15th, 1940	An incendiary bomb strike was recorded in the wider area further south of the site.
September 29th, 1940	An incendiary bomb strike was recorded in the general site area.
October 16th, 1940	One HE bomb strike was recorded in the wider surrounding area to the south-east.
October 21st, 1940	HE bombing was recorded in the wider surrounding area to the north-east and west.
November 19th, 1940	HE bombing was recorded in the wider surrounding area to the west and north-west.
November 29th – 30th, 1940	One HE bomb strike was recorded immediately south of the site area.
January 12th, 1941	HE and incendiary bombing is recorded in the wider surrounds to the south-east.
April 19th, 1941	One HE bombing incident was recorded across the general site area, with additional incidents sustained in the surrounding area further to the east and south-west.
April 20th, 1941	An incendiary bomb strike was recorded in the vicinity to the south of the site.

11.5. Medway Group Bomb Map

A local bomb map compiled by the Chatham Observer showing HE bomb strikes, parachute mines, flying bombs and rockets on the borough was obtained from Kent Archives. The section showing the area of the site is described in the table below and presented in **Annex J.**

Medway Group Bomb Map	
Date Range	Comments
1940-1945	No bombing incidents were recorded on-site. However, there were several in the surrounding area. Most notably, a stick of HE bomb strikes was recorded to the immediate south of the site. A further cluster of eight bomb strikes was recorded to the north of Longfield Road, the closest being situated approximately 100m north of the site boundary.

11.6. Kent V-1 Bomb Map

A local bomb map showing V-1 flying bomb strikes on the borough was obtained from The Evening News. The section showing the area of the site is described in the table below and presented in **Annex K**.

Essex V-1 Bomb Map	
Date Range	Comments
1940-1944	No bombing incidents were recorded in or around the general site area.

11.7. Kent War Diaries

Kent War Daires for the Rural District of Strood and the Medway group were obtained from Kent Archives. The War Diaries comprise a set of written records that detail the location and time of bombing incidents on a district or borough. Records are often updated as incidents develop, often with further details regarding the exact location of strikes and any damage caused. Incidents are sometimes accompanied by a map reference, which is not always sufficient to pinpoint the exact incident location due to the broad area they cover.

A transcript of the relevant written records is presented in the table below. Example imagery of these entries are presented in **Annex L**.

Kent War Diary – **Annex L**			
Date	Size of bomb	Record Transcription	Comments
16th August 1940	13 x HE	13 HE Meopham, MR1367. 1 HE Marstead Lane MR1367.	*The site was located within the civil parish of Meopham. The exact location of these incidents is unclear.*
15th September 1940	200 IBs	Meophan. Minor bombing at 15.00. Approx 200 IBs in corn stubble.	
21st October 1940	3 Delayed Action	Minor bombing incident at 15.29 hours at Meopham MR 089859 and 075859. Three delayed action bombs were dropped.	*The provided map references were located approximately 700m north-east and 650m north-west of the site.*
19th November 1940	17 x HE	Meopham. At 03.40 hrs, 17 HE in line between MRs 077862 + 074853	*The two map references provided are situated approximately 700m north-west and south-west of the site respectively.*
	IBs	Meopham 20.05 hrs. IBs at MR 085846. No details	*The provided map reference is located approximately 700m south-east of the site.*
29th November 1940	8 x HE	Hooks Green MMR 082858	*The provided map reference is situated 190m north of the site.*
19th March 1941	IBs	Meopham MR 087848, fire reported	*The provided map reference is situated approximately 650m south-east of the site.*
	2 x HE	Meopham M.R. 087849	*The provided map reference is situated approximately 570m south-east of the site.*

20th April 1941	4 x HE	Meopham MR 082854	*The provided map reference places these incidents in the immediate site vicinity.*
2nd November 1943	1 HE	Meopham. Correct MR 084/851	*The provided map reference is situated approximately 250m south-east of the site.*
21st August, 1944	1 x V-1 strike.	Meopham. Fly. By balloon MR078849. (Casualties) Nil. (Damage) Damage to property.	*MR078849 was located approximately 560m to the south-west of the site.*

11.8. Kent UXB Schedule

A Kent UXB Schedule was obtained from Kent Archives. A transcript of the relevant written records is presented in the table below. Example imagery of these entries are presented in **Annex M**.

Kent UXB Schedule – **Annex M**			
Date	Size of bomb	Record Transcription	Comments
2nd March, 1944	1 x HE	Meopham. MR 077856 Cleared 18.4.44	*This incident was located approximately 350m to the west of the site.*

11.9. WWII-Era Aerial Photography

WWII-era aerial photography for the site area was obtained from the National Monuments Record Office (Historic England) and Google Earth. This photography provides a record of the potential composition of the site during the war, as well as its condition immediately following the war (see **Annex N**).

WWII-Era Aerial Photography	
Date/Title	Description
1940s	WWII-era aerial imagery shows no immediately obvious evidence of bomb damage / cratering on-site. However, there were several bomb craters located approximately 100m-110m to the south-west.
11th October 1946	

11.10. Abandoned Bombs

A post air-raid survey of buildings, facilities, and installations would have included a search for evidence of bomb entry holes. If evidence of an entry hole was encountered, Bomb Disposal Officer Teams would normally have been requested to attempt to locate, render safe, and dispose of the bomb. Occasionally, evidence of UXBs was discovered but due to a relatively benign position, access problems, or a shortage of resources the UXB could not be exposed and rendered safe. Such an incident may have been recorded and noted as an 'abandoned bomb'.

Given the inaccuracy of WWII records, and the fact that these bombs were 'abandoned', their locations cannot be considered definitive or the lists exhaustive. The MoD states that 'action to make the devices safe would be taken only if it was thought they were unstable'. It should be noted that other than the 'officially' abandoned bombs, there will inevitably be UXBs that were never recorded.

1st Line Defence holds no records of officially registered abandoned bombs at or near the site of the proposed works.

11.11. Bomb Disposal Tasks

The information service from the Explosive Ordnance Disposal (EOD) Archive Information Office at 33 Engineer Regiment (now part of 29 EOD & Search Group) no longer processes commercial requests for information. It has therefore not been possible to include any updated official information regarding bomb disposal/clearance tasks with regards to this site. A database of known disposal/clearance tasks has been referred to which does not make reference to such instances occurring within the site of proposed works.

If any relevant information is received at a later date, MEC Consulting Group will be advised.

11.12. Evaluation of German Air Delivered UXO Records

German Air Delivered UXO Records Summary	
Factors	**Conclusion**
Density of Bombing *It is important to consider the bombing density when assessing the possibility that UXBs remain in an area. High bombing density could allow for error in record keeping due to extreme damage caused to the area.*	During WWII, the site was located within the Rural District of Strood. According to official Home Office bombing statistics, this district was subject to an overall low-moderate bombing density, with an average of 42.2 items of ordnance recorded per 1,000 acres. Any incidents are believed to have been largely sporadic, caused by Strood's proximity to London and other cities across Kent. Such attacks were called 'tip and run' raids, and they were opportunistic, indiscriminate attacks to areas near confirmed targets (see **Annex H** for more details). Kent Daily Bomb mapping recorded numerous incidents of HE and incendiary bombing across / surrounding the site area across multiple air raids between August 1940 and April 1941; it has not been possible to determine the exact location of specific incidents in relation to the site via this source however due to the scale of the mapping (see **Annex I** for more details). A Medway Group Bomb Map corroborated the presence of bombing in the immediate surrounds, with a stick of bombs recorded to the immediate south and a cluster of incidents noted further north of Longfield Road; nevertheless, this source recorded no bombing directly on site. Available written records largely corroborated the presence of bombing within Meopham across the dates specified on Kent Daily Bomb Mapping. Most notably, the Medway war diaries recorded four HE bombs in the immediate site vicinity in April 1941, and a further eight HE bombs were noted at Hooks Green approximately 190m north of the site in November 1940; these incidents appear to corroborate with those recorded closest to the site on the aforementioned Medway Bomb map.
Damage *If buildings or structures on a site sustained bomb or fire damage, any resulting rubble and debris could have obscured the entry holes of unexploded bombs dropped during the same or later raids. Similarly, a high explosive bomb strike in an area of open agricultural land will have caused soil disturbance, increasing the risk that a UXB entry hole would be overlooked.*	Post-war aerial imagery (see **Annex N**) shows several bomb craters located approximately 100m-110m to the south-west, separated from the site by further open land / vegetation. There was no direct evidence of damage or cratering visible on-site.
Ground Cover *The nature of the ground cover present during WWII would have a substantial influence on any visual indication that may indicate UXO being present.*	According to OS mapping and post-war aerial imagery, the site was predominantly occupied by open vegetated land. As such, it is expected that the nature of the ground cover present during the war was largely unconducive to the detection of UXO indicators. This is because features such as disturbed ground and bomb entry holes (which could be as small as 20cm in diameter) could have been easily overlooked or obscured in such conditions.

Access Frequency *UXO in locations where access was irregular would have a greater chance of passing unnoticed than at those that were regularly occupied. The importance of a site to the war effort is also an important consideration as such sites are likely to have been both frequently visited and subject to post- raid checks for evidence of UXO.*	It is anticipated that the majority of the site area did not experience a frequent and regular level of access during WWII, given its undeveloped composition. The presence of Longfield Road to the north and a number of properties to the east may have provided some additional level of observation, though this may have been somewhat limited and dependent on the vigilance of local residents and subsequent passers-by.
Bomb Failure Rate	There is no evidence to suggest that the bomb failure rate in the locality of the site would have been dissimilar to the 10% normally used.
Abandoned Bombs	1st Line Defence holds no records of abandoned bombs at or within the site vicinity.
Bombing Decoy sites	1st Line Defence could find no evidence of bombing decoy sites within the site vicinity.
Bomb Disposal Tasks	1st Line Defence could find no evidence of bomb disposal tasks within the site boundary and immediate area.

12. Introduction to Allied Ordnance

12.1. General

Many areas across the UK may be at risk from Allied UXO because of both wartime and peacetime military use. Typical military activities and uses that may have led to a legacy of military UXO at a site include former minefields, home guard positions, anti-aircraft emplacements, training and firing ranges, military camps, as well as weapons manufacture and storage areas.

Although land formerly used by the military was usually subject to clearance before returned to civilian use, items of UXO are sometimes discovered and can present a potential risk to construction projects.

It should be highlighted that there is no evidence that the site formerly had any military occupation or usage that could have led to contamination with such items of Allied ordnance. Despite this, urban areas, such as the location of the site, can be at risk from buried unexploded anti-aircraft projectiles fired during WWII – as addressed below.

12.2. Defending the UK From Aerial Attack

During WWII the War Office employed a number of defence tactics against the Luftwaffe from bombing major towns, cities, manufacturing areas, ports and airfields. These can be divided into passive and active defences (examples are provided in the table below).

Active Defences	Passive Defences
• Anti-aircraft gun emplacements to engage enemy aircraft. • Fighter aircraft to act as interceptors. • Rockets and missiles were used later during WWII.	• Blackouts and camouflaging to hinder the identification of Luftwaffe targets. • Decoy sites were located away from targets and used dummy buildings and lighting to replicate urban, military, or industrial areas. • Barrage balloons forced enemy aircraft to greater altitudes. • Searchlights were often used to track and divert adversary bomber crews during night raids.

Active defences such as anti-aircraft artillery present a greater risk of UXO contamination than passive defences. Unexploded ordnance resulting from dogfights and fighter interceptors is rarely encountered and difficult to accurately qualify.

12.3. Anti-Aircraft Artillery (AAA)

During WWII three main types of gun sites existed: heavy anti-aircraft (HAA), light anti-aircraft (LAA) and 'Z' batteries (ZAA). If the projectiles and rockets fired from these guns failed to explode or strike an aircraft they would descend back to land. The table below provides further information on the operation and ordnance associated with these type of weapons.

Anti-Aircraft Artillery				
Item	**Description**			
HAA	These large calibre guns such as the 3.7" QF (Quick Firing) were used to engage high flying enemy bombers. They often fired large HE projectiles, which were usually initiated by integral fuzes, triggered by impact, area, time delay or a combination of aforementioned mechanisms.			
LAA	These mobile guns were intended to engage fast, low flying aircraft. They were typically rotated between locations on the perimeters of towns and strategically important industrial works. As they could be moved to new positions with relative ease when required, records of their locations are limited. The most numerous of these were the 40mm Bofors gun which could fire up to 120 x 40mm HE projectiles per minute to over 1,800m.			
Variations in HAA and LAA Ammunition	**Gun type**	**Calibre**	**Shell Weight**	**Shell Dimensions**
	3.0 Inch	76mm	7.3kg	76mm x 356mm
	3.7 Inch	94mm	12.7kg	94mm x 438mm
	4.5 Inch	114mm	24.7kg	114mm x 578mm
	40mm	40mm	0.9kg	40mm x 311mm
Z-AA	Rockets were commonly designed to destroy heavily armoured military vehicles (anti-tank weapon). The device contains an explosive head (warhead) that can be accelerated using internal propellants to an intended target. Anti-aircraft rocket batteries were also utilised as part of air defence measures.			

The conditions in which anti-aircraft projectiles may have fallen unnoticed within a site area are analogous to those regarding air delivered ordnance. Unexploded anti-aircraft projectiles could essentially have fallen indiscriminately anywhere within range of the guns. The chance of such items being observed, reported and removed during the war depends on factors such as land use, ground cover, damage and frequency of access – the same factors that govern whether evidence of a UXB is likely to have been noted. More information about these factors with regards to this particular site can be found in the German Air Delivered Ordnance section of this report.

Illustrations of Anti-Aircraft artillery, projectiles and rockets are presented at **Appendix iv**.

13. The Likelihood of Contamination from Allied Ordnance

13.1. Introduction

There are several factors that may serve to either affirm, increase, or decrease the level of risk within a site with a history of military usage. Such factors are typically dependent upon the proximity of the proposed area of works to training activities, munition productions and storage, as well as its function across the years.

This section will examine the history of the proposed site and assess to what degree, if any, the site could have become contaminated as a result of the military use of the surrounding area.

13.2. Evaluation of Contamination Risk from Allied UXO

1st Line Defence has considered the following potential sources of Allied ordnance contamination:

Allied UXO Records Summary	
Sources of Allied UXO Contamination	**Conclusion**
Military Camps *Military camps present an elevated risk from ordnance simply due to the large military presence and likelihood of associated live ordnance training.*	1st Line Defence could find no evidence of a military camp within the site.
Anti-Aircraft Defences *Anti-Aircraft defences were employed across the country. Proximity to anti-aircraft defences increases the chance of encountering AA projectiles.*	1st Line Defence could find no evidence of Anti-Aircraft defences such as a HAA or LAA gun emplacement occupying or bordering the site. The closest HAA was located approximately 3.8km north-east of the site, in the vicinity of Lodge Lane. Despite this distance the maximum effective range of an AA projectile can be up to 15km. The conditions in which HAA or LAA projectiles may have fallen unnoticed within a site footprint are generally analogous to those regarding German air delivered ordnance.
Home Guard Activity *The Home Guard regularly undertook training and ordnance practice in open areas, as well as burying ordnance as part of anti-invasion defences.*	Evidence of Home Guard activity is often difficult to locate, owing to the ad-hoc nature of Home Guard activity within each local area. Such training was often conducted on a small scale at the discretion of individual commanders and as such was seldom recorded officially. As such, no positive evidence could be found to confirm the presence of HG units within proximity to the site.
Defensive Positions *Defensive positions suggest the presence of military activity, which is often indicative of ordnance storage, usage or disposal.*	There is no evidence of any pillbox, emplacement or other defensive features formerly located on or bordering the site footprint.
Training or firing ranges *Areas of ordnance training saw historical ordnance usage in large numbers, often with inadequate disposal of expended and live items. The presence of these ranges significantly impact on the risk of encountering items of ordnance in their vicinity.*	No evidence of training or firing ranges could be found within the site or surrounding area.

Defensive Minefields *Minefields were placed in strategic areas to defend the country in the event of a German invasion. Minefields were not always cleared with an appropriate level of vigilance.*	There is no evidence of defensive minefields affecting the site.
Ordnance Manufacture *Ordnance manufacture indicates an increased chance that items of ordnance were stored, or disposed of, within a location.*	No information of ordnance being stored, produced, or disposed of within the proposed site could be found.
Military Related Airfields *Military airfields present an elevated risk from ordnance simply due to the large military presence and likelihood of associated live ordnance training or bombing practice.*	The site was not situated within the perimeters or vicinity of a military airfield.

14. The Likelihood of UXO Contamination Summary

The following table assesses the likelihood that the site was contaminated by items of German air delivered and Allied ordnance. Factors such as the risk of UXO initiation, remaining, and encountering will be discussed later in the report.

UXO Contamination Summary	
Quality of the Historical Record	The research has evaluated pre- and post-WWII Ordnance Survey maps, Luftwaffe reconnaissance imagery, Kent Daily Bomb mapping, Medway Group Bomb map, Kent V-1 Flying Bomb mapping, Kent War Diary, a UXB Schedule, Home Intelligence Summary Files, post-war aerial imagery and available anecdotal information. The record set is generally considered to be of reasonable quality. While Kent Daily Bomb mapping depicted bombing across the area, the scale of this mapping does not allow for a precise location to be determined. Available written records were relatively comprehensive however and appeared to corroborate well with both Kent daily bomb mapping and the Medway bomb map.
German Air-Delivered Ordnance	• During WWII, the site was located within the Rural District of Strood. According to official Home Office bombing statistics, this district was subject to an overall low-moderate bombing density, with an average of 42.2 items of ordnance recorded per 1,000 acres. Bombing in the area can primarily be attributed to Meopham's location along the flight path to London. It was not uncommon for Luftwaffe aircraft to jettison surplus munitions in opportunistic 'tip and run raids' near confirmed targets (see Luftwaffe Reconnaissance imagery, **Annex H**). • According to historic OS mapping, the site was occupied by open, vegetated land. • Kent Daily Bomb mapping (see **Annex I**) recorded numerous incidents of HE and incendiary bombing within the immediate site surroundings, with others in the wider surrounding area, across multiple air raids between August 1940 and April 1941; it has not been possible to determine the exact location of specific incidents in relation to the site via this source however due to the scale of the mapping / lack of detail provided. • Additional bomb mapping for the Medway Group area corroborated the presence of bombing in the immediate surrounds, with a stick of four bombs recorded to the immediate south and a cluster of eight bombs noted further north of Longfield Road; nevertheless, this source recorded no bombing directly on site. Available written records appear to corroborate with the findings of the Medway bomb mapping, with the Medway war diaries recording four HE bombs in the immediate site vicinity in April 1941 and a further eight HE bombs at Hooks Green approximately 190m north of the site in November 1940. • WWII-era aerial photography appears to confirm that the closest incidents occurred in the area just south of the site, showing several bomb craters approximately 100m-110m to the south, separated from the site by further open land / vegetation. No direct evidence of damage or cratering can be seen within the site itself. • Considering the site was occupied by areas of open land, ground conditions would not have been particularly conducive to the detection of UXO indicators. This is because typical indicators of bombing, such as bomb entry holes, scattered earth, or indentations to the ground, could have been obscured by vegetation/crops. • Furthermore, considering the site was rural in nature, it is likely that it did not sustain a frequent level of access. This may have increased the likelihood that UXO could have gone unnoticed and unrecorded within the general site area. The proximity of roadways and small areas of development may have provided the site was some additional level of observation, though this may have been somewhat limited and dependent on local residents. • In summary, the site has been assessed to hold an overall **Low-Medium** risk from UXO contamination. Although available evidence suggests that several bombs fell in the immediate surrounds of the site, post-war aerial photography appears to show no visible evidence of damage to the site itself, instead showing several craters approximately 100m south of the site, corroborating with bomb mapping which plotted the closest incidents as having occurred in this area. Subsequently, proactive risk mitigation measures are not thought to be necessary on this occasion. As the possibility of UXO falling unnoticed within

	the site area cannot be entirely dismissed (due to the open nature of the site and the recorded bombing in the immediate surroundings), caution is nevertheless recommended when undertaking works in the area. UXO Safety Awareness Briefings are strongly recommended for all staff on site, and a UXO Risk Management Plan should be put in place.
Allied Ordnance	• No evidence could be found to indicate that the site formerly had any military occupation or usage that could have led to contamination with items of Allied ordnance, such as LSA and SAA. • The conditions in which HAA or LAA projectiles may have fallen unnoticed within the site boundary are however analogous to those regarding air delivered ordnance.

15. The Likelihood that UXO Remains

15.1. Introduction

It is important to consider the extent to which any explosive ordnance clearance (EOC) activities or extensive ground works have occurred on site. This may indicate previous ordnance contamination or reduce the risk that ordnance remains undiscovered.

15.2. UXO Clearance

1st Line Defence has found no evidence in the public domain or within internal records that any official ordnance clearance operations have taken place on site. Note however that we have not received confirmation of this fact from the 33 EOD Regiment Archive (now part of 29 EOD & Search Group). It should also be noted that in addition to 29 EOD & Search Group archival information, 1st Line Defence also do not currently have access to data that may be relevant including 5131(BD)SQN Archive, SD Training Technical Advisory Section (TAS) and MACA Records (bomb disposal callouts).

If such information is available at a later date, it is recommended that it be reviewed as it will assist with understanding both levels and types of contamination likely to be present, and may indicate risk reduction in certain areas.

15.3. Post-War Redevelopment

There does not appear to have been any development on-site, and the site remains occupied by open, vegetated land.

The risk of UXO remaining is considered to be mitigated at the location of and down to the depth of any post-war redevelopment on site. For example, the risk from deep buried UXO will only have been mitigated within the volumes of any post-war pile foundations or deep excavations for basement levels. The risk will however remain within virgin geology below and amongst these post-war works, down to the maximum bomb penetration depth.

16. The Likelihood of UXO Encounter

16.1. Introduction

For UXO to pose a risk at a site, there should be a means by which any potential UXO might be encountered on that site.

The likelihood of encountering UXO on the site of proposed works would depend on various factors, such as the type of UXO that might be present and the intrusive works planned on site. In most cases, UXO is more likely to be present below surface (buried) than on surface.

In general, the greater the extent and depth of intrusive works, the greater the risk of encountering. The most likely scenarios under which items of UXO could be encountered during construction works is during piling, drilling operations or bulk excavations for basement levels. The overall risk will depend on the extent of the works, such as the numbers of boreholes/piles (if required) and the volume of the excavations.

Generally speaking, the risk of encountering any type of UXO will be minimal for any works planned within the footprint and down to the depth of post-war foundations and excavations.

16.2. Encountering Air Delivered Ordnance

Since an air delivered bomb may come to rest at any depth between just below ground level and its maximum penetration depth, there is a chance that such an item (if present) could be encountered during shallow excavations (for services or site investigations) into the original WWII ground level as well as at depth.

17. The Likelihood of UXO Initiation

17.1. Introduction

UXO does not spontaneously explode. Older UXO devices will require an external event/energy to create the conditions for detonation to occur. The likelihood that a device will function can depend on a number of factors including the type of weaponry, its age and the amount of energy it is struck with.

17.2. Initiating Air Delivered Ordnance

Unexploded bombs do not spontaneously explode. All high explosive filling requires significant energy to create the conditions for detonation to occur.

In recent decades, there have been a number of incidents in Europe where Allied UXBs have detonated, and incidents where fatalities have resulted. There have been several hypotheses as to the reason why the issue is more prevalent in mainland Europe – reasons could include the significantly greater number of bombs dropped by the Allied forces on occupied Europe, the preferred use by the Allies of mechanical rather than electrical fuzes, and perhaps just good fortune. The risk from UXO in the UK is also being treated very seriously in many sectors of the construction industry, and proactive risk mitigation efforts will also have affected the lack of detonations in the UK.

There are certain construction activities which make initiation more likely, and several potential initiation mechanisms must be considered:

UXB Initiation	
Direct Impact	Unless the fuze or fuze pocket is struck, there needs to be a significant impact e.g. from piling or large and violent mechanical excavation, onto the main body of the weapon to initiate a buried iron bomb. Such violent action can cause the bomb to detonate.
Re- starting the Clock	A small proportion of German WWII bombs employed clockwork fuzes. It is probable that significant corrosion would have taken place within the fuze mechanism over the last 70+ years that would prevent clockwork mechanisms from functioning. Nevertheless, it was reported that the clockwork fuze in a UXB dealt with by 33 EOD Regiment in Surrey in 2002 did re-start.
Friction Impact	The most likely scenario resulting in the detonation of a UXB is friction impact initiating the shock-sensitive fuze explosive. The combined effects of seasonal changes in temperature and general degradation over time can cause explosive compounds to crystallise and extrude out from the main body of the bomb. It may only require a limited amount of energy to initiate the extruded explosive which could detonate the main charge.

18. Consequences of Initiation/Encounter

18.1. Introduction

The repercussions of the inadvertent detonation of UXO during intrusive ground works, or if an item or ordnance is interfered with or disturbed, are potentially profound, both in terms of human and financial cost. A serious risk to life and limb, damage to plant and total site shutdown during follow-up investigations are potential outcomes. However, if appropriate risk mitigation measures are put in place, the chances of initiating an item of UXO during ground works is comparatively low.

The consequences of encountering UXO can be particularly notable in the case of high-profile sites (such as airports and train stations) where it is necessary to evacuate the public from the surrounding area. A site may be closed for anything from a few hours to a week with potentially significant cost in lost time. It should be noted that even the discovery of suspected or possible item of UXO during intrusive works (if handled solely through the authorities), may also involve significant loss of production.

18.2. Consequences of Detonation

When considering the potential consequences of a detonation, it is necessary to identify the significant receptors that may be affected. The receptors that may potentially be at risk from a UXO detonation on a construction site will vary depending on the site specific conditions but can be summarised as follows:

- People – site workers, local residents and general public.
- Plant and equipment – construction plant on site.
- Services – subsurface gas, electricity, telecommunications.
- Structures – not only visible damage to above ground buildings, but potentially damage to foundations and the weakening of support structures.
- Environment – introduction of potentially contaminating materials.

19. 1st Line Defence Risk Assessment

19.1. Risk Assessment Stages

Taking into account the quality of the historical evidence, the assessment of the overall risk from unexploded ordnance is based on the following five considerations:

1. That the site was contaminated with unexploded ordnance.
2. That unexploded ordnance remains on site.
3. That such items will be encountered during the proposed works.
4. That ordnance may be initiated by the works operations.
5. The consequences of encountering or initiating ordnance.

19.2. Assessed Risk Level

1st Line Defence has assessed that there is an overall **Low-Medium Risk** from German and anti-aircraft unexploded ordnance at the site of proposed works. There is an assessed **Low Risk** from Allied unexploded ordnance.

Ordnance Type	Risk Level			
	Negligible	Low	Medium	High
German Unexploded HE Bombs		✓		
German 1kg Incendiary Bombs		✓		
Anti-Aircraft Artillery Projectiles		✓		
Allied Land Service and Small Arms Ammunition		✓		

Please note – although the risk from unexploded ordnance on this site has been assessed as 'Low-Medium', this does not mean there is 'no' risk of encountering UXO. This report has been undertaken with due diligence, and all reasonable care has been taken to access and analyse relevant historical information. By necessity, when dealing historical evidence, and when making assessments of UXO risk, various assumptions have to be made which we have discussed and justified throughout this report. Our reports take a common-sense and practical approach to the assessment of risk, and we strive to be reasonable and pragmatic in our conclusions.

It should however be stressed that if any suspect items are encountered during the proposed works, 1st Line Defence should be contacted for advice/assistance, and to re-assess the risk where necessary. The mitigation measures outlined in the next section are recommended as a minimum precaution to alert ground personnel to the history of the site, what to look out for, and what measures to take in the event that a suspect item is encountered. It should also be noted that the conclusions of this report are based on the scope of works outlined in the 'Proposed Works' section of this report. Should the scope of works change or additional works be proposed, 1st Line Defence should be contacted to re-evaluate the risk.

20. Proposed Risk Mitigation Methodology

20.1. General

The following risk mitigation measures are recommended to support the proposed works at Wrotham Road (West), Meopham, Kent:

Recommended Risk Mitigation Measures	
Activity	Recommended Risk Mitigation Measure
All Works	• **UXO Risk Management Plan** It is recommended that a site-specific plan for the management of UXO risk be written for this site. This plan should be kept on site and be referred to in the event that a suspect item of UXO is encountered at any stage of the project. It should detail the steps to be taken in the event of such a discovery, considering elements such as communication, raising the alarm, nominated responsible persons etc. Contact 1st Line Defence for help/more information. • **Site Specific UXO Awareness Briefings to all personnel conducting intrusive works.** As a minimum precaution, all personnel working on the site should be briefed on the basic identification of UXO and what to do in the event of encountering a suspect item. This should in the first instance be undertaken by a UXO Specialist. Posters and information on the risk of UXO can be held in the site office for reference.

In making this assessment and recommending these risk mitigation measures, if known, the works outlined in the 'Scope of the Proposed Works' section were considered. Should the planned works be modified or additional intrusive engineering works be considered, 1st Line Defence should be consulted to see if a re-assessment of the risk or mitigation recommendations is necessary.

1st Line Defence Limited **9/4/2025**

This Report has been produced in compliance with the Construction Industry Research and Information Association (CIRIA) C681 guidelines for the writing of Detailed UXO Risk Assessments.

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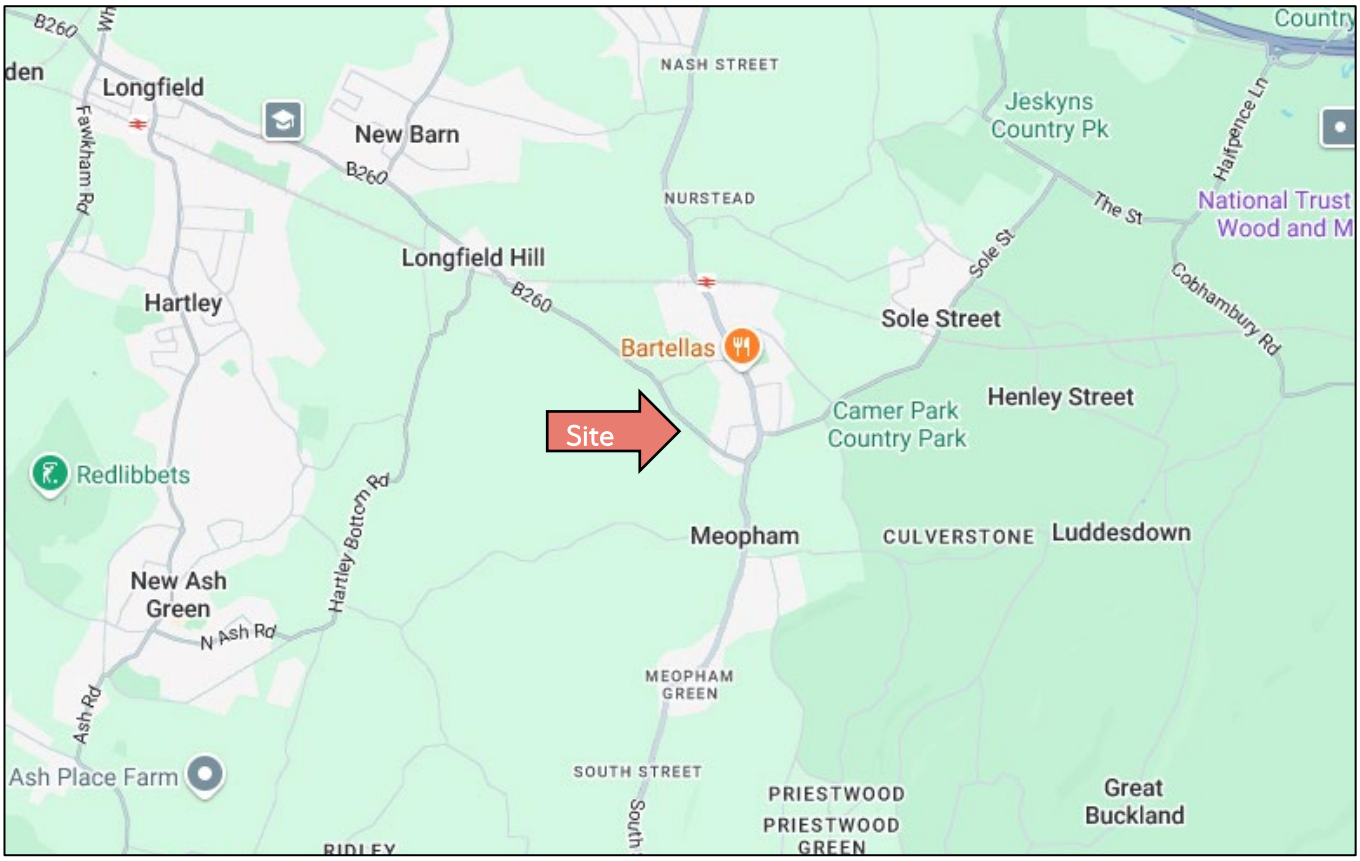
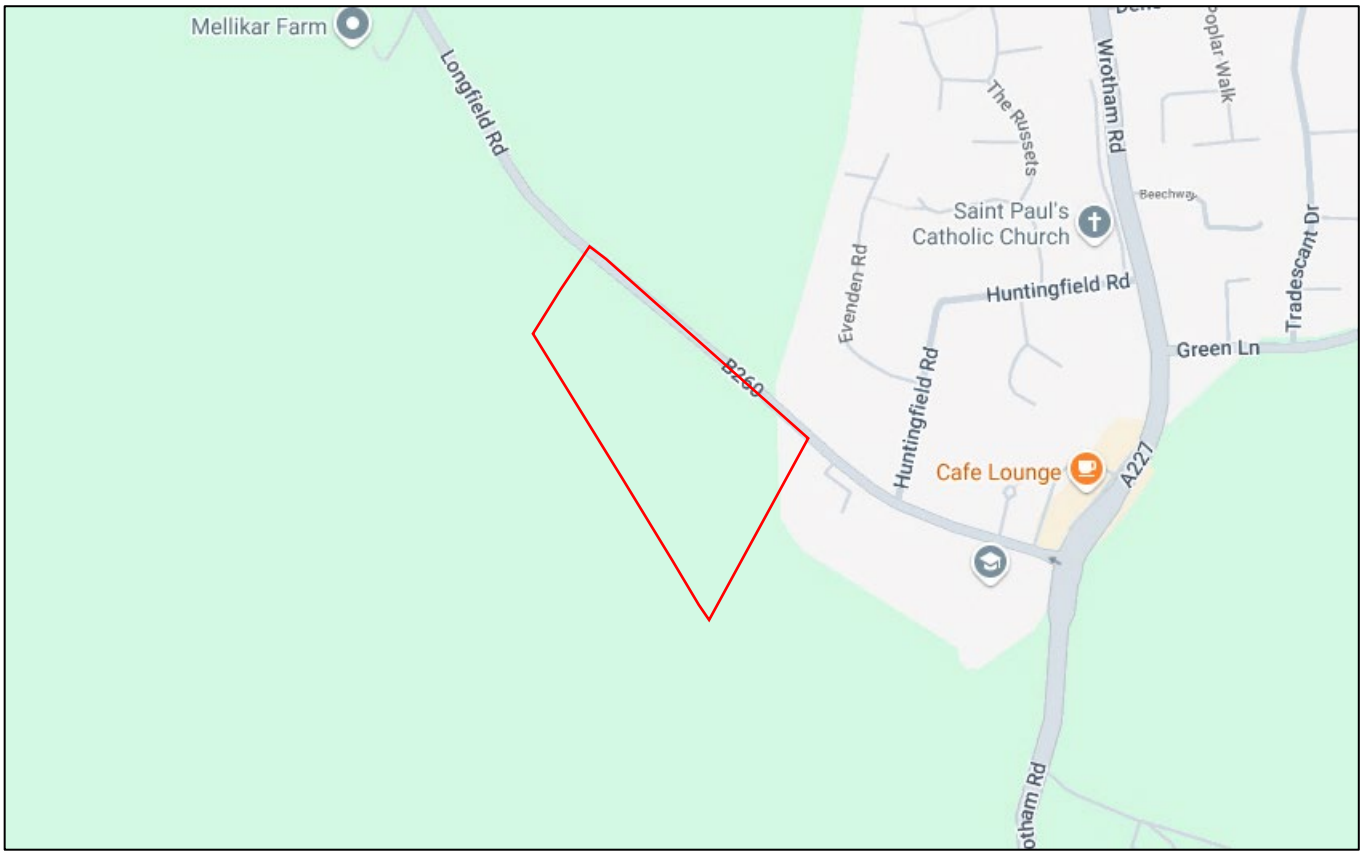
This report has been prepared by 1st Line Defence Limited with all reasonable care and skill. The report contains historical data and information from third party sources. 1st Line Defence Limited has sought to verify the accuracy and comprehensiveness of this information where possible but cannot be held accountable for any inherent errors. Furthermore, whilst every reasonable effort has been made to locate and access all relevant historical information, 1st Line Defence cannot be held responsible for any changes to risk level or mitigation recommendations resulting from documentation or other information which may come to light at a later date.





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Project: Wrotham Road (West), Meopham, Kent

Ref: DA21699-00

Source: Google Maps

Approximate site boundary

N

Recent Aerial Photography

Annex: B

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Ref: DA21699-00

Source: Google Earth

Client Provided Site Plan

Annex: C

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Approximate site boundary

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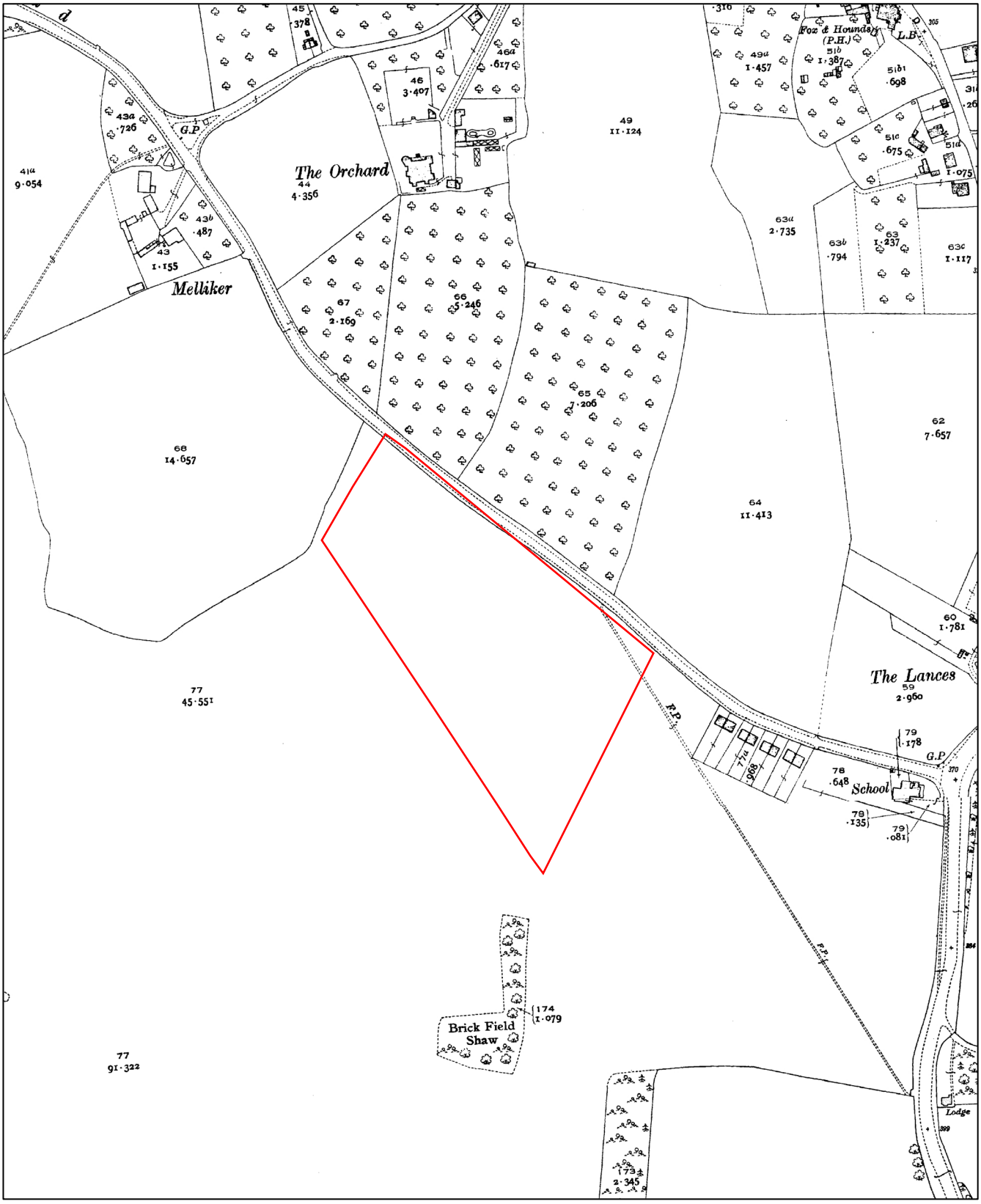
Project: Wrotham Road (West), Meopham, Kent

Ref: DA21699-00

Source: MEC Consulting Group

Pre-WWII Historical Map, 1933-1936

Annex: D1



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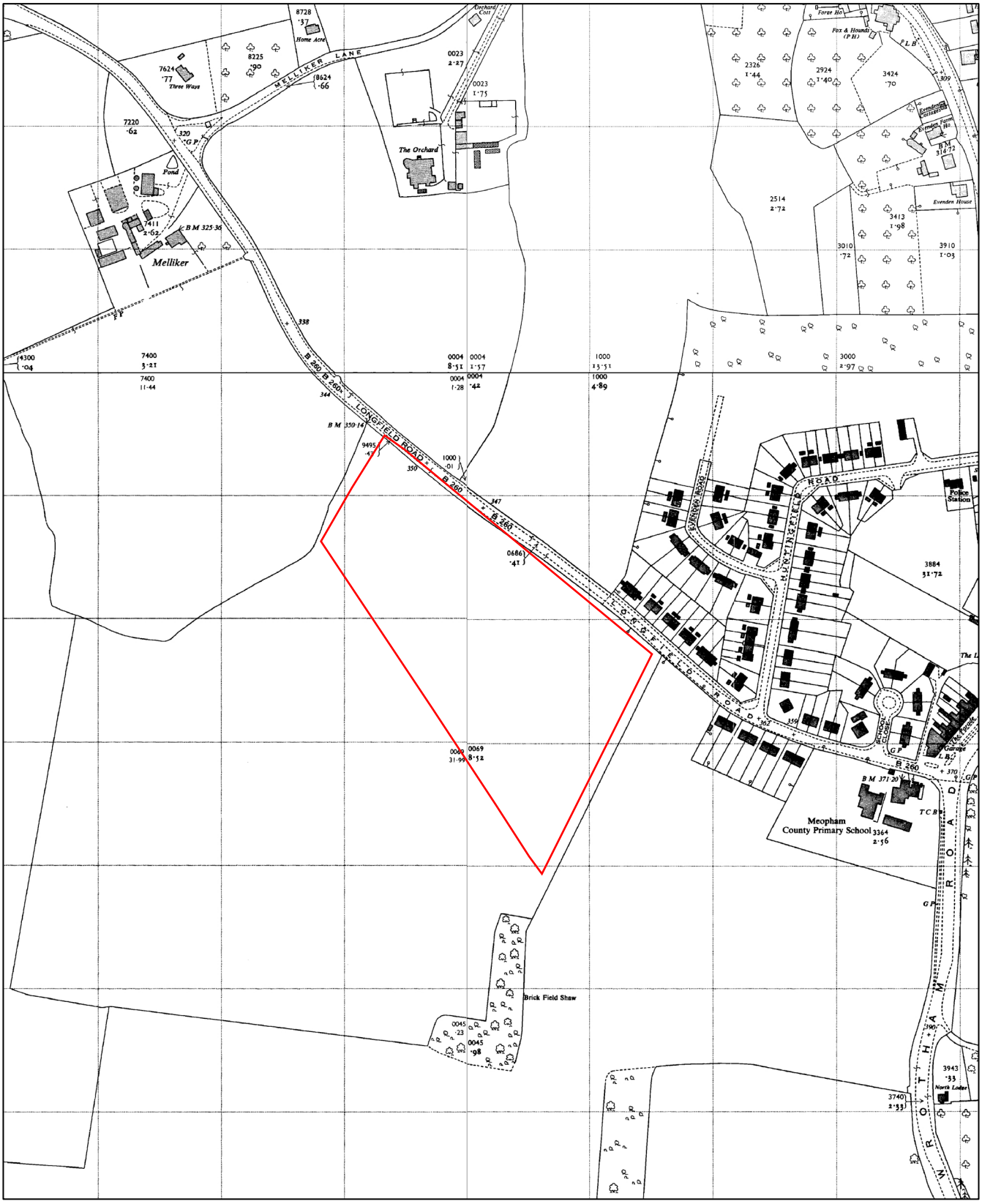
Ref: DA21699-00

Source: Landmark Maps

Post-WWII Historical Map, 1960-1964

Annex: D2



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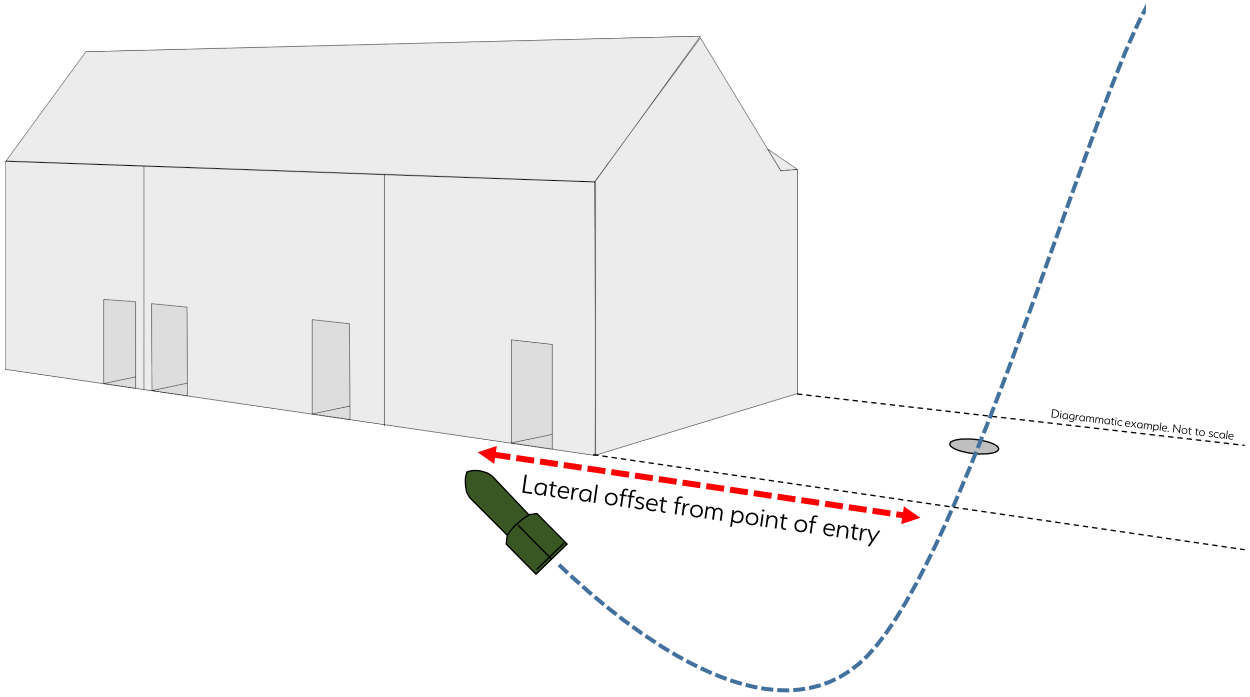
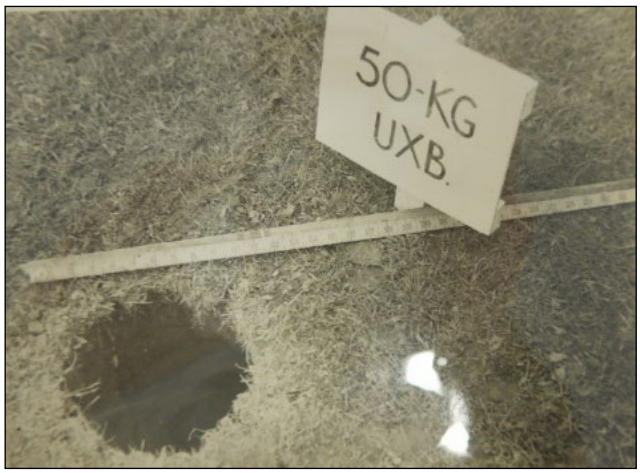
Source: Landmark Maps

Approximate site boundary

N

Example of UXO Entry Hole / The 'J-curve' Effect Principle





Top: J-curve Effect - Due to angle of entry, unexploded bombs would often end their trajectory at a lateral offset from point of entry, often ending up beneath adjacent extant structures/sites.

The photograph **above** shows a 250kg unexploded bomb found in Bermondsey in 2015, pointing upwards, demonstrating 'J-curve'.

One of the most common scenarios for UXO going unnoticed was when a UXB fell into a 'bomb site' (such as the area shown **Top Left**), the entry hole of the bomb obscured by any debris and rubble present. Note that the entry hole of a 50kg UXB could be as little as 20cm in diameter (**Left**).

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Project: Wrotham Road (West), Meopham, Kent

Ref: DA21699-00 **Source:** Various sources

BBC NEWS

WW2 bomb found near London City Airport blown up

An unexploded World War Two bomb found near London City Airport has been detonated.

The 500kg device was discovered at the King George V Dock on Sunday during planned work at the airport.

It was closed and all flights were cancelled on Monday after an exclusion zone was put in place.

The detonation, which took take place off Shoeburyness, Essex, was postponed on Tuesday because of high winds and dangerous conditions for divers.

The 1.5m-long German bomb - which was found in a bed of silt, 15m underwater - was carefully removed from the Thames and placed in a secure location a mile away from the coast of Essex.

500kg German HE Bomb, February 2018

BBC NEWS

Exeter WW2 bomb is detonated after homes evacuated

More than 2,600 households and 12 university halls of residence were cleared before the 2,200lb (1,000kg) device **was destroyed** on Saturday.

Police said the blast left a crater about the size of a double-decker bus.

Police have reported large pieces of metal debris hitting buildings and said some properties in the 100m (330ft) exclusion zone had sustained "structural damage".

1000kg German HE bomb, February 2021

BBC NEWS

Great Yarmouth: Huge blast after unplanned WW2 bomb detonation

A World War Two bomb found in Great Yarmouth has detonated while work was being done to defuse it, causing a huge blast that was heard for miles.

Army specialists were attempting to disarm it when there was an unplanned detonation at about 17:00 GMT.

People on social media said they heard a loud bang and felt buildings shake 15 miles (24km) away.

There have been no reports of injuries among the Army, emergency services or the public, Norfolk Police said.

Cordons were put in place when the bomb was first discovered close to two gas pipes on Tuesday, and work began to make it safe.

250kg German HE Bomb, February 2023

BBC NEWS

Plymouth unexploded WW2 bomb: Thousands of people displaced

A 500kg (1,102lb) German World War Two bomb that forced the evacuation of thousands of people in Plymouth has been detonated at sea.

The unexploded device was **found in a garden** on St Michael Avenue on Tuesday, sparking four days of disruption.

On Friday police closed roads and rail and bus services were stopped as the bomb was transported 1.4 miles (2.3km) through the city's streets.

The device was taken by boat beyond the breakwater and detonated at 21:51 GMT.

500kg German HE Bomb, February 2024

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Ref: DA21699-00

Source: BBC News

BASF has confirmed that an explosive device, most likely a World War II-era bomb, caused the blast that left one person injured Tuesday at a plant construction site in Germany.

The explosion was reported at BASF's Ludwigshafen toluene diisocyanate (TDI) plant, which recently broke ground for a 300,000 metric tons per year TDI production plant and other construction to expand its facilities.

BASF Provides Some Details

Responding to a request from *PaintSquare News* for more information on Wednesday (Feb. 27), BASF's manager of media relations and corporate communications Europe, Ursula von Stetten, wrote in an email, "So here [are] the facts: The detonation took place at 10:00 a.m. One person was injured; the injury is not serious. He will be kept in the hospital for some days.

"Cause of the detonation was an explosive device, presumably a bomb deriving from the Second World War. The device detonated when grounding work was done. No details on [a] delay [are] available. At the moment, the exact circumstances of the incident are [being] evaluated."

1st March 2013

WWII bomb injures 17 at Hattingen construction site

Seventeen people were injured on Friday when a construction crew unwittingly detonated a buried World War II-era bomb in Hattingen.

An excavator apparently drove over a 250-kilogramme (550 pound) American bomb, damaging surrounding buildings. Most of the injured suffered auditory trauma from the blast, and the excavator operator suffered injuries to his hands, police in the German state of North Rhine-Westphalia said.

"The hole was astoundingly small for such a large bomb full of so many explosives," Armin Gebhard, head of the Arnsberg department for military ordnance removal, told The Local. "But of course it damaged all the surrounding buildings too. We are really happy it wasn't worse."

19th September 2013

SPIEGEL ONLINE

Blast Kills One

World War II Bomb Explodes on German Motorway

A highway construction worker in Germany accidentally struck an unexploded World War II bomb, causing an explosion which killed him and wrecked several passing cars.

A World War II bomb has exploded during construction work on a German highway, killing one worker and injuring several motorists who were driving past, police said.

The worker had been cutting through the road surface near the south-western town of Aschaffenburg when his machine struck the bomb and triggered it. Police said they weren't sure yet what type of bomb it was. "The explosion seems to have been too small for it to have been an aircraft bomb," a police spokesman said.

23rd October 2006

BBC NEWS

World War II bomb kills three in Germany

A special commission is investigating the causes of the explosion, while prosecutors are considering whether the team leader should face charges of manslaughter through culpable negligence, the BBC's Oana Lungescu reports from Berlin.

The blast happened an hour before the defusing operation was due to start.

Officials said the three men who died were experienced sappers, or combat engineers, who over 20 years had defused up to 700 bombs.

More than 7,000 people were immediately evacuated when the 500kg bomb was found. Several schools, a kindergarten and local companies remain closed.

2nd June 2010

June 2006

KentOnline
News you can trust

20th September, 2013

Unexploded bomb discovered in Wrotham field by contractors at National Trust-owned land

Contractors made an explosive find when they discovered an unexploded bomb in a Wrotham field.

They had been clearing shrubland on National Trust-owned land at Wrotham Water Farm yesterday evening when they found the device.

Measuring 10 inches long and half-an-inch thick, it is thought to be an smoke or incendiary bomb - possibly dating back from the Second World War.

Police and bomb disposal experts were called at 6pm and carried out a controlled explosion at around 6.45pm.

Tenant farmer David Goodworth lives around a mile from the explosion site.

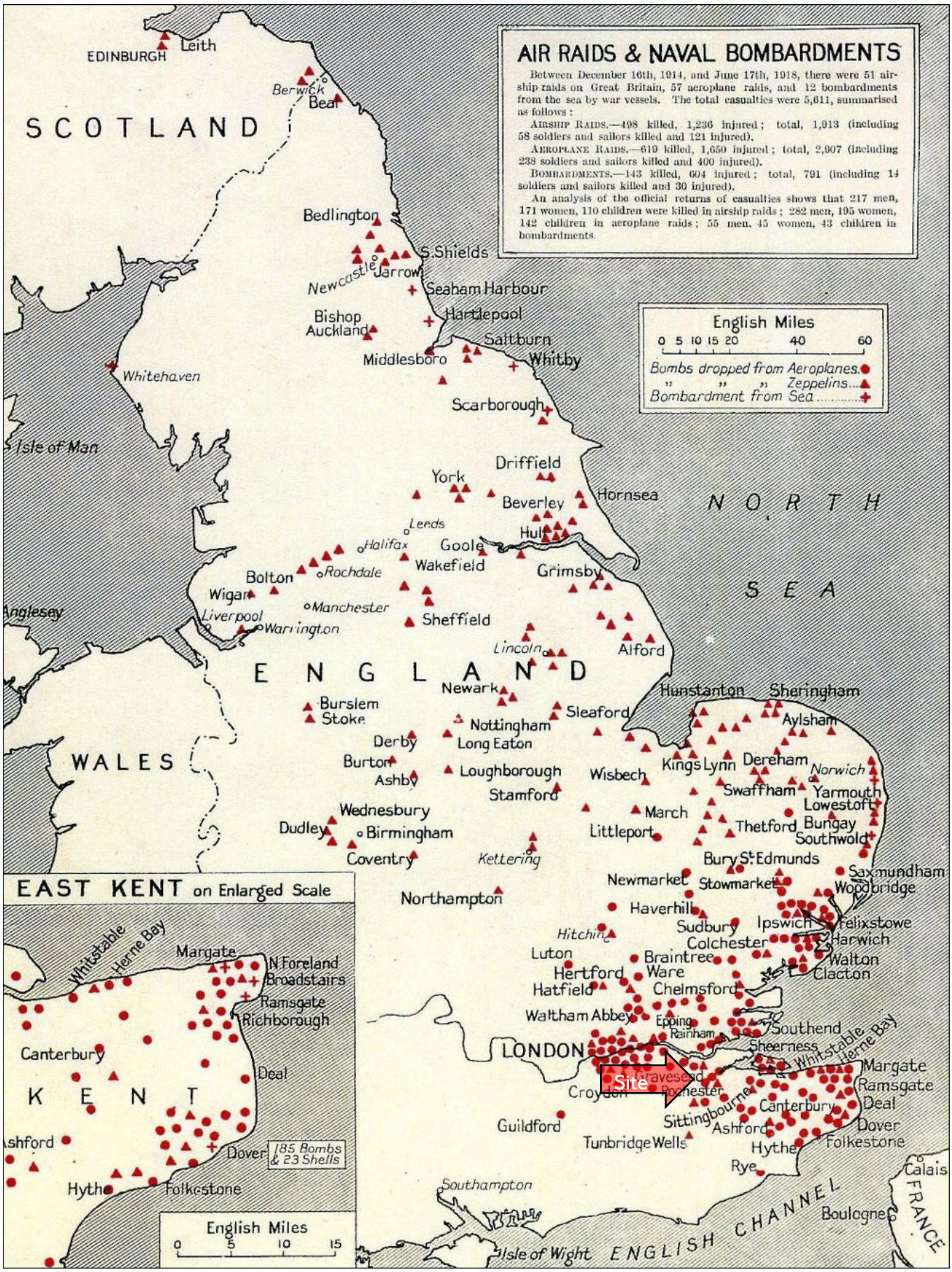
He said: "We found out that a bomb had been found at around 6pm and the explosion happened shortly afterwards.

"We had the dogs barking and the windows rattling and then it was all done and dusted. We were very impressed by how efficient it was."

No one was evacuated during the explosion, which happened in a rural field.

National Trust warden Sam Pettman, who raised the alarm, said: "It is something I have never come across before in this job but it was all very low key and the bomb was not dangerous in any way for the contractors."

WWI Map of Air Raids and Naval Bombardments



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Tel: +44 (0)1992 245 020

Client: MEC Consulting Group

Project: Wrotham Road (West), Meopham, Kent

N

Ref: DA21699-00

Source: J. Morris, German Air Raids on Britain

4th June, 1939

Gravesend, Kent

RAF Gravesend (centre image)

The Pobjoy Airmotors Factory

The southern section of this image was located approximately 3.7km to the north-east.

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Project: Wrotham Road (West), Meopham, Kent

Ref: DA21699-00

Source: Nigel J. Clarke, "Adolf Hitler's Home Counties Holiday Snaps"

N

August 17th, 1940

September 2nd, 1940

HE bomb strikes

Incendiary Bomb Strike

British Aircraft Crash

German Aircraft Crash

PM

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Ref: DA21699-00

Source: Kent History Centre

September 8th, 1940

September 15th, 1940

HE bomb strikes

Incendiary Bomb Strike

British Aircraft Crash

German Aircraft Crash

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Ref: DA21699-00

Source: Kent History Centre

September 29th, 1940

October 16th, 1940

HE bomb strikes Incendiary Bomb Strike

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Approximate site boundary

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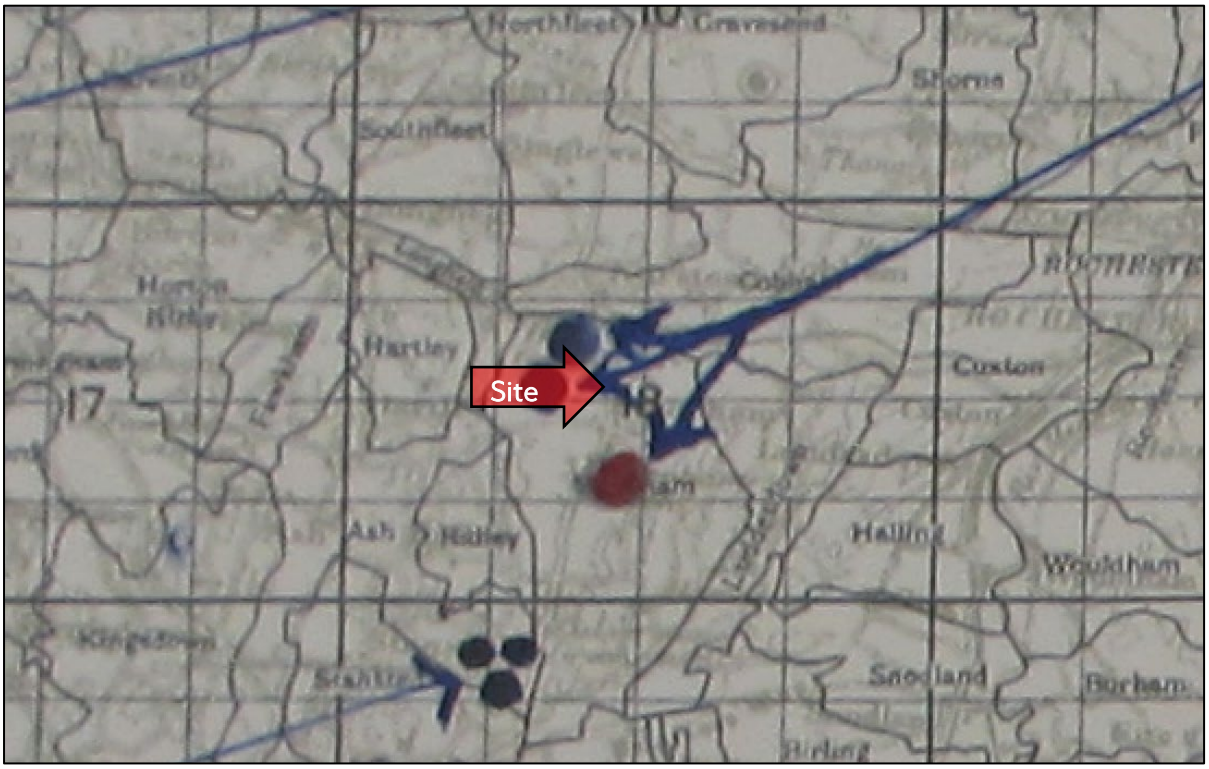
N

Ref: DA21699-00

Source: Kent History Centre

October 21st, 1940

November 19th, 1940



HE bomb strikes Incendiary Bomb Strike

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Approximate site boundary

Project: Wrotham Road (West), Meopham, Kent

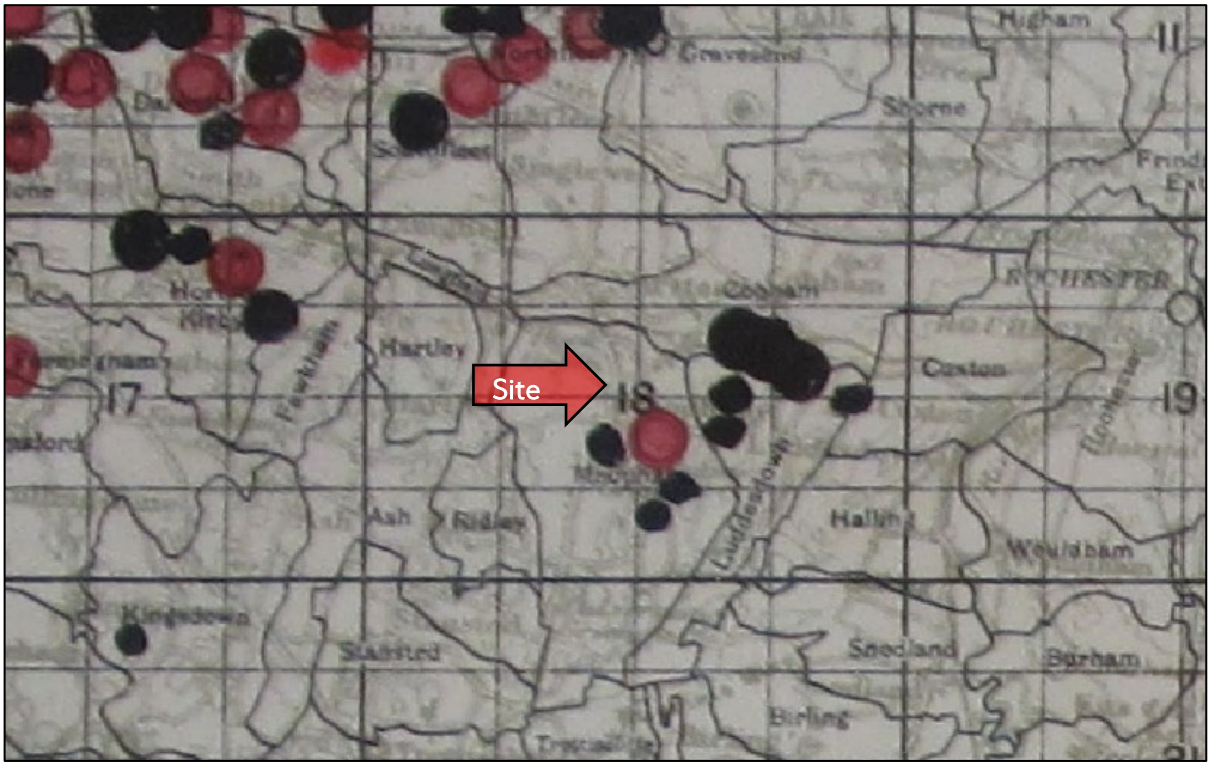
N

Ref: DA21699-00

Source: Kent History Centre

November 29th-30th 1940

January 12th 1941



HE bomb strikes Incendiary Bomb Strike

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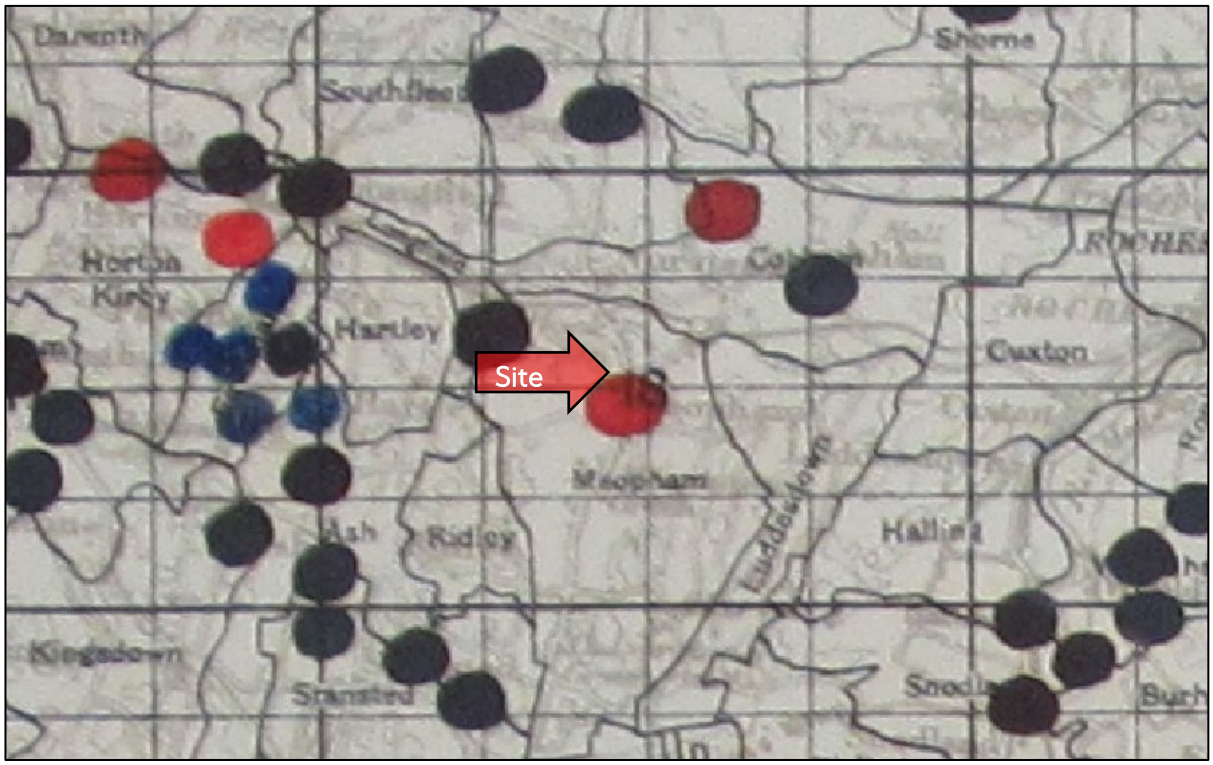
Client:	MEC Consulting Group	Approximate site boundary	N
Project:	Wrotham Road (West), Meopham, Kent		
Ref:	DA21699-00	Source: Kent History Centre	

April 19th, 1941

April 20th, 1941



HE bomb strikes Incendiary Bomb Strike PM

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Client: MEC Consulting Group

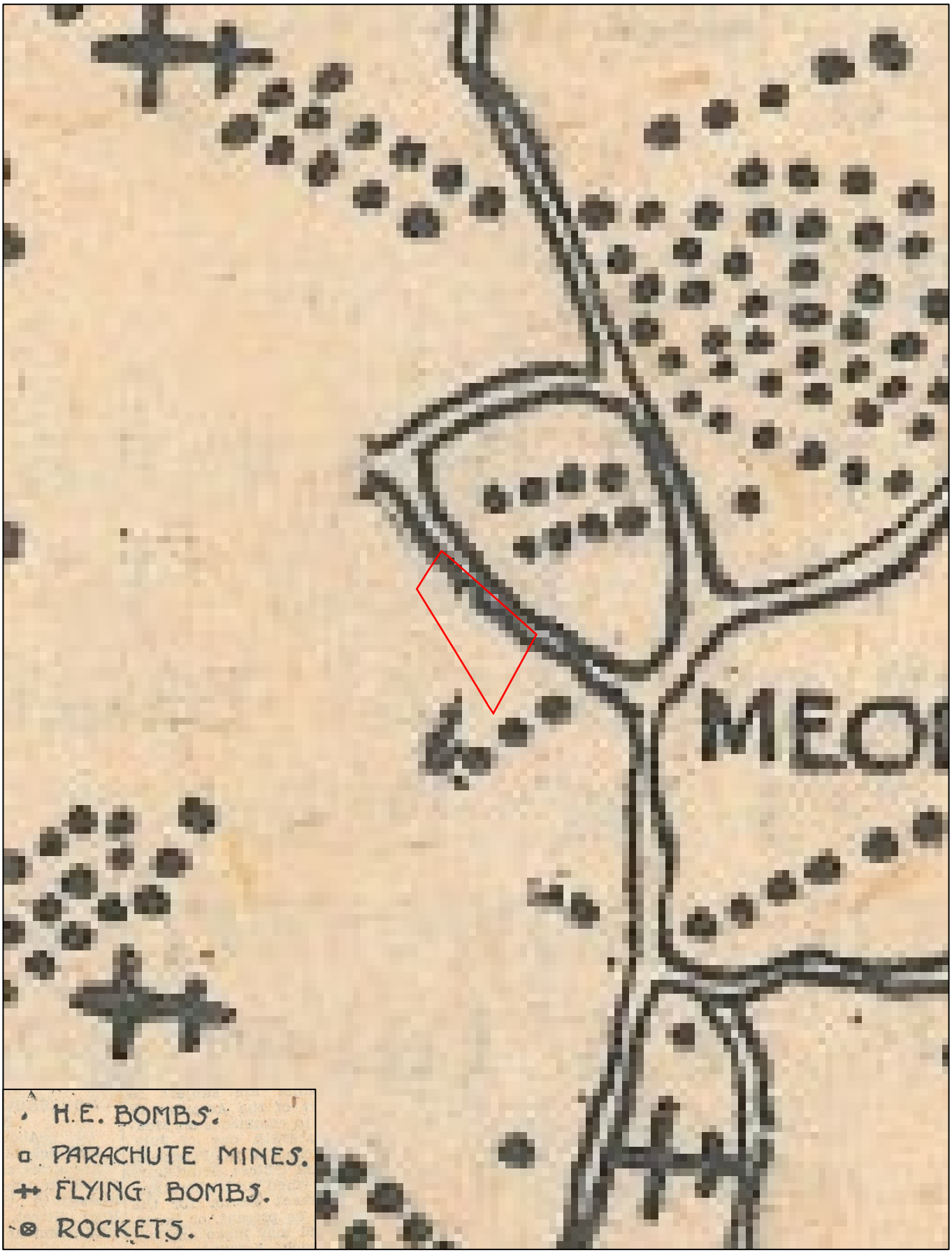
Approximate site boundary

Project: Wrotham Road (West), Meopham, Kent

N

Ref: DA21699-00

Source: Kent History Centre



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Client: MEC Consulting Group

Approximate site boundary

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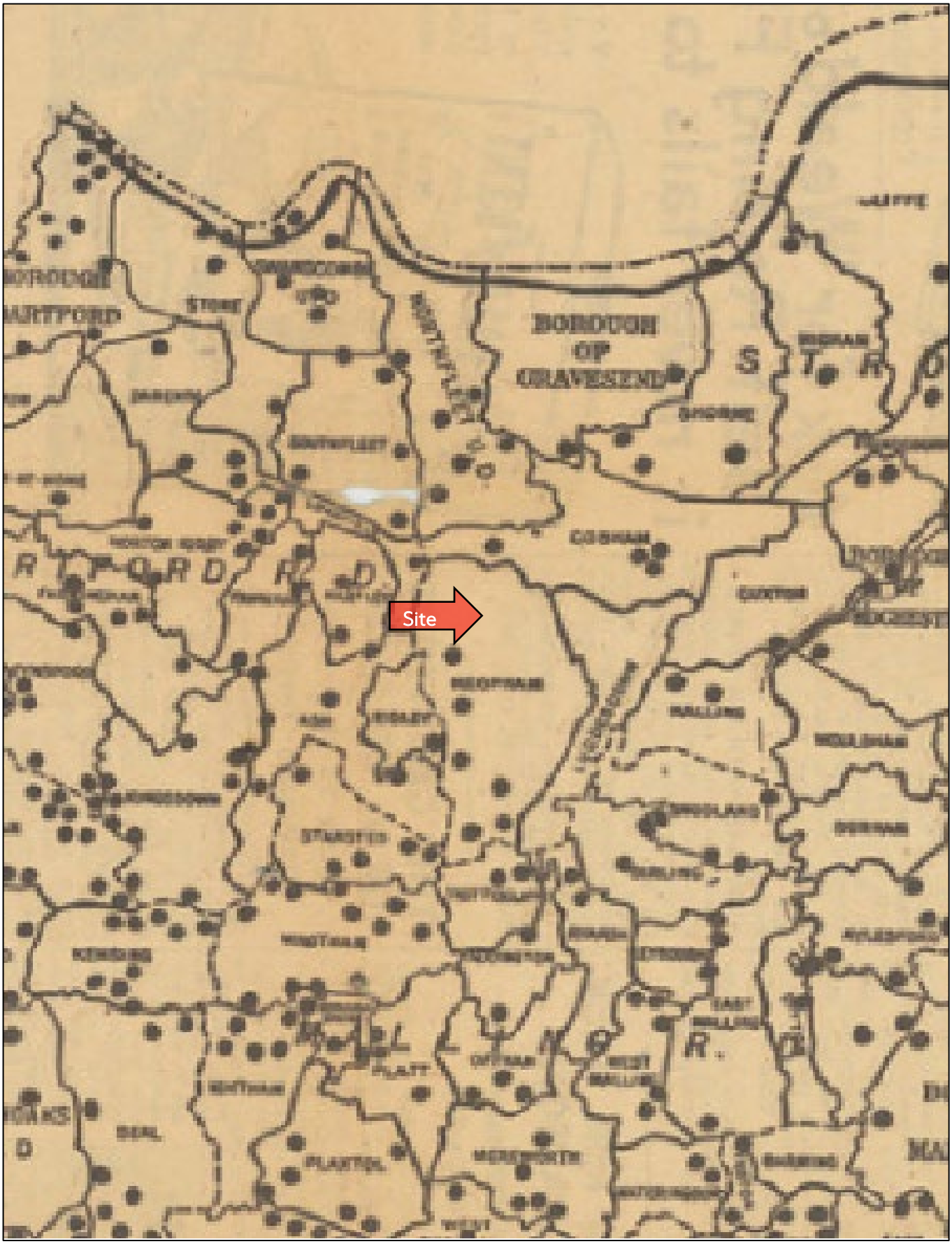
Project: Wrotham Road (West), Meopham, Kent

Ref: DA21699-00

Source: Kent Archives



V-1 Flying Bomb

1ST LINE DEFENCE

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Approximate site boundary

Project: Wrotham Road (West), Meopham, Kent

N

Ref: DA21699-00

Source: Kent Archives

Message Number	Date	Time Origin	Time Receipt	Parish	Time of Incident	Type of Bomb	No.	Information	Casualties K.	S.I.	SL.I.	Damage	Action taken and remarks	Initial of Officer making entry
												Fire at Culpers Rd		

50	-	-	19.56	20.27	-	-		REF. 16-41. Amended Casualties -	25	8	10			NOTED
				STROOD	12.40	H.E.	22	13 H.E. Meopham M.R. 1367	NIL			NIL		
								1 H.E. Inarsted Lane M.R. 1367				Telephone wires		
								4 H.E. near Birt House M.R. 1369				Telephone wires		NOTED
								1 H.E. High Halstow M.R. 1173				Slight		

Date 16. 5. 40

WAR DIARY.

MEDWAY GROUP INCIDENTS II 15/9/40

MESSAGE NO.	Date	Time ORIGIN	Time RECEIPT	LOCAL AUTHORITY	Information	CASUALTIES K	S.I.	S.L.	Action Taken DAMAGE	ACTION TAKEN and Remarks	Initial of Officer making entry
89	15.9.40	18.37	18.52	M.G.C.	STROOD. MEOPHAM. MINOR BOMBING AT 15.00 - APPROX. 200 I.B'S IN CORN STUBBLE.	NIL			NIL		R18

WAR DIARY. SHEET II

MEDWAY GROUP INCIDENTS. 21.10.40.

MESSAGE No	Date	Time ORIGIN	Time RECEIPT	LOCAL AUTHORITY	Information	CASUALTIES K	S.I.	L.I.	Action Taken DAMAGE	ACTION TAKEN and Remarks	Initial of Officer making entry
42.	21.10.40	1740	1754	MEDWAY GROUP	SITUATION REPORT. STROOD. MINOR BOMBING INCIDENT AT 15.29 HOURS AT MEOPHAM M/R 089859 AND 075859. THREE DELAYED ACTION BOMBS WERE DROPPED.	N	I	L	NIL	NONE	R18

WAR DIARY. 19.11.40.

Medway Group Incidents

MESSAGE NO.	Date	Time ORIGIN	Time RECEIPT	LOCAL AUTHORITY	Information	CASUALTIES K.	S.I.	SL.I.	Action Taken DAMAGE	ACTION TAKEN and Remarks	Initial of Officer making entry
8.	19.11.40.	10.02	10.14	Strood Rural	Meopham. At 03.40 hrs, 14 H.E's in line between M.R's 077862 + 074853.				Telephone + aeroplane	-	
41	do.	2050	2056	Strood R.D.	Meopham. 2005 hrs. 18 H.E. M.R. 085846 No details	NIL			trap wire down.	NO ACTION No action	Short Circuit
44	do.	2230	2234	Strood R.D.	Thurs 2050 - fire extinguished	None			flight to property.	No action	

14	30.11.40	11.20	11.30	STROOD R.D.	22.15/29	H.E	1	M.M.R. 998859 to 995865 CALVERSTONE GREEN M.M.R. 076816	NIL		NIL		NIL
				GILLINGHAM	23.05/29 19.15/29	H.E's	8	HOOKS GREEN M.M.R. 082858 ref 20.35/29. Total number	NIL		NIL		NIL

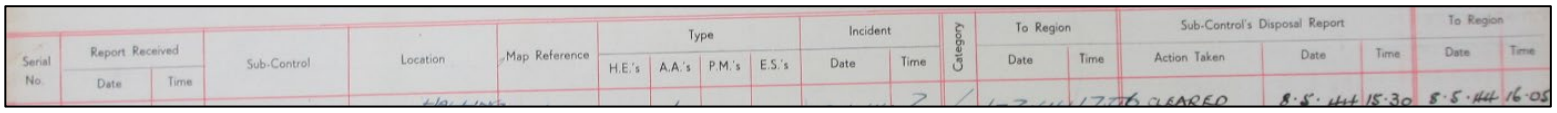
	81	19·3·41	22·20	22·37	STROOD R.D.	21·50	1·B·S		MEOPHAM M.R. 087848. FIRE REPORTED.								
70	"	21·26	21·29	STROOD R.D.	21·00 APPROX:	H·E	2		MEOPHAM M.R. 087849.								

131	26·4·41	17·23	17·29	STROOD R.	03·06	H E	4		MEOPHAM. M.R 082854.	N	1	L	NIL.	NIL.	No Action	
3															NO ACTION.	
36	21·4·41															

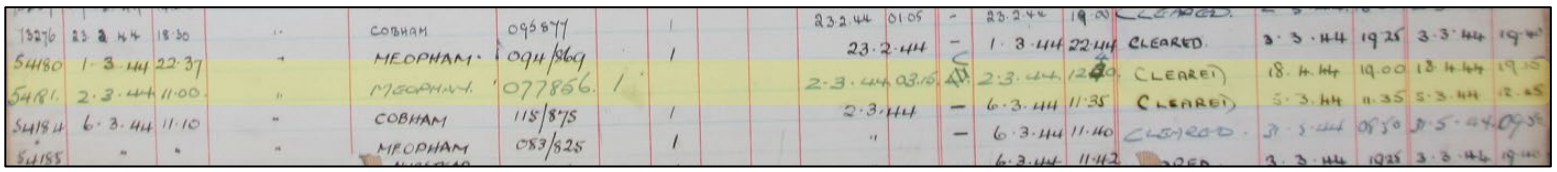
STROOD RURAL INCIDENTS. WAR DIARY. Date Nov. 2nd '43

	Message Number	Date	Time Origin	Time Receipt	Local Authority	Time of Incident	Type of Bomb	No.	Information	Casualties K.	S.I.	SL. I.	Damage	Action Taken and Remarks	Initial of Officer making entry
	13	2/11/43	19·26	19·39	Strood R.	19·24	HE.	1	EXPRESS At Meopham MR081/865					Region 19·40	SASH
	17	" "	19·57	20·05	"	19·27	"	1	Between Luston & Judesdown M.R 12/85					Region 20·08	SASH
	19	" "	20·28	20·32	"				FIRST INTERIM - REF 19·26 Meopham. Corrected M.R. 081/851	None			Damage to houses & electricity	Region 20·34	SASH

1.	21-8-44	03·09	03·20	Meopham	02·20	Fly	1.	By balloon M.R. 078849.	N	1	L	Damage to property.	Region 03·21	RAS.	



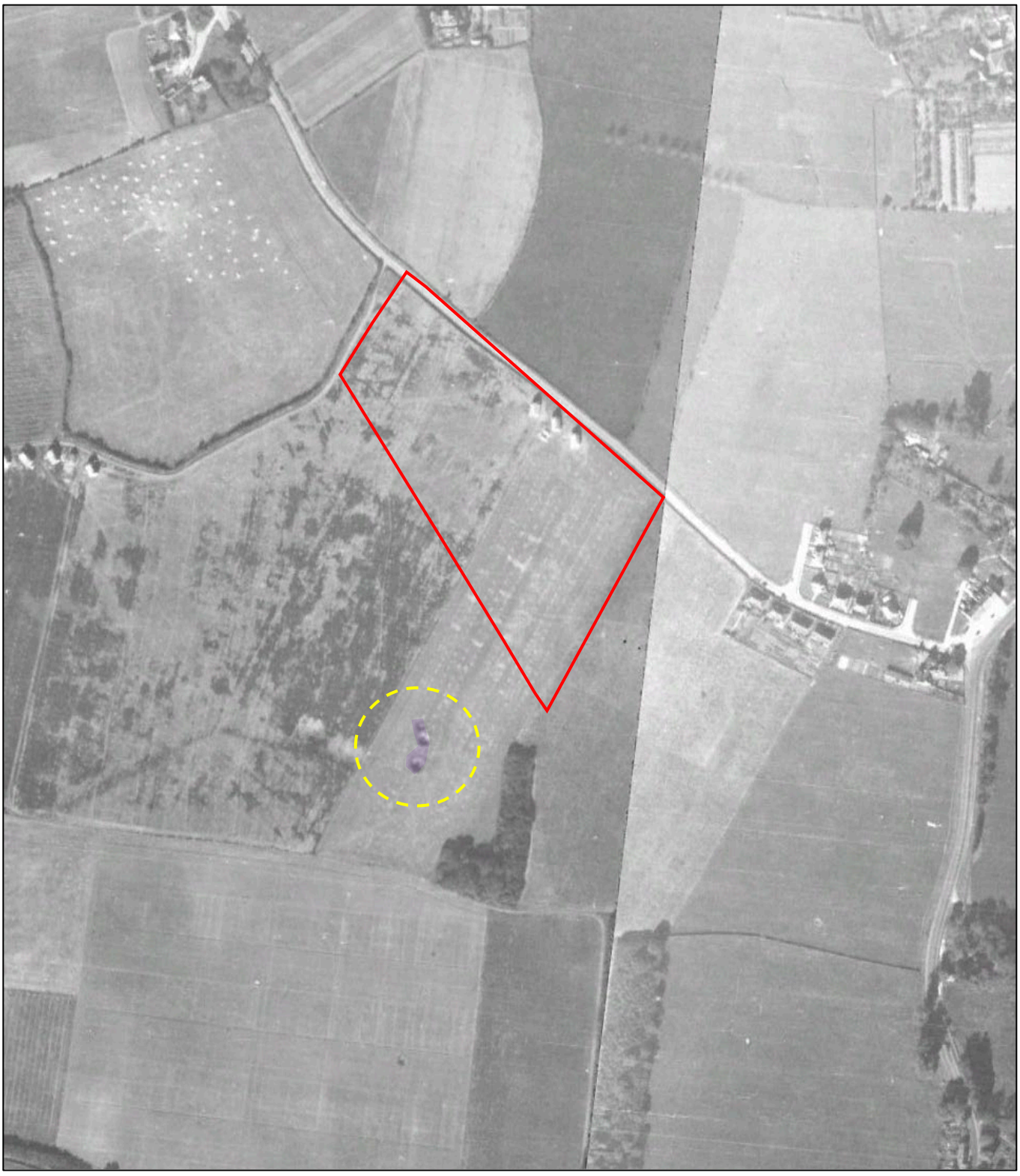
Serial No.	Report Received Date	Report Received Time	Sub-Control	Location	Map Reference	Type H.E.'s	Type A.A.'s	Type P.M.'s	Type E.S.'s	Incident Date	Incident Time	Category	To Region Date	To Region Time	Sub-Control's Disposal Report Action Taken	Sub-Control's Disposal Report Date	Sub-Control's Disposal Report Time	To Region Date	To Region Time
															CLEARED	8·5·44	15·30	8·5·44	16·05



13276	23·2·44	18·30	"	COBHAM	095877		1			23·2·44	0105	–	23·2·44	19·00	CLEARED				
54180	1·3·44	22·37	"	MEOPHAM	094/869		1			23·2·44		–	1·3·44	22·44	CLEARED	3·3·44	19·25	3·3·44	19·40
54181	2·3·44	11·00	"	MEOPHAM	077866	1				2·3·44	03·15	A	2·3·44	1200	CLEARED	18·4·44	19·00	18·4·44	19·35
54184	6·3·44	11·10	"	COBHAM	115/875		1			2·3·44		–	6·3·44	11·35	CLEARED	5·3·44	11·35	5·3·44	12·45
54185	"	"	"	MEOPHAM	083/825		1			"		–	6·3·44	11·40	CLEARED	3·3·44	0830	3·5·44	0930
													6·3·44	11·42		3·3·44	1935	3·3·44	19·40

Relevant Transcription: (Serial Number) 54181. (Report received date) 2/3/44. (Location) Meopham. (Map reference) 077856. (Type) HE. (Incident date) 2/3/44.

This incident was located approximately 350m to the west.



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Approximate site boundary

Project: Wrotham Road (West), Meopham, Kent

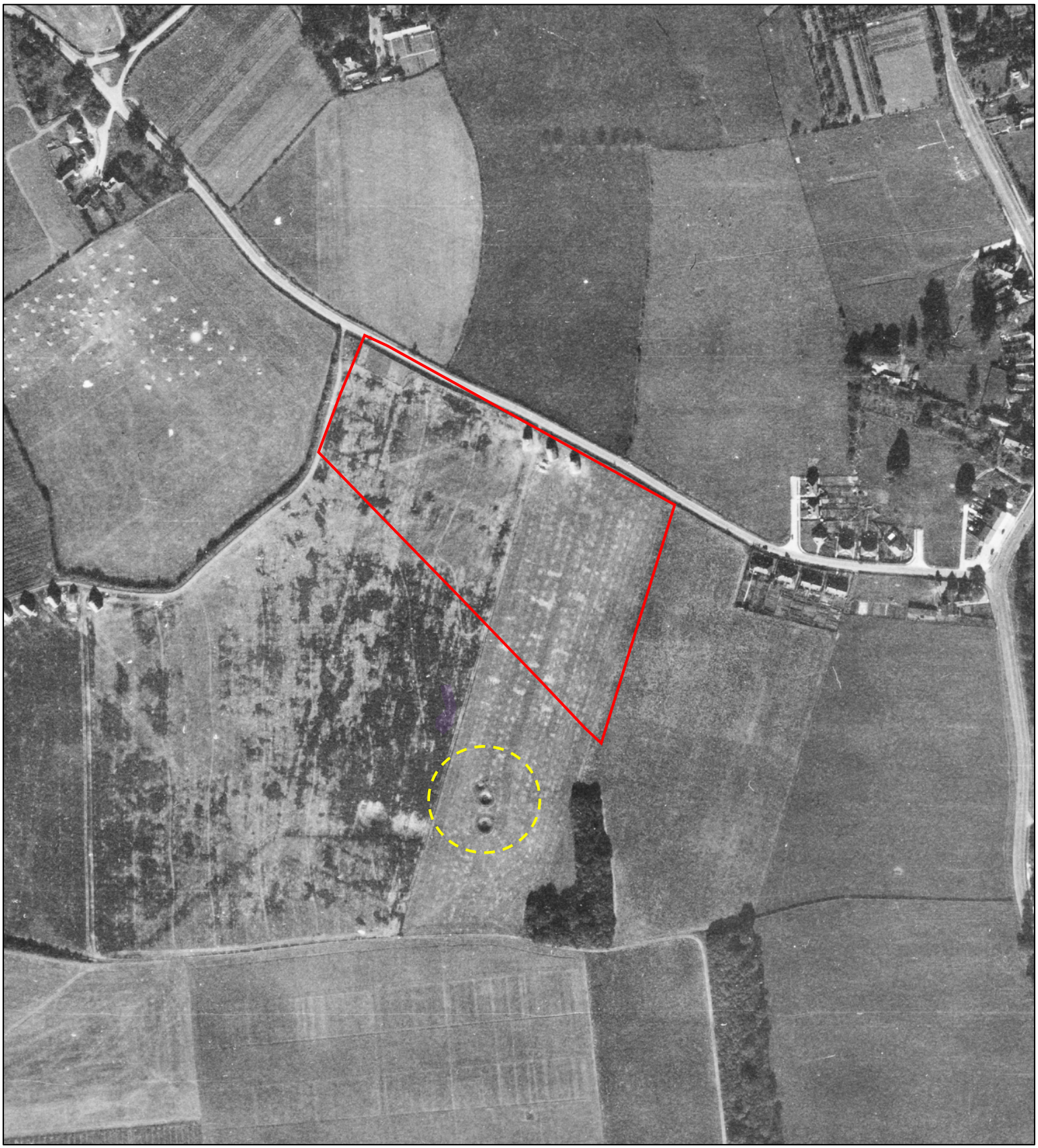
N

Ref: DA21699-00

Source: Google Earth

RAF Aerial Photography, 11th October 1946

Annex: N2



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Approximate site boundary

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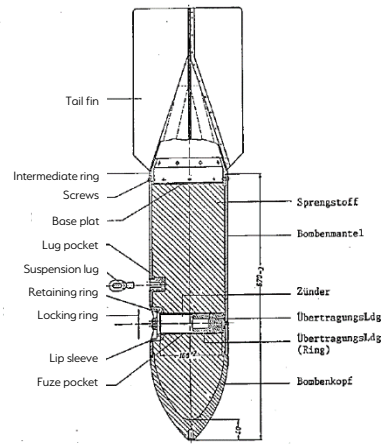
N

Ref: DA21699-00

Source: National Monuments Record Office (Historic England)

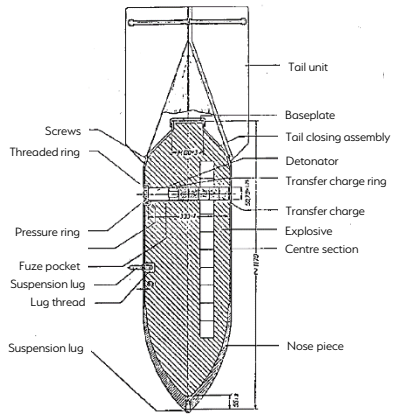
SC 50kg High Explosive Bomb

Bomb Weight	40-54kg (88-119lb)
Explosive Weight	25kg (55lb)
Fuze Type	Impact fuze/electro-mechanical time delay fuze
Bomb Dimensions	1,090 x 280mm (42.9 x 11.0in)
Body Diameter	200mm (7.87in)
Use	Against lightly damageable materials, hangars, railway rolling stock, ammunition depots, light bridges and buildings up to three stories.
Remarks	The smallest and most common conventional German bomb. Nearly 70% of bombs dropped on the UK were 50kg.



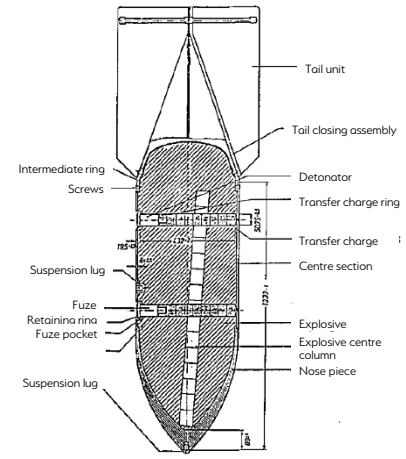
SC 250kg High Explosive Bomb

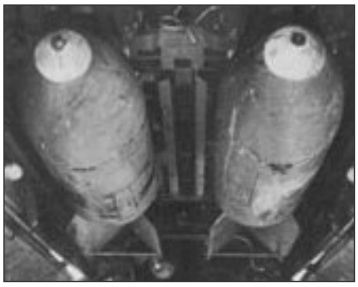
Bomb Weight	245-256kg (540-564lb)
Explosive Weight	125-130kg (276-287lb)
Fuze Type	Electrical impact/mechanical time delay fuze
Bomb Dimensions	1640 x 512mm (64.57 x 20.16in)
Body Diameter	368mm (14.5in)
Use	Against railway installations, embankments, flyovers, underpasses, large buildings and below-ground installations.
Remarks	It could be carried by almost all German bomber aircraft and was used to notable effect by the Junkers Ju-87 Stuka (*Sturzkampfflugzeug*, or dive-bomber).



SC 500kg High Explosive Bomb

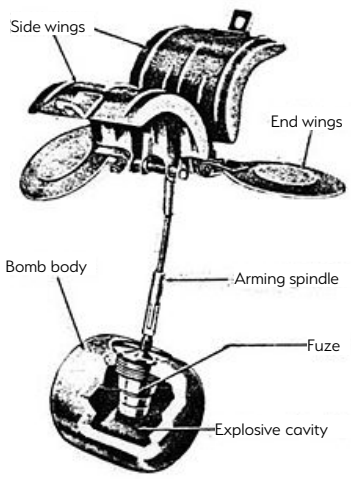
Bomb Weight	480-520kg (1,058-1,146lb)
Explosive Weight	250-260kg (551-573lb)
Fuze Type	Electrical impact/mechanical time delay fuze
Bomb Dimensions	1957 x 640mm (77 x 25.2in)
Body Diameter	470mm (18.5in)
Use	Against fixed airfield installations, hangars, assembly halls, flyovers, underpasses, high-rise buildings and below-ground installations.
Remarks	40/60 or 50/50 Amatol TNT, Trialene. Bombs recovered with Trialen filling have cylindrical paper-wrapped pellets, 1-15/16in. in length and diameter.





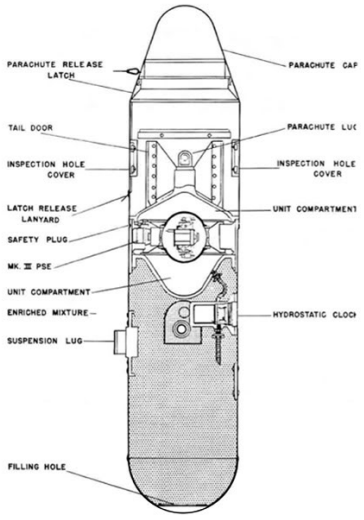
SD2 Anti-Personnel 'Butterfly Bomb'

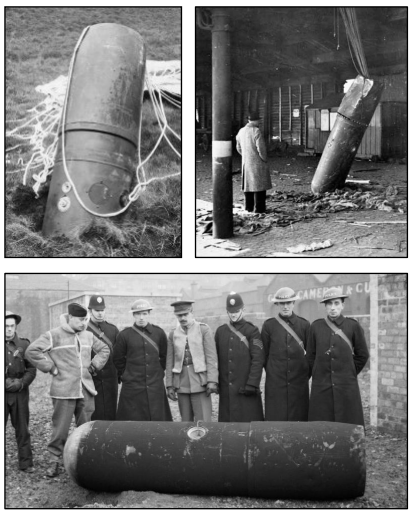
Bomb Weight	Approx. 2kg (4.41lb)
Explosive Weight	Approx. 7.5oz (225 grams) of Amatol surrounded by a layer of bituminous composition.
Fuze Type	41 fuze (time) , 67 fuze (clockwork time delay) or 70 fuze (anti-handling device)
Body Diameter	3in (7.62 cm) diameter, 3.1in (7.874) long
Use	Designed as an anti-personnel/fragmentation weapon. They were delivered by air, being dropped in containers of 23-144 sub-munitions that opened at a predetermined height, thus scattering the bombs.
Remarks	Quite rare. First used against Ipswich in 1940, but were also dropped on Kingston upon Hull, Grimsby and Cleethorpes in June 1943, amongst various other targets in UK. As the bombs fell the outer case flicked open via springs which caused four light metal drogues with a protruding 5 inch steel cable to deploy in the form of a parachute & wind vane, which armed the device as it span.



Parachute Mine (Luftmine B / LMB)

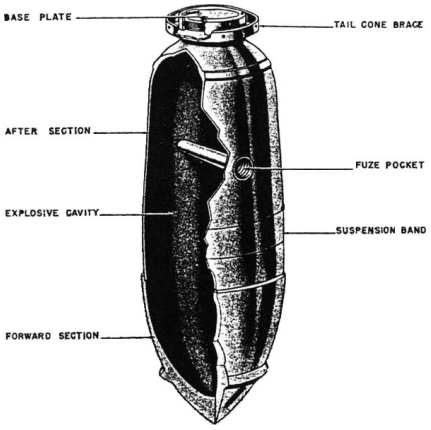
Bomb Weight	Approx. 990kg (2176lb)
Explosive Weight	Approx. 705kg (1,554lb)
Fuze Type	Impact/time delay/hydrostatic pressure fuze
Dimensions	2.64m x 0.64m (3.04m with parachute housing)
Use	Against civilian, military and industrial targets. Used as blast bombs and designed to detonate above ground level to maximise damage to a wider area.
Remarks	Deployed a parachute when dropped in order to control its descent. Had the potential to cause extensive damage within a 100m radius.





SC 1000kg High Explosive Bomb

Bomb Weight	Approx. 993-1027kg (2,189-2,264lb)
Explosive Weight	Approx. 530-620kg (1168-1367lb)
Fuze Type	Electrical impact/mechanical time delay fuze.
Filling	Mixture of 40% amatol and 60% TNT, but when used as an anti-shipping bomb it was filled with Trialen 105, a mixture of 15% RDX, 70% TNT and 15% aluminium powder.
Bomb Dimensions	2800 x 654mm (110 x 25.8in)
Body Diameter	654mm (18.5in)
Use	SC-type bombs were General Purpose Bombs used primarily for general demolition work. Constructed of parallel walls with comparatively heavy noses, they are usually of three-piece welded construction.



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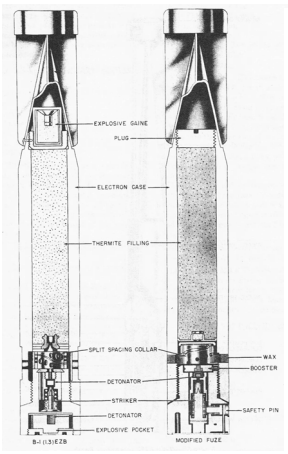
Project: Wrotham Road (West), Meopham, Kent

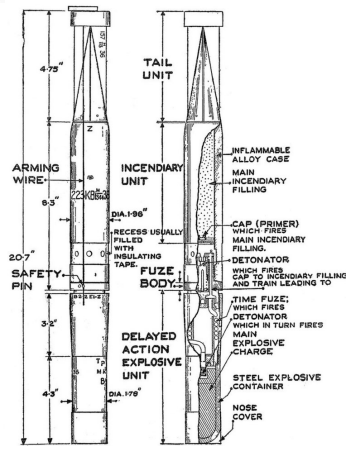
Ref: DA21699-00

Source: Various sources

1kg Incendiary Bomb

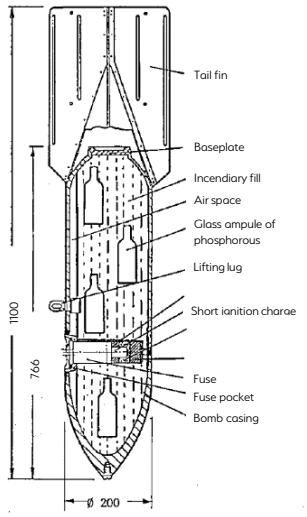
Bomb Weight	Approx. 1.0 - 1.3kg (2.2 and 2.9lb)
Explosive Weight	Approx. 680g (1.5lb) Thermite 8-15gm Explosive Nitropenta
Fuze Type	Impact fuze
Bomb Dimensions	350 x 50mm (13.8 x 1.97in)
Body Diameter	50mm (1.97in)
Use	As incendiary – dropped in clusters on towns and industrial complexes.
Remarks	Magnesium alloy case. Sometimes fitted with high explosive charge. The body is a cylindrical alloy casting threaded internally at the nose to receive the fuze holder and fuze.

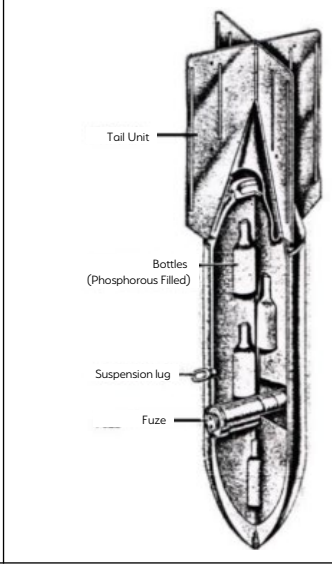




C50 A Incendiary Bomb

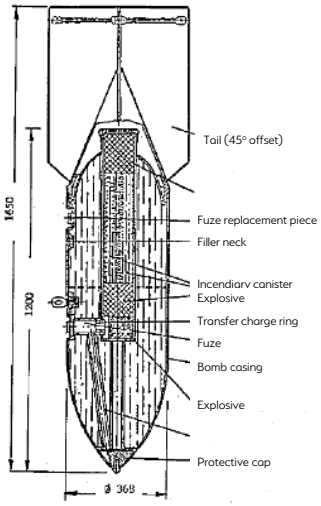
Bomb Weight	Approx. 41kg (90.4lb)
Explosive Weight	Approx. 0.03kg (0.066lb)
Incendiary Filling	12kg (25.5lb) liquid filling with phosphor igniters in glass phials. Benzine 85%; Phosphorus 4%; Pure Rubber 10%
Fuze Type	Electrical impact fuze
Bomb Dimensions	1,100 x 280mm (43.2 x 8in)
Use	Against any targets where an incendiary effect is required.
Remarks	Early fill was a phosphorous/carbon disulphide incendiary mixture.





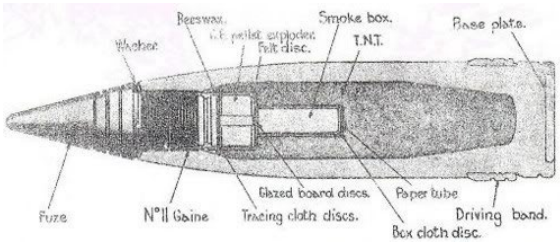
Flam C-250 Oil Bomb

Bomb Weight	480-520kg (1,058-1,146lb)
Explosive Weight	250-260kg (551-573lb)
Fuze Type	Electrical impact/mechanical time delay fuze
Bomb Dimensions	1957 x 640mm (77 x 25.2in)
Body Diameter	470mm (18.5in)
Use	Against fixed airfield installations, hangars, assembly halls, flyovers, underpasses, high-rise buildings and below-ground installations.
Remarks	40/60 or 50/50 Amatol TNT, Trialene. Bombs recovered with Trialen filling have cylindrical paper-wrapped pellets, 1-15/16in. in length and diameter.



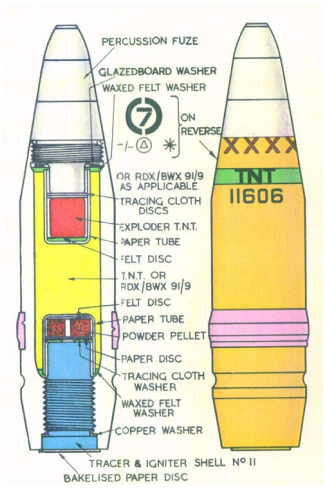
3.7 Inch QF Anti-Aircraft Projectile

Projectile Weight	28lb (12.6 kg)
Explosive Weight	2.52lbs
Fuze Type	Mechanical Time Fuze
Dimensions	3.7in x 14.7in (94mm x 360mm)
Rate of Fire	10 to 20 rounds per minute
Use	The 3.7in AA Mks 1-3 were the standard Heavy Anti-Aircraft guns of the British Army and were commonly used on the Home Front.
Ceiling	30,000ft to 59,000ft



40mm Bofors Projectile

Projectile Weight	1.96lb (0.86kg)
Explosive Weight	300g (0.6lb)
Fuze Type	Impact Fuze
Rate of Fire	120 rounds per minute
Projectile Dimensions	40 x 180mm
Ceiling	23,000ft (7000m)
Remarks	Light quick fire high explosive anti-aircraft projectile. Each projectile fitted with small tracer element. If no target hit, shell would explode when tracer burnt out. Designed to engage aircraft flying below 2,000ft.



3in Unrotated Projectile (UP) Anti-Aircraft Rocket ("Z" Battery)

HE Projectile Weight	3.4kg (7.6lb)
Explosive Weight	0.96kg (2.13lb)
Filling	High Explosive – TNT. Fitted with aerial burst fuzing
Dimensions of projectile	236 x 83mm (9.29 x 3.25in)
Remarks	As a short range rocket-firing anti-aircraft weapon developed for the Royal Navy. It was used extensively by British ships during the early days of World War II. The UP was also used in ground-based single and 128-round launchers known as Z Batteries. Shell consists of a steel cylinder reduced in diameter at the base and threaded externally to screw into the shell ring of the rocket motor.

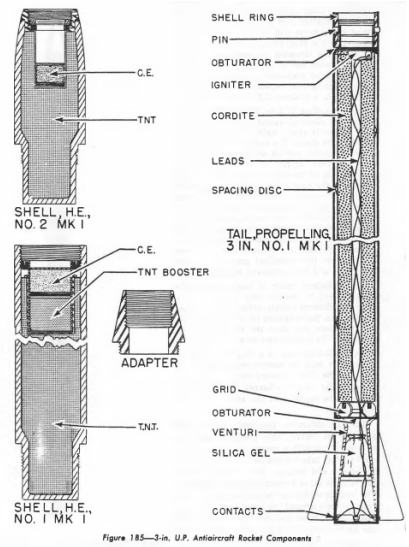


Figure 185.—3-in. U.P. Antiaircraft Rocket Components

1st Line Defence

Unit 3, Maple Park
Essex Road, Hoddesdon
Hertfordshire EN11 0EX

Call +44 (0) 1992 245 020
Email info@1stlinedefence.co.uk
Web www.1stlinedefence.co.uk

1ST LINE DEFENCE

Front cover image credit: London Bomb Census Mapping, The National Archives (HO 193)

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APPENDICES

APPENDIX F

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Doc. Ref.	29473-CALC-0402
Sheet	1 of 13
Engineer	RF
Date	16.04.25
Revision	-

SOIL INFILTRATION CALCULATIONS FRONT SHEET

SCHEME	Land West of Wrotham Road, Meopham
CLIENT	Richborough
ASPECTS OF SCHEME TO BE DESIGNED	Soil Infiltration Rate Testing
CODES OF PRACTICE, DESIGN SPECIFICATIONS & BRITISH STANDARDS	Soil Infiltration Rate testing and calculations completed in general accordance with BRE Digest 365 utilising the gravel fill pit method.
NOTES	The soil infiltration rate test results reported below apply to the specific test depth ranges as stated on the calculation sheets. Testing was undertaken in three locations (SA01-SA03) within the Thanet Formation. The locations of the soil infiltration test pits are shown on the attached exploratory hole location plan. Three tests were completed within SA02, with calculated infiltration rates ranging between 6.75×10^{-6} m/s and 9.73×10^{-6} m/s. SA02 was sited at the topographical low point, close to the centre of the northern boundary. A single test was completed in SA01; however, due to the time required to reach the 25% effective storage depth (17 hours), the location was considered unlikely to accommodate further testing within the available monitoring period. The calculated infiltration rate for this test was 1.13×10^{-6} m/s. Insufficient soakage was recorded in SA03 during a single test to enable the calculation of a representative infiltration rate in accordance with BRE 365. Two additional trial pits (TP01-TP02) were advanced to depths of up to 3.30m bgl to confirm groundwater levels and the depth to the Chalk bedrock. Groundwater was not encountered in trial pits or any of the three soakaway locations prior to undertaking infiltration testing. Chalk was encountered underlying the Thanet Formation at 3.00m bgl in TP01 and at 1.10m bgl in TP02. Based on the available results, it is considered that soakaways will be feasible at the location of SA02, utilising the lowest calculated value of 6.75×10^{-6} m/s for design purposes. Soakaways in the Thanet Formation at the topographically higher positions in the north-west and south-east, are not considered feasible. The underlying Chalk bedrock may be more conducive to infiltration, and based on the recorded ground conditions, will be encountered at a variable depth underlying the Thanet Formation. Additional testing will be required should deeper soakaways be proposed for the development.

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Sheets	Calculations		Checked by	Approved By	Date
3	Exploratory Hole Location Plan		JM	DT	08.05.25
4	SA01 – Test 1	Result = 1.13 x 10^{-6} m/s			
5	SA02 – Test 1	Result = 9.73 x 10^{-6} m/s			
6	**SA02 – Test 2**	**Result = 6.75 x 10^{-6} m/s**			
7	SA02 – Test 3	Result = 9.16 x 10^{-6} m/s			
8	SA03 – Test 1	Insufficient soakage to derive an infiltration rate			
9-13	Exploratory Hole Logs				

GENERAL NOTES

1. DO NOT SCALE THIS DRAWING.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEERS, ARCHITECTS AND SPECIALIST DESIGN DRAWINGS AND DETAILS.
3. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
4. THIS DRAWING IS FOR STRATEGY PURPOSES ONLY AND IS NOT TO BE USED FOR CONSTRUCTION PURPOSES.

KEY

SA01 SOIL INFILTRATION TEST PIT LOCATION

TP01 TRIAL PIT LOCATION

SITE BOUNDARY

REV:	AMENDMENTS:	DRN:	CHK:	APP:	DATE:
-	FIRST ISSUE	JM	CW	DT	08/04/25

PROJECT:
LAND WEST OF
WROTHAM ROAD
MEOPHAM

DRAWING TITLE:
EXPLORATORY HOLE
LOCATION PLAN

CLIENT:
RICHBOROUGH

DRAWING NUMBER:
29473_04_140_01.2

REVISION:	SHEET SIZE:	SCALE:
-	A1	1 : 1000

STATUS:
FOR INFORMATION / APPROVAL

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Scheme	**Land West of Wrotham Road, Meopham**	**Page No.**	4
Client	**Richborough**	**Calcs by**	RF
Job ref.	**29473**	**Checked By**	DT
		Date	15/04/25

Soil Infiltration Test - Gravel Filled Method

(In general accordance with BRE Digest 365, 2016, Soakaway Design)

Soakaway pit ref. **SA01** **Test** 1

Length **2.00** m

Width **0.45** m

Depth **2.00** m

Ground water level **N/A** m

Ground conditions

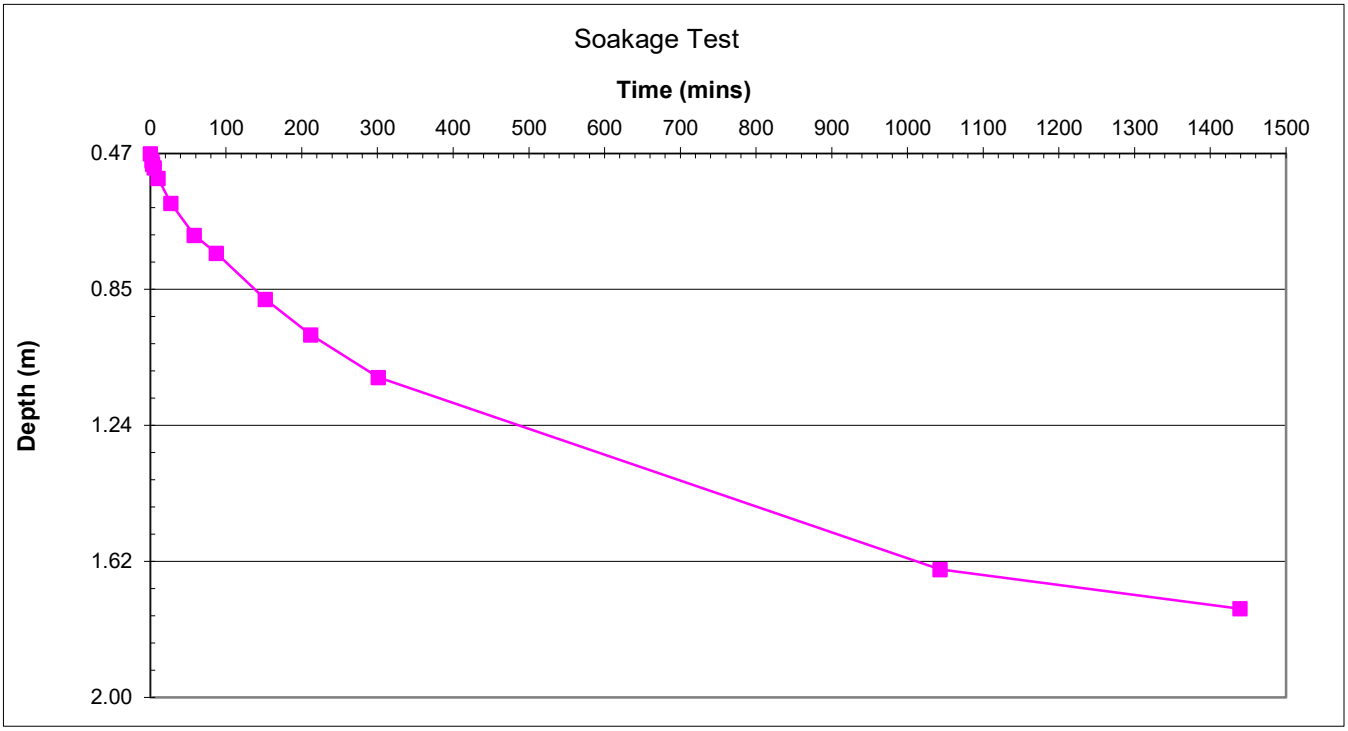
0.00-0.35m **Dark brown, sandy, silty, clay TOPSOIL with gravel sized fragments of flint.**

0.35-1.00m **Yellowish brown, clayey, silty, slightly gravelly, fine to coarse SAND. Gravels comprise subrounded, fine to coarse, flint. (THANET FORMATION)**

1.00-2.00m **Orangish brown, clayey, silty, gravelly SAND. Gravels comprise subrounded, fine to coarse flint. (THANET FORMATION)**

Time (mins)	Depth to water (m bgl)
0	0.47
2	0.49
3	0.50
5	0.51
10	0.54
27	0.61
58	0.70
87	0.75
152	0.88
212	0.98
301	1.10
1043	1.64
1439	1.75

Effective storage depth =	1.53	m
75% effective storage depth =	1.15	m
(ie depth below GL) =	0.85	m
25% effective storage depth =	0.38	m
(ie depth below GL) =	1.62	m
effective storage depth 75%-25% =	0.77	m
Time to fall to 75% effective depth =	138	mins
Time to fall to 25% effective depth =	1014	mins
Void Ratio =	40%	
V (75%-25%) =	0.28	m^3
a (50%) =	4.65	m^2
t (75%-25%) =	876.00	mins
SOIL INFILTRATION RATE =	**1.13E-06**	**m/s**



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Scheme	**Land West of Wrotham Road, Meopham**	**Page No.**	5
Client	**Richborough**	**Calcs by**	RF
Job ref.	**29473**	**Checked By**	DT
		Date	15/04/25

Soil Infiltration Test - Gravel Filled Method

(In general accordance with BRE Digest 365, 2016, Soakaway Design)

Soakaway pit ref. **SA02** **Test** 1

Length **2.00** m

Width **0.45** m

Depth **2.00** m

Ground water level **N/A** m

Ground conditions

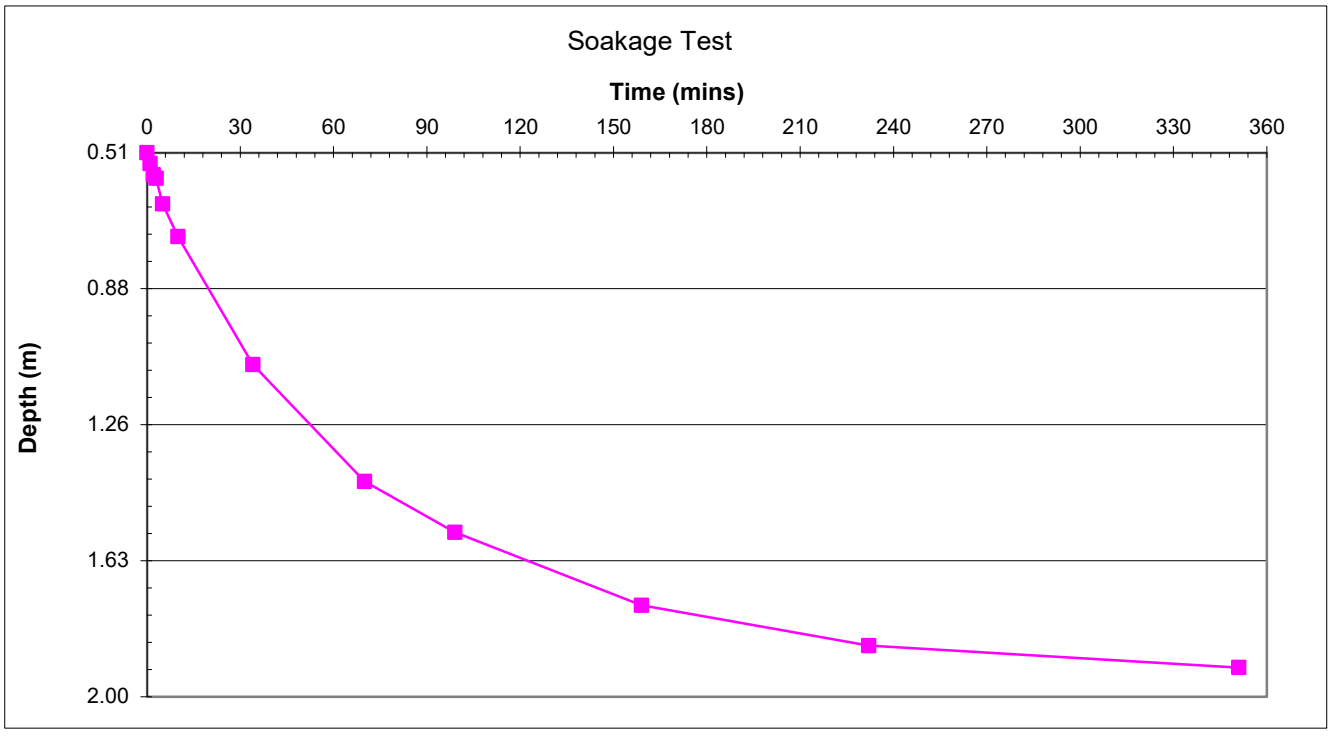
0.00-0.40m **Dark brown, sandy, silty, clay TOPSOIL with gravel sized fragments of flint.**

0.40-0.95m **Light brown, sandy, slightly gravelly, silty, CLAY. Gravels comprise subangular to subrounded, fine to coarse flint. (THANET FORMATION)**

0.95-2.00m **Yellowish brown, silty, sandy subangular to subrounded, fine to coarse GRAVEL of flint. (THANET FORMATION)**

Time (mins)	Depth to water (m bgl)
0	0.51
1	0.54
2	0.57
3	0.58
5	0.65
10	0.74
34	1.09
70	1.41
99	1.55
159	1.75
232	1.86
351	1.92

Effective storage depth =	1.49	m
75% effective storage depth =	1.12	m
(ie depth below GL) =	0.88	m
25% effective storage depth =	0.37	m
(ie depth below GL) =	1.63	m
effective storage depth 75%-25% =	0.75	m
Time to fall to 75% effective depth =	20	mins
Time to fall to 25% effective depth =	121	mins
Void Ratio =	40%	
V (75%-25%) =	0.27	m^3
a (50%) =	4.55	m^2
t (75%-25%) =	101.00	mins
SOIL INFILTRATION RATE =	**9.73E-06**	**m/s**



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Scheme	**Land West of Wrotham Road, Meopham**	**Page No.**	6
Client	**Richborough**	**Calcs by**	RF
Job ref.	**29473**	**Checked By**	DT
		Date	15/04/25

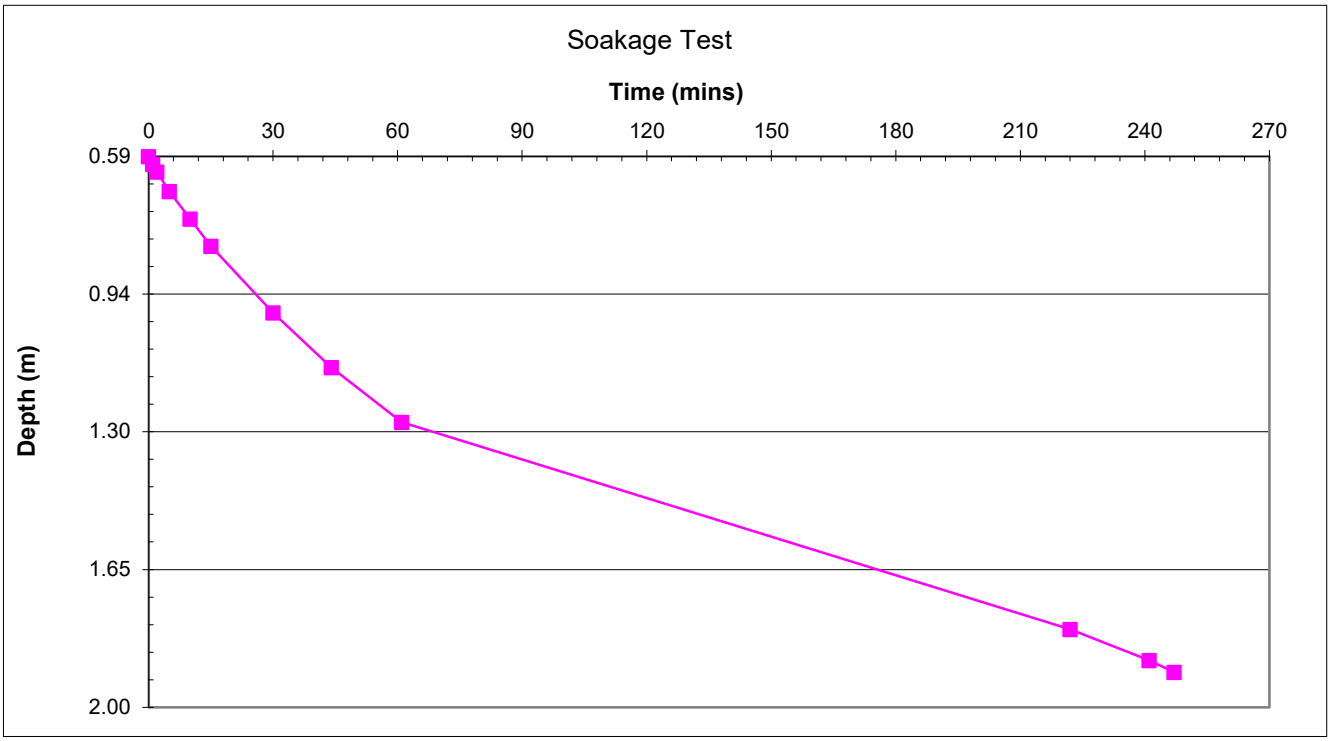
Soil Infiltration Test - Gravel Filled Method

(In general accordance with BRE Digest 365, 2016, Soakaway Design)

Soakaway pit ref.	**SA02**	**Test** 2
Length	**2.00** m	
Width	**0.45** m	
Depth	**2.00** m	
Ground water level	**N/A** m	
Ground conditions	**0.00-0.40m**	**Dark brown, sandy, silty, clay TOPSOIL with gravel sized fragments of flint.**
	0.40-0.95m	**Light brown, sandy, slightly gravelly, silty, CLAY. Gravels comprise subangular to subrounded, fine to coarse flint. (THANET FORMATION)**
	0.95-2.00m	**Yellowish brown, silty, sandy subangular to subrounded, fine to coarse GRAVEL of flint. (THANET FORMATION)**

Time (mins)	Depth to water (m bgl)
0	0.59
1	0.61
2	0.63
5	0.68
10	0.75
15	0.82
30	0.99
44	1.13
61	1.27
222	1.80
241	1.88
247	1.91

Effective storage depth =	1.41	m
75% effective storage depth =	1.06	m
(ie depth below GL) =	0.94	m
25% effective storage depth =	0.35	m
(ie depth below GL) =	1.65	m
effective storage depth 75%-25% =	0.71	m
Time to fall to 75% effective depth =	26	mins
Time to fall to 25% effective depth =	170	mins
Void Ratio =	40%	
V (75%-25%) =	0.25	m^3
a (50%) =	4.35	m^2
t (75%-25%) =	144.00	mins
SOIL INFILTRATION RATE =	**6.75E-06**	**m/s**



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Scheme	**Land West of Wrotham Road, Meopham**	**Page No.**	7
Client	**Richborough**	**Calcs by**	RF
Job ref.	**29473**	**Checked By**	DT
		Date	15/04/25

Soil Infiltration Test - Gravel Filled Method

(In general accordance with BRE Digest 365, 2016, Soakaway Design)

Soakaway pit ref. **SA02** **Test** 3

Length **2.00** m
Width **0.45** m
Depth **2.00** m
Ground water level **N/A** m

Ground conditions

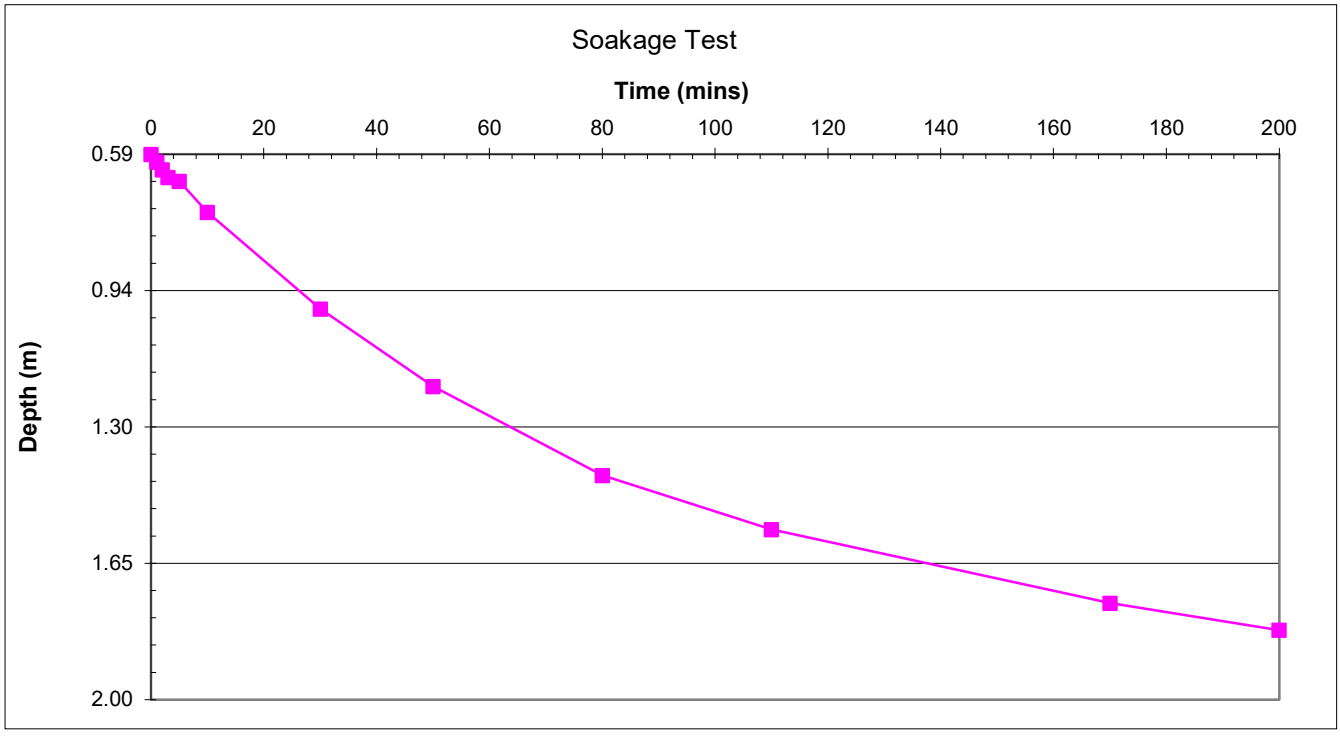
0.00-0.40m **Dark brown, sandy, silty, clay TOPSOIL with gravel sized fragments of flint.**

0.40-0.95m **Light brown, sandy, slightly gravelly, silty, CLAY. Gravels comprise subangular to subrounded, fine to coarse flint. (THANET FORMATION)**

0.95-2.00m **Yellowish brown, silty, sandy subangular to subrounded, fine to coarse GRAVEL of flint. (THANET FORMATION)**

Time (mins)	Depth to water (m bgl)
0	0.59
1	0.61
2	0.63
3	0.65
5	0.66
10	0.74
30	0.99
50	1.19
80	1.42
110	1.56
170	1.75
200	1.82

Effective storage depth =	1.41	m
75% effective storage depth =	1.06	m
(ie depth below GL) =	0.94	m
25% effective storage depth =	0.35	m
(ie depth below GL) =	1.65	m
effective storage depth 75%-25% =	0.71	m
Time to fall to 75% effective depth =	28	mins
Time to fall to 25% effective depth =	134	mins
Void Ratio =	40%	
V (75%-25%) =	0.25	m^3
a (50%) =	4.35	m^2
t (75%-25%) =	106.00	mins
SOIL INFILTRATION RATE =	**9.16E-06**	**m/s**



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Scheme	**Land West of Wrotham Road, Meopham**	**Page No.**	8
Client	**Richborough**	**Calcs by**	RF
Job ref.	**29473**	**Checked By**	DT
		Date	15/04/25

Soil Infiltration Test - Gravel Filled Method

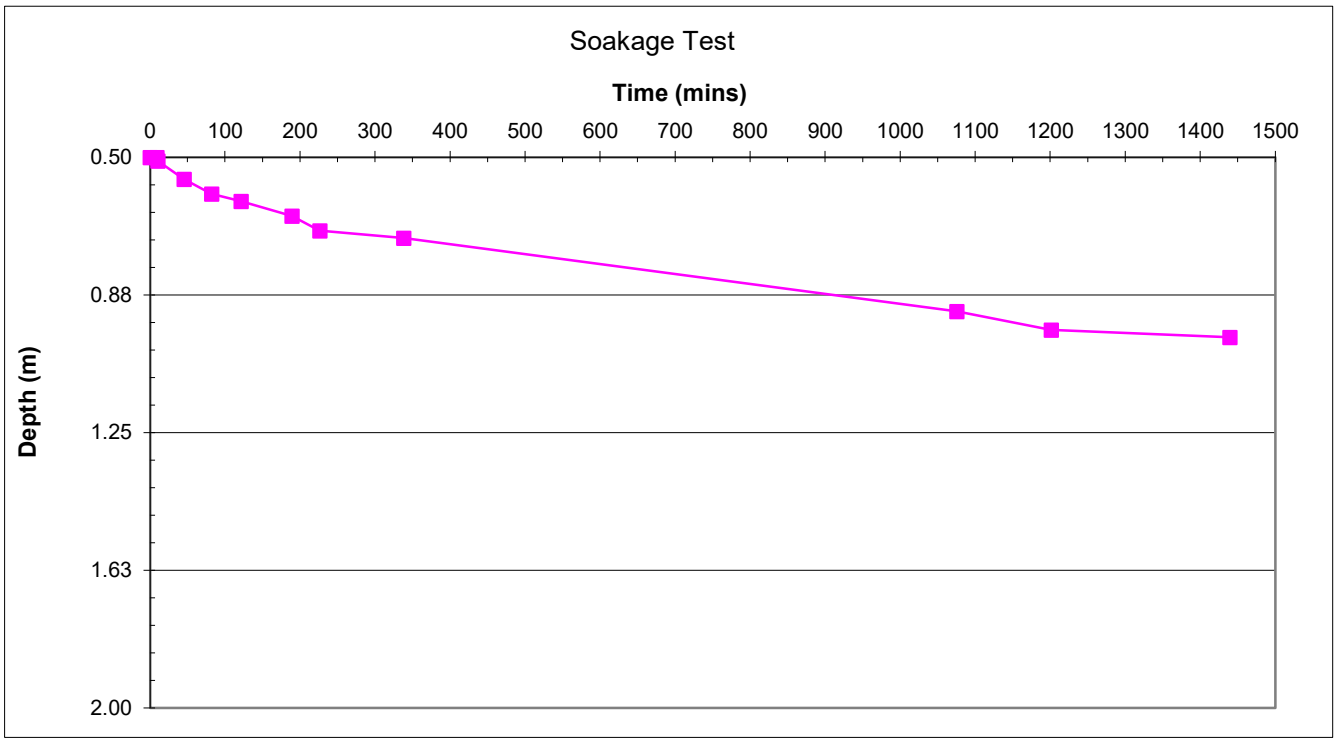
(In general accordance with BRE Digest 365, 2016, Soakaway Design)

Soakaway pit ref.	**SA03**	**Test** 1
Length	**2.20** m	
Width	**0.45** m	
Depth	**2.00** m	
Ground water level	m	
Ground conditions	**0.00-0.35m**	**Dark brown, slightly sandy, silty, clay TOPSOIL with gravel sized fragments of flint.**
	0.35-1.30m	**Brown, sandy, slightly gravelly, silty, CLAY. Gravels comprise subangular to subrounded, fine to coarse flint. (THANET FORMATION)**
	1.30-2.00m	**Yellowish brown, silty, sandy subangular to subrounded, fine to coarse GRAVEL of flint (THANET FORMATION)**

Time (mins)	Depth to water (m bgl)
0	0.5
9	0.50
10	0.51
45	0.56
82	0.60
121	0.62
189	0.66
226	0.70
338	0.72
1075	0.92
1201	0.97
1439	0.99

Effective storage depth =	1.50	m
75% effective storage depth =	1.13	m
(ie depth below GL) =	0.88	m
25% effective storage depth =	0.38	m
(ie depth below GL) =	1.63	m
effective storage depth 75%-25% =	0.75	m
Time to fall to 75% effective depth =	970	mins
Time to fall to 25% effective depth =	N/A	mins
Void Ratio =	40%	
V (75%-25%) =	0.30	m^3
a (50%) =	4.97	m^2
t (75%-25%) =	N/A	mins

Insufficient soakage to derive an infiltration rate.



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LE67 2GB

Exploratory Hole ID:	SA01
	Sheet 1 of 1

Project:	Land West of Wrotham Road	Project No.	Start Date:	End Date:	Plant Used:
		29473	07/04/2025	07/04/2025	JCB 3CX
Location:	Meopham	Logged By: CC	Easting and Northing Co-ordinates:		Elevation (m AOD):
Client:	Richborough	Approved By: DT	564136.23	166773.92	110.00

Strata Description	Legend	Depth (m)	Level (m AOD)	Samples Type	Samples Depth	Tests	Groundwater (m)
Dark brown, sandy, silty, clay TOPSOIL with gravel sized fragments of flint.							
		0.35	109.65				
Yellowish brown, clayey, silty, slightly gravelly, fine to coarse SAND. Gravels comprise fine to coarse, subrounded flint. THANET FORMATION							
		1.00	109.00				
Orangish brown, clayey, silty, gravelly SAND. Gravels comprise subrounded, fine to coarse flint. THANET FORMATION							
		2.00	108.00				
End of Trial Pit							

Remarks:

Exploratory hole location scanned with Cable Avoidance Tool and Signal Generator.
Descriptions based on visual inspection by a Geo-environmental engineer.
Groundwater was not encountered.
Visual or olfactory evidence of contamination was not observed.
Co-ordinates and elevations estimated from the topographical survey.

Stability: Stable

Dimensions:

Length: 2.00m
Width: 0.45m
Depth: 2.00m

Key:

B - Bulk Sample
D - Disturbed Sample
ES - Environmental Sample
W - Water Sample
PID - PID Reading
HSV - Hand Shear Vane Reading

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Hugglescote, Leicestershire
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Exploratory Hole ID:	SA02
	Sheet 1 of 1

Project:	Land West of Wrotham Road	Project No. 29473	Start Date: 07/04/2025	End Date: 07/04/2025	Plant Used: JCB 3CX
Location:	Meopham	Logged By: CC	Easting and Northing Co-ordinates: 564033.53 166853.29		Elevation (m AOD): 106.30
Client:	Richborough	Approved By: DT			

Strata Description	Legend	Depth (m)	Level (m AOD)	Samples Type	Samples Depth	Tests	Groundwater (m)
Dark brown, sandy, silty, clay TOPSOIL with gravel sized fragments of flint.		0.40	105.90				
Light brown, sandy, slightly gravelly, silty, CLAY. Gravels comprise subangular to subrounded, fine to coarse flint. THANET FORMATION		0.95	105.35				
Yellowish brown, silty, sandy subangular to subrounded, fine to coarse GRAVEL of flint. THANET FORMATION		2.00	104.30				
End of Trial Pit							

Remarks:

Exploratory hole location scanned with Cable Avoidance Tool and Signal Generator.
Descriptions based on visual inspection by a Geo-environmental engineer.
Groundwater was not encountered.
Visual or olfactory evidence of contamination was not observed.
Co-ordinates and elevations estimated from the topographical survey.

Stability: Stable

Dimensions:

Length: 2.00m
Width: 0.45m
Depth: 2.00m

Key:

B - Bulk Sample
D - Disturbed Sample
ES - Environmental Sample
W - Water Sample
PID - PID Reading
HSV - Hand Shear Vane Reading

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Hugglescote, Leicestershire
LE67 2GB

Exploratory Hole ID:	SA03
	Sheet 1 of 1

Project:	Land West of Wrotham Road	Project No. 29473	Start Date: 07/04/2025	End Date: 07/04/2025	Plant Used: JCB 3CX
Location:	Meopham	Logged By: CC	Easting and Northing Co-ordinates: 563938.25 166923.26		Elevation (m AOD): 108.00
Client:	Richborough	Approved By: DT			

Strata Description	Legend	Depth (m)	Level (m AOD)	Samples Type	Samples Depth	Tests	Groundwater (m)
Dark brown, slightly sandy, silty, clay TOPSOIL with gravel sized fragments of flint.		0.35	107.65				
Brown, sandy, slightly gravelly, silty, CLAY. Gravels comprise subangular to subrounded, fine to coarse flint. THANET FORMATION		1.30	106.70				
Yellowish brown, silty, sandy subangular to subrounded, fine to coarse GRAVEL of flint. THANET FORMATION		2.00	106.00				
End of Trial Pit							

Remarks:

Exploratory hole location scanned with Cable Avoidance Tool and Signal Generator.
Descriptions based on visual inspection by a Geo-environmental engineer.
Groundwater was not encountered.
Visual or olfactory evidence of contamination was not observed.
Co-ordinates and elevations estimated from the topographical survey.

Stability: Stable

Dimensions:

Length: 2.22m
Width: 0.45m
Depth: 2.00m

Key:

B - Bulk Sample
D - Disturbed Sample
ES - Environmental Sample
W - Water Sample
PID - PID Reading
HSV - Hand Shear Vane Reading

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The Old Chapel, Station Road
Hugglescote, Leicestershire
LE67 2GB

Exploratory Hole ID:	**TP01**
	Sheet 1 of 1

Project:	Land West of Wrotham Road	Project No. 29473	Start Date: 10/04/2025	End Date: 10/04/2025	Plant Used: JCB 3CX
Location:	Meopham	Logged By: CC	Easting and Northing Co-ordinates: 563977.35 166894.13		Elevation (m AOD): 107.60
Client:	Richborough	Approved By: DT			

Strata Description	Legend	Depth (m)	Level (m AOD)	Samples Type	Samples Depth	Tests	Groundwater (m)
Dark brown, sandy, silty clay TOPSOIL with gravel sized fragments of flint.							
Orangish brown, clayey, silty, slightly gravelly SAND. Gravels comprise subangular to subrounded, fine to coarse flint. THANET FORMATION		0.35	107.25				
Structureless CHALK composed of slightly sandy, silty, subangular to subrounded, medium to coarse GRAVEL with occasional cobbles. Gravel is white. Matrix is cream. (Grade Dc) SEAFORD CHALK FORMATION		3.00	104.60				
End of Trial Pit		3.30	104.30				

Remarks:

Exploratory hole location scanned with Cable Avoidance Tool and Signal Generator.
Descriptions based on visual inspection by a Geo-environmental engineer.
Groundwater was not encountered.
Visual or olfactory evidence of contamination was not observed.
Co-ordinates and elevations estimated from the topographical survey.

Stability: Stable

Dimensions:

Length: 2.20m
Width: 0.45m
Depth: 3.30m

Key:

B - Bulk Sample
D - Disturbed Sample
ES - Environmental Sample
W - Water Sample
PID - PID Reading
HSV - Hand Shear Vane Reading

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Exploratory Hole ID: TP02

Sheet 1 of 1

Project:	Land West of Wrotham Road	Project No. 29473	Start Date: 10/04/2025	End Date: 10/04/2025	Plant Used: JCB 3CX
Location:	Meopham	Logged By: CC	Easting and Northing Co-ordinates: 564089.39 166807.33		Elevation (m AOD): 107.50
Client:	Richborough	Approved By: DT			

Strata Description	Legend	Depth (m)	Level (m AOD)	Samples Type	Samples Depth	Tests	Groundwater (m)
Dark brown, sandy, silty clay TOPSOIL with gravel sized fragments of flint.		0.35	107.15				
Brown, slightly sandy, silty CLAY. THANET FORMATION		1.10	106.40				
Structureless CHALK composed of slightly sandy, silty, subangular to subrounded, medium to coarse GRAVEL with occasional cobbles. Gravel is white. Matrix is cream. (Grade Dc) SEAFORD CHALK FORMATION		2.30	105.20				
End of Trial Pit							

Remarks:

Exploratory hole location scanned with Cable Avoidance Tool and Signal Generator.
Descriptions based on visual inspection by a Geo-environmental engineer.
Groundwater was not encountered.
Visual or olfactory evidence of contamination was not observed.
Co-ordinates and elevations estimated from the topographical survey.

Stability: Stable

Dimensions:

Length: 2.00m
Width: 0.45m
Depth: 2.30m

Key:

B - Bulk Sample
D - Disturbed Sample
ES - Environmental Sample
W - Water Sample
PID - PID Reading
HSV - Hand Shear Vane Reading

- CIVIL ENGINEERING
- TRANSPORT
- FLOOD RISK & DRAINAGE
- STRUCTURES
- GEO-ENVIRONMENTAL
- ACOUSTIC AIR
- UTILITIES
- GEOMATICS
- LIGHTING
- EXPERT WITNESS

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