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geo environmental

Phase I Geo-Environmental Report

Land off Old Ashford Road, Lenham

Dean Lewis Estates Ltd.

SHF.1528.004.GE.R.001

'Experience and expertise working in union'

enzygo.com

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Phase I Geo-Environmental Report for Land off Old Ashford Road, Lenham.

Project:	Land off Old Ashford Road, Lenham
For:	Dean Lewis Estates Ltd.
Ref:	SHF.1528.004.GE.R.001
Status:	Final
Date:	May 2019
Author:	Deanna Leedle BSc (Hons), FGS. **Graduate Geo-Environmental Engineer**
Reviewer:	Nick Brook BSc (Hons), FGS. **Senior Consultant**
Approver:	Dr Stephen Black- BSc (Hons), MSc, PhD. **Associate Director**

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1.0 INTRODUCTION

1.1 Background

Enzygo Geo-Environmental Limited has been commissioned by Dean Lewis Estates Limited [the client] to prepare a Phase 1 Geo-Environmental Report for a site, located at Land off Old Ashford Road, Lenham, ME17 2GQ.

1.2 Proposed Development

The proposed development is residential, with gardens, landscaping and associated infrastructure. At the time of writing a proposed development layout has not been provided.

1.3 Objectives

The objectives of the study are to:

- Review historical plans, geology, hydrogeology and site sensitivity information to complete a Desk Study. A Groundsure report has been obtained, copies of which are included in Appendix 1;
- Assess the implications of any potential environmental risks, liabilities and development constraints associated with the site in relation to the future use and in relation to off-site receptors;
- Conduct a comprehensive site walkover, to assess likely ground conditions;
- Provide a factual and interpretative report relating to the desk study; and
- Provide preliminary recommendations in relation to environmental risk, potential remedial options and to present an initial geotechnical assessment.

1.4 Risk Classification

Enzygo Geo-environmental has utilised the available information, together with our experience to assess the likely risks to development from land quality issues. Definitions of the risk terms used are provided on the following table:

Table 1.4 Risk Classification

Risk	Description
Dismissed	The risk has been dismissed.
Negligible	No contamination risk has been identified which is likely to affect development.
Low	No significant contaminated land risks have been encountered affecting development and a low risk that remediation will be required.
Low-Moderate	There are unlikely to be significant contaminated land issue associated with the site which will adversely affect its re-development. However, minor or localised contamination may be present requiring remediation. Remediation should be possible under a discovery strategy and with a call out service.
Moderate	Some potential contaminated land risks have been encountered or identified which may affect re- development. The risks identified are unlikely to affect the entire site or preclude development. Remediation is considered feasible as part of the development process and no further investigation is considered necessary.
Moderate-High	Some potentially significant contaminated land risks have been identified at the property that requires remediation. It is recommended that a separate remedial methodology is prepared supported by a site-specific risk assessment
High	Significant potential contaminated land risks have been identified and remediation is required supported by further intrusive ground investigation, risk assessment and remedial design.

Where adverse risks are identified these are discussed within the report.

2.0 SITE SETTING

Table 2.0 Site Description

Item	Description
Site Address	Land off Old Ashford Road, Lenham, ME17 2GQ
National Grid Reference	590508mE 151839mN

2.1 Current Site Description

The following description has been compiled from an inspection of the site, undertaken on 11th March 2019 by an experienced Geo-environmental Engineer. A site features plan, SHF.1528.004.GE.DR.001.P01, is included within the drawings section.

The main access is through a track off Ashford Road that leads to the farmstead, to the north of the site.

The site currently comprises four agricultural fields. The site is bounded by Old Ashford Road to the north, fields and residential development to the east and west, with agricultural to the south with ditches and semi-mature to mature vegetation along site boundaries.

There were no overhead cables noted on site.

The site falls to the southwest, from an elevation of approximately 116m Above Ordnance Datum (m AOD) to the northeast of the site, to approximately 98m AOD to the southwest.

2.2 Surrounding Area

Land uses surrounding the site are summarised as follows:

Table 2.2 Land Use Surrounding the Area

Direction	Land Use
North	Bounded by Old Ashford Road with residential, commercial and agricultural development beyond.
East	Bounded by agricultural fields and residential development
South	Bounded by agricultural land with railway and further agricultural land beyond
West	Bounded by agricultural land with further agricultural land and residential development beyond

3.0 SITE HISTORY

3.1 Historical Maps

A review of historical Ordnance Survey maps and information pertinent to the site and within a 250m radius is summarised below:

Table 3.1 Historical Maps

Potentially Contaminative Historical Land Use		
Map Edition	**Site**	**Surrounding Area**
1866-1871	Five agricultural fields. Two ponds, one of which is a 'large' pond in the south of the site	Pond located approximately 50m east. Pond located approximately 50-180m east. Tank located approximately 100m east. Pond located approximately 70m southeast. 'Tanyard Farm' located approximately 100-160m west. Pond located approximately 130m northwest. Pond located approximately 200m northwest. Pond located approximately 250m northwest.
1896-1897	As above, with large pond shown as mill pond, associated with a 'bone mill'	Railway located approximately 170-250m southwest. Pond located approximately 250m northwest.
1906-1909	As above, with bone mill now marked as disused	Development and urbanisation of East Lenham. Pond located approximately 40m northeast.
1955	'Bone Mill' and mill pond no longer apparent (smaller pond now shown on boundary)	Development and urbanisation of Lenham.
1969-1970	Five agricultural fields No ponds now shown	Garage located approximately 50m north. Tank located approximately 100m east, no longer apparent. 'East Lenham Farm Cottages' located approximately 200m east. Pond located approximately 10m northeast. Pond located approximately 40m northeast, no longer apparent.
1990-1993	Four agricultural fields.	Garage located approximately 50m north, now labelled as garden centre. Warehouses located approximately 50m north.

2002	Five agricultural fields.	Garden centre located approximately 50m north, now longer apparent. Pond located approximately 5m east. Pond located approximately 140m east. Pond located approximately 70m southeast, no longer apparent. Pond located approximately 130m northwest, no longer apparent.
2010	No significant changes	'Ashmill Business Park' located approximately 10m north. Pond located approximately 5m east, no longer apparent.
2014	No significant change.	'Ashmill Business Park' located approximately 10m north, no longer apparent. Warehouses located approximately 50m north, no longer apparent. 'East Lenham Farm Cottages' located approximately 200m east, no longer apparent. 'Tanyard Farm' located approximately 100-160m west, no longer apparent. Pond located approximately 250m northwest, no longer apparent.

There is a potential local risk from metals/metalloids, PAH and possibly asbestos in infill to ponds on site. There is also a risk of ground gas generation associated with the infilled ponds on site.

No other significant risks are identified.

4.0 ENVIRONMENTAL SETTING

4.1 Ground Conditions

The British Geological Survey (BGS) indicates that the site is underlain by the following geological sequence:

Table 4.1 Geological Sequence

Geological Unit	Type	Descriptions	Aquifer Classification
Superficial	Head	Clay, silt, sand and gravel	Secondary (Undifferentiated)
	Alluvium	Clay, silt, sand and peat	Secondary (Undifferentiated)
Bedrock	West Melbury Chalk Formation	Chalk	Principal
	Gault Formation	Mudstone	Unproductive

There are no faults recorded within 250m of site.

No Made Ground is identified on or adjacent to the site by the BGS.

There are no records of landslips within 250m of site.

There are no exceedances of General Assessment Criteria (GAC) of background soil chemistry for the site.

There are no exploratory hole records within 250m of site.

4.2 Groundwater

The permeability of the superficial geology is recorded as very low to high, reflecting the variation of the underlying strata.

The permeability of the solid geology is recorded as very low to low for the mudstone and high to very high for the chalk.

Part of the site in the northeast is within a Source Protection Zone SPZ 3 (Total Catchment).

There are no current groundwater and surface water abstraction licenses within 250m of the site.

4.3 Coal Mining

The site is not within a Coal Authority Reporting Area and there are no coal mining areas within 1000m.

4.4 Non-Coal Mining and Cavities

There is one record of non-coal mining activities onsite for the mining of chalk.

No cavities are identified within 250m of the site.

4.5 Ground Workings

Historic ground workings have been identified within 250m of site, the closest being on site listed as ponds additionally there are listings for sewage works.

There are no active current ground workings within 250m of site.

There is a potential risk for ground gas generation associated with the potential infill from the infilled ponds.

4.6 Hydrology

There two main watercourses on site, which fed the former mill pond. These flow off site to the south.

A flood risk assessment has been undertaken by Enzygo, to be reported under separate cover (SHF.1528.004.HY.R.001).

4.7 Radon Risk Potential

The Groundsure Geo Insight report indicates that the site is not in a Radon Affected Area. No radon protective measures are considered necessary at the present time.

4.8 Natural Hazards Finding

BGS information presented within the Groundsure report identified the following ground conditions:

Table 4.8 Natural Hazards

Hazard	Risk Designation (Groundsure)
Collapsible Ground	Very Low
Compressible Ground	High
Ground Dissolution	Negligible
Landslide	Very Low
Running Sand	Low
Swelling / Shrinking Clay	Moderate

The risk rating for the site is considered very low to high for ground subsidence hazards.

4.9 Sensitive Land Uses

There are two Areas of Outstanding Natural Beauty (AONB) the closest located approximately 37m north listed as the Kent Downs. No other Environmentally Sensitive Areas have been identified within 250m of the site.

4.10 Unexploded Ordnance (UXO)

Unexploded Bomb Risk Map (UXO – Appendix 2) indicates that the site is within a moderate risk area, and a free pre-desk study assessment has been commissioned.

The desk study found that the site is at low risk, although a high explosive bomb did fall and explode on the southern part of the site during World War Two. If a suspected UXO is encountered during development appropriate action should be taken, in accordance with established guidance.

4.11 Environmental Sensitivity

Overall the site is currently considered to be of low to moderate environmental sensitivity due to the following:

- The underlying strata are designated as a Secondary and Principal aquifer;
- There are surface water features on and within 250m of site;
- The site is located within SPZ 3; and
- No ecological designations on the site.

The proposed end use of the site is for a residential and recreational and as such future sensitivity will be high for end-users.

4.12 Industrial Land Uses

There are thirteen historic industrial site entries within 250m of site, the closest being on site listed as 'mill pond'. There are thirteen current industrial land uses the closest is located approximately 23m north and is listed as cutting, drilling and welding services.

There are no records of fuel stations within 250m of site.

There are no records of National Grid High Voltage Underground Electricity Transmission Cables within 250m of the site.

There are no records of National Grid high pressure gas transmission pipelines within 250m of the site.

No new risks are identified from the register of industrial land uses.

4.13 Regulatory Database

The following information has been obtained from a commercially available environmental database.

Table 4.12 Regulatory Database

Environmental Permits, Incidents and Registers	0-250m	250-500m	Details
Site determined as contaminated land	0	0	Not Applicable.
Authorised industrial processes	0	0	Not Applicable.
Registered radioactive substances	0	0	Not Applicable.
Records of Part A (2) and Part B Activities	0	0	Not Applicable.
Enforcements, prohibitions or prosecutions	0	0	Not Applicable.
Pollution Incidents	4	1	The closest pollution incident was approximately 76m north, in 2002 and listed as Inorganic chemicals/products with no impact to water, land and air.
List 1 Dangerous Substance Inventory Sites	0	0	Not Applicable.
List 2 Dangerous Substance Inventory Sites	0	0	Not Applicable.
Consents issued under the Planning (Hazardous Substances) Act 1990	0	0	Not Applicable.
Control of Major Accident Hazard (COMAH)/ Notification of Installations Handling Hazardous Substances (NIHHS) sites	0	0	Not Applicable.
Records of Licensed Discharge Consents	12	0	There are seven current licenses, the closest approximately located 29m north listed as treated sewage discharge.

No new significant risks are identified from the regulatory database.

4.14 Landfill Sites and Waste Treatment Sites

No current or historic landfills are identified within 250m of the site.

There are no records of active licensed waste sites of waste treatment, transfer or disposal site within 250m of the site.

4.15 Railways and Tunnels

There are six active records of tunnels or railways within 250m of site, the closest located approximately 154m southwest listed as rail.

5.0 PRELIMINARY ASSESSMENT

5.1 Preliminary Conceptual Model

Based on the information obtained the following Preliminary Conceptual Model has been prepared:

Table 5.1 Preliminary Conceptual Model

Source	Location	Exposure Pathway	Potential Receptor	Probability of Exposure	Details
Human Health					
Asbestos, hydrocarbons and metals (pesticides)	Made Ground/(Topsoil): On-site	Ingestion, dermal and inhalation	Construction Workers	Negligible	Standard construction PPE will address risk under CDM.
			Site users	Low to Moderate	Potential risk from made ground (infill to ponds)/topsoil mitigated with appropriate remedial action.
Asbestos, metals and hydrocarbons.	Historic Buildings (possible – associated with historic mill).	Ingestion dermal and inhalation.	Construction Workers.	Negligible	Standard construction PPE will address risk under CDM 2015 Regulations.
			Site users.	Negligible	Contamination likely to be localised.
Asbestos, metals and hydrocarbons.	Unforeseen Contamination.	Ingestion dermal and inhalation.	Construction Workers.	Dismissed	Standard construction PPE will address risk under CDM 2015 Regulations.
			Site users.	Low to Moderate	High sensitivity end use.
Hydrocarbon and metals.	Migration from off-site sources.	Ingestion dermal and inhalation.	Construction Workers.	Negligible	Contamination likely to be localised.
			Site users.		
Ground Gas.	Landfill.	Asphyxiant, Toxic & Explosive.	Construction Workers.	Dismissed	No source.
			Site users.		
	Made Ground/Potentially Infilled Ground.		Construction Workers.	Low to Moderate	Potential gas generation may be mitigated through appropriate remedial action following ground investigation.
			Site users.		
Radon	Natural Soils	Inhalation	Construction Workers	Dismissed	No radon protective measures are considered necessary at the present time.
			Site Users		
Groundwater					
Hydrocarbon and metals.	Unforeseen Contamination.	Vertical Migration.	Groundwater.	Negligible to Low	Significant widespread impact to soil unlikely – potential from former ponds
Surface Water					
Hydrocarbon and metals.	Unforeseen Contamination.	Horizontal Migration.	River Network.	Negligible	Inland rivers and drains listed on site flowing to a topographical low (towards railway).
Environmental Receptors					
On site contaminants		Ingestion dermal and inhalation.	Ecology.	Dismissed	No receptor.
		Direct.	Archaeology.	Dismissed	No receptor.
		Direct.	Geology.	Dismissed	No receptor.
		Phytotoxic.	Woodland.	Dismissed	No receptor.

Source	Location	Exposure Pathway	Potential Receptor	Probability of Exposure	Details
		Phytotoxic.	Crops.	Dismissed	No receptor.
		Ingestion dermal and inhalation.	Livestock.	Dismissed	No receptor.
Building Services					
On site contaminants		Direct.	Historic Buildings.	Low	No sources identified.
		Direct.	Proposed Buildings.	Dismissed	No sources identified.
		Permeate into pipework.	Water Pipes.	Dismissed	No sources identified.

6.0 DISCUSSION AND RECOMMENDATIONS

The site is considered to present a low to (locally) moderate contamination risk, associated with current and historic land-use.

It is understood that the site is to be subdivided into two development parcels, with a northeastern parcel allocated for housing and a southwestern parcel (with infilled pond and mill pond present) to be used for recreational purposes. It is considered that conventional foundations should be suitable for residential properties, founding within the natural soils over the majority of the residential parcel, within residual clayey soils of the Gault Formation and West Melbury Chalk. Head deposits are likely to be present along the southwestern margin of the residential parcel and alternative foundations may be required to accommodate possible weaker soils. These could contain peat.

Soakaway testing has been undertaken and failed to generate suitable infiltration rates. (Refer to separate letter report on soakaway testing by Enzygo, SHF.1528.004.GE.L.001.)

A Phase 2 ground investigation should be undertaken to provide design information for future development works and to also assess land quality issues and remediation requirements as/if necessary.

As the contamination risks at the site are considered to be low to moderate, future investigation should be able to be undertaken post-planning, under a suitable worded Planning Condition.

SHF.1528.004.GE.DR.001.P01 - Site Features Plan

Samuel House, 5 Fox Valley Way, Stocksbridge, Sheffield, S36 2AA

CLIENT: Dean Lewis Estates Ltd

SCALE: Not to Scale

PROJECT REF: SHF.1528.004

DRAWN: DL

CHECKED: NB

DATE: March 2019

PROJECT: Old Ashford Road, Lenham, Kent

TITLE: Site Features Plan

FIGURE NO: SHF.1528.004.GE.DR.001

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Appendix 1 – Emapsite Dataset

EmapSite

Masdar House, 1 Reading Road,
Eversley, RG27 0RP

Groundsure Reference:	EMS-528124_710283
Your Reference:	EMS_528124_710283
Report Date	20 Feb 2019
Report Delivery Method:	Email - pdf

Enviro Insight

Address: Old Ashford Road, Lenham, Old Ashford Road, Lenham, ME172QA

Dear Sir/ Madam,

Thank you for placing your order with Groundsure. Please find enclosed the **Groundsure Enviro Insight** as requested.

If you would like further assistance regarding this report then please contact the emapsite customer services team on 0118 9736883 quoting the above report reference number.

Yours faithfully,

emapsite customer services team

Enc.
Groundsure Enviroinsight

Enviro Insight

Address:	**Old Ashford Road, Lenham, Old Ashford Road, Lenham, ME172QA**
Date:	**20 Feb 2019**
Reference:	**EMS-528124_710283**
Client:	**EmapSite**

NW N NE

W E

SW S SE

Aerial Photograph Capture date:	15-Apr-2015
Grid Reference:	590589,151830
Site Size:	12.1962ha

Report Reference: EMS-528124_710283
Client Reference: EMS_528124_710283

Contents Page

Overview of Findings

For further details on each dataset, please refer to each individual section in the main report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

Section 1: Historical Industrial Sites	On-site	0-50	51-250	251-500
1.1 Potentially Contaminative Uses identified from 1:10,000 scale mapping	8	2	3	28
1.2 Additional Information – Historical Tank Database	0	0	5	1
1.3 Additional Information – Historical Energy Features Database	0	0	0	4
1.4 Additional Information – Historical Petrol and Fuel Site Database	0	0	0	0
1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database	0	1	0	0
1.6 Historical military sites	0	0	0	0
1.7 Potentially Infilled Land	7	8	17	17

Section 2: Environmental Permits, Incidents and Registers	On-site	0-50m	51-250	251-500
2.1 Industrial Sites Holding Environmental Permits and/or Authorisations				
2.1.1 Records of historic IPC Authorisations	0	0	0	0
2.1.2 Records of Part A(1) and IPPC Authorised Activities	0	0	0	0
2.1.3 Records of Red List Discharge Consents	0	0	0	0
2.1.4 Records of List 1 Dangerous Substances Inventory sites	0	0	0	0
2.1.5 Records of List 2 Dangerous Substances Inventory sites	0	0	0	0
2.1.6 Records of Part A(2) and Part B Activities and Enforcements	0	0	0	0
2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations	0	0	0	0
2.1.8 Records of Licensed Discharge Consents	0	4	8	0
2.1.9 Records of Water Industry Referrals	0	0	0	0
2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site	0	0	0	0
2.2 Records of COMAH and NIHHS sites	0	0	0	0
2.3 Environment Agency/Natural Resources Wales Recorded Pollution Incidents				
2.3.1 National Incidents Recording System, List 2	0	0	4	1
2.3.2 National Incidents Recording System, List 1	0	0	0	0
2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990	0	0	0	0

Section 3: Landfill and Other Waste Sites	On-site	0-50m	51-250	251-500	501-1000	1000-1500
3.1 Landfill Sites						
3.1.1 Environment Agency/Natural Resources Wales Registered Landfill Sites	0	0	0	0	0	Not searched
3.1.2 Environment Agency/Natural Resources Wales Historic Landfill Sites	0	0	0	0	1	0
3.1.3 BGS/DoE Landfill Site Survey	0	0	0	0	0	0
3.1.4 Records of Landfills in Local Authority and Historical Mapping Records	0	0	0	0	0	0
3.2 Landfill and Other Waste Sites Findings						
3.2.1 Operational and Non-Operational Waste Treatment, Transfer and Disposal Sites	0	0	0	0	Not searched	Not searched
3.2.2 Environment Agency/Natural Resources Wales Licensed Waste Sites	0	0	0	0	4	0

Section 4: Current Land Use	On-site	0-50m	51-250	251-500
4.1 Current Industrial Sites Data	0	2	11	Not searched
4.2 Records of Petrol and Fuel Sites	0	0	0	0
4.3 National Grid Underground Electricity Cables	0	0	0	0
4.4 National Grid Gas Transmission Pipelines	0	0	0	0

Section 5: Geology	
5.1 Records of Artificial Ground and Made Ground present beneath the study site	None identified
5.2 Records of Superficial Ground and Drift Geology present beneath the study site	Identified
5.3 For records of Bedrock and Solid Geology beneath the study site see the detailed findings section.	

Section 6: Hydrogeology and Hydrology	0-500m
6.1 Records of Strata Classification in the Superficial Geology within 500m of the study site	Identified
6.2 Records of Strata Classification in the Bedrock Geology within 500m of the study site	Identified

	On-site	0-50m	51-250	251-500	501-1000	1000-2000
6.3 Groundwater Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	3
6.4 Surface Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	1
6.5 Potable Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	0
6.6 Source Protection Zones (within 500m of the study site)	1	0	1	0	Not searched	Not searched
6.7 Source Protection Zones within Confined Aquifer	0	0	0	0	Not searched	Not searched
6.8 Groundwater Vulnerability and Soil Leaching Potential (within 500m of the study site)	2	0	#250GWV #	#500GWV #	Not searched	Not searched

Section 6: Hydrogeology and Hydrology

	0-500m					
	On-site	0-50m	51-250	251-500	501-1000	1000-1500
6.9 Environment Agency/Natural Resources Wales information on river quality within 1500m of the study site	Yes	No	No	No	No	No
6.10 Ordnance Survey MasterMap Water Network entries within 500m of the site	12	2	40	20	Not searched	Not searched
6.11 Surface water features within 250m of the study site	Yes	Yes	Yes	Not searched	Not searched	Not searched

Section 7: Flooding

7.1 Enviroment Agency Zone 2 floodplains within 250m of the study site	None identified
7.2 Environment Agency/Natural Resources Wales Zone 3 floodplains within 250m of the study site	None identified
7.3 Risk of flooding from Rivers and the Sea (RoFRaS) rating for the study site	Very Low
7.4 Flood Defences within 250m of the study site	None identified
7.5 Areas benefiting from Flood Defences within 250m of the study site	None identified
7.6 Areas used for Flood Storage within 250m of the study site	None identified
7.7 Maximum BGS Groundwater Flooding susceptibility within 50m of the study site	Potential at Surface
7.8 BGS confidence rating for the Groundwater Flooding susceptibility areas	High

Section 8: Designated Environmentally Sensitive Sites

	On-site	0-50m	51-250	251-500	501-1000	1000-2000
8.1 Records of Sites of Special Scientific Interest (SSSI)	0	0	0	0	1	0
8.2 Records of National Nature Reserves (NNR)	0	0	0	0	0	0
8.3 Records of Special Areas of Conservation (SAC)	0	0	0	0	0	0
8.4 Records of Special Protection Areas (SPA)	0	0	0	0	0	0
8.5 Records of Ramsar sites	0	0	0	0	0	0
8.6 Records of Ancient Woodlands	0	0	0	2	2	18
8.7 Records of Local Nature Reserves (LNR)	0	0	0	0	0	0
8.8 Records of World Heritage Sites	0	0	0	0	0	0
8.9 Records of Environmentally Sensitive Areas	0	0	0	0	0	0

Section 8: Designated Environmentally Sensitive Sites	On-site	0-50m	51-250	251-500	501-1000	1000-2000
8.10 Records of Areas of Outstanding Natural Beauty (AONB)	0	1	0	0	1	0
8.11 Records of National Parks	0	0	0	0	0	0
8.12 Records of Nitrate Sensitive Areas	0	0	0	0	0	0
8.13 Records of Nitrate Vulnerable Zones	2	0	0	2	0	6
8.14 Records of Green Belt land	0	0	0	0	0	0

Section 9: Natural Hazards

9.1 Maximum risk of natural ground subsidence	High
9.1.1 Maximum Shrink-Swell hazard rating identified on the study site	Moderate
9.1.2 Maximum Landslides hazard rating identified on the study site	Very Low
9.1.3 Maximum Soluble Rocks hazard rating identified on the study site	Negligible
9.1.4 Maximum Compressible Ground hazard rating identified on the study site	High
9.1.5 Maximum Collapsible Rocks hazard rating identified on the study site	Very Low
9.1.6 Maximum Running Sand hazard rating identified on the study site	Low
9.2 Radon	
9.2.1 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?	The site is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.
9.2.2 Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?	No radon protective measures are necessary.

Section 10: Mining

10.1 Coal mining areas within 75m of the study site	None identified
10.2 Non-Coal Mining areas within 50m of the study site boundary	Identified
10.3 Brine affected areas within 75m of the study site	None identified

Using this report

The following report is designed by Environmental Consultants for Environmental Professionals bringing together the most up-to-date market leading environmental data. This report is provided under and subject to the Terms & Conditions agreed between Groundsure and the Client. The document contains the following sections:

1. Historical Industrial Sites

Provides information on past land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. Potentially Infilled Land features are also included. This search is conducted using radii of up to 500m.

2. Environmental Permits, Incidents and Registers

Provides information on Regulated Industrial Activities and Pollution Incidents as recorded by Regulatory Authorities, and sites determined as Contaminated Land. This search is conducted using radii up to 500m.

3. Landfills and Other Waste Sites

Provides information on landfills and other waste sites that may pose a risk to the study site. This search is conducted using radii up to 1500m.

4. Current Land Uses

Provides information on current land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. These searches are conducted using radii of up to 500m. This includes information on potentially contaminative industrial sites, petrol stations and fuel sites as well as high pressure gas pipelines and underground electricity transmission lines.

5. Geology

Provides information on artificial and superficial deposits and bedrock beneath the study site.

6. Hydrogeology and Hydrology

Provides information on productive strata within the bedrock and superficial geological layers, abstraction licences, Source Protection Zones (SPZs) and river quality. These searches are conducted using radii of up to 2000m.

7. Flooding

Provides information on river and coastal flooding, flood defences, flood storage areas and groundwater flood areas. This search is conducted using radii of up to 250m.

8. Designated Environmentally Sensitive Sites

Provides information on the Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites, Local Nature Reserves (LNR), Areas of Outstanding Natural Beauty (AONB), National Parks (NP), Environmentally Sensitive Areas, Nitrate Sensitive Areas, Nitrate Vulnerable Zones and World Heritage Sites and Scheduled Ancient Woodland. These searches are conducted using radii of up to 2000m.

9. Natural Hazards

Provides information on a range of natural hazards that may pose a risk to the study site. These factors include natural ground subsidence and radon..

10. Mining

Provides information on areas of coal and non-coal mining and brine affected areas.

11. Contacts

This section of the report provides contact points for statutory bodies and data providers that may be able to provide further information on issues raised within this report. Alternatively, Groundsure provide a free Technical Helpline (08444 159000) for further information and guidance.

Note: Maps

Only certain features are placed on the maps within the report. All features represented on maps found within this search are given an identification number. This number identifies the feature on the mapping and correlates it to the additional information provided below. This identification number precedes all other information and takes the following format -Id: 1, Id: 2, etc. Where numerous features on the same map are in such close proximity that the numbers would obscure each other a letter identifier is used instead to represent the features. (e.g. Three features which overlap may be given the identifier “A” on the map and would be identified separately as features 1A, 3A, 10A on the data tables provided).

Where a feature is reported in the data tables to a distance greater than the map area, it is noted in the data table as “Not Shown”.

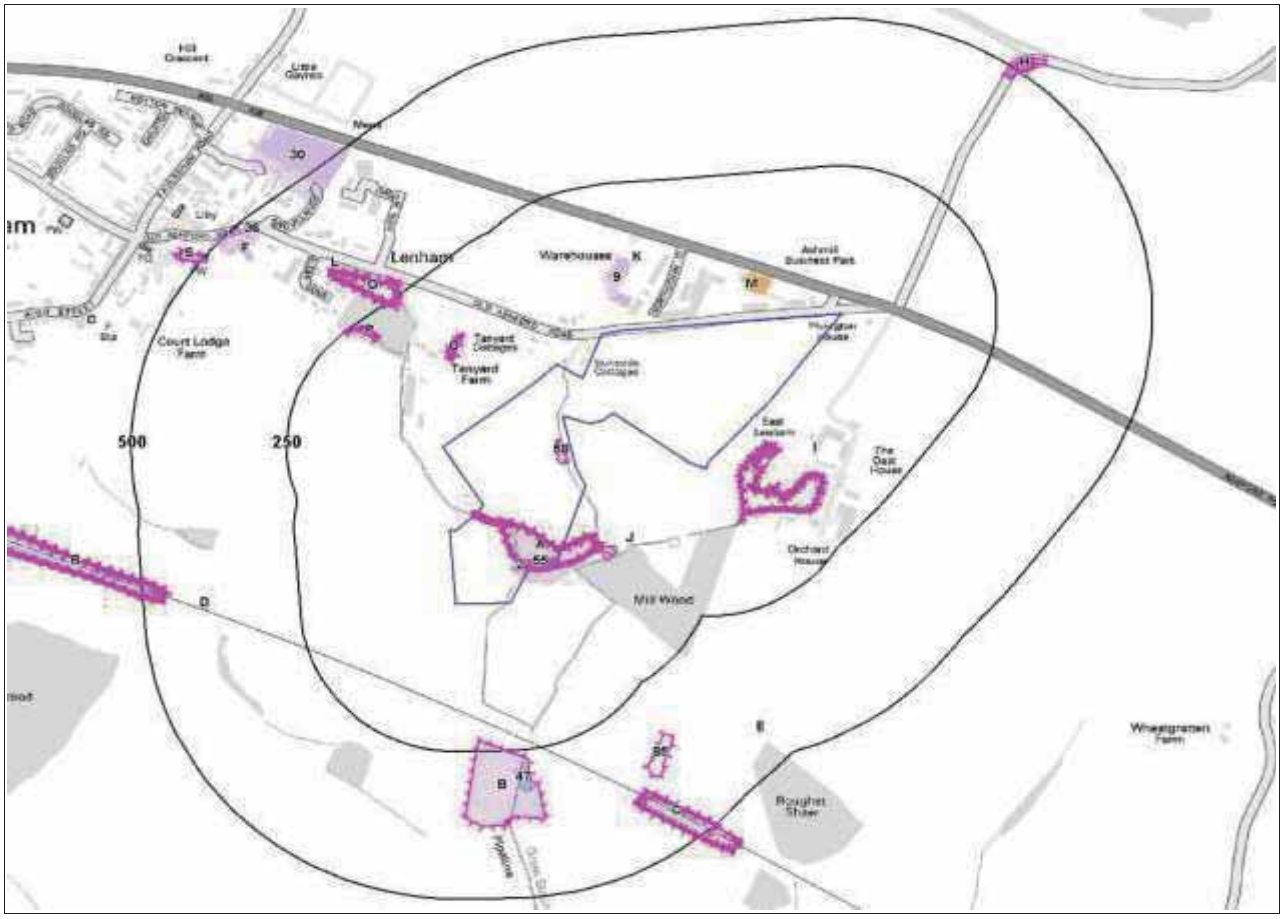
All distances given in this report are in Metres (m). Directions are given as compass headings such as N: North, E: East, NE: North East from the nearest point of the study site boundary.

1. Historical Land Use

NW N NE

W E

SW S SE



Site Outline

250
500
Search Buffers (m)

Historical 1:10,000 and 1:10,560 scale mapping

Industrial Land Use

Potentially Infilled Land

Historical 1:2,500, 1:1,250 and 1:500 scale mapping

Energy Features

Petrol Stations

Historical military sites

Tanks

Garages

1. Historical Industrial Sites

1.1 Potentially Contaminative Uses identified from 1:10,000 scale Mapping

The systematic analysis of data extracted from standard 1:10,560 and 1:10,000 scale historical maps provides the following information:

Records of sites with a potentially contaminative past land use within 500m of the search boundary: 41

ID	Distance [m]	Direction	Use	Date
1A	0	On Site	Mill Pond	1908
2	0	On Site	Disused Bone Mill	1906
3A	0	On Site	Disused Bone Mill	1908
4A	0	On Site	Mill Pond	1906
5A	0	On Site	Mill Pond	1906
6A	0	On Site	Mill Pond	1896
7A	0	On Site	Bone Mill	1896
8A	0	On Site	Bone Mill	1906
9	37	N	Unspecified Warehouses	1990
10M	49	N	Garage	1970
11J	97	E	Unspecified Tank	1871
12I	108	SE	Unspecified Tank	1871
13B	232	S	Sewage Works	1970
14B	279	S	Unspecified Tanks	1970
15C	385	SE	Cuttings	1896
16C	385	SE	Cuttings	1906
17C	386	SE	Cuttings	1896
18C	386	SE	Cuttings	1909
19C	386	SE	Cuttings	1909
20D	395	W	Railway Building	1969
21D	395	W	Railway Building	1991
22C	398	SE	Cuttings	1970
23C	398	SE	Cuttings	1955
24C	398	SE	Cuttings	1990
25E	435	SE	Tank	1906
26E	435	SE	Unspecified Tank	1909
27E	436	SE	Unspecified Tank	1909
28F	445	NW	Smithy	1906
29F	458	NW	Smithy	1906
30	458	NW	Unspecified Station	1970
31G	460	W	Cuttings	1906
32G	461	W	Cuttings	1896
33G	463	W	Cuttings	1908
34R	463	W	Cuttings	1961

35F	469	NW	Smithy	1896
36	471	NW	Smithy	1908
37F	473	NW	Smithy	1871
38G	478	W	Cuttings	1906
39H	481	NE	Old Chalk Pit	1896
40S	498	NW	Grave Yard	1871
41H	499	NE	Cuttings	1955

1.2 Additional Information – Historical Tank Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical tanks within 500m of the search boundary: 6

ID	Distance (m)	Direction	Use	Date
42I	88	SE	Unspecified Tank	1897
43J	98	E	Unspecified Tank	1897
44K	113	N	Unspecified Tank	1999
45K	113	N	Unspecified Tank	1996
46K	115	N	Unspecified Tank	1988
47	280	S	Tanks	1969

1.3 Additional Information – Historical Energy Features Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical energy features within 500m of the search boundary: 4

ID	Distance (m)	Direction	Use	Date
48L	347	NW	Electricity Substation	1999
49L	347	NW	Electricity Substation	1996
50L	349	NW	Electricity Substation	1969
51L	350	NW	Electricity Substation	1988

1.4 Additional Information – Historical Petrol and Fuel Site Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical petrol stations and fuel sites within 500m of the search boundary: 0

Database searched and no data found.

1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical garage and motor vehicle repair sites within 500m of the search boundary: 1

ID	Distance (m)	Direction	Use	Date
52M	41	N	Garage	1969

1.6 Historical military sites

Certain military installations were not noted on historic mapping for security reasons. Whilst not all military land is necessarily of concern, Groundsure has researched and digitised a number of Ordnance Factories and other military industrial features (e.g. Ordnance Depots, Munitions Testing Grounds) which may be of contaminative concern. This research was drawn from a number of different sources, and should not be regarded as a definitive or exhaustive database of potentially contaminative military installations. The boundaries of sites within this database have been estimated from the best evidence available to Groundsure at the time of compilation.

Records of historical military sites within 500m of the search boundary: 0

Database searched and no data found.

1.7 Potentially Infilled Land

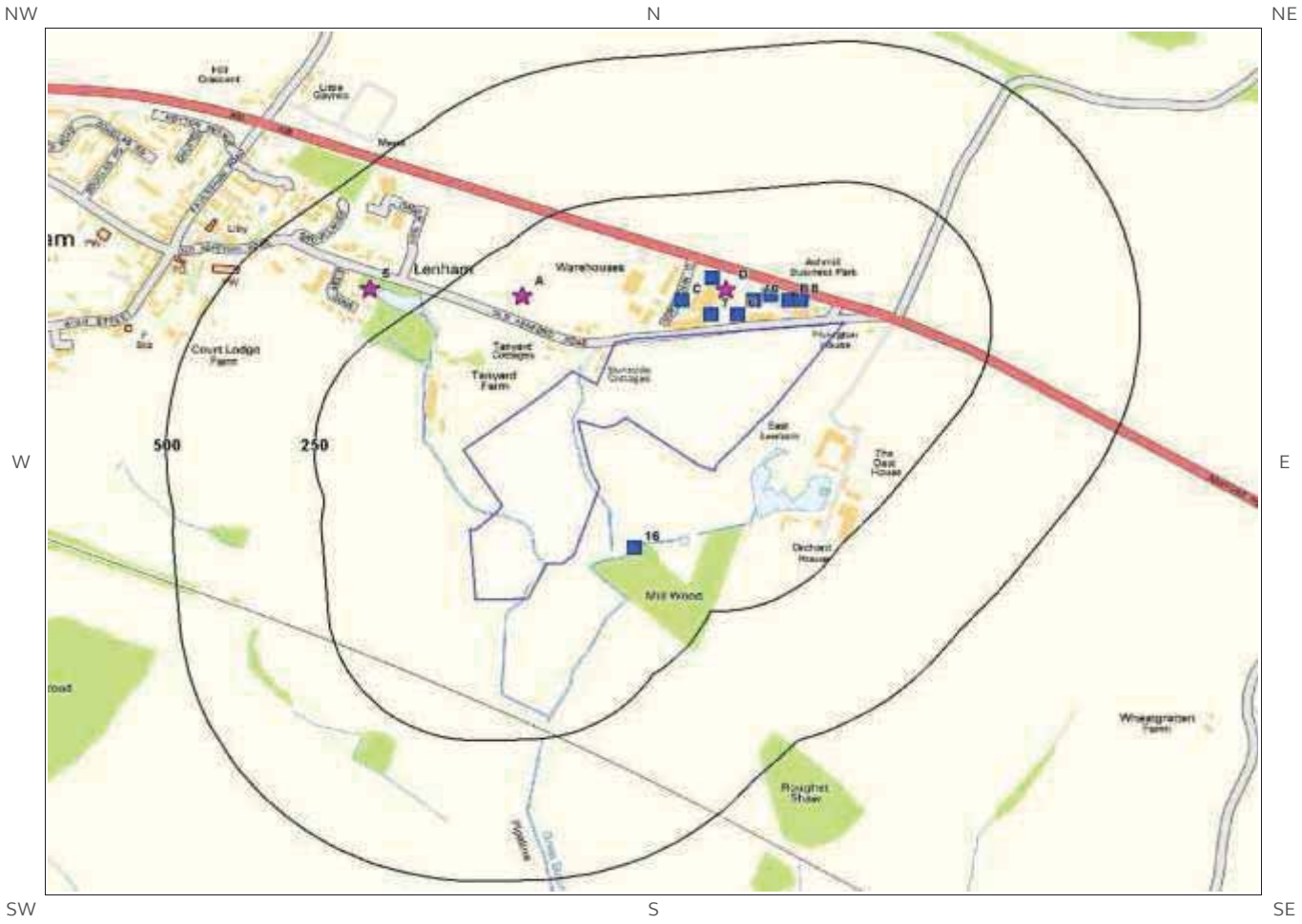
Records of Potentially Infilled Features from 1:10,000 scale mapping within 500m of the study site: 49

The following Historical Potentially Infilled Features derived from the Historical Mapping information is provided by Groundsure:

ID	Distance(m)	Direction	Use	Date
53A	0	On Site	Mill Pond	1906
54A	0	On Site	Mill Pond	1908
55	0	On Site	Pond	1955
56A	0	On Site	Mill Pond	1896
57A	0	On Site	Mill Pond	1906
58	0	On Site	Pond	1896
59A	0	On Site	Pond	1871
60N	44	SE	Pond	1906
61N	44	SE	Ponds	1906
62N	44	SE	Ponds	1896
63N	45	SE	Ponds	1871
64N	46	SE	Ponds	1990

65N	46	SE	Ponds	1970
66N	46	SE	Ponds	1955
67N	48	SE	Pond	1908
68O	109	NW	Pond	1955
69O	110	NW	Pond	1970
70O	110	NW	Pond	1990
71O	114	NW	Pond	1896
72O	114	NW	Pond	1906
73O	115	NW	Pond	1906
74P	207	NW	Pond	1970
75P	207	NW	Pond	1990
76P	213	NW	Ponds	1896
77B	232	S	Sewage Works	1970
78Q	236	NW	Pond	1955
79Q	237	NW	Pond	1908
80Q	241	NW	Pond	1896
81Q	241	NW	Pond	1906
82Q	241	NW	Pond	1906
83Q	244	NW	Pond	1970
84Q	244	NW	Pond	1990
85	332	SE	Pond	1955
86C	385	SE	Cuttings	1896
87C	385	SE	Cuttings	1906
88C	386	SE	Cuttings	1909
89C	386	SE	Cuttings	1896
90C	386	SE	Cuttings	1909
91C	398	SE	Cuttings	1970
92C	398	SE	Cuttings	1990
93C	398	SE	Cuttings	1955
94G	460	W	Cuttings	1906
95G	461	W	Cuttings	1896
96G	463	W	Cuttings	1908
97R	463	W	Cuttings	1961
98G	478	W	Cuttings	1906
99H	481	NE	Old Chalk Pit	1896
100S	498	NW	Grave Yard	1871
101H	499	NE	Cuttings	1955

2. Environmental Permits, Incidents and Registers Map



Site Outline

250
500
Search Buffers (m)

Recorded Pollution Incident

Dangerous Substances (List 1)

Dangerous Substances (List 2)

Water Industry Referrals

Licenced Discharge Consents

Red List Discharge Consents

RAS 3 & 4 Authorisations

Part A(1) Authorised Processes and Historic IPC Authorisations

Part A(2) and Part B Authorised Processes

COMAH / NIHHS Sites

Sites Determined as Contaminated Land

Hazardous Substance Consents and Enforcements

2. Environmental Permits, Incidents and Registers

2.1 Industrial Sites Holding Licences and/or Authorisations

Searches of information provided by the Environment Agency/Natural Resources Wales and Local Authorities reveal the following information:

2.1.1 Records of historic IPC Authorisations within 500m of the study site:

0

Database searched and no data found.

2.1.2 Records of Part A(1) and IPPC Authorised Activities within 500m of the study site:

0

Database searched and no data found.

2.1.3 Records of Red List Discharge Consents (potentially harmful discharges to controlled waters) within 500m of the study site:

0

Database searched and no data found.

2.1.4 Records of List 1 Dangerous Substances Inventory Sites within 500m of the study site:

0

Database searched and no data found.

2.1.5 Records of List 2 Dangerous Substance Inventory Sites within 500m of the study site:

0

Database searched and no data found.

2.1.6 Records of Part A(2) and Part B Activities and Enforcements within 500m of the study site:

0

Database searched and no data found.

2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations:

0

Database searched and no data found.

2.1.8 Records of Licensed Discharge Consents within 500m of the study site:

12

The following Licensed Discharge Consents records are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details	
6	29	N	590783 152045	Address: BLOCK C NORTHDOWN BUSINESS PARK, BLOCK C NORTHDOWN BUSINESS PARK, ASHFORD ROAD, MAIDSTONE, KENT, ME17 2DL Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: P20421 Permit Version: 1	Receiving Water: UNDERGROUND STRATA Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 08/03/2005 Effective Date: 08-Mar-2005 Revocation Date: -
7	33	N	590739 152045	Address: THE LITTLE CHEST CAFE, THE LITTLE CHEST CAFE, ASHFORD ROAD, LENHAM, MAIDSTONE, KENT, ME17 2DL Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: P09546 Permit Version: 1	Receiving Water: INTO LAND Status: VARIED UNDER EPR 2010 Issue date: 19/12/2000 Effective Date: 19-Dec-2000 Revocation Date: -
8	45	N	590890 152070	Address: PHASE 2 ASHMILL BUSINESS PARK, PHASE 2 ASHMILL BUSINESS PARK, ASHFORD ROAD, LENHAM, MAIDSTONE, KENT, ME17 2GQ Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: P10773 Permit Version: 1	Receiving Water: INTO LAND Status: PRE NRA LEGISLATION WHERE ISSUE DATE < 01-SEP-89 (HISTORIC ONLY) Issue date: 23/09/2002 Effective Date: 23-Sep-2002 Revocation Date: -
9B	46	N	590870 152070	Address: UNIT 3 ASHMILL BUSINESS PARK, ASHFORD ROAD, LENHAM, MAIDSTONE, KENT, ME17 2GQ Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: P21498 Permit Version: 1	Receiving Water: UNDERGROUND STRATA Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 22/10/2007 Effective Date: 22-Oct-2007 Revocation Date: -
10	51	N	590810 152070	Address: ASHMILL LTD, ASHMILL LTD, ADJACENT TO LITTLE CHEST CAFE, ASHFORD ROAD, LENHAM, KENT	Receiving Water: INTO LAND Status: VARIED UNDER EPR 2010 Issue date: 21/01/2013

ID	Distance (m)	Direction	NGR	Details	
				Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: P10431 Permit Version: 2	Effective Date: 21-Jan-2013 Revocation Date: -
11B	59	N	590840 152080	Address: PHASE 3 ASHMILL BUSINESS PARK, PHASE 3 ASHMILL BUSINESS PARK, ASHFORD ROAD, LENHAM, MAIDSTONE, KENT, ME17 2GQ Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: P10772 Permit Version: 1	Receiving Water: INTO LAND Status: PRE NRA LEGISLATION WHERE ISSUE DATE < 01-SEP-89 (HISTORIC ONLY) Issue date: 23/09/2002 Effective Date: 23-Sep-2002 Revocation Date: -
12C	62	N	590690 152070	Address: PLOT E1, PLOT E1, NORTHDOWN BUSINESS PARK, ASHFORD ROAD, LENHAM KENT, ME17 2DY Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: P07965 Permit Version: 1	Receiving Water: INTO LAND Status: PRE NRA LEGISLATION WHERE ISSUE DATE < 01-SEP-89 (HISTORIC ONLY) Issue date: 14/01/2000 Effective Date: 14-Jan-2000 Revocation Date: -
13C	62	N	590690 152070	Address: PLOT E1, PLOT E1, NORTHDOWN BUSINESS PARK, ASHFORD ROAD, LENHAM KENT, ME17 2DY Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: P07965 Permit Version: 1	Receiving Water: INTO LAND Status: PRE NRA LEGISLATION WHERE ISSUE DATE < 01-SEP-89 (HISTORIC ONLY) Issue date: 14/01/2000 Effective Date: 14-Jan-2000 Revocation Date: -
14C	62	N	590690 152070	Address: PLOT D NORTHDOWN BUSINESS PARK, PLOT D NORTHDOWN BUSINESS PARK, ASHFORD ROAD, LENHAM, MAIDSTONE, KENT Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: P07332 Permit Version: 1	Receiving Water: INTO LAND Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 09/10/1998 Effective Date: 09-Oct-1998 Revocation Date: -
15C	62	N	590690 152070	Address: ASHMILL LTD, ASHMILL LTD, ADJACENT TO LITTLE CHEST CAFE, ASHFORD ROAD, LENHAM, KENT Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: P10431 Permit Version: 1	Receiving Water: INTO LAND Status: PRE NRA LEGISLATION WHERE ISSUE DATE < 01-SEP-89 (HISTORIC ONLY) Issue date: 18/12/2001 Effective Date: 18-Dec-2001 Revocation Date: 20/01/2013
16	91	E	590610 151630	Address: A BARR AND SONS, EAST LENHAM FARM, A BARR AND SONS LTD, EAST LENHAM FARM, LENHAM, KENT, ME17 2DP Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: P11088/1 Permit Version: 1	Receiving Water: TRIBUTARY OF GREAT STOUR Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 28/02/2003 Effective Date: 28-Feb-2003 Revocation Date: -
17D	97	N	590740 152110	Address: PLOT B, PLOT B, NORTHDOWN BUSINESS PARK, ASHFORD RD, LENHAM, KENT Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: P09547 Permit Version: 1	Receiving Water: INTO LAND Status: PRE NRA LEGISLATION WHERE ISSUE DATE < 01-SEP-89 (HISTORIC ONLY) Issue date: 19/12/2000 Effective Date: 19-Dec-2000 Revocation Date: -

2.1.9 Records of Water Industry Referrals (potentially harmful discharges to the public sewer) within 500m of the study site:

0

Database searched and no data found.

2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site:

0

Database searched and no data found.

2.2 Dangerous or Hazardous Sites

Records of COMAH & NIHHS sites within 500m of the study site: 0

Database searched and no data found.

2.3 Environment Agency/Natural Resources Wales Recorded Pollution Incidents

2.3.1 Records of National Incidents Recording System, List 2 within 500m of the study site:

5

The following NIRS List 2 records are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details	
1D	76	N	590762 152090	Incident Date: 08-Aug-2002 Incident Identification: 98787 Pollutant: Inorganic Chemicals/Products Pollutant Description: Other Inorganic Chemical or Product	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
2A	160	NW	590420 152080	Incident Date: 04-Sep-2001 Incident Identification: 33108 Pollutant: Inert Materials and Wastes:Specific Waste Materials Pollutant Description: Construction and Demolition Materials and Wastes:Asbestos	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)
3A	160	NW	590420 152080	Incident Date: 04-Sep-2001 Incident Identification: 33108 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)
4A	160	NW	590420	Incident Date: 04-Sep-2001	Water Impact: Category 4 (No Impact)

ID	Distance (m)	Direction	NGR	Details	
			152080	Incident Identification: 33108 Pollutant: Specific Waste Materials Pollutant Description: Asbestos	Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)
5	325	NW	590163 152092	Incident Date: 18-Jul-2004 Incident Identification: 251729 Pollutant: Oils and Fuel Pollutant Description: Hydraulic Oils	Water Impact: Category 2 (Significant) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)

2.3.2 Records of National Incidents Recording System, List 1 within 500m of the study site:

0

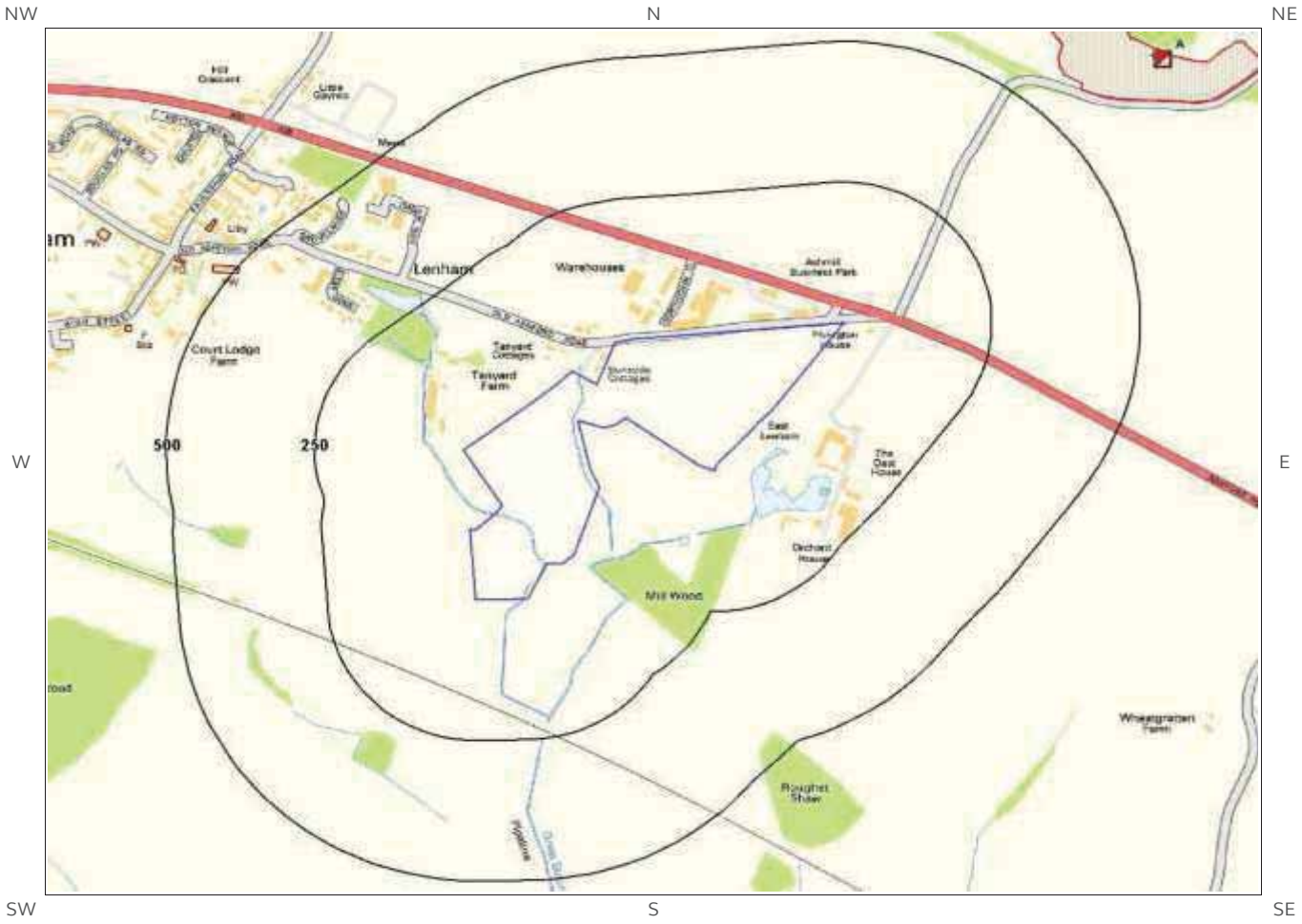
Database searched and no data found.

2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990

Records of sites determined as contaminated land under Section 78R of the Environmental Protection Act 1990 are there within 500m of the study site 0

Database searched and no data found.

3. Landfill and Other Waste Sites Map



Site Outline

250 500 Search Buffers (m)

EA/NRW Active Landfill

EA/NRW Historic Landfill

BGS / DoE Survey Landfill

Historic and Planned Waste Sites

EA/NRW Licensed Waste Site

Local Authority/Historical Mapping Landfill Records

3. Landfill and Other Waste Sites

3.1 Landfill Sites

3.1.1 Records from Environment Agency/Natural Resources Wales landfill data within 1000m of the study site:

0

Database searched and no data found.

3.1.2 Records of Environment Agency/Natural Resources Wales historic landfill sites within 1500m of the study site:

1

The following landfill records are represented as either points or polygons on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details	
1	577	NE		Site Address: Lenham Quarry, Hubbards Hill, Maidstone, Lenham, Kent Waste Licence: Yes Site Reference: - Waste Type: Inert Environmental Permitting Regulations (Waste) Reference: SH1/L/GHB001	Licence Issue: 09-Jan-1992 Licence Surrendered: 06-Nov-2008 Licence Holder Address: Poundhurst Road, Ashford, Ruckinge, Kent Operator: G H Bromley Haulage Limited Licence Holder: G H Bromley Haulage Limited First Recorded: - Last Recorded: -

3.1.3 Records of BGS/DoE non-operational landfill sites within 1500m of the study site:

0

Database searched and no data found.

3.1.4 Records of Landfills from Local Authority and Historical Mapping Records within 1500m of the study site:

0

Database searched and no data found.

3.2 Other Waste Sites

3.2.1 Records of waste treatment, transfer or disposal sites within 500m of the study site:

0

Database searched and no data found.

3.2.2 Records of Environment Agency/Natural Resources Wales licensed waste sites within 1500m of the study site:

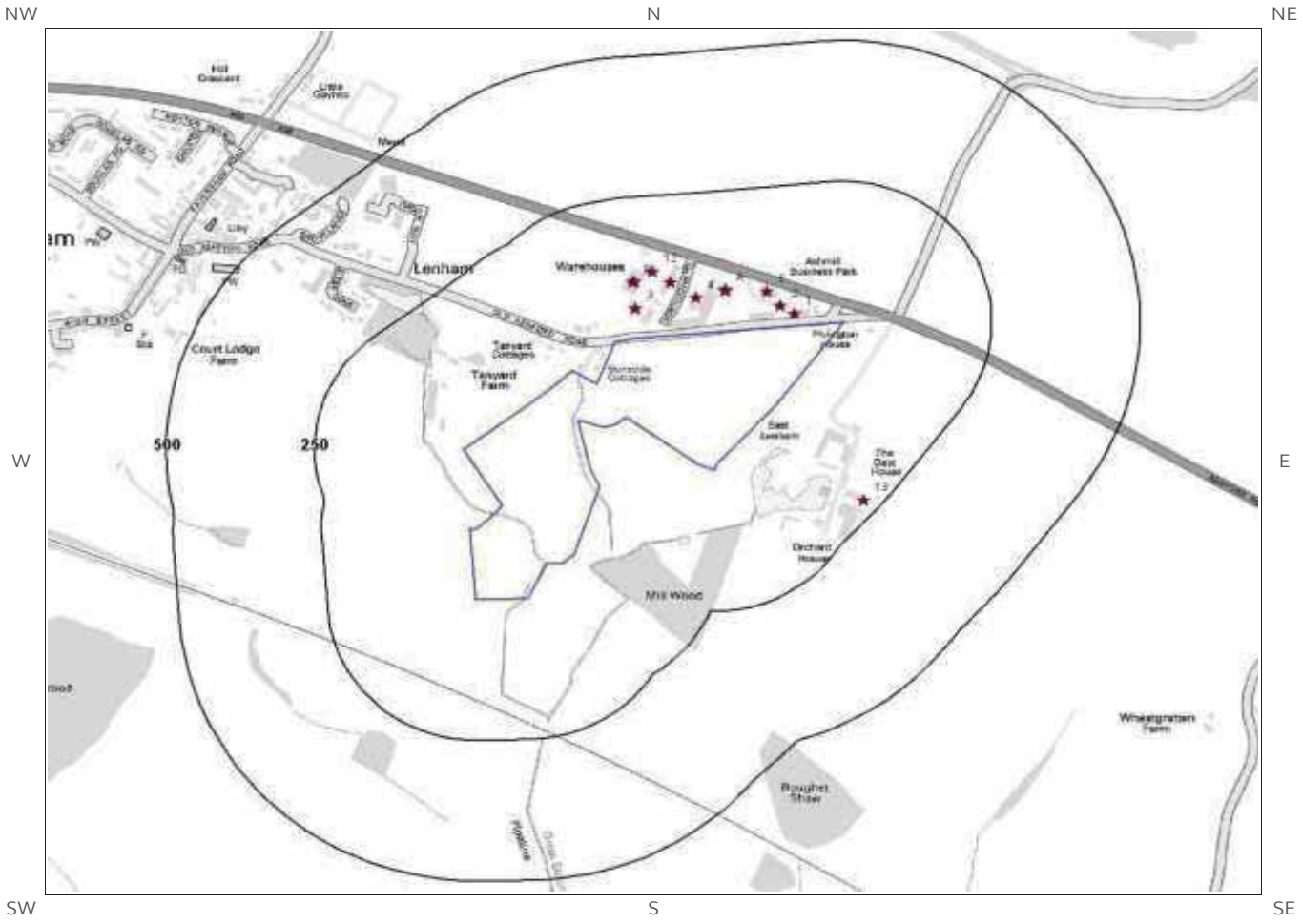
4

The following waste treatment, transfer or disposal sites records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details	
2A	714	NE	591500 152500	Site Address: Hubbards Hill, Lenham, Maidstone, Kent, ME17 2EJ Type: Landfill taking Non-Biodegradeable Wastes Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: GHB001 EPR reference: - Operator: G H Bromley Haulage Limited Waste Management licence No: 19513 Annual Tonnage: 74999.0	Issue Date: 09/01/1992 Effective Date: - Modified: 23/10/2000 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Closure Site Name: Lenham Quarry Correspondence Address: Ladswood Farm, Poundhurst Road, Ruckinge, Ashford, Kent, TN26 2PH
3A	714	NE	591500 152500	Site Address: Hubbards Hill, Lenham, Maidstone, Kent, ME17 2EJ Type: Landfill taking Non-Biodegradeable Wastes Size: >= 25000 tonnes < 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: GHB001 EPR reference: - Operator: G H Bromley Haulage Limited Waste Management licence No: 19513 Annual Tonnage: 74999.0	Issue Date: 09/01/1992 Effective Date: - Modified: 23/10/2000 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Closure Site Name: Lenham Quarry Correspondence Address: Ladswood Farm, Poundhurst Road, Ruckinge, Ashford, Kent, TN26 2PH
4A	714	NE	591500 152500	Site Address: Hubbards Hill, Lenham, Maidstone, Kent, ME17 2EJ Type: Landfill taking Non-Biodegradeable Wastes Size: >= 25000 tonnes < 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: GHB001 EPR reference: - Operator: G H Bromley Haulage Waste Management licence No: 19513 Annual Tonnage: 75000.0	Issue Date: 09/01/1992 Effective Date: - Modified: 23/10/2000 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Modified Site Name: Lenham Quarry Correspondence Address: Ladswood Farm, Poundhurst Road, Ruckinge, Ashford, Kent, TN26 2PH
5A	714	NE	591500 152500	Site Address: Hubbards Hill, Lenham, Maidstone, Kent, ME17 2EJ Type: Landfill taking Non-Biodegradeable Wastes Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: GHB001 EPR reference: EA/EPR/AP3291SN/S002 Operator: G H Bromley Haulage Limited Waste Management licence No: 19513	Issue Date: 09/01/1992 Effective Date: - Modified: 23/10/2000 Surrendered Date: 06/11/2008 Expiry Date: - Cancelled Date: - Status: Surrendered Site Name: Lenham Quarry Correspondence Address: -

ID	Distance (m)	Direction	NGR	Details
				Annual Tonnage: 0.0

4. Current Land Use Map



Site Outline

Search Buffers (m)
250
500

Current Industrial Sites

Petrol & Fuel Sites

Electricity Transmission Cables

Gas Transmission Pipelines

4. Current Land Uses

4.1 Current Industrial Data

Records of potentially contaminative industrial sites within 250m of the study site: 13

The following records are represented as points on the Current Land Uses map.

ID	Distance (m)	Direction	Company	NGR	Address	Activity	Category
1	23	N	Inline Track Welding	590879 152047	Ashmill Business Park, Ashford Road, Lenham, Maidstone, Kent, ME17 2GQ	Cutting, Drilling and Welding Services	Construction Services
2	38	N	Worldwind Music	590856 152061	Ashmill Business Park, Ashford Road, Lenham, Maidstone, Kent, ME17 2GQ	Musical Instruments	Consumer Products
3	54	N	Warehouse	590611 152057	Kent, ME17	Container and Storage	Transport, Storage and Delivery
4	65	N	Denimex	590713 152075	Northdown Business Park, Ashford Road, Lenham, Maidstone, Kent, ME17 2DL	Agricultural Machinery and Goods	Industrial Products
5	65	N	Bridgen Welding Ltd	590833 152086	Ashmill Business Park, Ashford Road, Lenham, Maidstone, Kent, ME17 2GQ	Special Purpose Machinery and Equipment	Industrial Products
6A	75	N	N I Pallets	590762 152089	The Little Chest, Ashford Road, Lenham, Maidstone, Kent, ME17 2DL	Packaging	Industrial Products
7A	75	N	B W S Ltd	590762 152089	The Little Chest, Ashford Road, Lenham, Maidstone, Kent, ME17 2DL	Distribution and Haulage	Transport, Storage and Delivery
8A	76	N	Simms International	590762 152090	Northdown Business Park, Ashford Road, Lenham, Maidstone, Kent, ME17 2DL	Container and Storage	Transport, Storage and Delivery
9	95	N	Dictator	590670 152102	Inga House Northdown Business Park, Ashford Road, Lenham, Maidstone, Kent, ME17 2DL	Special Purpose Machinery and Equipment	Industrial Products
10B	100	N	Countrystyle Recycling	590607 152102	Ashford Road, Lenham, Maidstone, Kent, ME17 2DL	Recycling, Reclamation and Disposal	Recycling Services
11B	102	N	Warehouse	590609 152105	Kent, ME17	Container and Storage	Transport, Storage and Delivery
12	117	N	Tank	590640 152122	Kent, ME17	Tanks (Generic)	Industrial Features
13	222	SE	Silo	590995 151716	Kent, ME17	Hoppers and Silos	Farming

4.2 Petrol and Fuel Sites

Records of petrol or fuel sites within 500m of the study site: 0

Database searched and no data found.

4.3 National Grid High Voltage Underground Electricity Transmission Cables

This dataset identifies the high voltage electricity transmission lines running between generating power plants and electricity substations. The dataset does not include the electricity distribution network (smaller, lower voltage cables distributing power from substations to the local user network). This information has been extracted from databases held by National Grid and is provided for information only with no guarantee as to its completeness or accuracy. National Grid do not offer any warranty as to the accuracy of the available data and are excluded from any liability for any such inaccuracies or errors.

Records of National Grid high voltage underground electricity transmission cables within 500m of the study site: 0

Database searched and no data found.

4.4 National Grid High Pressure Gas Transmission Pipelines

This dataset identifies high-pressure, large diameter pipelines which carry gas between gas terminals, power stations, compressors and storage facilities. The dataset does not include the Local Transmission System (LTS) which supplies gas directly into homes and businesses. This information has been extracted from databases held by National Grid and is provided for information only with no guarantee as to its completeness or accuracy. National Grid do not offer any warranty as to the accuracy of the available data and are excluded from any liability for any such inaccuracies or errors.

Records of National Grid high pressure gas transmission pipelines within 500m of the study site: 0

Database searched and no data found.

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5. Geology

5.1 Artificial Ground and Made Ground

Database searched and no data found.

The database has been searched on site, including a 50m buffer.

5.2 Superficial Ground and Drift Geology

The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
ALV-XCZSP	ALLUVIUM	CLAY, SILT, SAND AND PEAT
HEAD-XCZSV	HEAD	CLAY, SILT, SAND AND GRAVEL

5.3 Bedrock and Solid Geology

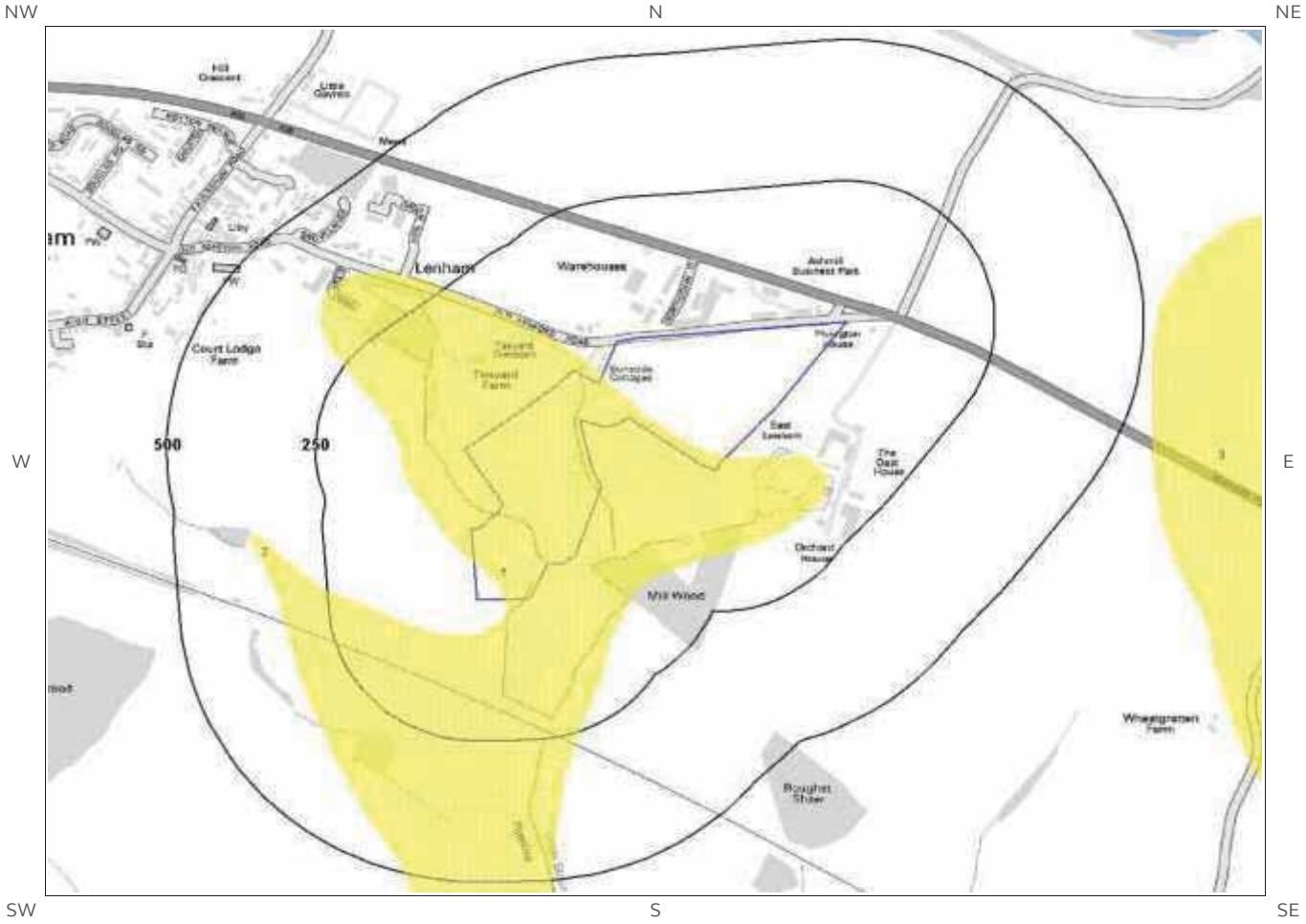
The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
WMCH-CHLK	WEST MELBURY MARLY CHALK FORMATION	CHALK
GLT-MDST	GAULT FORMATION	MUDSTONE

(Derived from the BGS 1:50,000 Digital Geological Map of Great Britain)

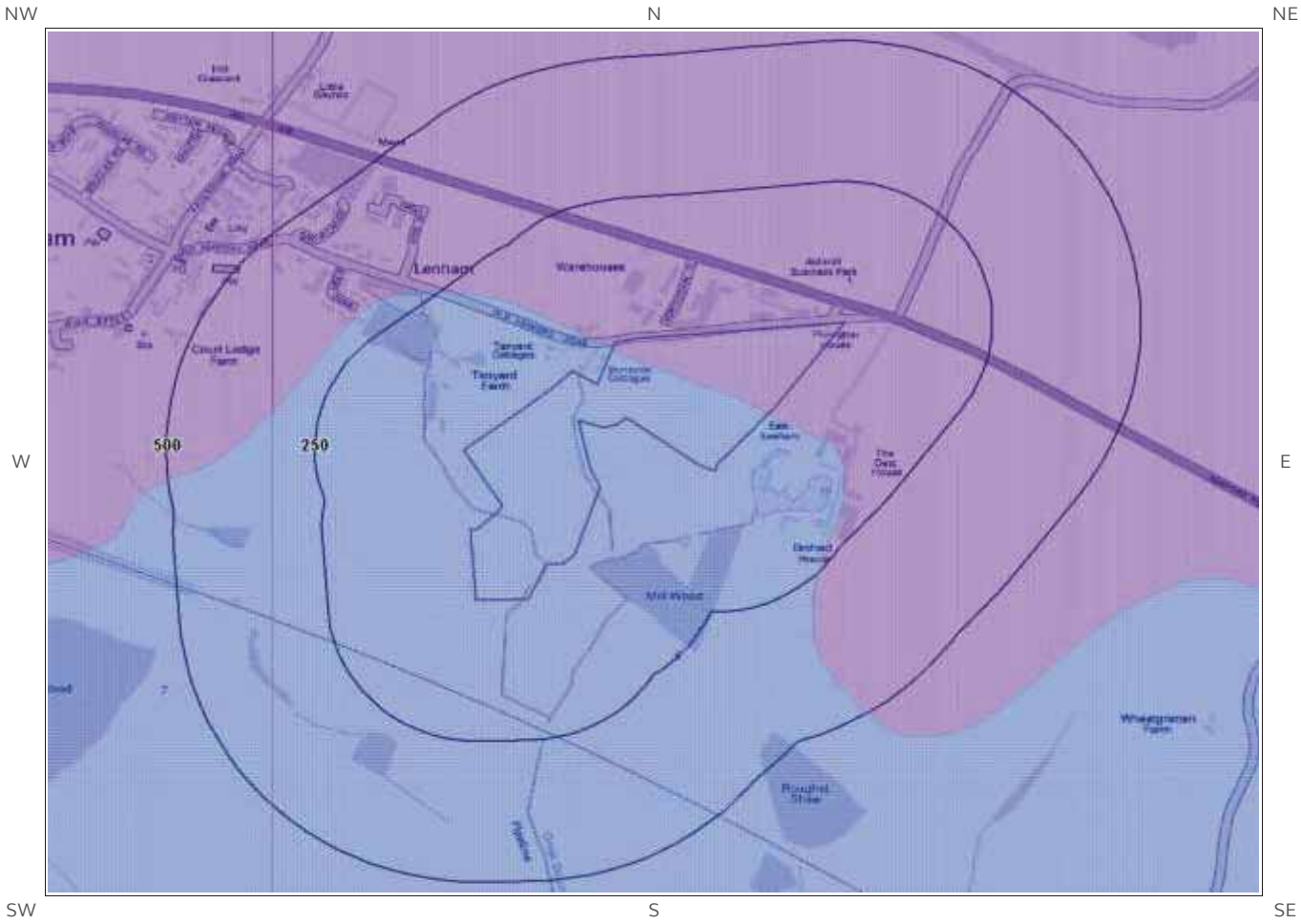
6 Hydrogeology and Hydrology

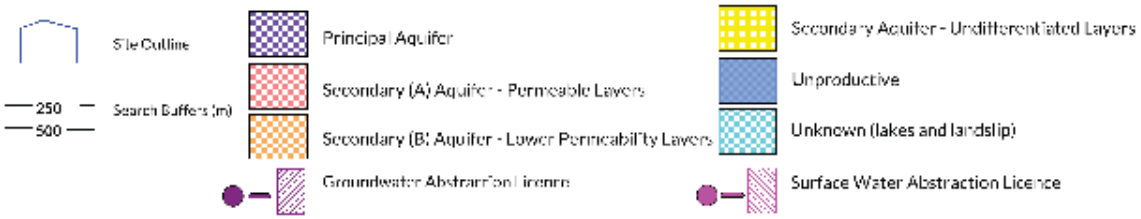
6a. Aquifer Within Superficial Geology



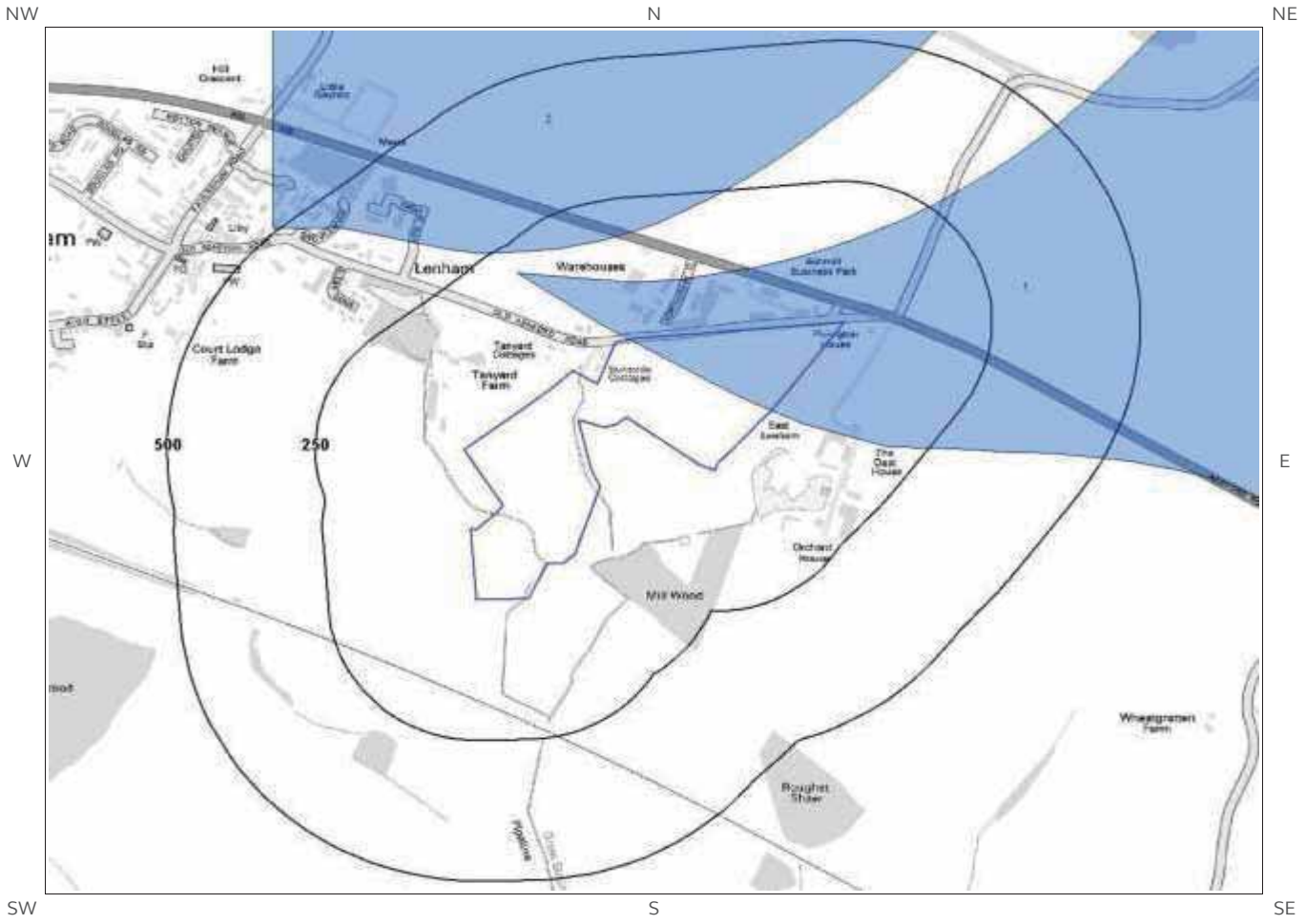
Site Outline
250
500
Search Buffers (m)
Principal Aquifer
Secondary (A) Aquifer - Permeable Layers
Secondary (B) Aquifer - Lower Permeability Layers
Secondary Aquifer - Undifferentiated Layers
Unproductive
Unknown (lakes and landslip)

6b. Aquifer Within Bedrock Geology and Abstraction Licences





6c. Hydrogeology – Source Protection Zones and Potable Water Abstraction Licences



Site Outline

250 500 Search Buffers (m)

Source Protection Zone 1 - Inner Catchment

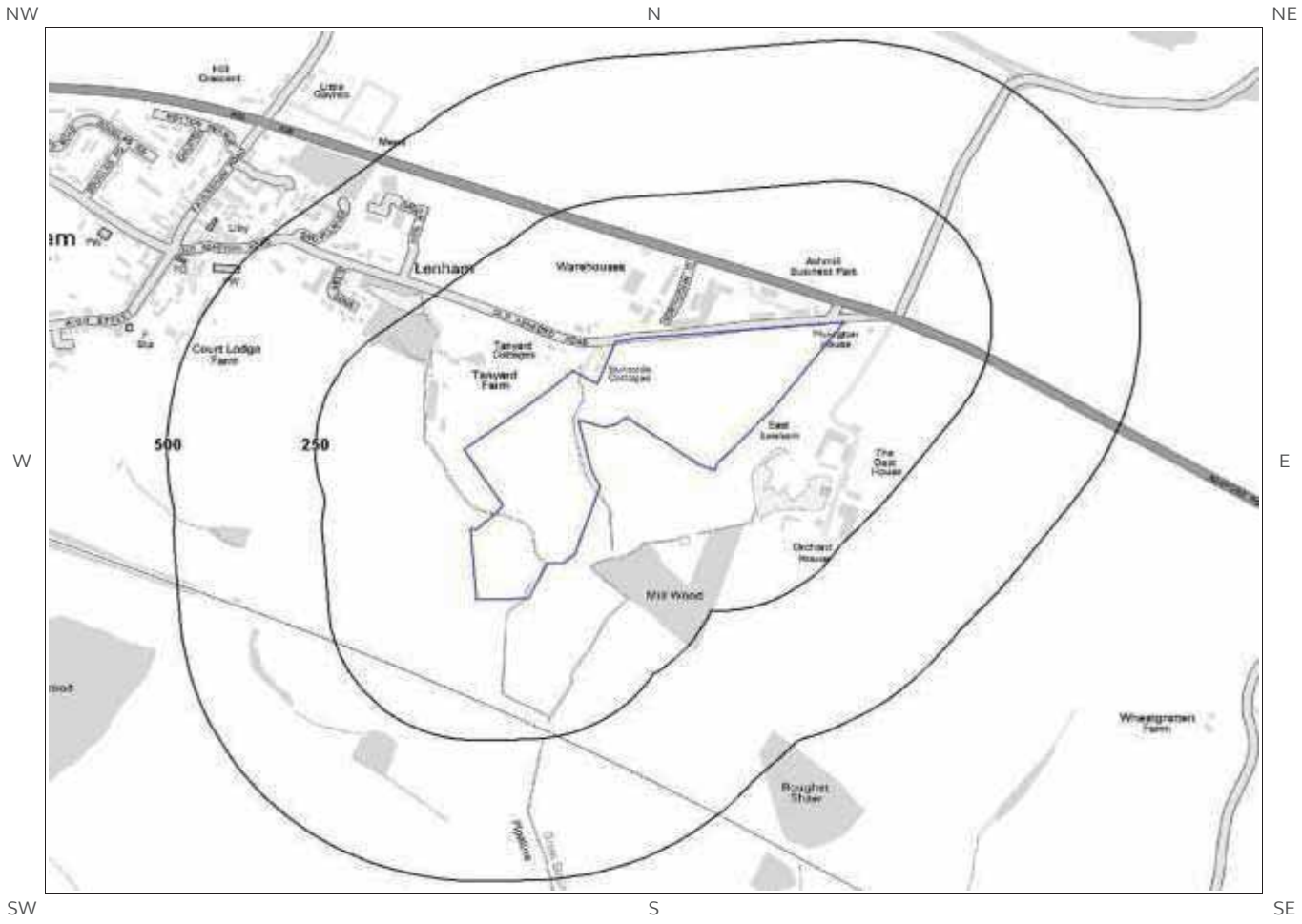
Source Protection Zone 2 - Outer Catchment

Source Protection Zone 3 - Total Catchment

Source Protection Zone 4 - Zone of Special Interest

Potable Water Abstraction Licence

6d. Hydrogeology – Source Protection Zones within confined aquifer



Site Outline

250 — Search Buffers (m)
500 —

Source Protection Zone 1 - Inner Catchment

Source Protection Zone 2C - Outer Catchment within Confined Aquifer

Source Protection Zone 3C - Total Catchment within Confined Aquifer

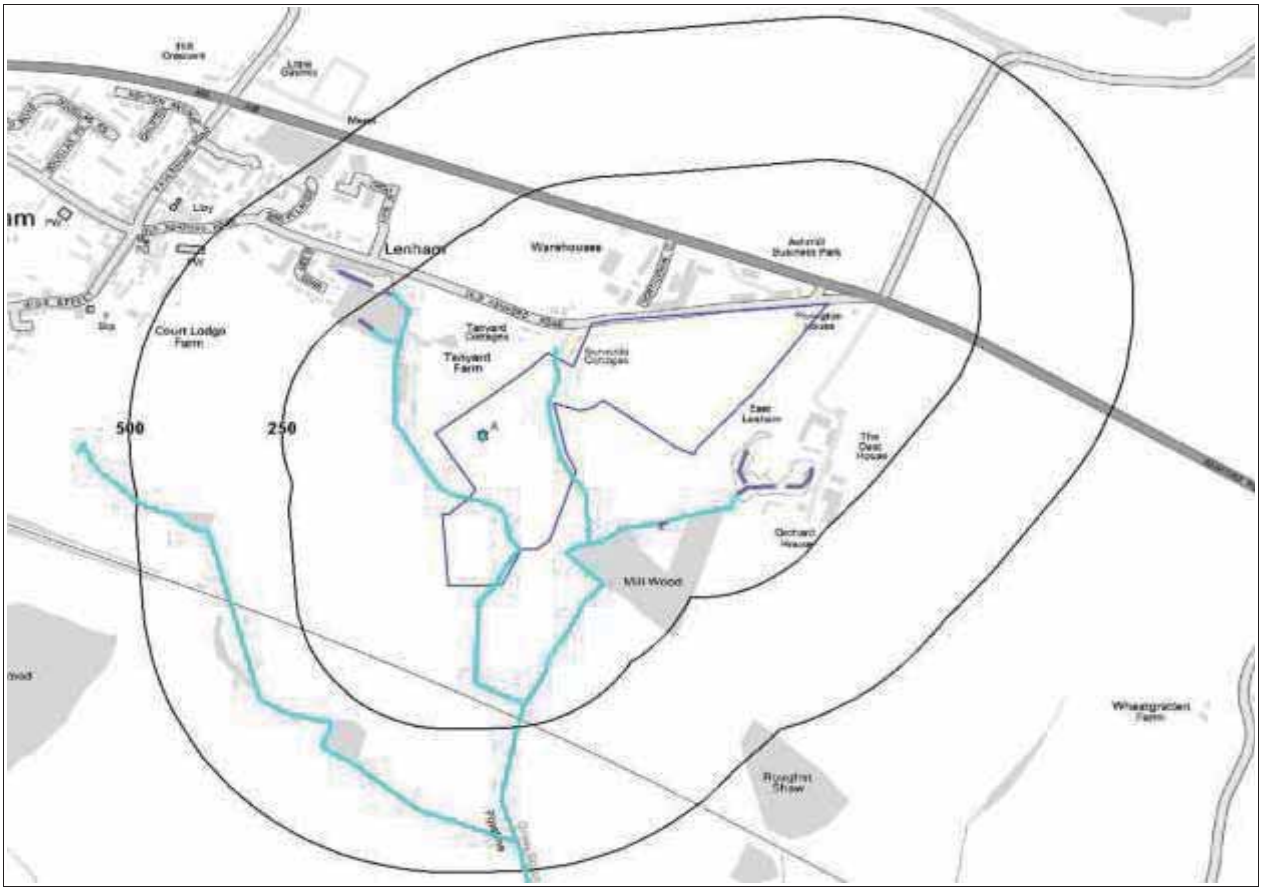
Potable Water Abstraction Licence

6e. Hydrology – Watercourse Network and River Quality

NW N NE

W E

SW S SE



Site Outline

250

500

Search Buffers (m)

Tidal River

Inland River

Underground or Elevated Tidal River

Underground or Elevated Inland River

Foreshore

General Quality Assessment: Chemistry

Canal

Underground or Elevated Canal

Lock or Flight of Locks

Lake, Reservoir, or Marsh

Drain or Transfer

General Quality Assessment: Biology

6.Hydrogeology and Hydrology

6.1 Aquifer within Superficial Deposits

Records of strata classification within the superficial geology at or in proximity to the property Yes

From 1 April 2010, the Environment Agency/Natural Resources Wales's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the Groundsure Enviro Insight User Guide.

The following aquifer records are shown on the Aquifer within Superficial Geology Map (6a):

ID	Distance (m)	Direction	Designation	Description
1	0	On Site	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	335	W	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

6.2 Aquifer within Bedrock Deposits

Records of strata classification within the bedrock geology at or in proximity to the property Yes

From 1 April 2010, the Environment Agency/Natural Resources Wales's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the Groundsure Enviro Insight User Guide.

The following aquifer records are shown on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	Designation	Description
1	0	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
6	0	On Site	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow
7	321	W	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow
2	328	W	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

6.3 Groundwater Abstraction Licences

Groundwater Abstraction Licences within 2000m of the study site — Identified

The following Abstraction Licences records are represented as points, lines and regions on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	NGR	Details	
Not shown	1232	SE	591410 150730	Status: Historical Licence No: 11/053 Details: Mineral Washing Direct Source: Southern Region Groundwater Point: POINT A, BOREHOLE AT LENHAM FORSTAL Data Type: Point Name: Brett Aggregates Ltd	Annual Volume (m^3): 27000 Max Daily Volume (m^3): 816 Original Application No: - Original Start Date: - Expiry Date: - Issue No: 102 Version Start Date: 01/02/2007 Version End Date:
Not shown	1232	SE	591410 150730	Status: Active Licence No: 11/053 Details: Dust Suppression Direct Source: Southern Region Groundwater Point: POINT A, BOREHOLE AT LENHAM FORSTAL Data Type: Point Name: Brett Aggregates Ltd	Annual Volume (m^3): 27000 Max Daily Volume (m^3): 816 Original Application No: - Original Start Date: 09/07/1993 Expiry Date: - Issue No: 103 Version Start Date: 03/04/2014 Version End Date:
Not shown	1232	SE	591410 150730	Status: Active Licence No: 11/053 Details: General Washing/Process Washing Direct Source: Southern Region Groundwater Point: POINT A, BOREHOLE AT LENHAM FORSTAL Data Type: Point Name: Brett Aggregates Ltd	Annual Volume (m^3): 27000 Max Daily Volume (m^3): 816 Original Application No: - Original Start Date: 09/07/1993 Expiry Date: - Issue No: 103 Version Start Date: 03/04/2014 Version End Date:

6.4 Surface Water Abstraction Licences

Surface Water Abstraction Licences within 2000m of the study site — Identified

The following Surface Water Abstraction Licences records are represented as points, lines and regions on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	NGR	Details	
Not shown	1368	S	589830 150270	Status: Active Licence No: 9/40/04/0265/SR Details: Spray Irrigation - Direct Direct Source: Southern Region Surface Waters Point: POINTS X-Y, RIVER GREATE STOUR AT BOWLEY FARM Data Type: Line Name: JKW Alexander Ltd	Annual Volume (m^3): 16366 Max Daily Volume (m^3): 409 Application No: - Original Start Date: 22/03/1966 Expiry Date: - Issue No: 101 Version Start Date: 01/12/2006 Version End Date:

6.5 Potable Water Abstraction Licences

Potable Water Abstraction Licences within 2000m of the study site — None identified

Database searched and no data found.

6.6 Source Protection Zones

Source Protection Zones within 500m of the study site — Identified

The following Source Protection Zones records are represented on the SPZ and Potable Water Abstraction Map (6c):

ID	Distance (m)	Direction	Zone	Description
1	0	On Site	3	Total catchment
2	182	N	3	Total catchment

6.7 Source Protection Zones within Confined Aquifer

Source Protection Zones within the Confined Aquifer within 500m of the study site — None identified

Historically, Source Protection Zone maps have been focused on regulation of activities which occur at or near the ground surface, such as prevention of point source pollution and bacterial contamination of water supplies. Sources in confined aquifers were often considered to be protected from these surface pressures due to the presence of a low permeability confining layer (e.g. glacial till, clay). The increased interest in subsurface activities such as onshore oil and gas exploration, ground source heating and cooling requires protection zones for confined sources to be marked on SPZ maps where this has not already been done.

Database searched and no data found.

6.8 Groundwater Vulnerability and Soil Leaching Potential

Environment Agency/Natural Resources Wales information on groundwater vulnerability and soil leaching potential within 500m of the study site Identified

Distance (m)	Direction	Classification	Soil Vulnerability Category	Description
0	On Site	Minor Aquifer/High Leaching Potential	H1	Soils which readily transmit liquid discharges because they are shallow or susceptible to rapid flow directly to rock, gravel or groundwater.
0	On Site	Major Aquifer/Intermediate Leaching Potential	I1	Soils which can possibly transmit a wide range of pollutants.
321	W	Major Aquifer/Intermediate Leaching Potential	I1	Soils which can possibly transmit a wide range of pollutants.

6.9 River Quality

Environment Agency/Natural Resources Wales information on river quality within 1500m of the study site Identified

6.9.1 Biological Quality:

Biological Quality data describes water quality in terms of 83 groups of macroinvertebrates, some of which are pollution sensitive. The results are graded from A ('Very Good') to F ('Bad').

The following Biological Quality records are shown on the Hydrology Map (6e):

ID	Distance (m)	Direction	NGR	River Quality Grade	Biological Quality Grade				
					2005	2006	2007	2008	2009
38A	0	On Site	590400 151800	River Name: Great Stour Reach: Bybrook Bridge - Lenham End/Start of Stretch: Start of Stretch NGR	A	A	A	A	A
39A	0	On Site	590400 151800	River Name: Great Stour Reach: Bybrook Bridge - Lenham End/Start of Stretch: Start of Stretch NGR	A	A	B	B	B

6.9.2 Chemical Quality:

Chemical quality data is based on the General Quality Assessment Headline Indicators scheme (GQAHI). In England, each chemical sample is measured for ammonia and dissolved oxygen. In Wales, the samples are measured for biological oxygen demand (BOD), ammonia and dissolved oxygen. The results are graded from A ('Very Good') to F ('Bad').

The following Chemical Quality records are shown on the Hydrology Map (6e):

					Chemical Quality Grade				
ID	Distance (m)	Direction	NGR	River Quality Grade	2005	2006	2007	2008	2009
40A	0	On Site	590400 151800	River Name: R. Great Stour Reach: Bybrook Bridge - Lenham End/Start of Stretch: Start of Stretch NGR	B	B	B	B	C

6.10 Ordnance Survey MasterMap Water Network

Ordnance Survey MasterMap Water Network entries within 500m of the study site

This watercourse information is provided by Ordnance Survey MasterMap Water Network. The data provides a detailed centre line following the curve of the waterway precisely, so all distances provided in the report should be understood as measurements to the centreline rather than a measurement to the nearest point of the watercourse. Underground watercourses are inferred from entry and exit points so caution is advised in using these to indicate precise locations of underground watercourses when planning site investigation and development.

The following Ordnance Survey MasterMap Water Network records are represented on the Hydrology Map (6e):

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
1	0 On Site	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.1
2	0 On Site	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
3	0 On Site	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: Underground Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
4	0 On Site	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
5	0 On Site	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions)

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
				Average Width in Watercourse Section (m): 2.2
6	0 On Site	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.7
7	0 On Site	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.1
8	0 On Site	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
9	0 On Site	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: Underground Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
10	0 On Site	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
11	0 On Site	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.2
12	0 On Site	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.7
7	34 SE	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.3
13	34 SE	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.3
8	55 W	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: Underground Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
14	55 W	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: Underground Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
9	56 E	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
15	56 E	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
10	57 W	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.4
16	57 W	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.4
11	60 SE	Not Specified	Lake, loch or reservoir.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
17	60 SE	Not Specified	Lake, loch or reservoir.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
12	61 E	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.4
18	61 E	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.4
13	99 SE	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 20.4
14	99 SE	Not Specified	Lake, loch or reservoir.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
19	99 SE	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 20.4
20	99 SE	Not Specified	Lake, loch or reservoir.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
15	103 S	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.5
21	103	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
	S			Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.5
16	104 SE	Not Specified	Lake, loch or reservoir.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
22	104 SE	Not Specified	Lake, loch or reservoir.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
17	107 SE	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: Underground Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
23	107 SE	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: Underground Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
18	114 S	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: Underground Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
24	114 S	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: Underground Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
19	125 S	Not Specified	Lake, loch or reservoir.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 6.4
25	125 S	Not Specified	Lake, loch or reservoir.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 6.4
20	132 S	Not Specified	Lake, loch or reservoir.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.4
21	132 S	Not Specified	Lake, loch or reservoir.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 8.1
26	132 S	Not Specified	Lake, loch or reservoir.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.4
27	132 S	Not Specified	Lake, loch or reservoir.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions)

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
				Average Width in Watercourse Section (m): 8.1
22	160 NW	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.3
23	160 NW	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.8
28	160 NW	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.3
29	160 NW	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.8
24	205 NW	Not Specified	Lake, loch or reservoir.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
30	205 NW	Not Specified	Lake, loch or reservoir.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
25	212 S	Great Stour	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.4
31	212 S	Great Stour	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.4
26	220 S	Great Stour	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: Underground Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
32	220 S	Great Stour	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: Underground Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
27	237 NW	Not Specified	Lake, loch or reservoir.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 24.1
33	237 NW	Not Specified	Lake, loch or reservoir.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 24.1

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
28	251 S	Great Stour	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.7
34	251 S	Great Stour	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.7
29	260 S	Great Stour	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: Underground Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
35	260 S	Great Stour	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: Underground Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
30	264 S	Great Stour	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.3
36	264 S	Great Stour	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.3
31	306 SW	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
37	306 SW	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
32	350 W	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
38	350 W	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
33	385 W	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
Not shown	385 W	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
34	395	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
	S			Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
Not shown	395 S	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
35	450 S	Great Stour	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.3
Not shown	450 S	Great Stour	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.3
36	451 W	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: Underground Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
Not shown	451 W	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: Underground Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
37	454 W	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
Not shown	454 W	Not Specified	Inland river not influenced by normal tidal action.	Catchment Area: Stour Kent Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided

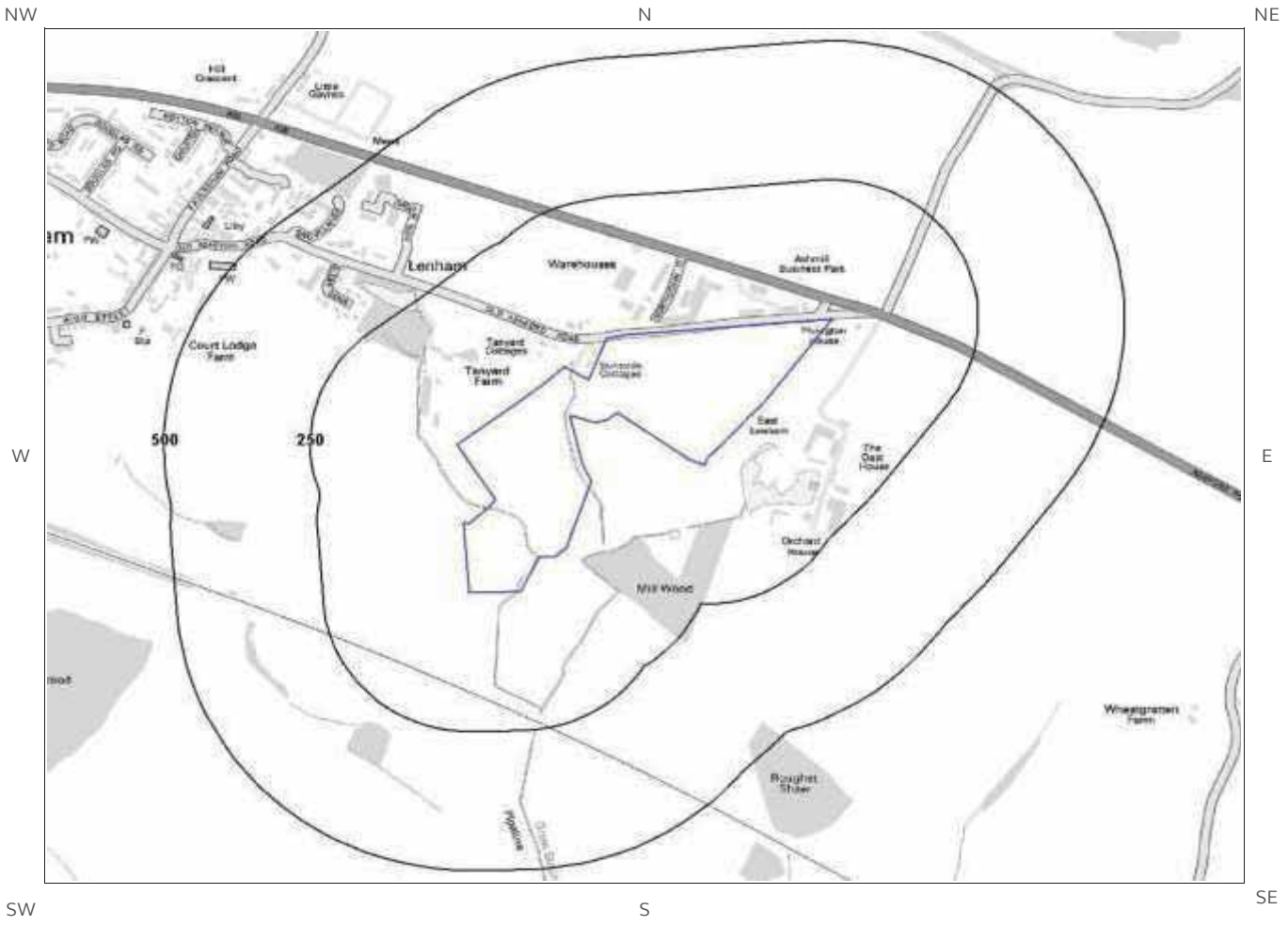
6.11 Surface Water Features

Surface water features within 250m of the study site — Identified

The following surface water records are not represented on mapping:

Distance (m)	Direction
0	On Site
0	On Site
0	On Site
0	On Site
0	On Site
32	SE
50	SE
52	SE
56	W
102	S
149	NW

7a. Environment Agency/Natural Resources Wales Flood Map for Planning (from rivers and the sea)



Site Outline

Search Buffers (m)

Zone 2 Floodplain

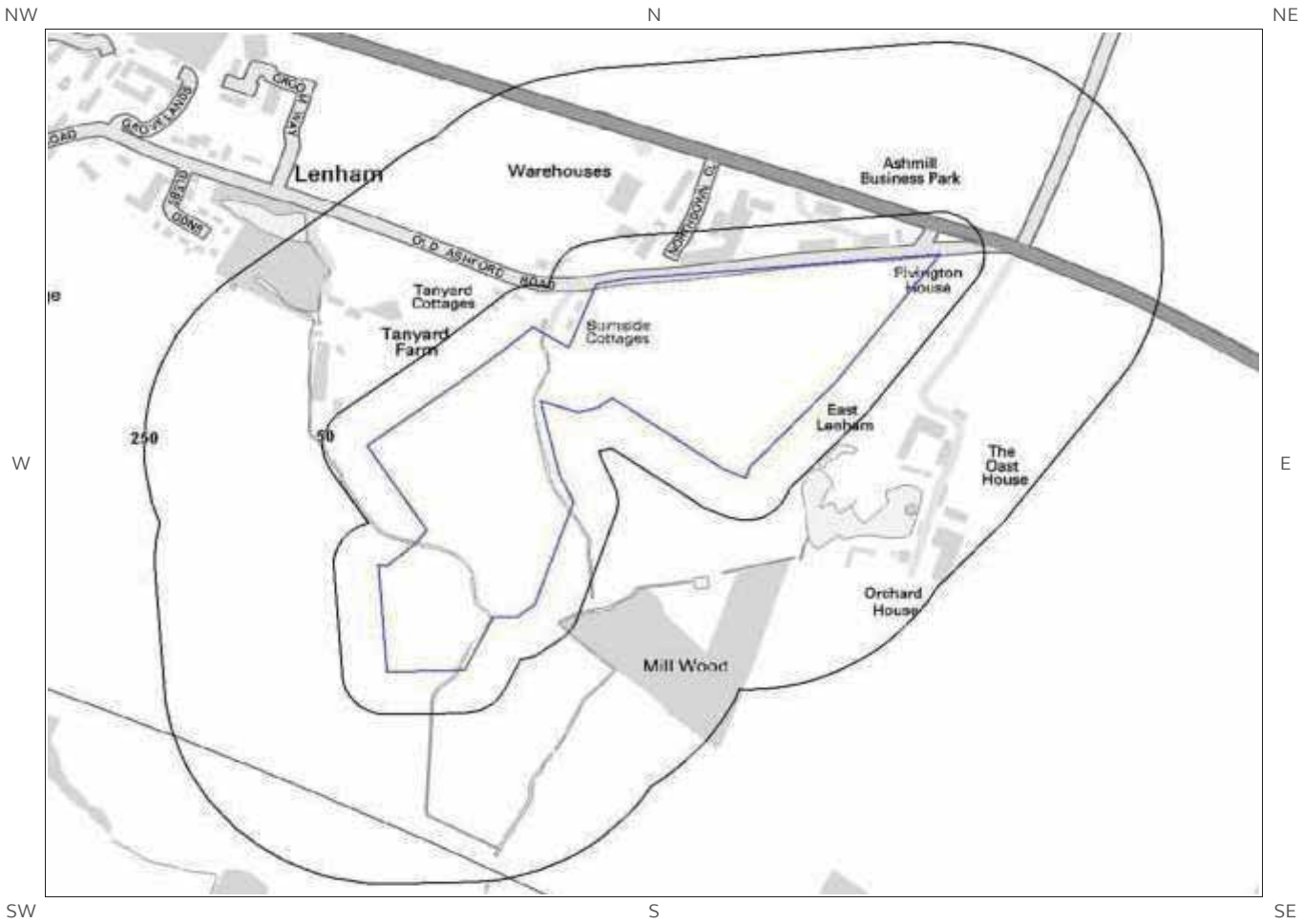
Zone 3 Floodplain

Flood Defences

Area used for Flood Storage

Area Benefiting from Flood Defences

7b. Environment Agency/Natural Resources Wales Risk of Flooding from Rivers and the Sea (RoFRaS) Map



Site Outline

Search Buffers (m)

RoFRaS Rating

- Very Low
- Low
- Medium
- High

7 Flooding

7.1 River and Coastal Zone 2 Flooding

Environment Agency/Natural Resources Wales Zone 2 floodplain within 250m — None identified

Environment Agency/Natural Resources Wales Zone 2 floodplains estimate the annual probability of flooding as between 1 in 1000 (0.1%) and 1 in 100 (1%) from rivers and between 1 in 1000 (0.1%) and 1 in 200 (0.5%) from the sea. Any relevant data is represented on Map 7a – Flood Map for Planning:

Database searched and no data found.

7.2 River and Coastal Zone 3 Flooding

Environment Agency/Natural Resources Wales Zone 3 floodplain within 250m — None identified

Zone 3 shows the extent of a river flood with a 1 in 100 (1%) or greater chance of occurring in any year or a sea flood with a 1 in 200 (0.5%) or greater chance of occurring in any year. Any relevant data is represented on Map 7a – Flood Map for Planning.

Database searched and no data found.

7.3 Risk of Flooding from Rivers and the Sea (RoFRaS) Flood Rating

Highest risk of flooding onsite — Very Low

The Environment Agency/Natural Resources Wales RoFRaS database provides an indication of river and coastal flood risk at a national level on a 50m grid with the flood rating at the centre of the grid calculated and given above. The data considers the probability that the flood defences will overtop or breach by considering their location, type, condition and standard of protection.

RoFRaS data for the study site indicates the property is in an area with a Very Low (less than 1 in 1000) chance of flooding in any given year.

7.4 Flood Defences

Flood Defences within 250m of the study site — None identified

Database searched and no data found.

7.5 Areas benefiting from Flood Defences

Areas benefiting from Flood Defences within 250m of the study site — None identified

7.6 Areas benefiting from Flood Storage

Areas used for Flood Storage within 250m of the study site	None identified

7.7 Groundwater Flooding Susceptibility Areas

7.7.1 British Geological Survey groundwater flooding susceptibility areas within 50m of the boundary of the study site	Identified
Clearwater Flooding or Superficial Deposits Flooding	Superficial Deposits Flooding

Notes: Groundwater flooding may either be associated with shallow unconsolidated sedimentary aquifers which overlie unproductive aquifers (Superficial Deposits Flooding), or with unconfined aquifers (Clearwater Flooding).

7.7.2 Highest susceptibility to groundwater flooding in the search area based on the underlying geological conditions

Potential at Surface

Where potential for groundwater flooding to occur at surface is indicated, this means that given the geological conditions in the area groundwater flooding hazard should be considered in all land-use planning decisions. It is recommended that other relevant information e.g. records of previous incidence of groundwater flooding, rainfall, property type, and land drainage information be investigated in order to establish relative, but not absolute, risk of groundwater flooding.

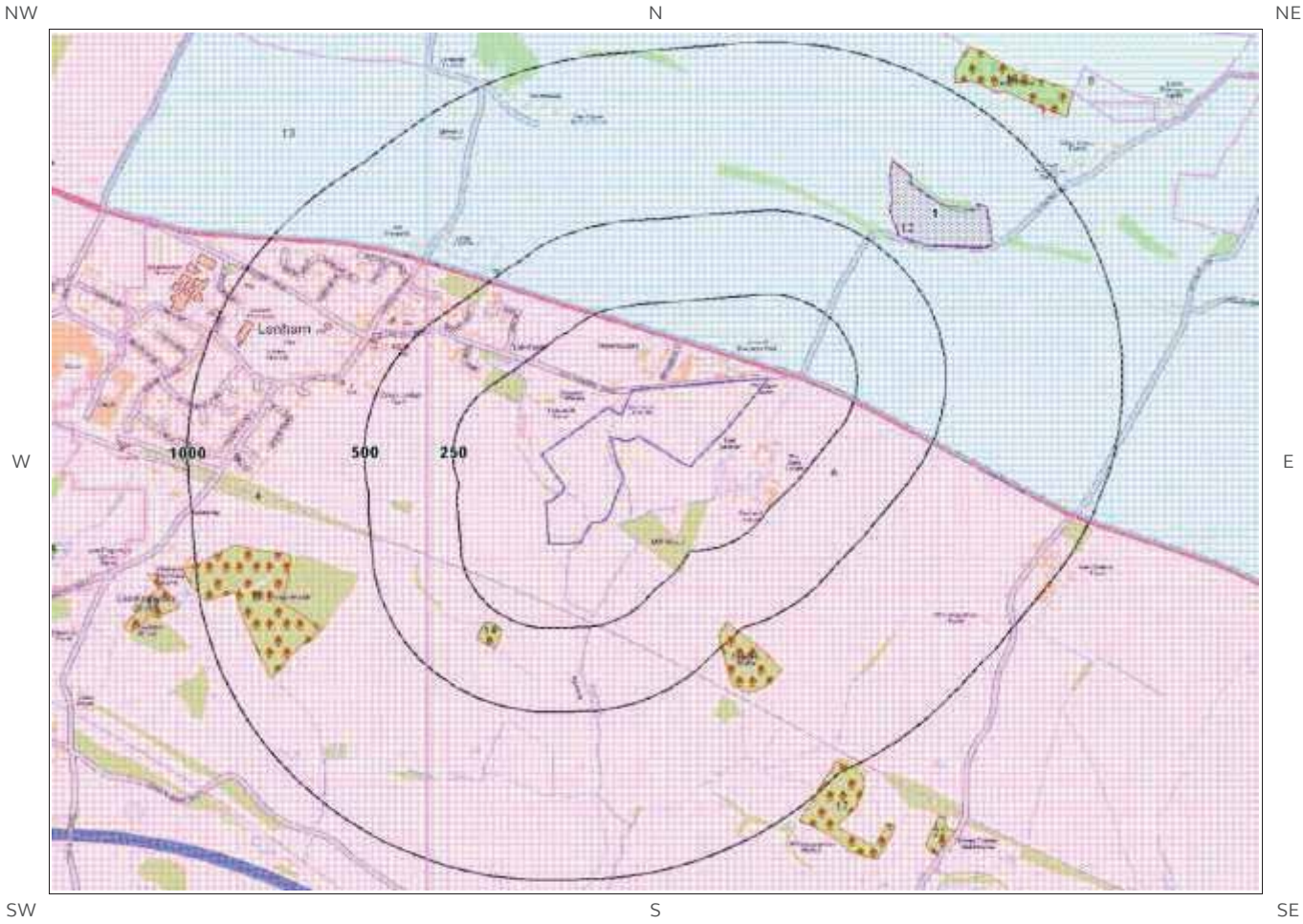
7.8 Groundwater Flooding Confidence Areas

British Geological Survey confidence rating in this result	High

Notes: Groundwater flooding is defined as the emergence of groundwater at the ground surface or the rising of groundwater into man-made ground under conditions where the normal range of groundwater levels is exceeded.

The confidence rating is on a threefold scale - Low, Moderate and High. This provides a relative indication of the BGS confidence in the accuracy of the susceptibility result for groundwater flooding. This is based on the amount and precision of the information used in the assessment. In areas with a relatively lower level of confidence the susceptibility result should be treated with more caution. In other areas with higher levels of confidence the susceptibility result can be used with more confidence.

8. Designated Environmentally Sensitive Sites Map



Site Outline

AONB
National Park
SSSI
Special Protection Areas
Nitrate Vulnerable Zones
Green Belt
Environmentally Sensitive Areas
Special Areas of Conservation
World Heritage Sites
Nitrate Sensitive Areas
Ancient Woodland
National Nature Reserve
Local Nature Reserves
Ramsar Sites

8. Designated Environmentally Sensitive Sites

Designated Environmentally Sensitive Sites within 2000m of the study site | Identified

8.1 Records of Sites of Special Scientific Interest (SSSI) within 2000m of the study site:

1

The following Site of Special Scientific Interest (SSSI) records provided by Natural England/Natural Resources Wales are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	SSSI Name	Data Source
1	561	NE	Lenham Quarry	Natural England

8.2 Records of National Nature Reserves (NNR) within 2000m of the study site:

0

Database searched and no data found.

8.3 Records of Special Areas of Conservation (SAC) within 2000m of the study site:

0

Database searched and no data found.

8.4 Records of Special Protection Areas (SPA) within 2000m of the study site:

0

Database searched and no data found.

8.5 Records of Ramsar sites within 2000m of the study site:

0

Database searched and no data found.

8.6 Records of Ancient Woodland within 2000m of the study site:

The following records of Designated Ancient Woodland provided by Natural England/Natural Resources Wales are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	Ancient Woodland Name	Data Source
14	282	SW	ROUND WOOD	Ancient and Semi-Natural Woodland
15	456	SE	EAST LENHAM ROUGHETT	Ancient and Semi-Natural Woodland
16	685	W	OXLEY WOOD	Ancient and Semi-Natural Woodland
17	964	SE	WHEATGRATTEN WOOD	Ancient and Semi-Natural Woodland
18	1026	NE	LADE WOOD	Ancient and Semi-Natural Woodland
19	1062	W	GREEN SHAW/LEADING CROSS GREEN WOOD	Ancient and Semi-Natural Woodland
Not shown	1134	N	UNKNOWN	Ancient and Semi-Natural Woodland
Not shown	1241	N	UNKNOWN	Ancient and Semi-Natural Woodland
22	1248	SE	NEW POND SHAW	Ancient and Semi-Natural Woodland
Not shown	1297	N	SATLING SHAW	Ancient and Semi-Natural Woodland
24	1389	W	KILN WOOD	Ancient and Semi-Natural Woodland
Not shown	1531	S	ALDER BED	Ancient and Semi-Natural Woodland
Not shown	1534	W	KILN WOOD SHAW	Ancient and Semi-Natural Woodland
Not shown	1668	W	KILN WOOD	Ancient and Semi-Natural Woodland
Not shown	1730	N	COLISTERS PLANTATION	Ancient and Semi-Natural Woodland
Not shown	1773	SW	TOLL WOOD	Ancient and Semi-Natural Woodland
Not shown	1782	SW	HORSE PASTURE SHAVE	Ancient and Semi-Natural Woodland
Not shown	1804	NW	DICKLEY WOOD	Ancient and Semi-Natural Woodland
Not shown	1864	SW	PARK WOOD	Ancient and Semi-Natural Woodland
Not shown	1876	W	UNKNOWN	Ancient and Semi-Natural Woodland
Not shown	1900	NW	RUSHMORE WOOD	Ancient and Semi-Natural Woodland
Not shown	1944	E	UNKNOWN	Ancient and Semi-Natural Woodland

8.7 Records of Local Nature Reserves (LNR) within 2000m of the study site:

0

Database searched and no data found.

8.8 Records of World Heritage Sites within 2000m of the study site:

0

Database searched and no data found.

8.9 Records of Environmentally Sensitive Areas within 2000m of the study site:

0

Database searched and no data found.

8.10 Records of Areas of Outstanding Natural Beauty (AONB) within 2000m of the study site:

2

The following Area of Outstanding Natural Beauty (AONB) records provided by Natural England/Natural Resources Wales are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	AONB/NSA Name	Data Source
12	37	N	Kent Downs	Natural England
13	657	NW	Kent Downs	Natural England

8.11 Records of National Parks (NP) within 2000m of the study site:

0

Database searched and no data found.

8.12 Records of Nitrate Sensitive Areas within 2000m of the study site:

0

Database searched and no data found.

8.13 Records of Nitrate Vulnerable Zones within 2000m of the study site:

10

The following Nitrate Vulnerable Zone records produced by DEFRA are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	NVZ Name	Data Source
2A	0	On Site	Existing	DEFRA
3A	0	On Site	Existing	DEFRA
4	321	W	Existing	DEFRA
5	321	W	Existing	DEFRA
6	1210	NE	New	DEFRA
Not shown	1432	NW	Existing	DEFRA
Not shown	1538	S	Existing	DEFRA
Not shown	1538	S	Existing	DEFRA
Not shown	1576	S	Existing	DEFRA
Not shown	1576	S	Existing	DEFRA

8.14 Records of Green Belt land within 2000m of the study site:

0

Database searched and no data found.

9. Natural Hazards Findings

9.1 Detailed BGS GeoSure Data

BGS GeoSure Data has been searched to 50m. The data is included in tabular format. If you require further information on geology and ground stability, please obtain a Groundsure Geo Insight, available from our website. The following information has been found:

9.1.1 Shrink Swell

Maximum Shrink-Swell* hazard rating identified on the study site — Moderate

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Ground conditions predominantly high plasticity. Do not plant or remove trees or shrubs near to buildings without expert advice about their effect and management. For new build, consideration should be given to advice published by the National House Building Council (NHBC) and the Building Research Establishment (BRE). There is a probable increase in construction cost to reduce potential shrink-swell problems. For existing property, there is a probable increase in insurance risk during droughts or where vegetation with high moisture demands is present.

9.1.2 Landslides

Maximum Landslide* hazard rating identified on the study site — Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.

9.1.3 Soluble Rocks

Maximum Soluble Rocks* hazard rating identified on the study site — Negligible

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.

* This indicates an automatically generated 50m buffer and site.

9.1.4 Compressible Ground

Maximum Compressible Ground* hazard rating identified on the study site — High

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Very significant potential for compressibility problems. Avoid large differential loadings of ground. Do not drain or de-water ground near the property without technical advice. For new build consider possibility of compressible ground in ground investigation, construction and building design. Consider effects of groundwater changes. Construction may not be possible at economic cost. For existing property probable increase in insurance risk from compressibility especially if water conditions or loading of the ground change significantly.

9.1.5 Collapsible Rocks

Maximum Collapsible Rocks* hazard rating identified on the study site — Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

9.1.6 Running Sand

Maximum Running Sand*[*] hazard rating identified on the study site — Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Possibility of running sand problems after major changes in ground conditions. Normal maintenance to avoid leakage of water-bearing services or water bodies (ponds, swimming pools) should reduce likelihood of problems due to running sand. For new build consider possibility of running sand into trenches or excavations if water table is high or sandy strata are exposed to water. Avoid concentrated water inputs to site. Unlikely to be an increase in construction costs due to potential for running sand. For existing property no significant increase in insurance risk due to running sand problems is likely.

* This indicates an automatically generated 50m buffer and site.

9.2 Radon

9.2.1 Radon Affected Areas

Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level? The site is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.

The radon data in this report is supplied by the BGS/Public Health England and is the definitive map of Radon Affected Areas in Great Britain and Northern Ireland. The dataset was created using long-term radon measurements in over 479,000 homes across Great Britain and 23,000 homes across Northern Ireland, combined with geological data. The dataset is considered accurate to 50m to allow for the margin of error in geological lines, and the findings of this report supercede any answer given in the less accurate Indicative Atlas of Radon in Great Britain, which simplifies the data to give the highest risk within any given 1km grid square. As such, the radon atlas is considered indicative, whereas the data given in this report is considered definitive.

9.2.2 Radon Protection

Is the property in an area where Radon Protection are required for new properties or extensions to existing
ones as described in publication BR211 by the Building Research Establishment? No radon protective measures are necessary.

10. Mining

10.1 Coal Mining

Coal mining areas within 75m of the study site — None identified

Database searched and no data found.

10.2 Non-Coal Mining

Non-Coal Mining areas within 50m of the study site boundary — Identified

The following non-coal mining information is provided by the BGS:

Distance (m)	Direction	Name	Commodity	Assessment of likelihood
0.0	On Site	Not available	Chalk	Sporadic underground mining of restricted extent may have occurred. Potential for difficult ground conditions are unlikely and localised and are at a level where they need not be considered

Past underground mine workings are uncommon, localised and of limited area. The rock types present in this area are such that minor mineral veins may be present within them on which it is possible that there have been attempts to work these by underground methods and/or it is possible that small scale underground extraction of other materials may have occurred. All such occurrences are likely to be restricted in size and infrequent. It should be noted, however, that there is always the possibility of the existence of other sub-surface excavations, such as wells, cess pits, follies, air raid shelters/bunkers and other military structures etc. that could affect surface ground stability but which are outside the scope of this dataset. However, if in a coalfield area you should still consider a Coal Authority mining search for the area of interest.

10.3 Brine Affected Areas

Brine affected areas within 75m of the study site — None identified
Guidance: No Guidance Required.

Contact Details

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sales@emapsite.com

British Geological Survey Enquiries
Kingsley Dunham Centre
Keyworth, Nottingham NG12 5GG
Tel: 0115 936 3143.
Fax: 0115 936 3276.
Email:
Web:**www.bgs.ac.uk**
BGS Geological Hazards Reports and general geological enquiries:
enquiries@bgs.ac.uk

Environment Agency
National Customer Contact Centre, PO Box 544
Rotherham, S60 1BY
Tel: 03708 506 506
Web: **www.environment-agency.gov.uk**
Email: enquiries@environment-agency.gov.uk

Public Health England
Public information access office
Public Health England, Wellington House
133-155 Waterloo Road, London, SE1 8UG
www.gov.uk/phe
Email:**enquiries@phe.gov.uk**
Main switchboard**: 020 7654 8000**

The Coal Authority
200 Lichfield Lane
Mansfield
Notts NG18 4RG
Tel: 0345 7626 848
DX 716176 Mansfield 5
www.coal.gov.uk

Ordnance Survey
Adanac Drive, Southampton
SO16 0AS
Tel: 08456 050505

Local Authority
Authority: Maidstone Borough Council
Phone: 01622 602 000
Web: http://www.maidstone.gov.uk
Address: Maidstone House, King Street, Maidstone, Kent, ME16 6JQ

Gemapping PLC
Virginia Villas, High Street, Hartley Witney,
Hampshire RG27 8NW
Tel: 01252 845444

Standard Terms and Conditions

Groundsure's Terms and Conditions can be viewed online at this link:

https://www.groundsure.com/terms-and-conditions-feb11-2019

EmapSite

Masdar House, 1 Reading Road,
Eversley, RG27 0RP

Report Reference: EMS-528124_710282

Your Reference: EMS_528124_710282

Report Date 20 Feb 2019

Report Delivery Method: Email - pdf

Geo Insight

Address: Old Ashford Road, Lenham, Old Ashford Road, Lenham, ME172QA

Dear Sir/ Madam,

Thank you for placing your order with Groundsure. Please find enclosed the **Groundsure Geo Insight** as requested.

If you would like further assistance regarding this report then please contact the emapsite customer services team on 0118 9736883 quoting the above report reference number.

Yours faithfully,

emapsite customer services team

Enc.
Groundsure Geo Insight

Geo Insight

Address:	**Old Ashford Road, Lenham, Old Ashford Road, Lenham, ME172QA**
Date:	**20 Feb 2019**
Reference:	**EMS-528124_710282**
Client:	**EmapSite**

NW N NE

W E

SW S SE

Aerial Photograph Capture date:	15-Apr-2015
Grid Reference:	590589,151830
Site Size:	12.1962ha

Contents Page

Overview of Findings

The Groundsure Geo Insight provides high quality geo-environmental information that allows geo-environmental professionals and their clients to make informed decisions and be forewarned of potential ground instability problems that may affect the ground investigation, foundation design and possibly remediation options that could lead to possible additional costs.

The report is based on the BGS 1:50,000 and 1:10,000 Digital Geological Map of Great Britain, BGS Geosure data; BRITPITS database; Non-coal mining data and Borehole Records, Coal Authority data including brine extraction areas, PBA non-coal mining and natural cavities database, Johnson Poole and Bloomer mining data and Groundsure's unique database including historical surface ground and underground workings.

For further details on each dataset, please refer to each individual section in the report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

Section 1: Geology 1:10,000 Scale		
1.1 Artificial Ground	1.1 Is there any Artificial Ground/ Made Ground present beneath the study site at 1:10,000 scale?	No
1.2 Superficial Geology and Landslips	1.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site at 1:10,000 scale?*	No
	1.2.2 Are there any records of landslip within 500m of the study site boundary at 1:10,000 scale?	No
1.3 Bedrock, Solid Geology and linear features	1.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.	
	1.3.2 Are there any records of linear features within 500m of the study site boundary at 1:10,000 scale?	No

Section 2: Geology 1:50,000 Scale		
2.1 Artificial Ground	2.1.1 Is there any Artificial Ground/ Made Ground present beneath the study site?	No
	2.1.2 Are there any records relating to permeability of artificial ground within the study site*boundary?	No
2.2 Superficial Geology and Landslips	2.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site?*	Yes
	2.2.2 Are there any records of permeability of superficial ground within 500m of the study site?	Yes
	2.2.3 Are there any records of landslip within 500m of the study site boundary?	No
	2.2.4 Are there any records relating to permeability of landslips within the study site* boundary?	No

Section 2: Geology 1:50,000 Scale

2.3 Bedrock, Solid Geology and linear features	2.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.	
	2.3.2 Are there any records relating to permeability of bedrock ground within the study site boundary?	Yes
	2.3.3 Are there any records of linear features within 500m of the study site boundary?	No

Section 3: Radon

3. Radon	3.1Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?	The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.
	3.2Radon Protection	No radon protective measures are necessary.

Section 4: Ground Workings	On-site	0-50m	51-250	251-500	501-1000
4.1 Historical Surface Ground Working Features from Small Scale Mapping	7	8	17	Not Searched	Not Searched
4.2 Historical Underground Workings from Small Scale Mapping	0	0	0	0	0
4.3 Current Ground Workings	0	0	0	0	3

Section 5: Mining, Extraction & Natural Cavities	On-site	0-50m	51-250	251-500	501-1000
5.1 Historical Mining	0	0	0	0	0
5.2 Coal Mining	0	0	0	0	0
5.3 Johnson Poole and Bloomer Mining Area	0	0	0	0	0
5.4 Non-Coal Mining*	1	0	0	1	2
5.5 Non–Coal Mining Cavities	0	0	0	0	1
5.5 Natural Cavities	0	0	0	0	4

Section 5: Mining, Extraction & Natural Cavities	On-site	0-50m	51-250	251-500	501-1000
5.6 Brine Extraction	0	0	0	0	0
5.7 Gypsum Extraction	0	0	0	0	0
5.8 Tin Mining	0	0	0	0	0
5.9 Clay Mining	0	0	0	0	0

Section 6: Natural Ground Subsidence	On-site
6.1 Shrink-Swell Clay	Moderate
6.2 Landslides	Very Low
6.3 Ground Dissolution of Soluble Rocks	Negligible
6.4 Compressible Deposits	High
6.5 Collapsible Deposits	Very Low
6.5 Running Sand	Low

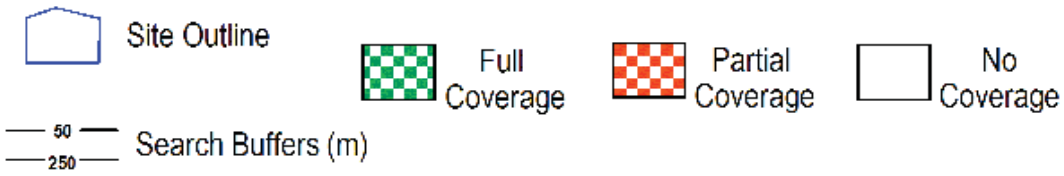
Section 7: Borehole Records	On-site	0-50m	51-250
7 BGS Recorded Boreholes	0	0	0

Section 8: Estimated Background Soil Chemistry	On-site	0-50m	51-250
8 Records of Background Soil Chemistry	9	8	0

Section 9: Railways and Tunnels	On-site	0-50m	51-250	250-500
9.1 Tunnels	0	0	0	Not Searched
9.2 Historical Railway and Tunnel Features	0	0	0	Not Searched
9.3 Historical Railways	0	0	0	Not Searched
9.4 Active Railways	0	0	6	Not Searched
9.5 Railway Projects	0	0	0	0

1:10,000 Scale Availability

1_10,000 Availability Legend



Availability of 1:10,000 Scale Geology Mapping

The following information represents the availability of the key components of the 1:10,000 scale geological data.

ID	Distance	Artificial Coverage	Superficial Coverage	Bedrock Coverage	Mass Movement Coverage
1	0.0	No deposits are mapped	No coverage	No coverage	No coverage

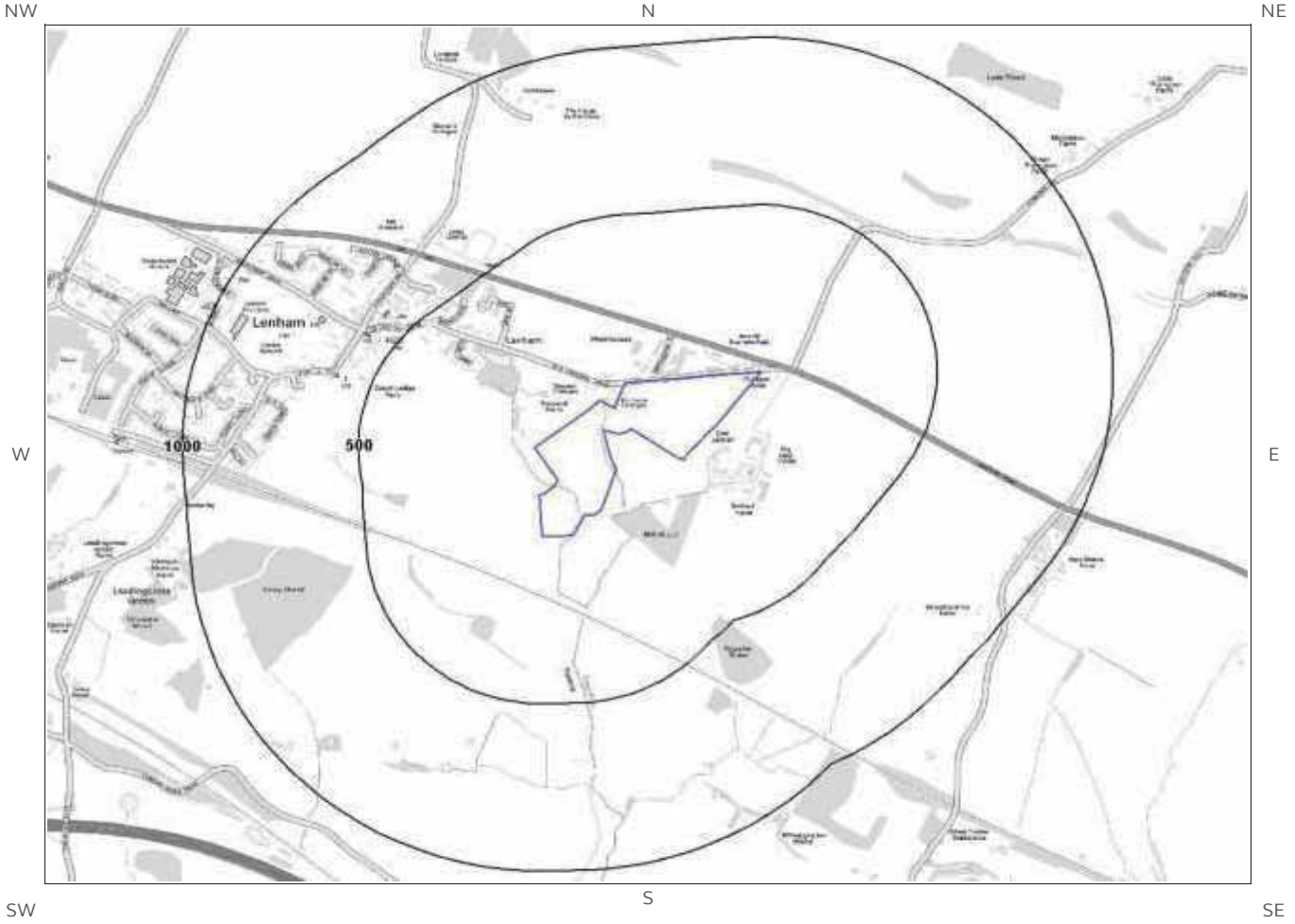
Guidance: The 1:10,000 scale geological interpretation is the most detailed generally available from BGS and is the scale at which most geological surveying is carried out in the field. The database is presented as four types of geology (artificial, mass movement, superficial and bedrock), although not all themes are mapped or available on every map sheet. Therefore a coverage layer showing the availability of the four themes is presented above.

The definitions of coverage are as follows:

Geology	Full Coverage	Partial Coverage	No Coverage
Bedrock	The whole tile has been mapped	Some but not all the tile has been mapped	No coverage
Superficial	The whole tile has been mapped	Some but not all of the tile has been mapped	No coverage
Artificial	Some deposits are mapped on this tile	-	No deposits are mapped
Mass Movement	Some deposits are mapped on this tile	-	No coverage

1 Geology (1:10,000 scale).

1.1 Artificial Ground map (1:10,000 scale)



Artificial Ground Legend

Site Outline

500
1000
Search Buffers (m)

Made Ground (undivided)

Disturbed Ground (undivided)

Worked Ground (undivided)

Landscaped Ground (undivided)

Infilled Ground

Reclaimed Ground

1. Geology 1:10,000 scale

1.1 Artificial Ground

The following geological information represented on the mapping is derived from 1:10,000 scale BGS Geological mapping.

Are there any records of Artificial/ Made Ground within 500m of the study site boundary at 1:10,000 scale? No

Database searched and no data found.

1.2 Superficial Deposits and Landslips map (1:10,000 scale)

Artificial Ground Legend

Site Outline

500
1000
Search Buffers (m)

1.2 Superficial Deposits and Landslips

The following geological information represented on the mapping is derived from 1:10,000 scale BGS Geological mapping

1.2.1 Superficial Deposits/ Drift Geology

Are there any records of Superficial Deposits/ Drift Geology within 500m of the study site boundary at 1:10,000 scale? No

Database searched and no data found.

1.2.2 Landslip

Are there any records of Landslip within 500m of the study site boundary at 1:10,000 scale?

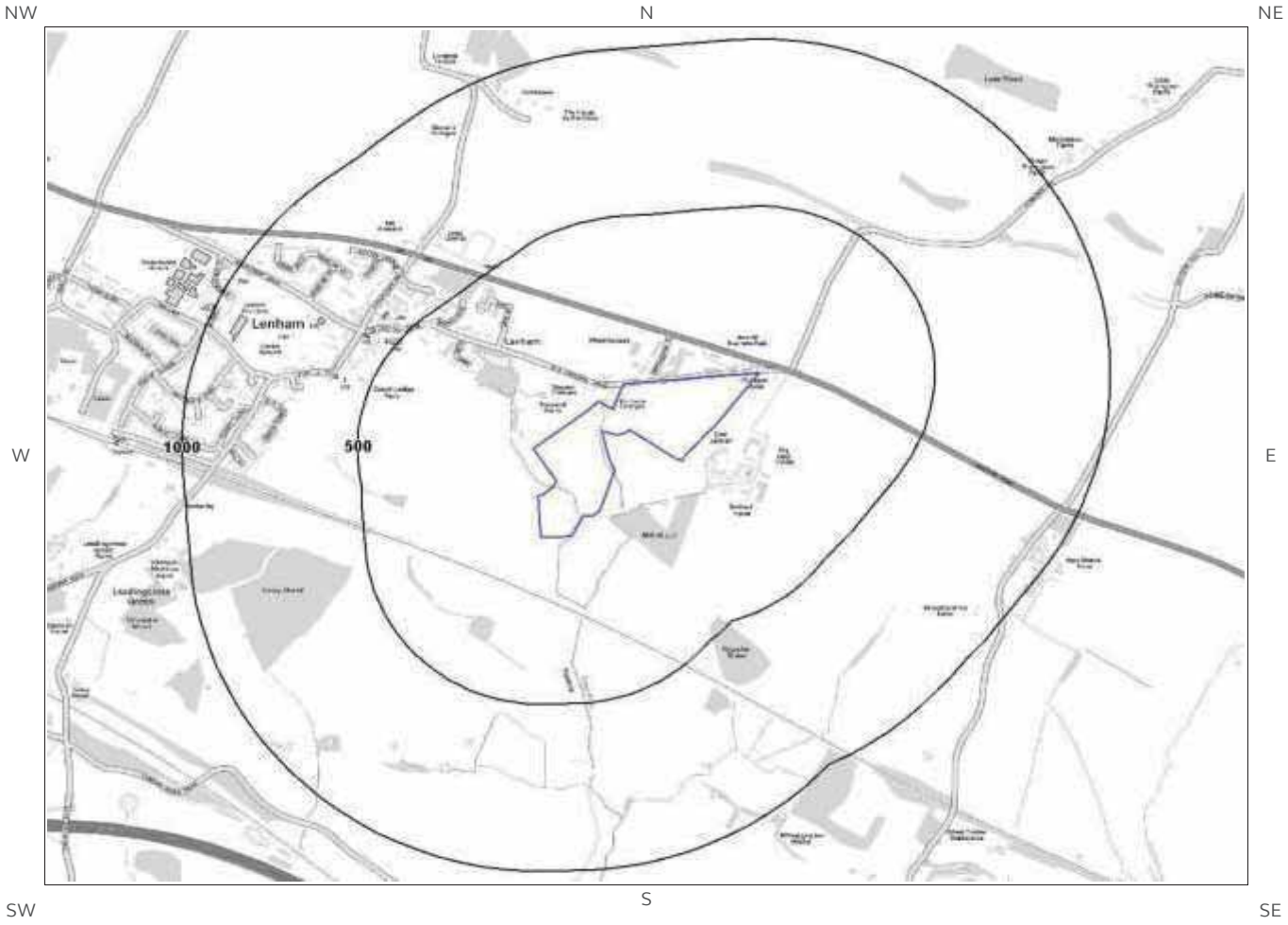
No

Database searched and no data found.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:10,000 scale

This Geology shows the main components as discrete layers, these are: Artificial / Made Ground, Superficial / Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

1.3 Bedrock and linear features map (1:10,000 scale)



Bedrock and linear features Legend

Site Outline

500
1000
Search Buffers (m)

1.3 Bedrock and linear features

The following geological information represented on the mapping is derived from 1:10,000 scale BGS Geological mapping.

1.3.1 Bedrock/ Solid Geology

Records of Bedrock/Solid Geology within 500m of the study site boundary at 1:10,000 scale.

Database searched and no data found at this scale.

1.3.2 Linear features

Are there any records of linear features within 500m of the study site boundary at 1:10,000 scale? No

Database searched and no data found at this scale.

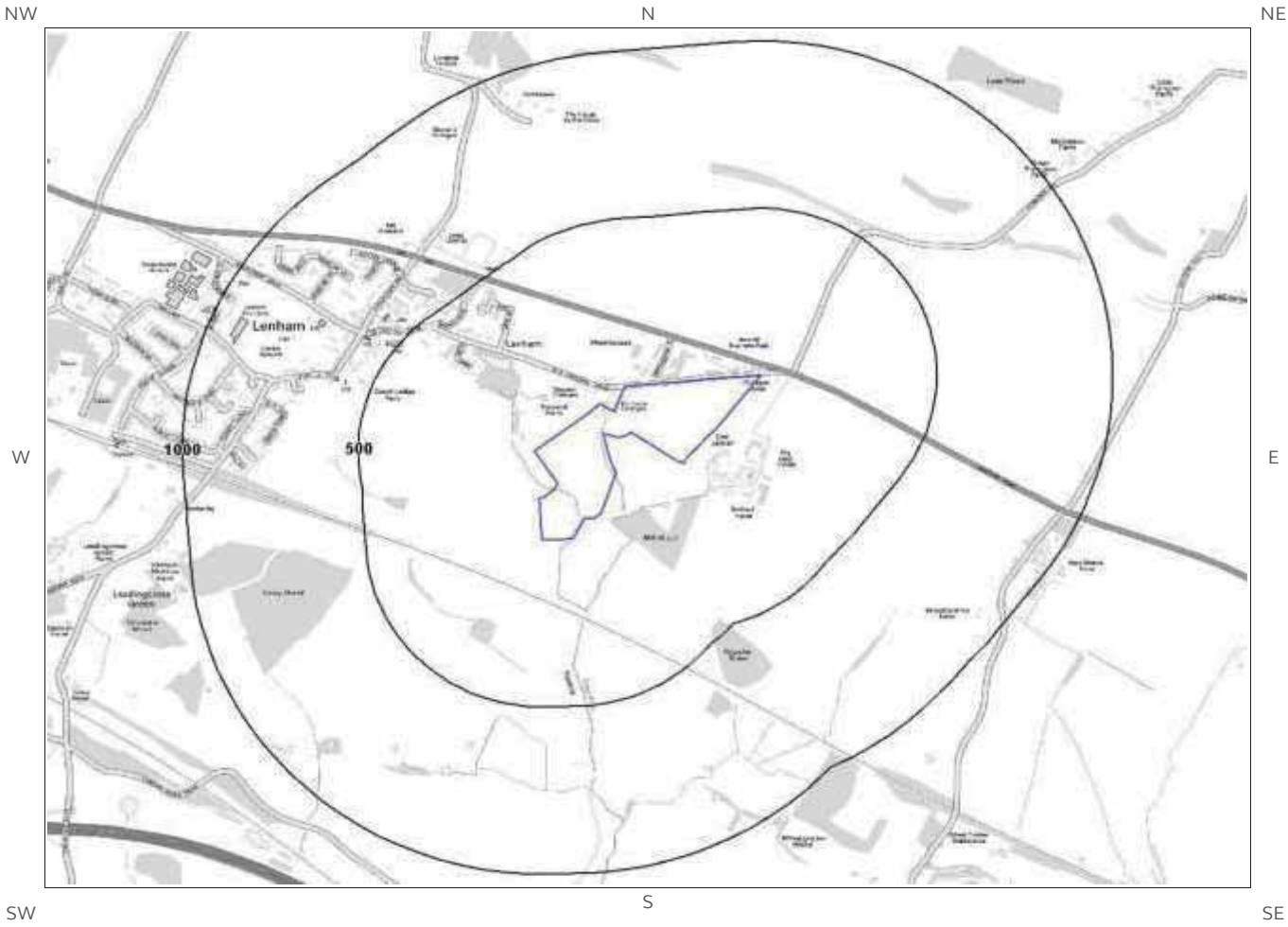
The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of great Britain at 1:10,000 scale.

This Geology shows the main components as discrete layers, these are: Bedrock/ Solid Geology and linear features such as faults. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

---

2 Geology 1:50,000 Scale

2.1 Artificial Ground map



Site Outline

500
1000
Search Buffers (m)

Made Ground (undivided)

Worked Ground (undivided)

Infilled Ground

Disturbed Ground (undivided)

Landscaped Ground (undivided)

Reclaimed Ground

2. Geology 1:50,000 scale

2.1 Artificial Ground

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No: 288

2.1.1 Artificial/ Made Ground

Are there any records of Artificial/ Made Ground within 500m of the study site boundary? No

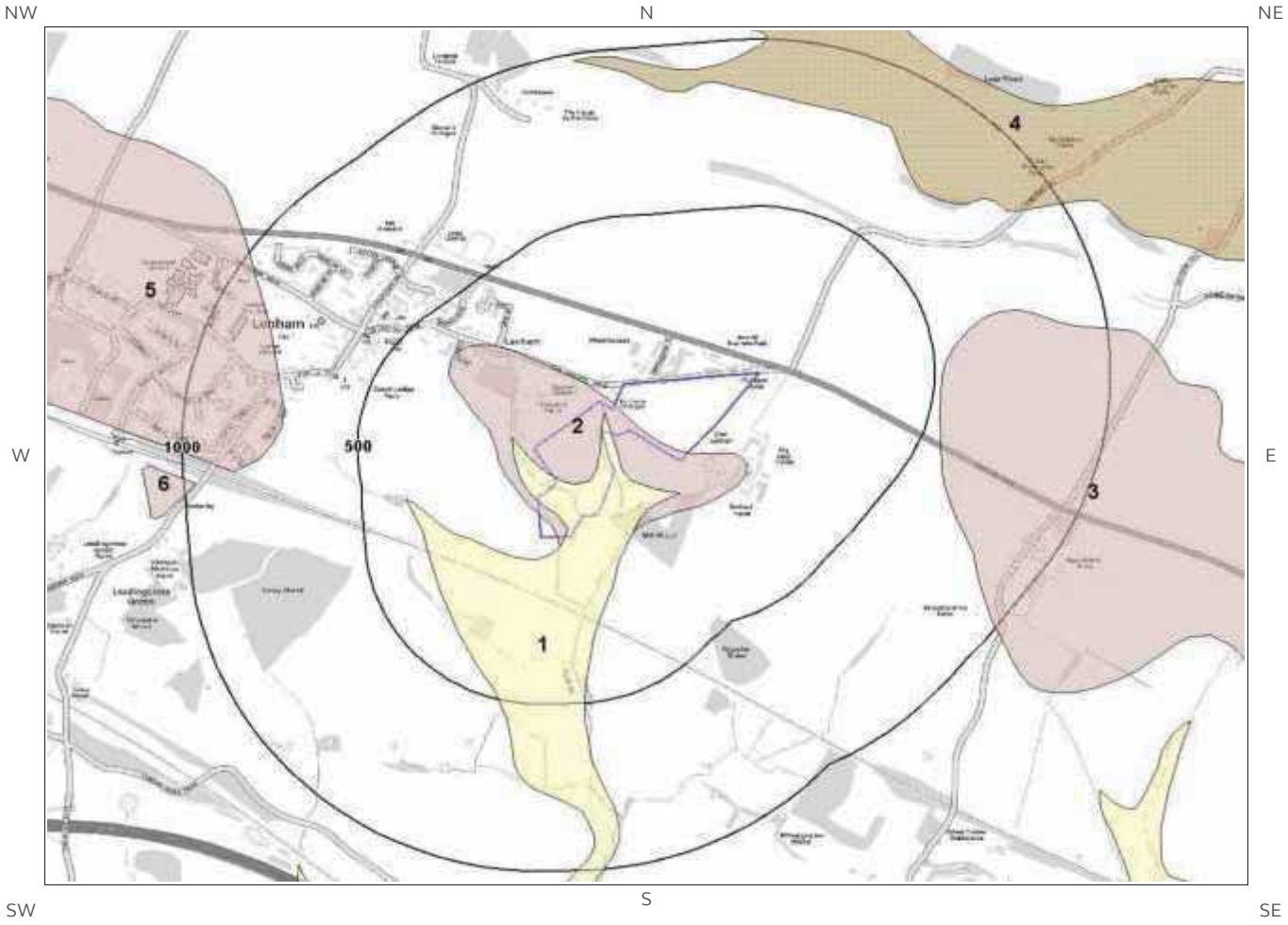
Database searched and no data found.

2.1.2 Permeability of Artificial Ground

Are there any records relating to permeability of artificial ground within the study site boundary? No

Database searched and no data found.

2.2 Superficial Deposits and Landslips map (1:50,000 scale)



Site Outline

500
1000
Search Buffers (m)

2.2 Superficial Deposits and Landslips

2.2.1 Superficial Deposits/ Drift Geology

Are there any records of Superficial Deposits/ Drift Geology within 500m of the study site boundary? Yes

ID	Distance	Direction	LEX Code	Description	Rock Description
1	0.0	On Site	ALV-XCZSP	ALLUVIUM	CLAY, SILT, SAND AND PEAT
2	0.0	On Site	HEAD-XCZSV	HEAD	CLAY, SILT, SAND AND GRAVEL

2.2.2 Permeability of Superficial Ground

Are there any records relating to permeability of superficial ground within the study site boundary? Yes

Distance (m)	Direction	Flow Type	Maximum Permeability	Minimum Permeability
0.0	On Site	Mixed	High	Very Low
0.0	On Site	Intergranular	Moderate	Very Low

2.2.3 Landslip

Are there any records of Landslip within 500m of the study site boundary? No

Database searched and no data found.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

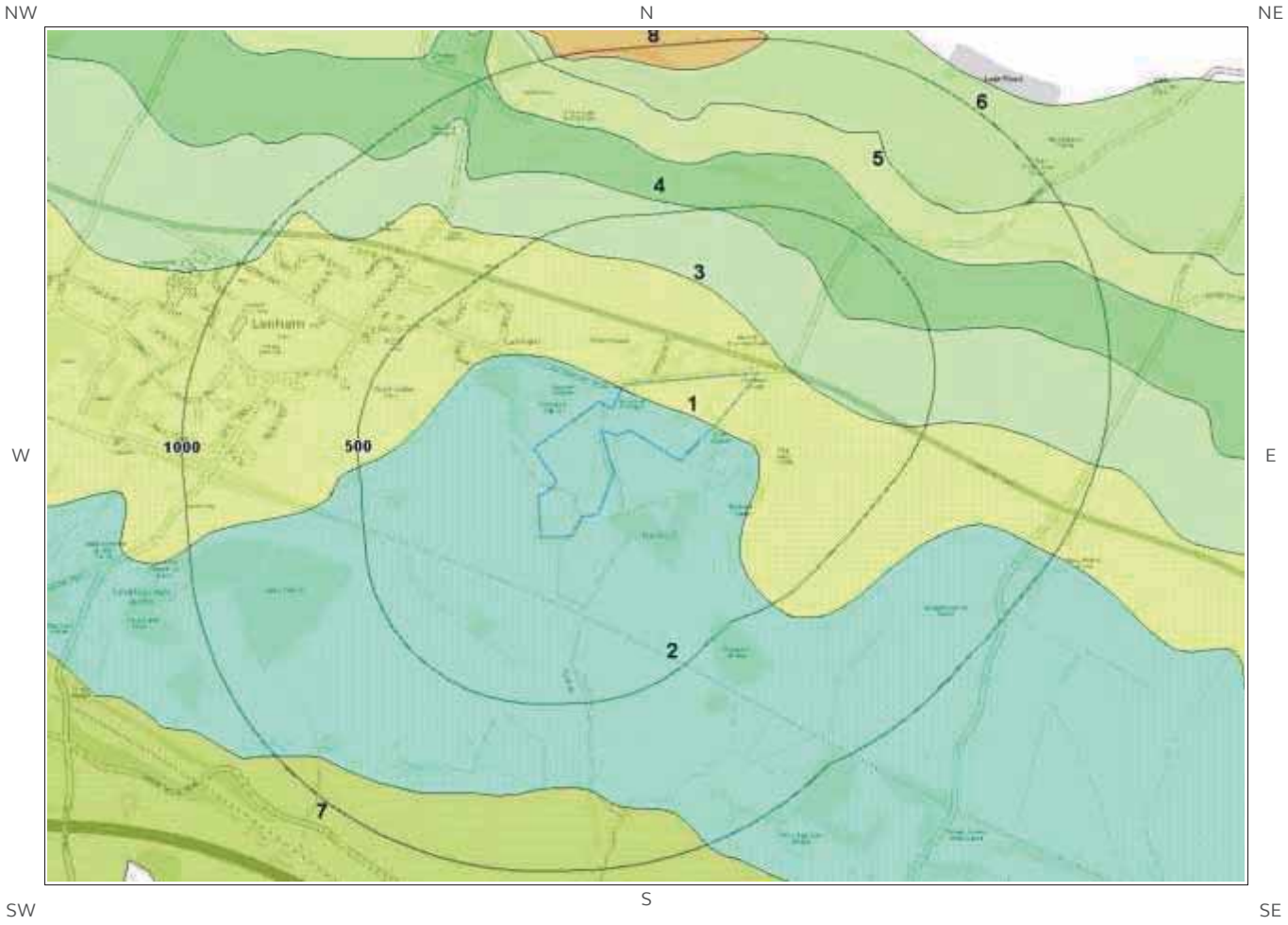
This Geology shows the main components as discrete layers, there are: Artificial/ Made Ground, Superficial/ Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

2.2.4 Landslip Permeability

Are there any records relating to permeability of landslips within the study site boundary? No

Database searched and no data found.

2.3 Bedrock and linear features map (1:50,000 scale)



Site Outline

500
1000
Search Buffers (m)

2.3 Bedrock, Solid Geology & linear features

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No: 288

2.3.1 Bedrock/Solid Geology

Records of Bedrock/Solid Geology within 500m of the study site boundary:

ID	Distance	Direction	LEX Code	Rock Description	Rock Age
1	0.0	On Site	WMCH-CHLK	WEST MELBURY MARLY CHALK FORMATION - CHALK	CENOMANIAN
2	0.0	On Site	GLT-MDST	GAULT FORMATION - MUDSTONE	ALBIAN
3	74.0	NE	ZZCH-CHLK	ZIG ZAG CHALK FORMATION - CHALK	CENOMANIAN
4	294.0	NE	HCK-CHLK	HOLYWELL NODULAR CHALK FORMATION - CHALK	CENOMANIAN

2.3.2 Permeability of Bedrock Ground

Are there any records relating to permeability of bedrock ground within the study site boundary? Yes

Distance	Direction	Flow Type	Maximum Permeability	Minimum Permeability
0.0	On Site	Fracture	Very High	High
0.0	On Site	Fracture	Low	Very Low

2.3.3 Linear features

Are there any records of linear features within 500m of the study site boundary? No

Database searched and no data found.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

This Geology shows the main components as discrete layers, these are: Bedrock/Solid Geology and linear features such as faults. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nation wide coverage.

3 Radon Data

3.1 Radon Affected Areas

Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level? The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.

The radon data in this report is supplied by the BGS/Public Health England and is the definitive map of Radon Affected Areas in Great Britain and Northern Ireland. The dataset was created using long-term radon measurements in over 479,000 homes across Great Britain and 23,000 homes across Northern Ireland, combined with geological data. The dataset is considered accurate to 50m to allow for the margin of error in geological lines, and the findings of this report supercede any answer given in the less accurate Indicative Atlas of Radon in Great Britain, which simplifies the data to give the highest risk within any given 1km grid square. As such, the radon atlas is considered indicative, whereas the data given in this report is considered definitive.

3.2 Radon Protection

Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment? No radon protective measures are necessary.

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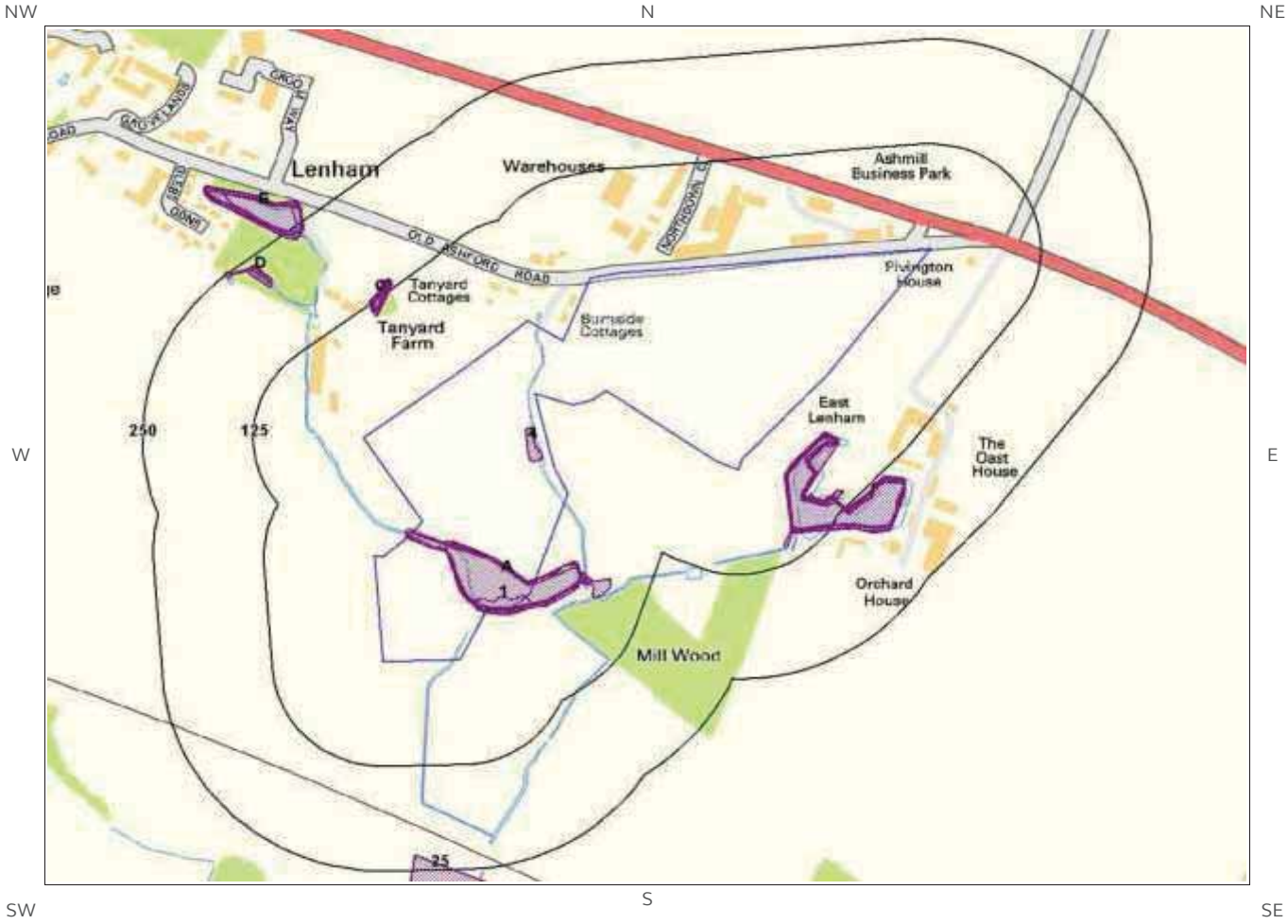
4 Ground Workings map



Ground Workings Legend

Site Outline

125
250
Search Buffers (m)

Historic Surface Ground Workings

Historic Underground Workings

Current Ground Workings

4 Ground Workings

4.1 Historical Surface Ground Working Features derived from Historical Mapping

This dataset is based on Groundsure's unique Historical Land Use Database derived from 1:10,560 and 1:10,000 scale historical mapping

Are there any Historical Surface Ground Working Features within 250m of the study site boundary? Yes

ID	Distance (m)	Direction	NGR	Use	Date
1	0.0	On Site	590478 151606	Pond	1955
2A	0.0	On Site	590485 151647	Pond	1871
3A	0.0	On Site	590470 151644	Mill Pond	1908
4	0.0	On Site	590514 151797	Pond	1896
5A	0.0	On Site	590497 151641	Mill Pond	1896
6A	0.0	On Site	590492 151639	Mill Pond	1906
7A	0.0	On Site	590493 151642	Mill Pond	1906
8B	44.0	SE	590810 151738	Pond	1906
9B	44.0	SE	590808 151738	Ponds	1906
10B	44.0	SE	590812 151743	Ponds	1896
11B	45.0	SE	590813 151754	Ponds	1871
12B	46.0	SE	590813 151749	Ponds	1955
13B	46.0	SE	590813 151749	Ponds	1970
14B	46.0	SE	590813 151749	Ponds	1990
15B	48.0	SE	590813 151749	Pond	1908
16C	109.0	NW	590341 151969	Pond	1955
17C	110.0	NW	590344 151972	Pond	1970
18C	110.0	NW	590344 151972	Pond	1990
19C	114.0	NW	590343 151976	Pond	1896
20C	114.0	NW	590340 151975	Pond	1906
21C	115.0	NW	590341 151976	Pond	1906

ID	Distance (m)	Direction	NGR	Use	Date
22D	207.0	NW	590204 151996	Pond	1970
23D	207.0	NW	590204 151996	Pond	1990
24D	213.0	NW	590170 152001	Ponds	1896
25	232.0	S	590422 151233	Sewage Works	1970
26E	236.0	NW	590196 152071	Pond	1955
27E	237.0	NW	590196 152072	Pond	1908
28E	241.0	NW	590197 152078	Pond	1896
29E	241.0	NW	590195 152076	Pond	1906
30E	241.0	NW	590196 152076	Pond	1906
31E	244.0	NW	590204 152074	Pond	1970
32E	244.0	NW	590204 152074	Pond	1990

4.2 Historical Underground Working Features derived from Historical Mapping

This data is derived from the Groundsure unique Historical Land Use Database. It contains data derived from 1:10,000 and 1:10,560 historical Ordnance Survey Mapping and includes some natural topographical features (Shake Holes for example) as well as manmade features that may have implications for ground stability. Underground and mining features have been identified from surface features such as shafts. The distance that these extend underground is not shown.

Are there any Historical Underground Working Features within 1000m of the study site boundary? No

Database searched and no data found.

4.3 Current Ground Workings

This dataset is derived from the BGS BRITPITS database covering active; inactive mines; quarries; oil wells; gas wells and mineral wharves; and rail deposits throughout the British Isles.

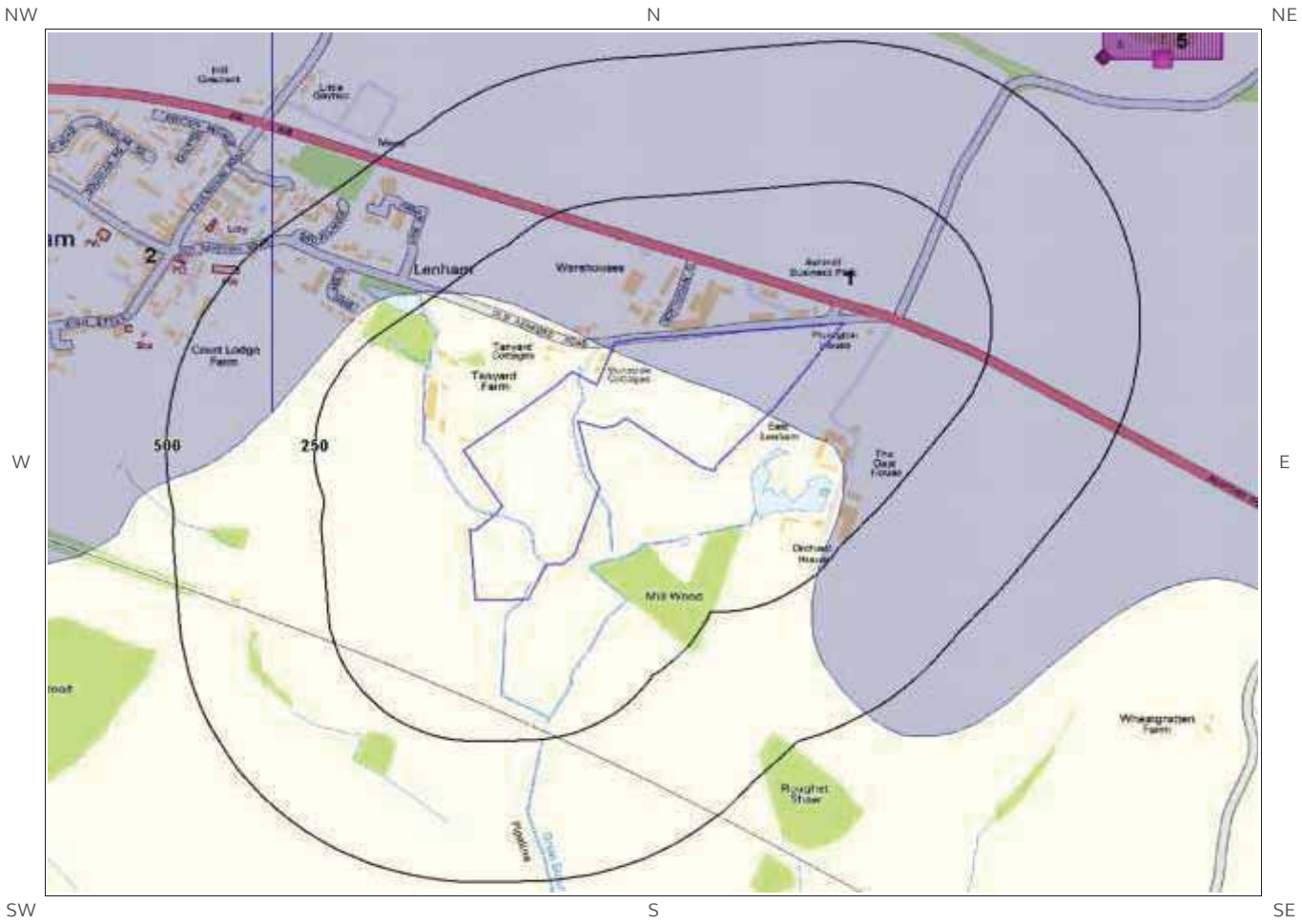
Are there any BGS Current Ground Workings within 1000m of the study site boundary? Yes

The following Current Ground Workings information is provided by British Geological Survey:

ID	Distance (m)	Direction	NGR	Commodity Produced	Pit Name	Type of working	Status
Not shown	515.0	NE	591252 152457	Chalk	Pivington Farm Chalk Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	789.0	NE	591605 152488	Chalk	Pivington Farm	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased

ID	Distance (m)	Direction	NGR	Commodity Produced	Pit Name	Type of working	Status
Not shown	983.0	N	590230 152915	Chalk	Lee Farm	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased

5 Mining, Extraction & Natural Cavities map



Mining, Extraction and Natural Cavities Legend

5 Mining, Extraction & Natural Cavities

5.1 Historical Mining

This dataset is derived from Groundsure unique Historical Land-use Database that are indicative of mining or extraction activities.

Are there any Historical Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

5.2 Coal Mining

This dataset provides information as to whether the study site lies within a known coal mining affected area as defined by the coal authority.

Are there any Coal Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

5.3 Johnson Poole and Bloomer

This dataset provides information as to whether the study site lies within an area where JPB hold information relating to mining.

Are there any JPB Mining areas within 1000m of the study site boundary? No

The following information provided by JPB is not represented on mapping: Database searched and no data found.

5.4 Non-Coal Mining

This dataset provides information as to whether the study site lies within an area which may have been subject to non-coal historic mining.

Are there any Non-Coal Mining areas within 1000m of the study site boundary? Yes

The following non-coal mining information is provided by the BGS:

ID	Distance (m)	Direction	Name	Commodity	Assessment of likelihood
1	0.0	On Site	Not available	Chalk	Sporadic underground mining of restricted extent may have occurred. Potential for difficult ground conditions are unlikely and localised and are at a level where they need not be considered

ID	Distance (m)	Direction	Name	Commodity	Assessment of likelihood
2	328.0	W	Not available	Chalk	Sporadic underground mining of restricted extent may have occurred. Potential for difficult ground conditions are unlikely and localised and are at a level where they need not be considered
Not shown	751.0	S	Not available	Sand	Sporadic underground mining of restricted extent may have occurred. Potential for difficult ground conditions are unlikely and localised and are at a level where they need not be considered
Not shown	838.0	SW	Not available	Sand	Sporadic underground mining of restricted extent may have occurred. Potential for difficult ground conditions are unlikely and localised and are at a level where they need not be considered

5.5 Non-Coal Mining Cavities

This dataset provides information from the Peter Brett Associates (PBA) mining cavities database (compiled for the national study entitled "Review of mining instability in Great Britain, 1990" PBA has also continued adding to this database) on mineral extraction by mining.

Are there any Non-Coal Mining cavities within 1000m of the study site boundary? Yes

The following Non-Coal Mining Cavities information provided by Peter Brett Associates:

ID	Distance (m)	Direction	NGR	Address	Superficial Deposits	Bedrock Deposits	Extracted Mineral
5	714.0	NE	591500 152500	Lenham, Kent	-	Middle Chalk Formation, Melbourn Rock	Chalk

5.6 Natural Cavities

This dataset provides information based on the Peter Brett Associates natural cavities database. The dataset is made up of points and polygons. Where polygons are used these represent an area in which it is expected the cavities could be found. It does not indicate that cavities are present everywhere within the polygon, and caution should be used in the interpretation of this data.

Are there any Natural Cavities within 1000m of the study site boundary? Yes

The following Natural Cavities information provided by Peter Brett Associates:

ID	Distance (m)	Direction	NGR	Superficial Deposits	Bedrock Deposits	Cavity Type and Number
6	642.0	NE	591400 152500	-	Chalk Group	Solution Pipe x 40
7	642.0	NE	591500 152550	-	Chalk Group	Solution Pipe
Not shown	710.0	N	591200 152700	-	Chalk Group	Solution Pipe x 1
Not shown	710.0	N	591200 152700	-	Chalk Group	Solution Pipe

5.7 Brine Extraction

This data provides information from the Cheshire Brine Subsidence Compensation Board.

Are there any Brine Extraction areas within 1000m of the study site boundary? No

Database searched and no data found.

5.8 Gypsum Extraction

This dataset provides information on Gypsum extraction from British Gypsum records.

Are there any Gypsum Extraction areas within 1000m of the study site boundary? No

Database searched and no data found.

5.9 Tin Mining

This dataset provides information on tin mining areas and is derived from tin mining records. This search is based upon postcode information to a sector level..

Are there any Tin Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

5.10 Clay Mining

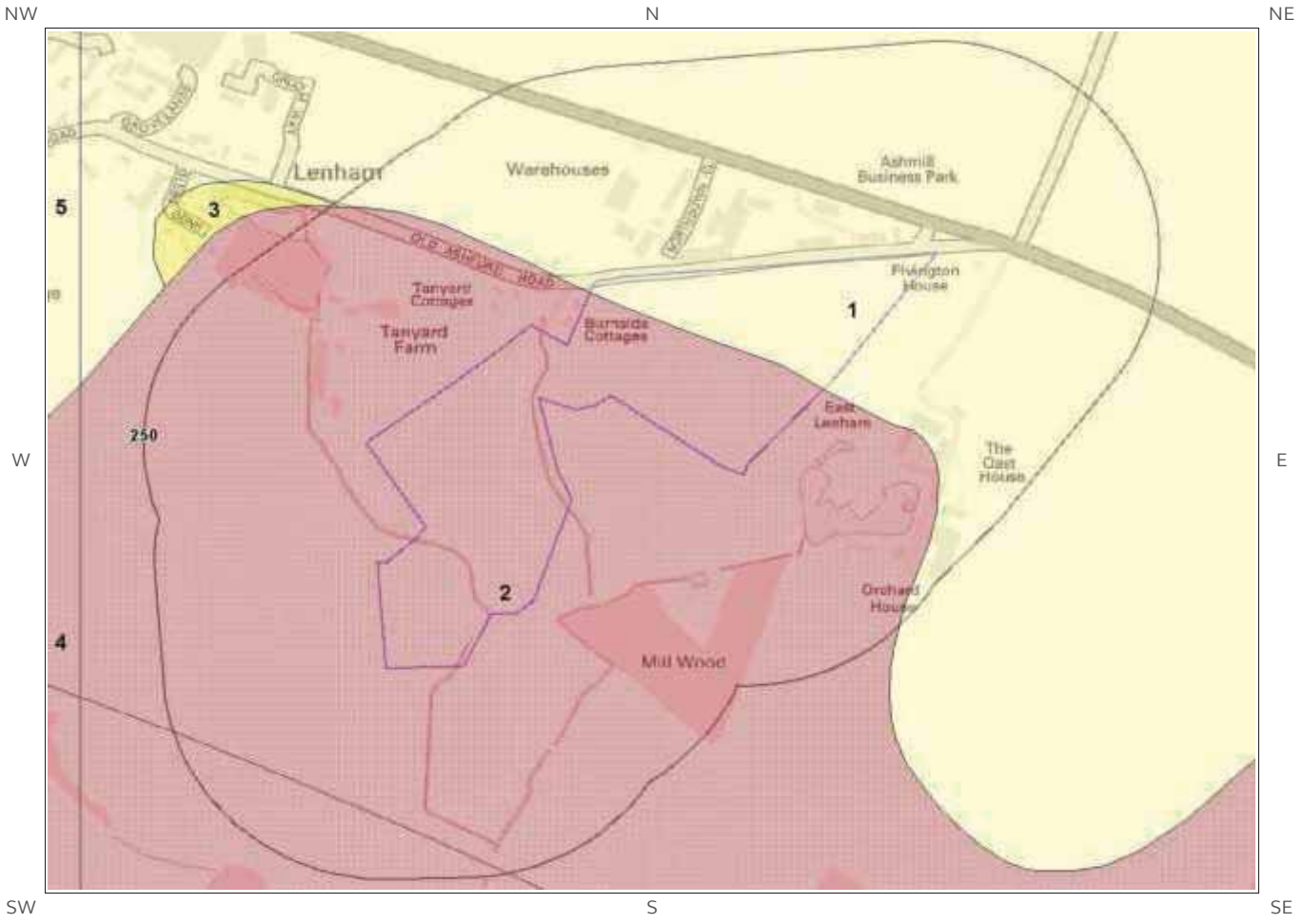
This dataset provides information on Kaolin and Ball Clay mining from relevant mining records.

Are there any Clay Mining areas within 1000m of the study site boundary? No

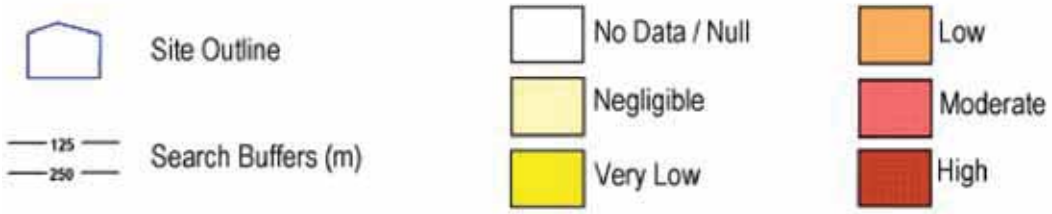
Database searched and no data found.

6 Natural Ground Subsidence

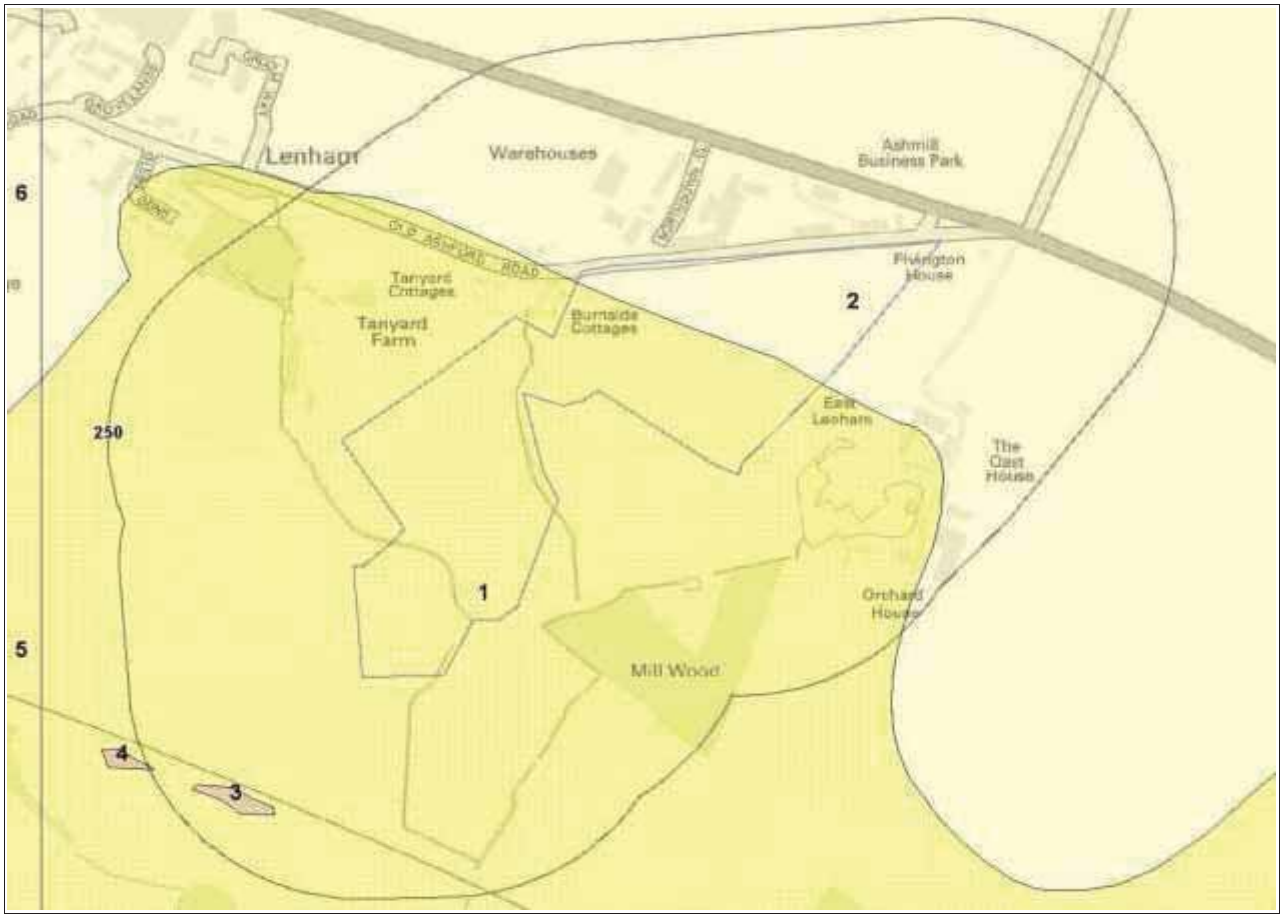
6.1 Shrink-Swell Clay map



Shrink Swell Clay Legend



6.2 Landslides map



Landslides Legend

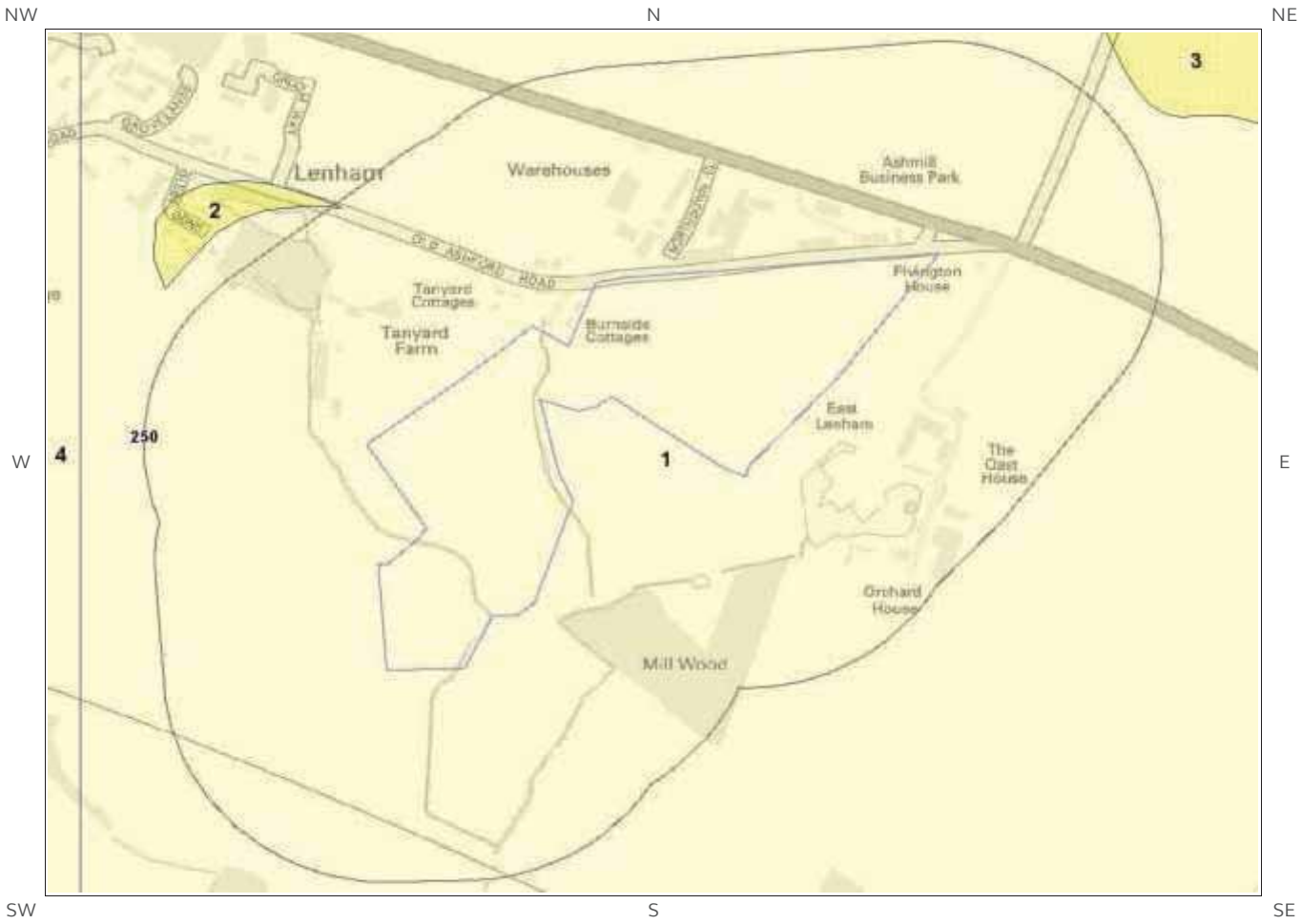
Site Outline

125
250
Search Buffers (m)

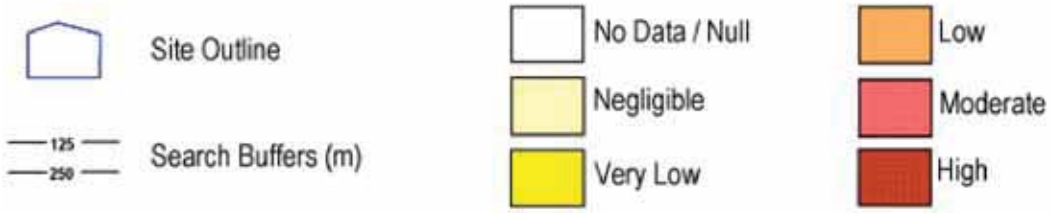
No Data / Null
Negligible
Very Low

Low
Moderate
High

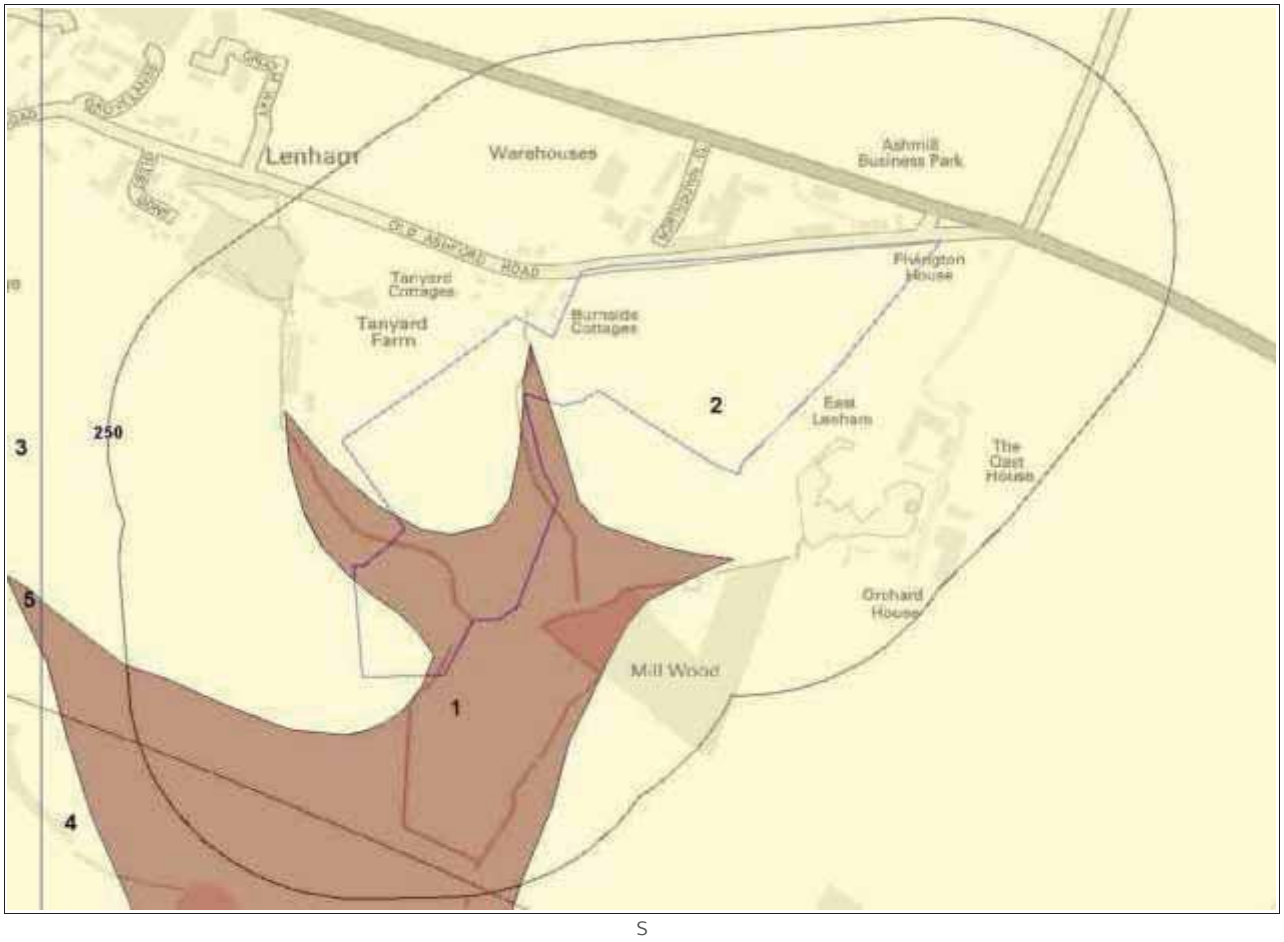
6.3 Ground Dissolution of Soluble Rocks map



Ground Dissolution Soluble Rocks Legend



6.4 Compressible Deposits map



Compressible Deposits Legend

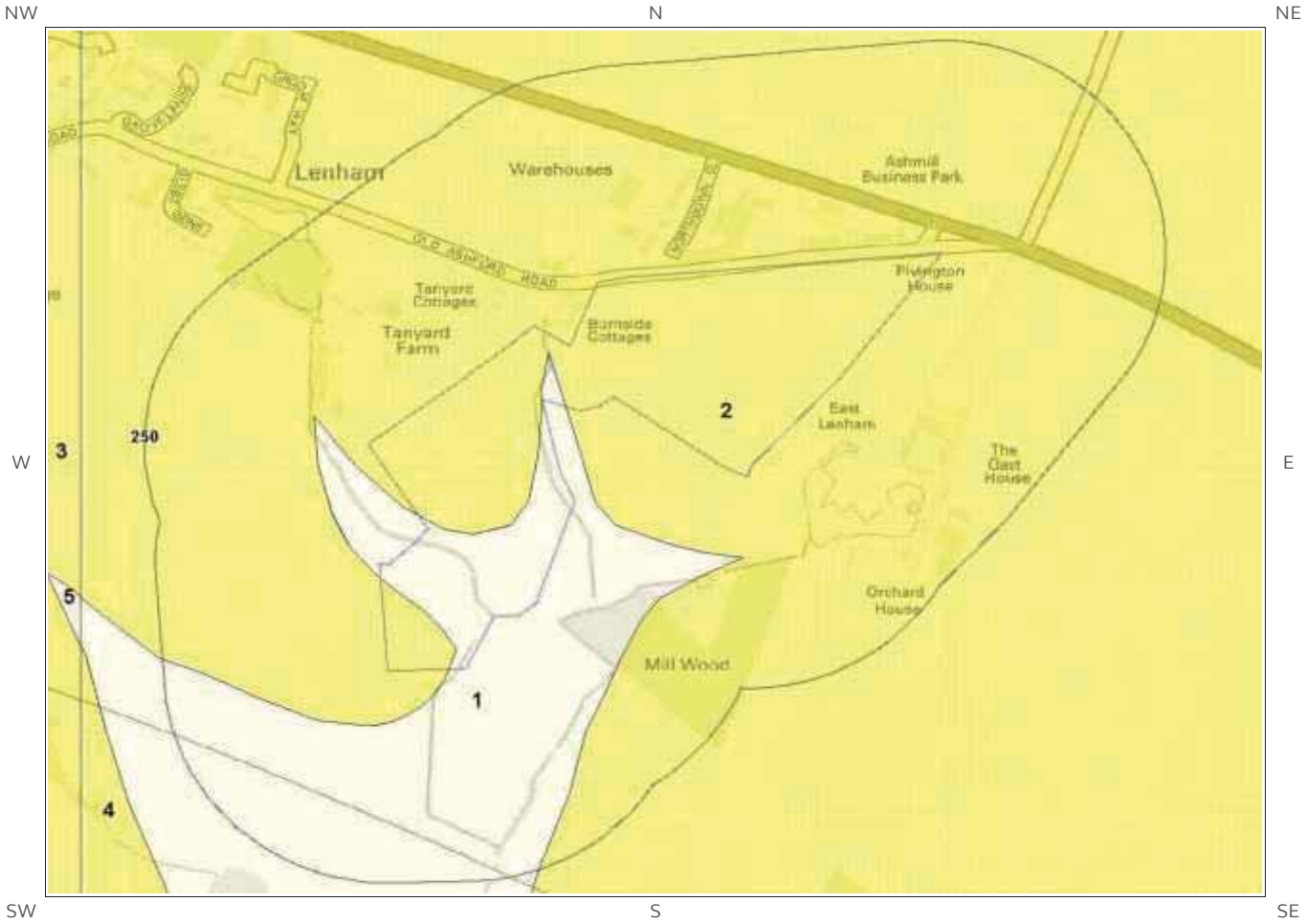
Site Outline

125
250
Search Buffers (m)

No Data / Null
Negligible
Very Low

Low
Moderate
High

6.5 Collapsible Deposits map



Collapsible Deposits Legend

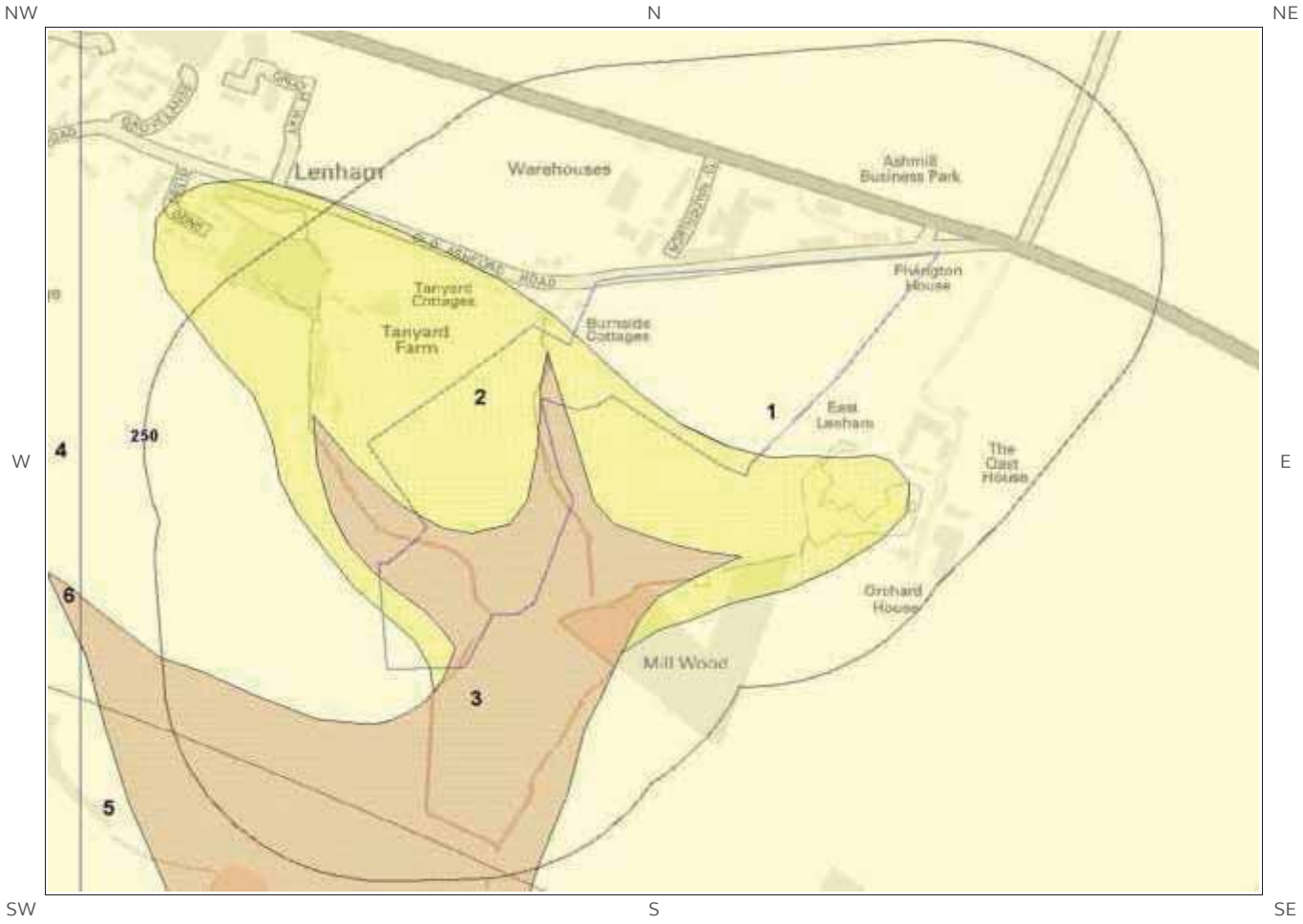
Site Outline

125
250
Search Buffers (m)

No Data / Null
Negligible
Very Low

Low
Moderate
High

6.6 Running Sand map



Running Sand Legend

Site Outline

125
250
Search Buffers (m)

No Data / Null
Negligible
Very Low

Low
Moderate
High

6 Natural Ground Subsidence

The National Ground Subsidence rating is obtained through the 6 natural ground stability hazard datasets, which are supplied by the British Geological Survey (BGS).

The following GeoSure data represented on the mapping is derived from the BGS Digital Geological map of Great Britain at 1:50,000 scale.

What is the maximum hazard rating of natural subsidence within the study site*[*] boundary? High

6.1 Shrink-Swell Clays

The following Shrink Swell information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	Ground conditions predominantly non-plastic. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely likely due to potential problems with shrink-swell clays.
2	0.0	On Site	Moderate	Ground conditions predominantly high plasticity. Do not plant or remove trees or shrubs near to buildings without expert advice about their effect and management. For new build, consideration should be given to advice published by the National House Building Council (NHBC) and the Building Research Establishment (BRE). There is a probable increase in construction cost to reduce potential shrink-swell problems. For existing property, there is a probable increase in insurance risk during droughts or where vegetation with high moisture demands is present.

6.2 Landslides

The following Landslides information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.

* This includes an automatically generated 50m buffer zone around the site

ID	Distance (m)	Direction	Hazard Rating	Details
2	0.0	On Site	Negligible	No indicators for slope instability identified. No special actions required to avoid problems due to landslides. No special ground investigation required and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.

6.3 Ground Dissolution of Soluble Rocks

The following Ground Dissolution information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.

6.4 Compressible Deposits

The following Compressible Deposits information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	High	Very significant potential for compressibility problems. Avoid large differential loadings of ground. Do not drain or de-water ground near the property without technical advice. For new build - consider possibility of compressible ground in ground investigation, construction and building design. Consider effects of groundwater changes. Construction may not be possible at economic cost. For existing property - probable increase in insurance risk from compressibility especially if water conditions or loading of the ground change significantly.
2	0.0	On Site	Negligible	No indicators for compressible deposits identified. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.

6.5 Collapsible Deposits

The following Collapsible Rocks information provided by the British Geological Survey:

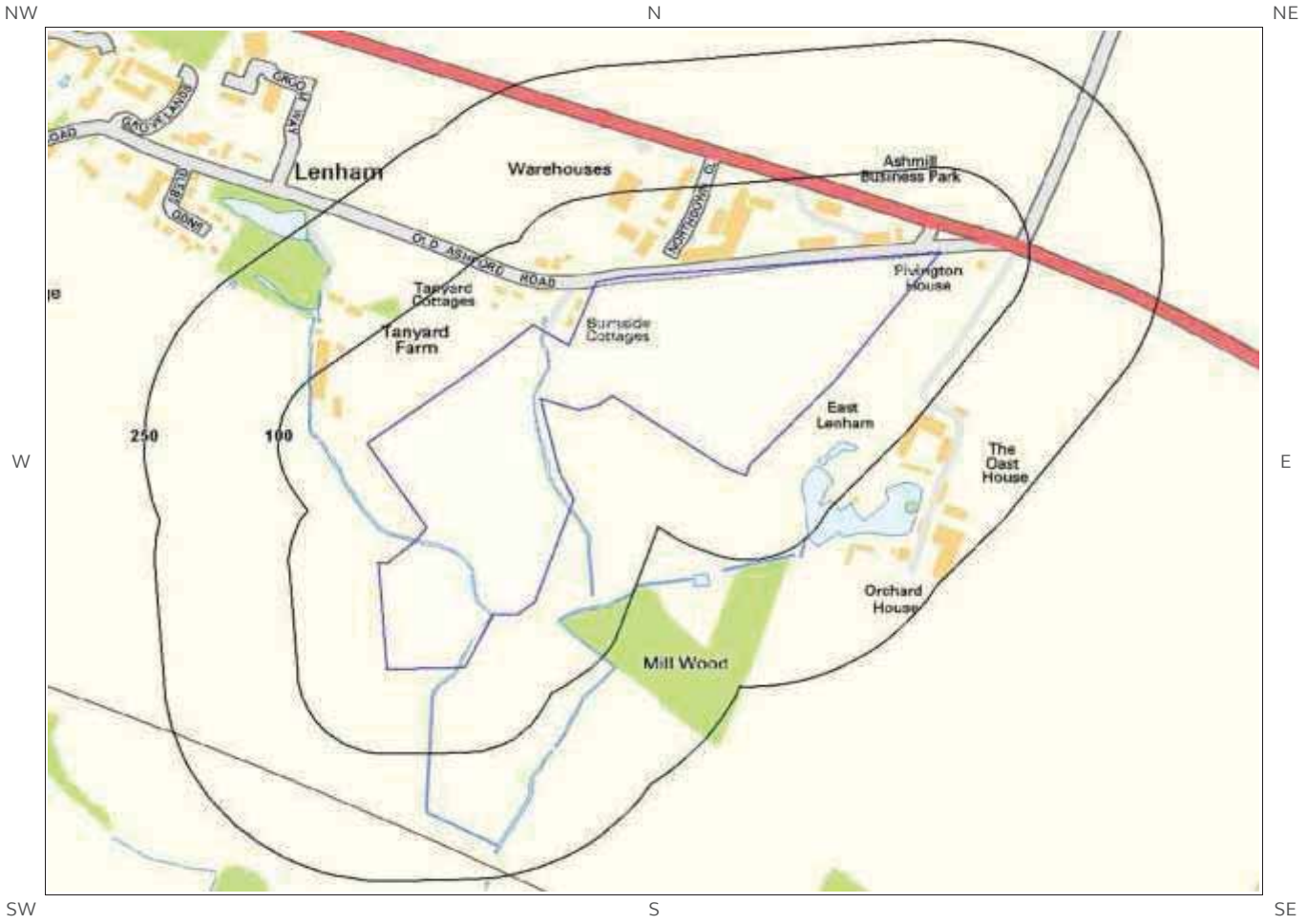
ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for collapsible deposits identified. No actions required to avoid problems due to collapsible deposits. No special ground investigation required, or increased construction costs or increased financial risk due to potential problems with collapsible deposits.
2	0.0	On Site	Very Low	Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

6.6 Running Sands

The following Running Sands information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for running sand identified. No special actions required to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.
2	0.0	On Site	Very Low	Very low potential for running sand problems if water table rises or if sandy strata are exposed to water. No special actions required, to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.
3	0.0	On Site	Low	Possibility of running sand problems after major changes in ground conditions. Normal maintenance to avoid leakage of water-bearing services or water bodies (ponds, swimming pools) should reduce likelihood of problems due to running sand. For new build - consider possibility of running sand into trenches or excavations if water table is high or sandy strata are exposed to water. Avoid concentrated water inputs to site. Unlikely to be an increase in construction costs due to potential for running sand. For existing property - no significant increase in insurance risk due to running sand problems is likely.

7 Borehole Records map



Borehole Records Legend

Site Outline

Borehole Locations

125
250
Search Buffers (m)

7 Borehole Records

The systematic analysis of data extracted from the BGS Borehole Records database provides the following information.

Records of boreholes within 250m of the study site boundary: 0

Database searched and no data found.

8 Estimated Background Soil Chemistry

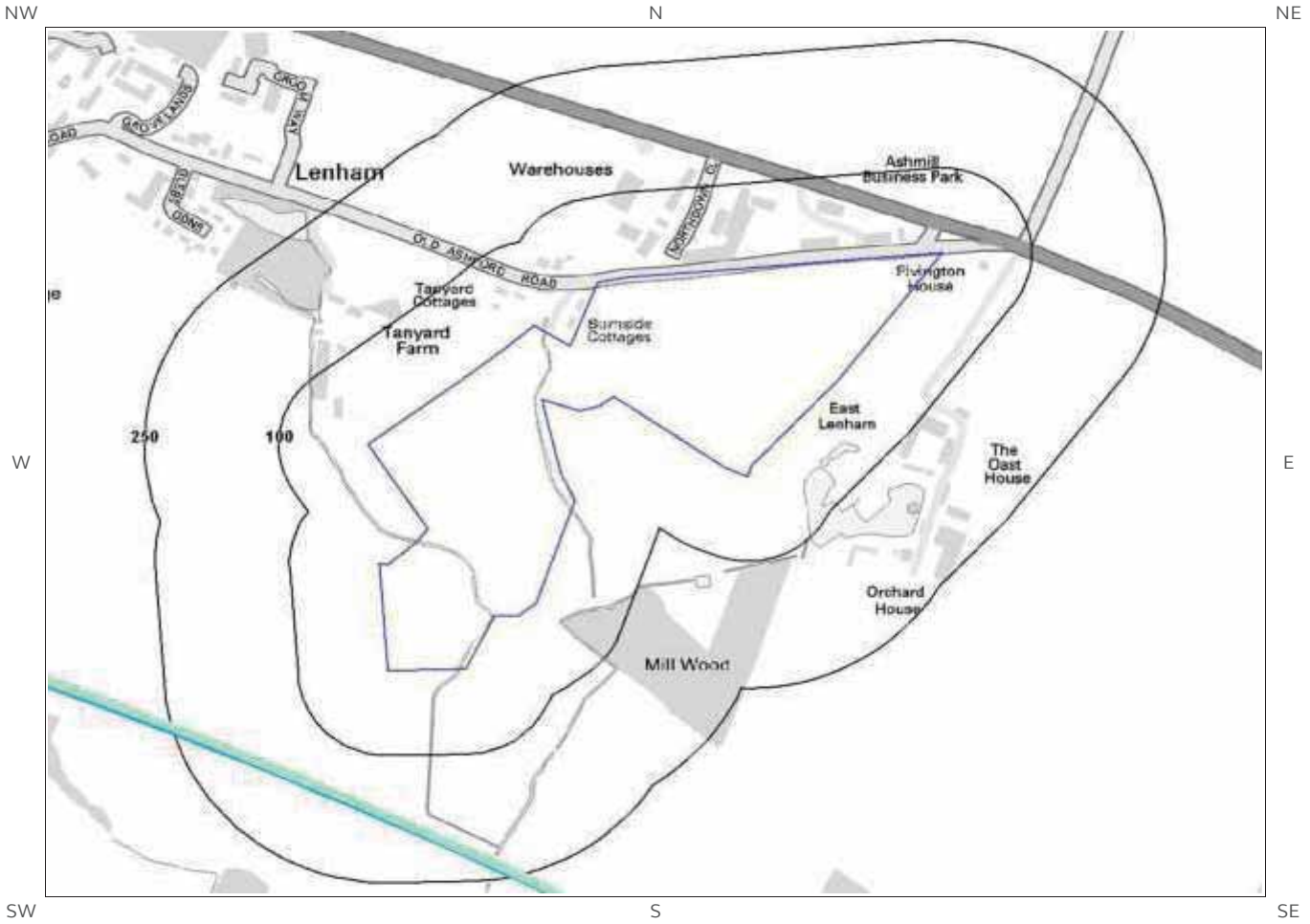
Records of background estimated soil chemistry within 250m of the study site boundary: 17

For further information on how this data is calculated and limitations upon its use, please see the Groundsure Geo Insight User Guide, available on request.

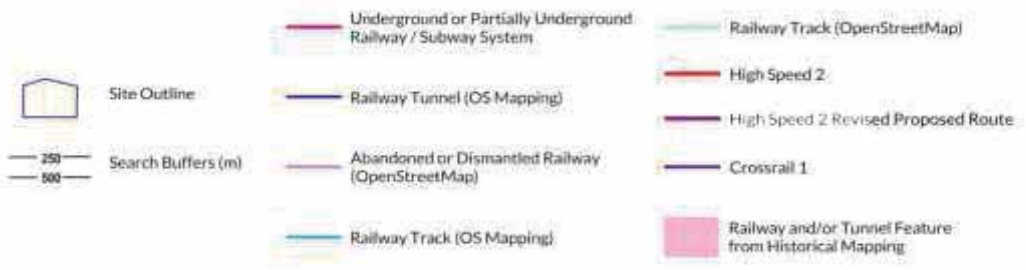
Distance (m)	Direction	Sample Type	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Nickel (Ni)	Lead (Pb)
0.0	On Site	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	<15 mg/kg	<100 mg/kg
0.0	On Site	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	<15 mg/kg	<1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	<15 mg/kg	<1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	<15 mg/kg	<100 mg/kg
33.0	N	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
37.0	NW	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
37.0	NW	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
38.0	E	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
38.0	S	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
39.0	S	Sediment	<15 mg/kg	<1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg	<100 mg/kg
49.0	SE	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
49.0	SE	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg

*As this data is based upon underlying 1:50,000 scale geological information, a 50m buffer has been added to the search radius.

9 Railways and Tunnels map



Railways and Tunnels Legend



9 Railways and Tunnels

9.1 Tunnels

This data is derived from OpenStreetMap and provides information on the possible locations of underground railway systems in the UK - the London Underground, the Tyne & Wear Metro and the Glasgow Subway.

Have any underground railway lines been identified within the study site boundary?	No
Have any underground railway lines been identified within 250m of the study site boundary?	No

Database searched and no data found.

Any records that have been identified are represented on the Railways and Tunnels map.

This data is derived from Ordnance Survey mapping and provides information on the possible locations of railway tunnels forming part of the UK overground railway network.

Have any other railway tunnels been identified within the site boundary?	No
Have any other railway tunnels been identified within 250m of the site boundary?	No

Database searched and no data found.

Any records that have been identified are represented on the Railways and Tunnels map.

9.2 Historical Railway and Tunnel Features

This data is derived from Groundsure's unique Historical Land-use Database and contains features relating to tunnels, railway tracks or associated works that have been identified from historical Ordnance Survey mapping.

Have any historical railway or tunnel features been identified within the study site boundary?	No
Have any historical railway or tunnel features been identified within 250m of the study site boundary?	No

Database searched and no data found.

Any records that have been identified are represented on the Railways and Tunnels map.

9.3 Historical Railways

This data is derived from OpenStreetMap and provides information on the possible alignments of abandoned or dismantled railway lines in proximity to the study site.

Have any historical railway lines been identified within the study site boundary? No

Have any historical railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Multiple sections of the same track may be listed in the detail above
Any records that have been identified are represented on the Railways and Tunnels map.

9.4 Active Railways

These datasets are derived from Ordnance Survey mapping and OpenStreetMap and provide information on the possible locations of active railway lines in proximity to the study site.

Have any active railway lines been identified within the study site boundary? No

Have any active railway lines been identified within 250m of the study site boundary? Yes

Distance (m)	Direction	Name	Type
154	SW	Not given	Rail
154	SW	Not given	Rail
157	SW	Not given	Rail
157	SW	Not given	Rail
162	SW	Not given	Multi Track
162	SW	Not given	Multi Track

Multiple sections of the same track may be listed in the detail above
Any records that have been identified are represented on the Railways and Tunnels map.

9.5 Railway Projects

These datasets provide information on the location of large scale railway projects High Speed 2 and Crossrail 1 .

Is the study site within 5km of the route of the High Speed 2 rail project? No

Is the study site within 500m of the route of the Crossrail 1 rail project? No

Further information on proximity to these routes, the project construction status and associated works can be obtained through the purchase of a Groundsure HS2 and Crossrail 1 Report.

The route data has been digitised from publicly available maps by Groundsure. The route as provided relates to the Crossrail 1 project only, and does not include any details of the Crossrail 2 project, as final details of the route for Crossrail 2 are still under consultation.

Please note that this assessment takes account of both the original Phase 2b proposed route and the amended route proposed in 2016. As the Phase 2b route is still under consultation, Groundsure are providing information on both options until the final route is formally confirmed. Practitioners should take account of this uncertainty when advising clients.

Contact Details

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Keyworth, Nottingham NG12 5GG
Tel: 0115 936 3143.
Fax: 0115 936 3276.
Email:**enquiries@bgs.ac.uk**
Web:**www.bgs.ac.uk**
BGS Geological Hazards Reports and general geological enquiries

British Gypsum

British Gypsum Ltd
East Leake
Loughborough
Leicestershire
LE12 6HX

The Coal Authority

200 Lichfield Lane
Mansfield
Notts NG18 4RG
Tel: 0345 7626 848
DX 716176 Mansfield 5
www.coal.gov.uk

Public Health England

Public information access office
Public Health England, Wellington House
133-155 Waterloo Road, London, SE1 8UG
https://www.gov.uk/government/organisations/public-health-england
Email: **enquiries@phe.gov.uk**
Main switchboard: 020 7654 8000

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Getmapping PLC

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Website:**http://www.peterbrett.com/home**

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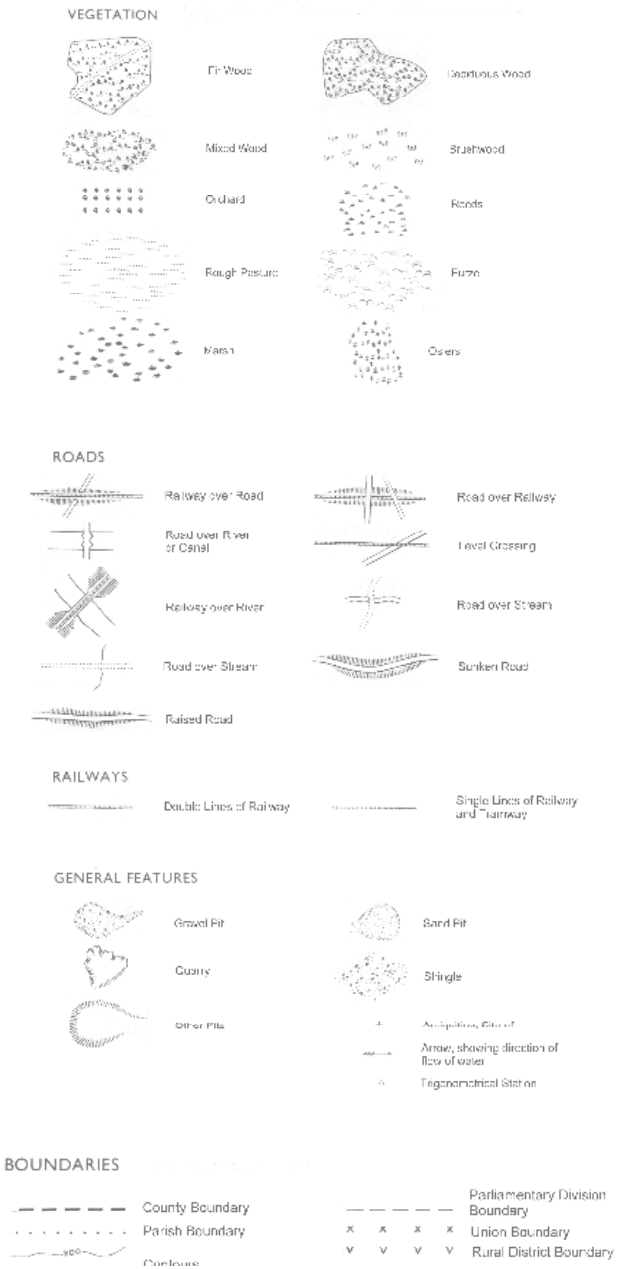
County Series 1:10,560 scale



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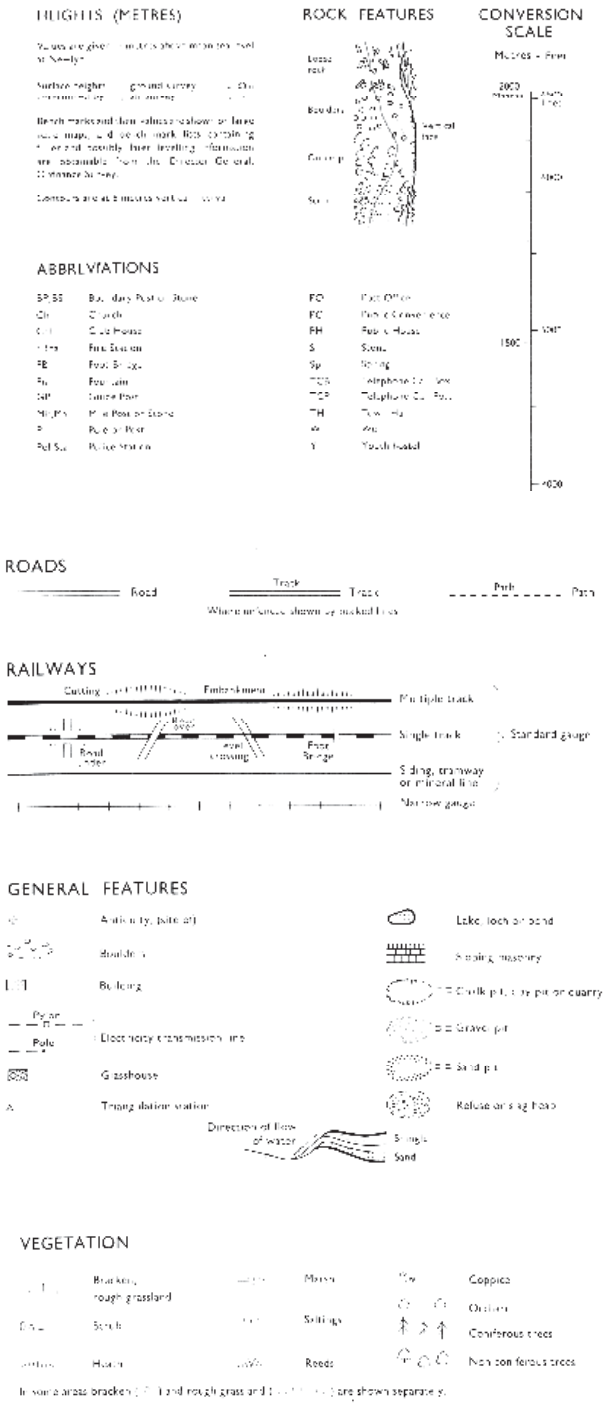

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Historical Map Pack Legend

County Series & National Grid

1:10,560 scale

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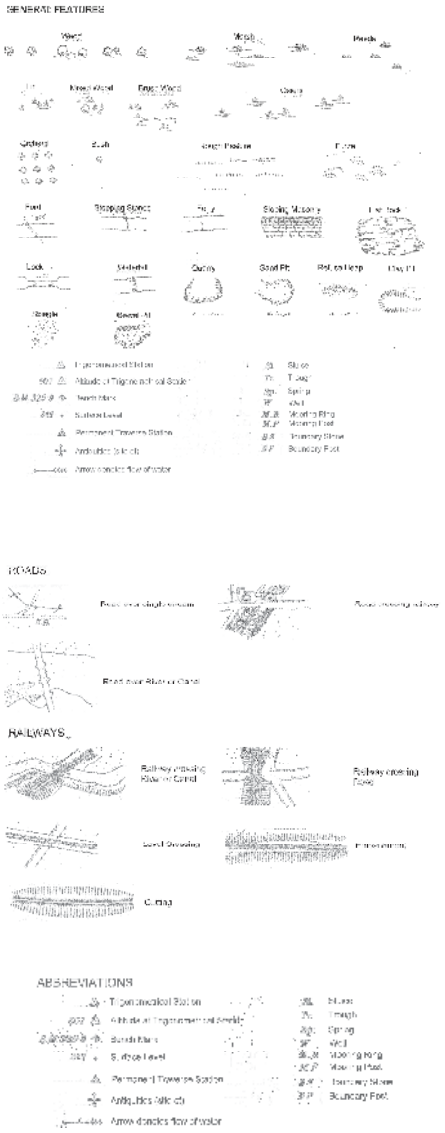
Technical Helpline

Tel 08444159000

groundsureinsight@groundsure.com
www.groundsure.com

County Series 1:2,500 scale



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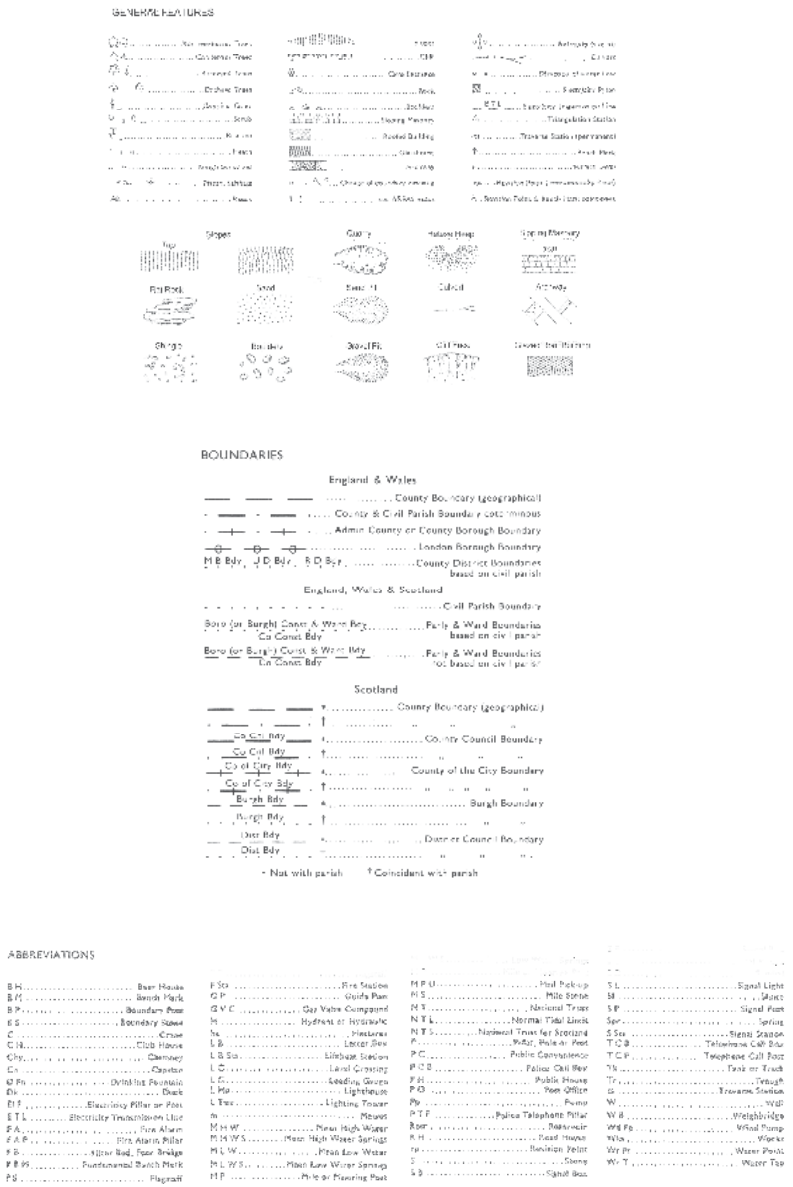

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Historical Map Pack Legend

County Series

1:1,250 scale

~

County Series & National Grid

1:2,500 scale

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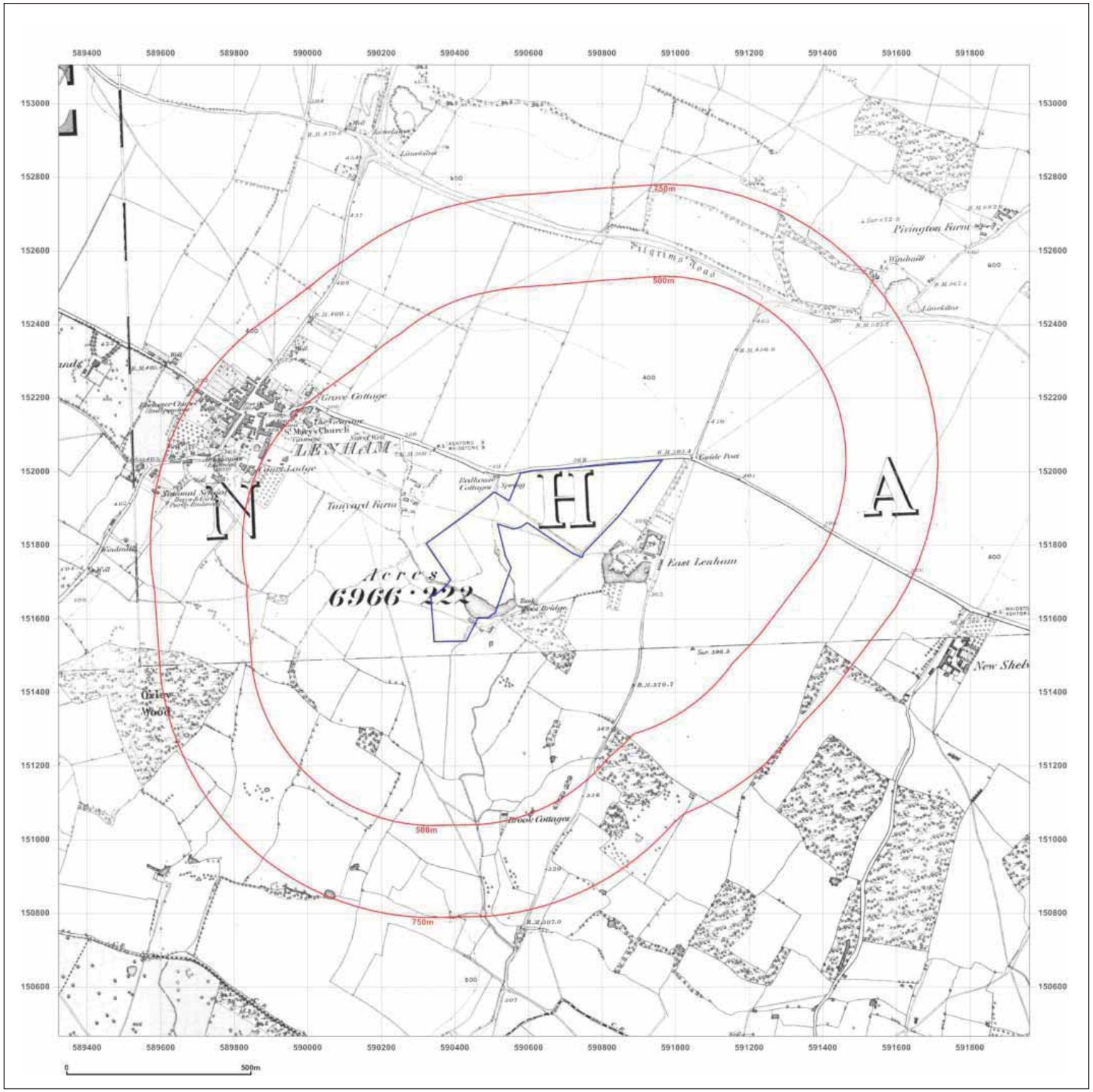

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Site Details:

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Report Ref: EMS-528124_710281
Grid Ref: 590642, 151785

Map Name: County Series

Map date: **1866-1871**

Scale: 1:10,560

Printed at: 1:10,560

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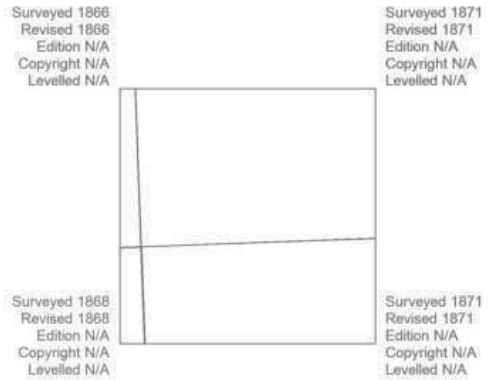

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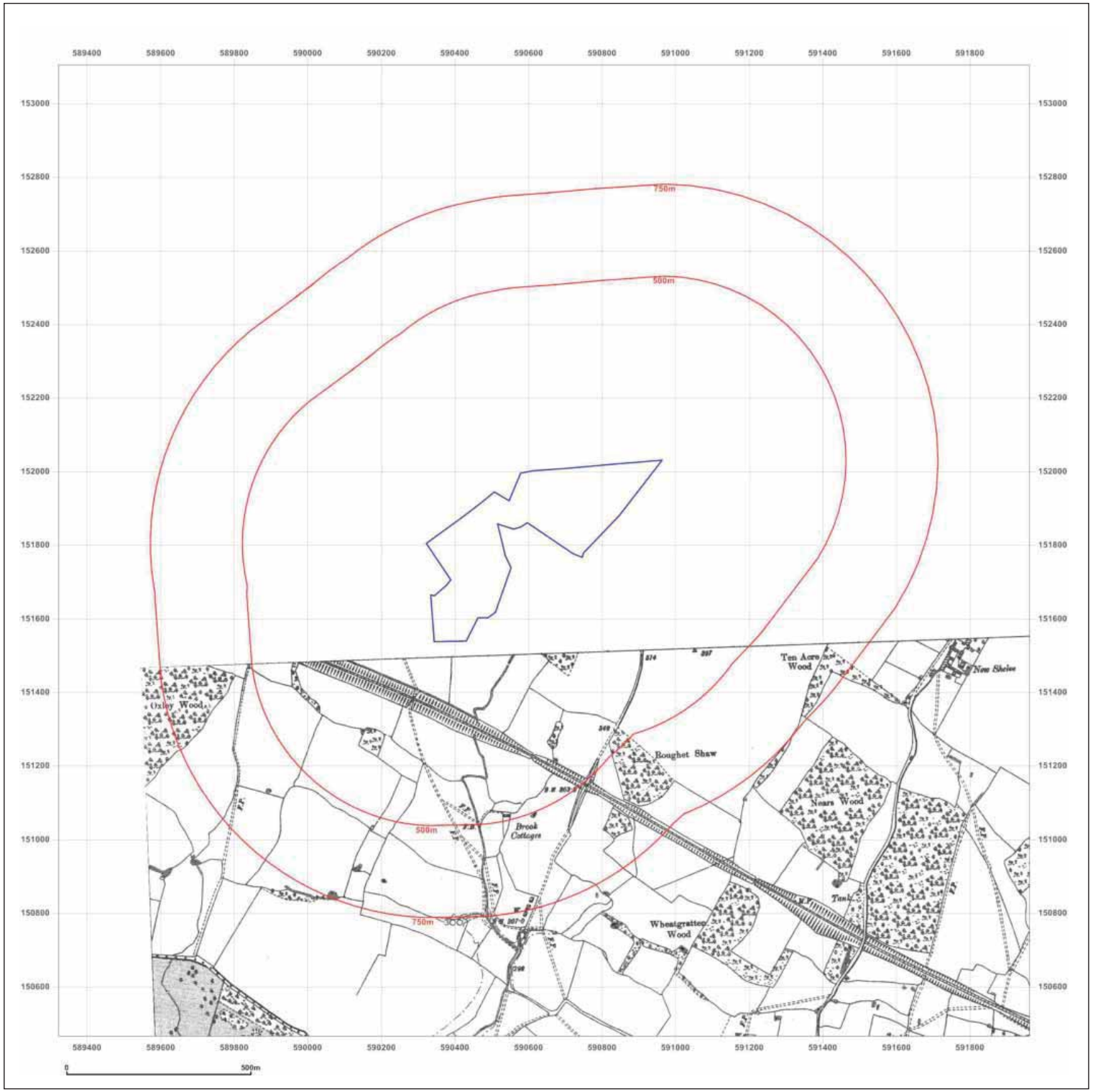

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Report Ref: EMS-528124_710281
Grid Ref: 590642, 151785

Map Name: County Series
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Scale: 1:10,560
Printed at: 1:10,560

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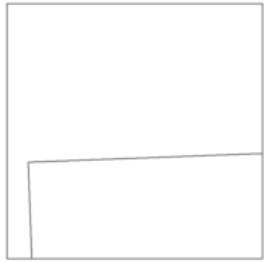

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Edition N/A
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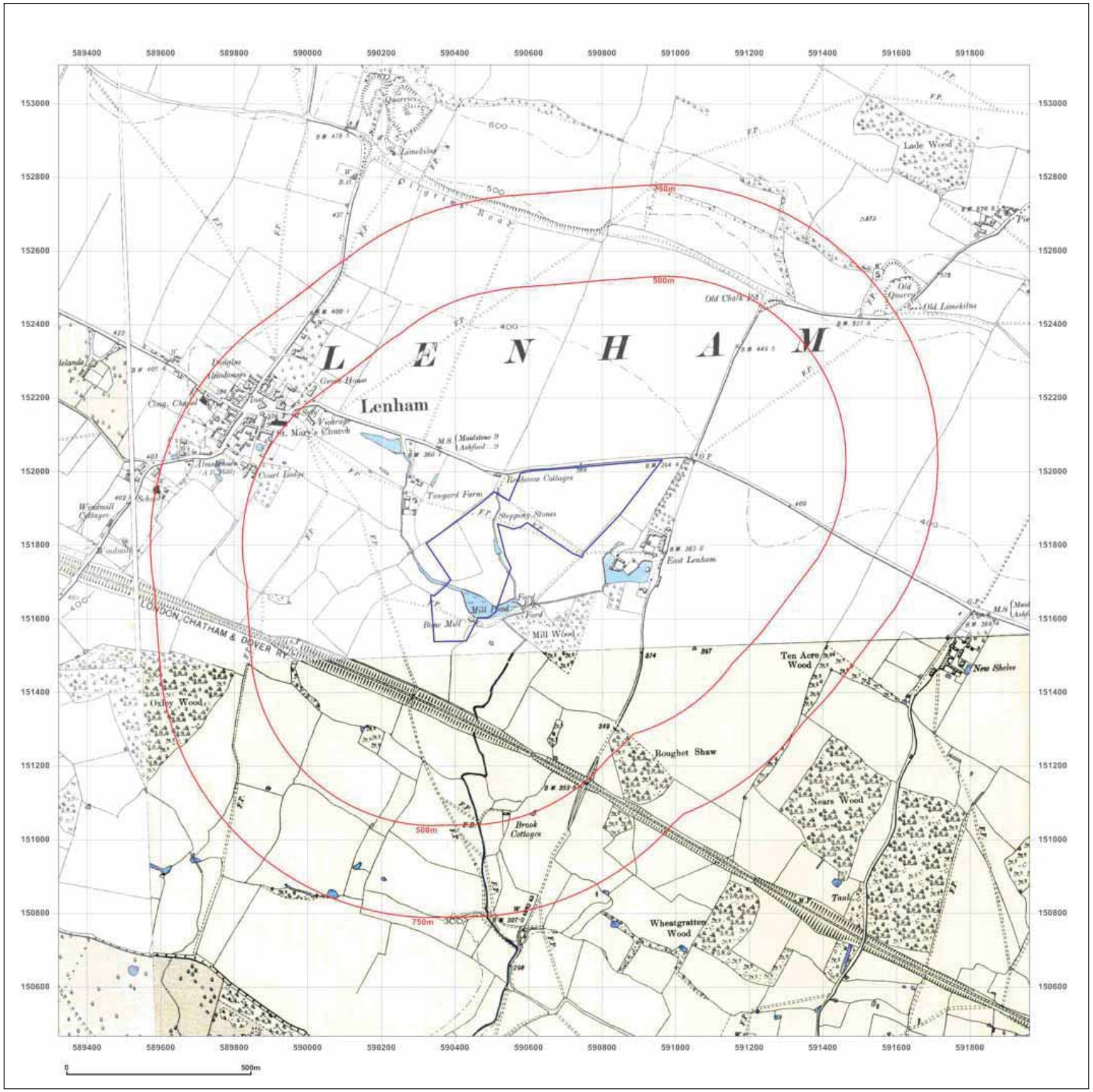

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Report Ref: EMS-528124_710281
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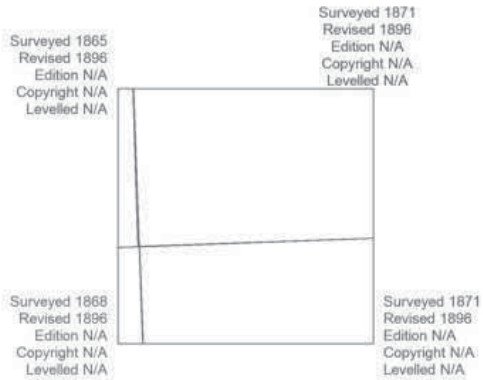

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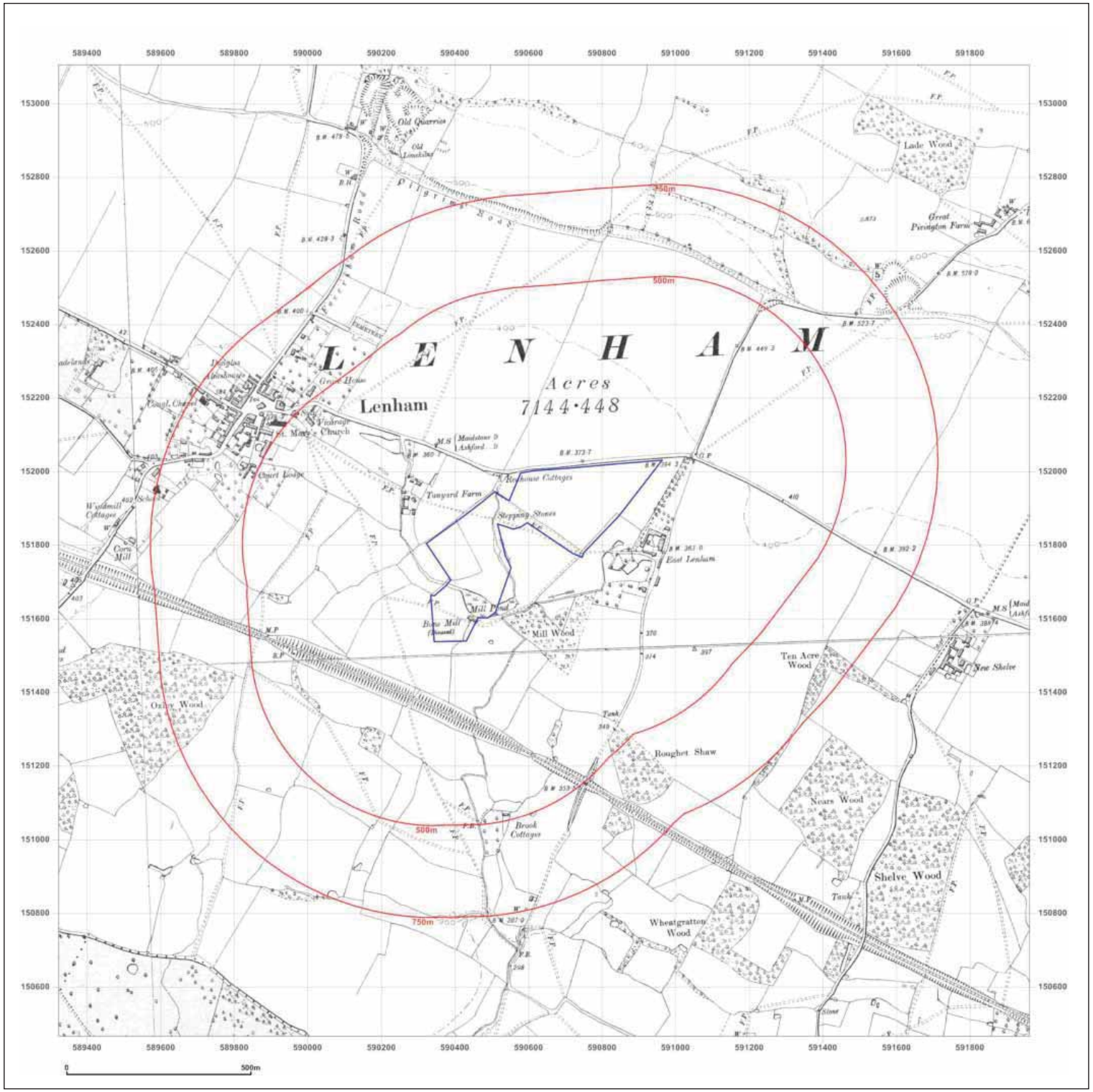

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Report Ref: EMS-528124_710281
Grid Ref: 590642, 151785

Map Name: County Series
Map date: 1906-1907
Scale: 1:10,560
Printed at: 1:10,560

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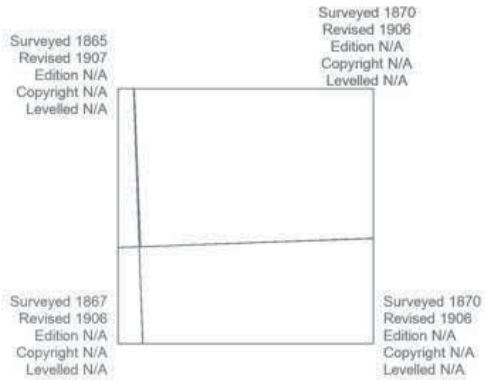

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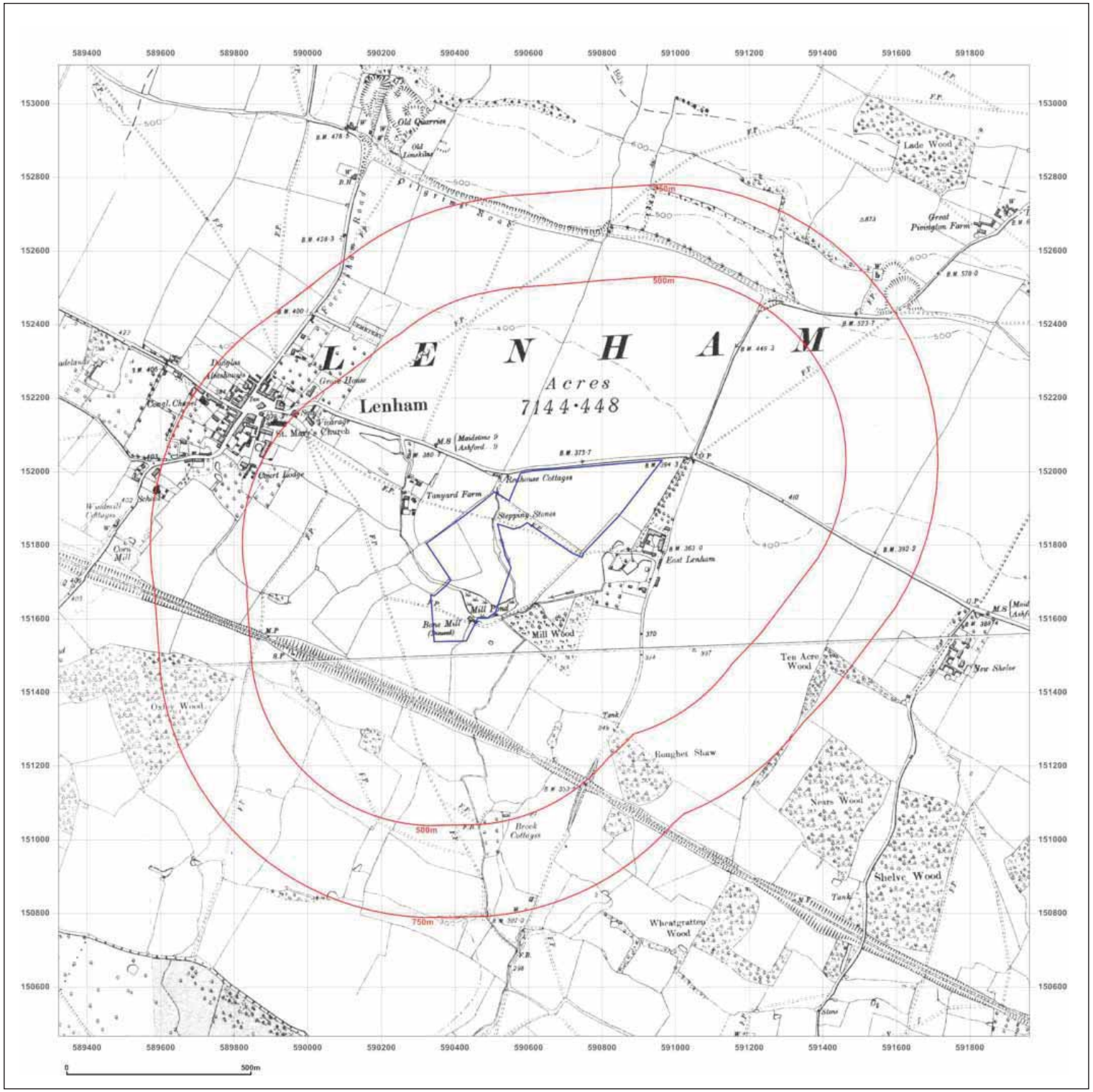

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Report Ref: EMS-528124_710281
Grid Ref: 590642, 151785

Map Name: County Series
Map date: 1906-1909
Scale: 1:10,560
Printed at: 1:10,560

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Edition 1909
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Surveyed 1870
Revised 1906
Edition N/A
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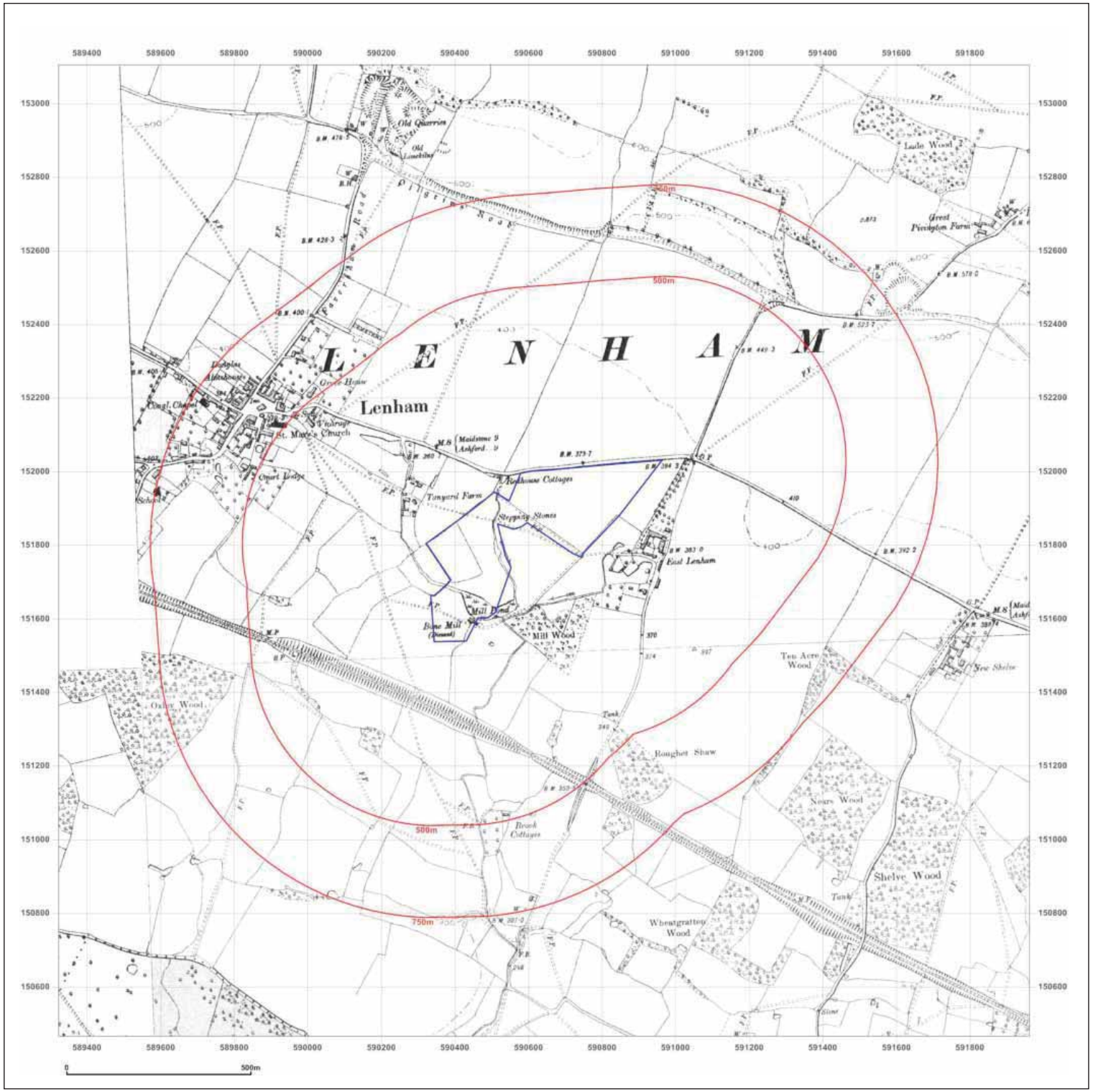

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Client Ref: EMS_528124_710281
Report Ref: EMS-528124_710281
Grid Ref: 590642, 151785

Map Name: County Series
Map date: 1908-1909
Scale: 1:10,560
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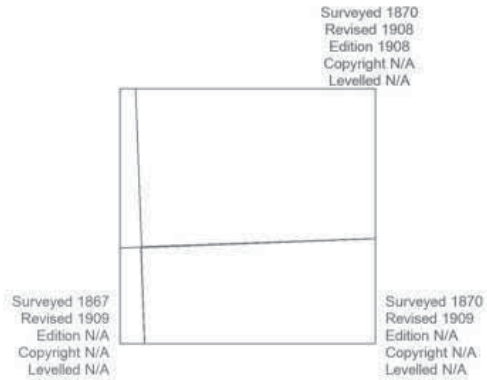

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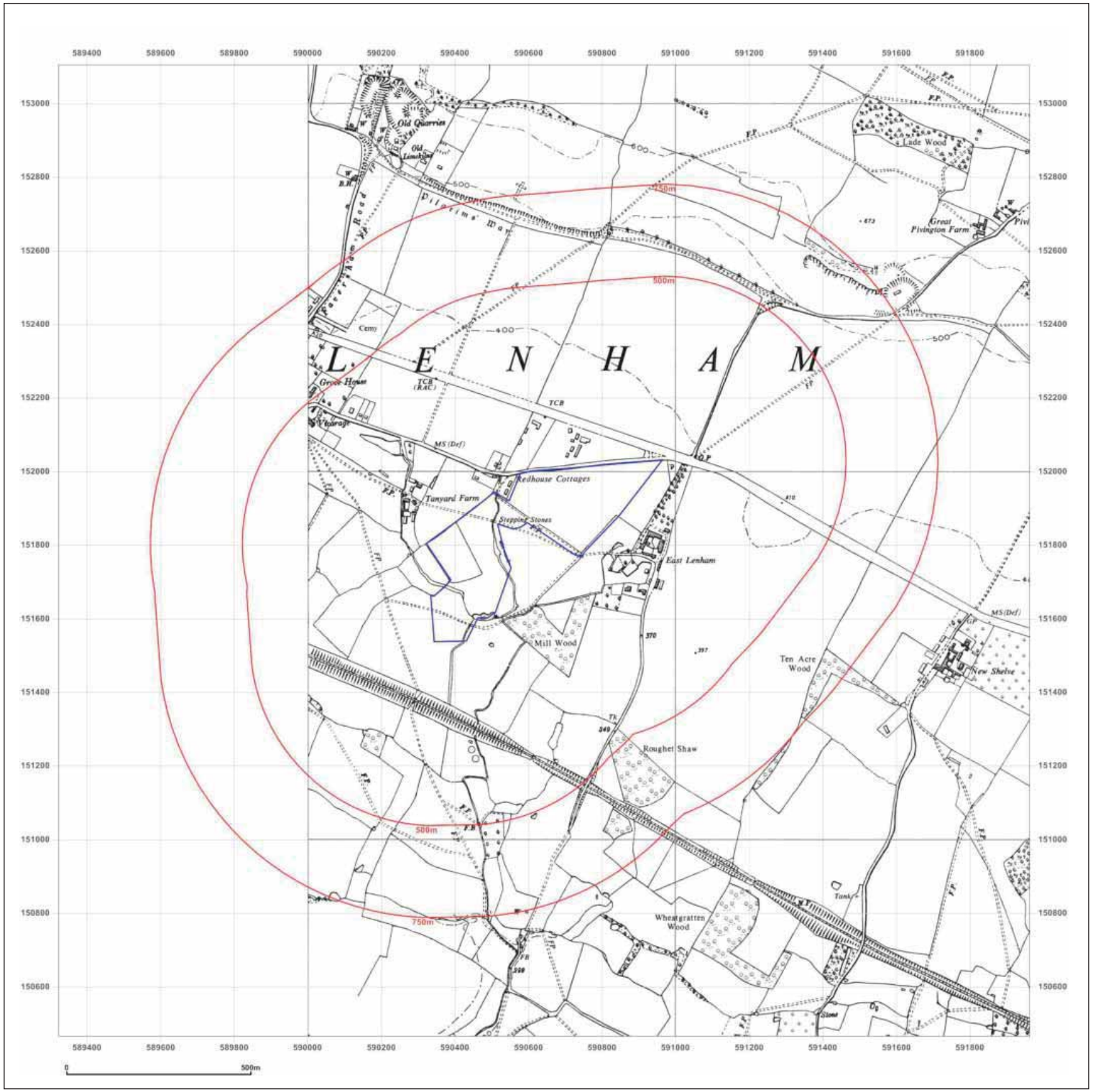

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Report Ref: EMS-528124_710281
Grid Ref: 590642, 151785

Map Name: Provisional
Map date: 1955
Scale: 1:10,560
Printed at: 1:10,560

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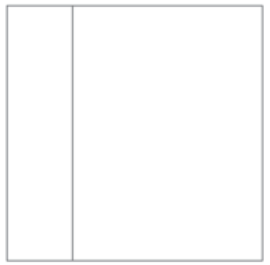

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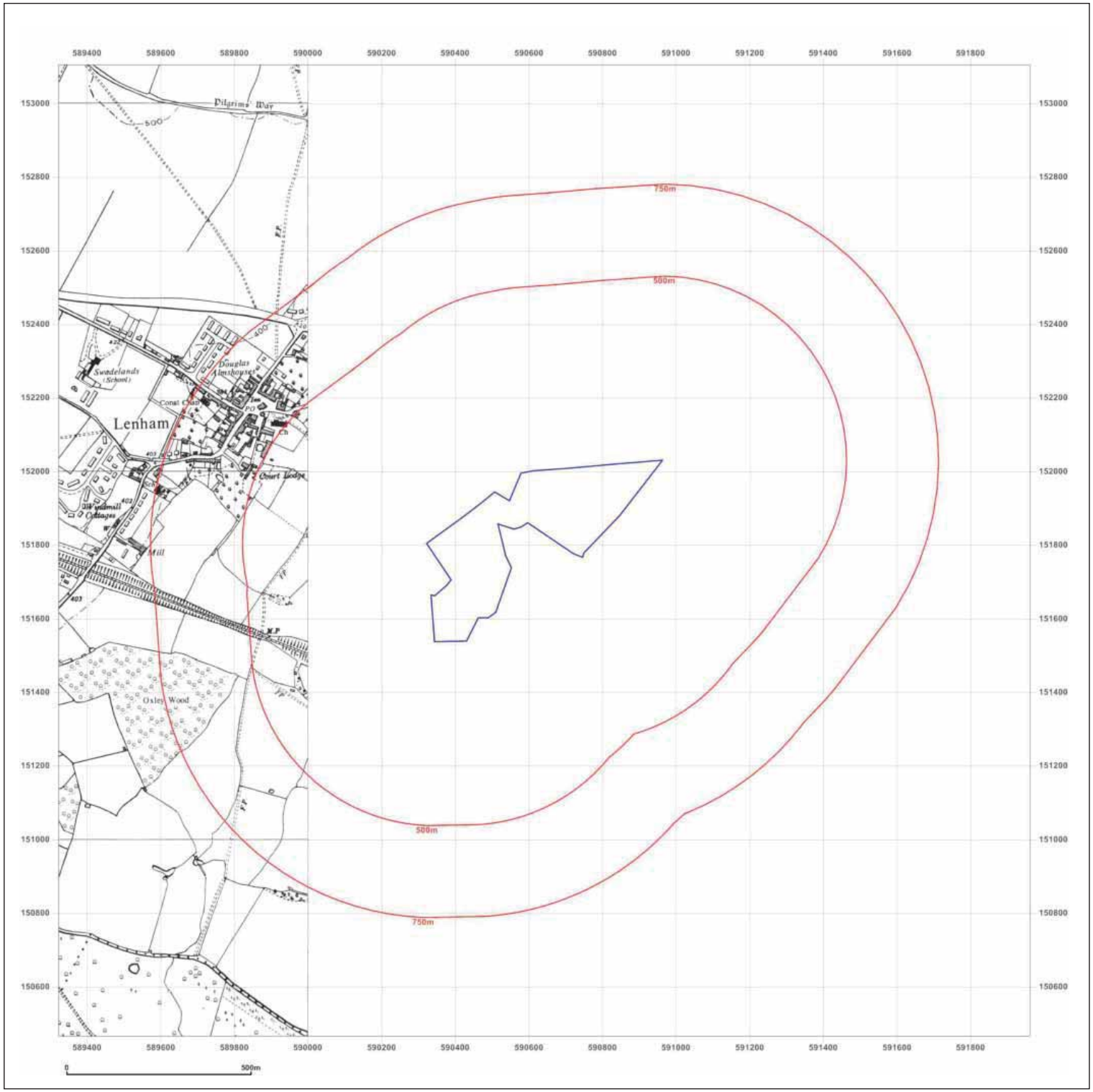

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Client Ref: EMS_528124_710281
Report Ref: EMS-528124_710281
Grid Ref: 590642, 151785

Map Name: Provisional
Map date: 1961
Scale: 1:10,560
Printed at: 1:10,560

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Surveyed 1955
Revised 1960
Edition N/A
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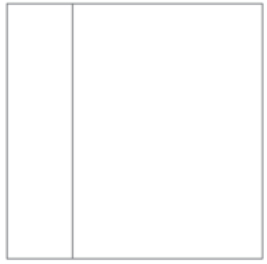

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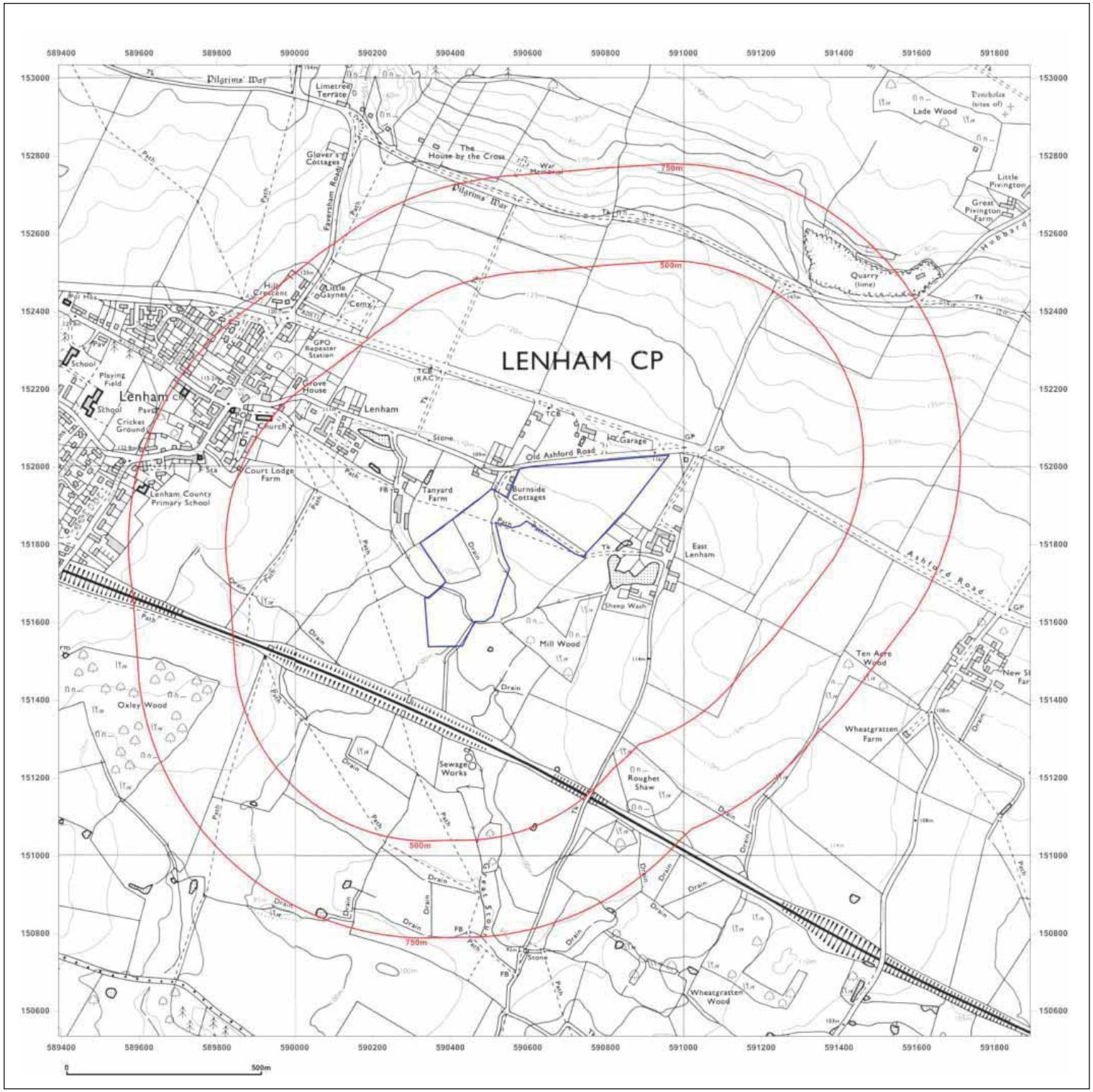

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Client Ref: EMS_528124_710281
Report Ref: EMS-528124_710281
Grid Ref: 590642, 151785

Map Name: National Grid
Map date: **1969-1970**
Scale: 1:10,000
Printed at: 1:10,000

N
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Edition N/A
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Surveyed 1970
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Map legend available at:
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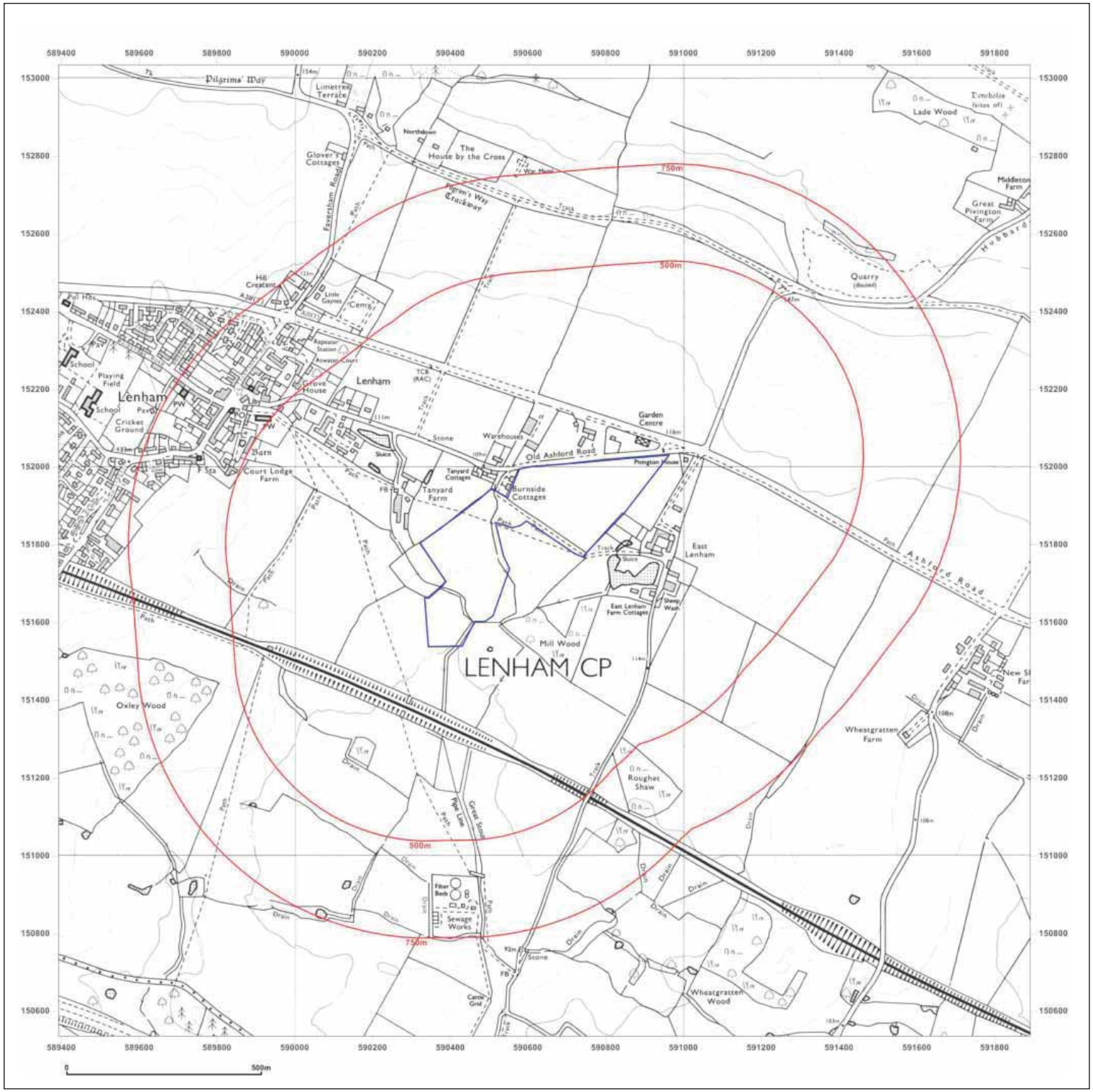

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Site Details:

Old Ashford Road, Lenham,Old Ashford Road,,Lenham,ME172QA

Client Ref: EMS_528124_710281
Report Ref: EMS-528124_710281
Grid Ref: 590642, 151785

Map Name: National Grid
Map date: 1990-1991
Scale: 1:10,000
Printed at: 1:10,000

N
W E
S

Surveyed 1986
Revised 1991
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1988
Revised 1990
Edition N/A
Copyright N/A
Levelled N/A

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Site Details:

Old Ashford Road, Lenham,Old Ashford Road,,Lenham,ME172QA

Client Ref: EMS_528124_710281
Report Ref: EMS-528124_710281
Grid Ref: 590642, 151785

Map Name: 1:10,000 Raster
Map date: 2002
Scale: 1:10,000
Printed at: 1:10,000

N
W E
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2002

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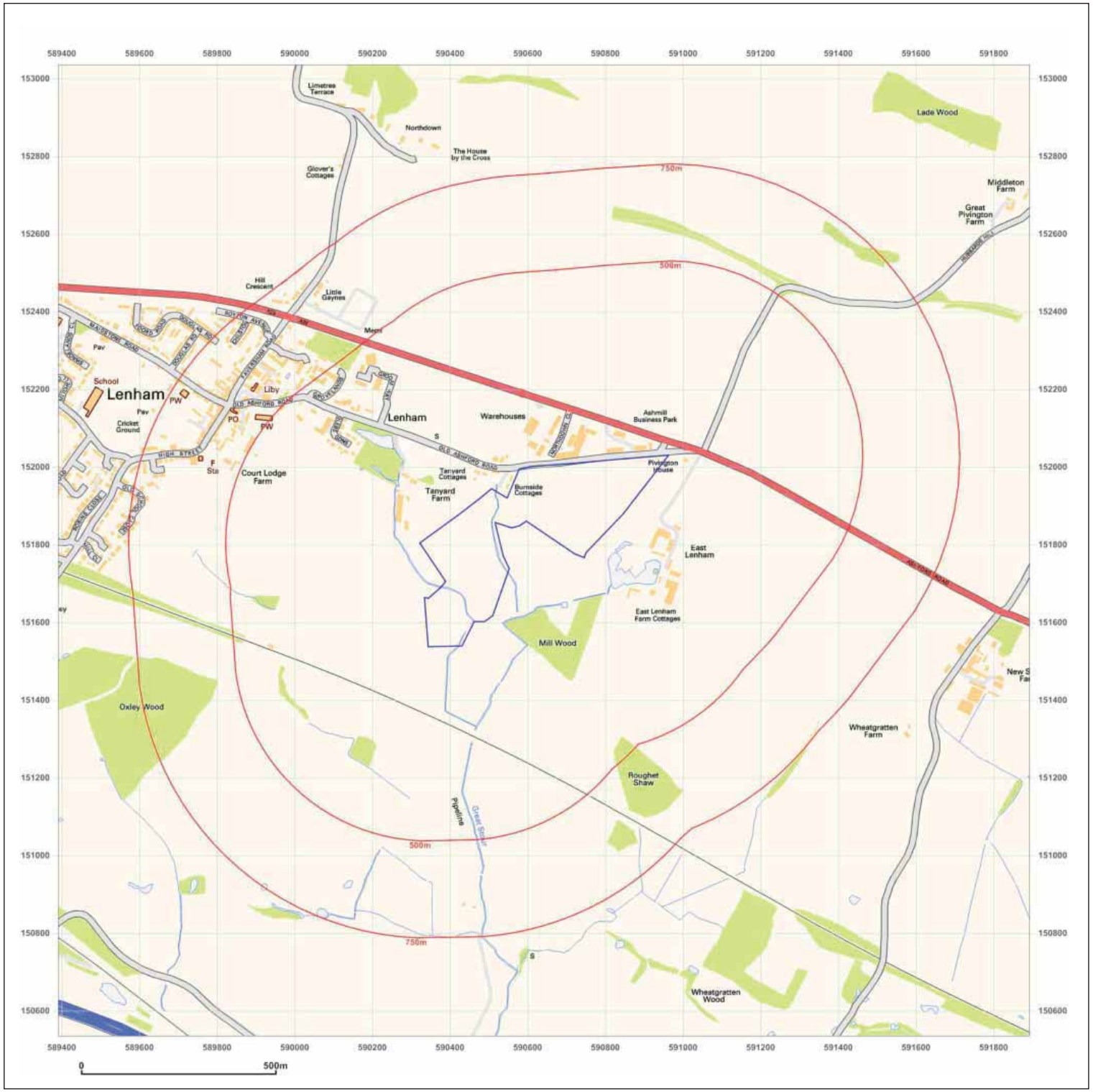

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Site Details:

Old Ashford Road, Lenham,Old Ashford Road,,Lenham,ME172QA

Client Ref: EMS_528124_710281
Report Ref: EMS-528124_710281
Grid Ref: 590642, 151785

Map Name: National Grid
Map date: 2010
Scale: 1:10,000
Printed at: 1:10,000

N
W E
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2010

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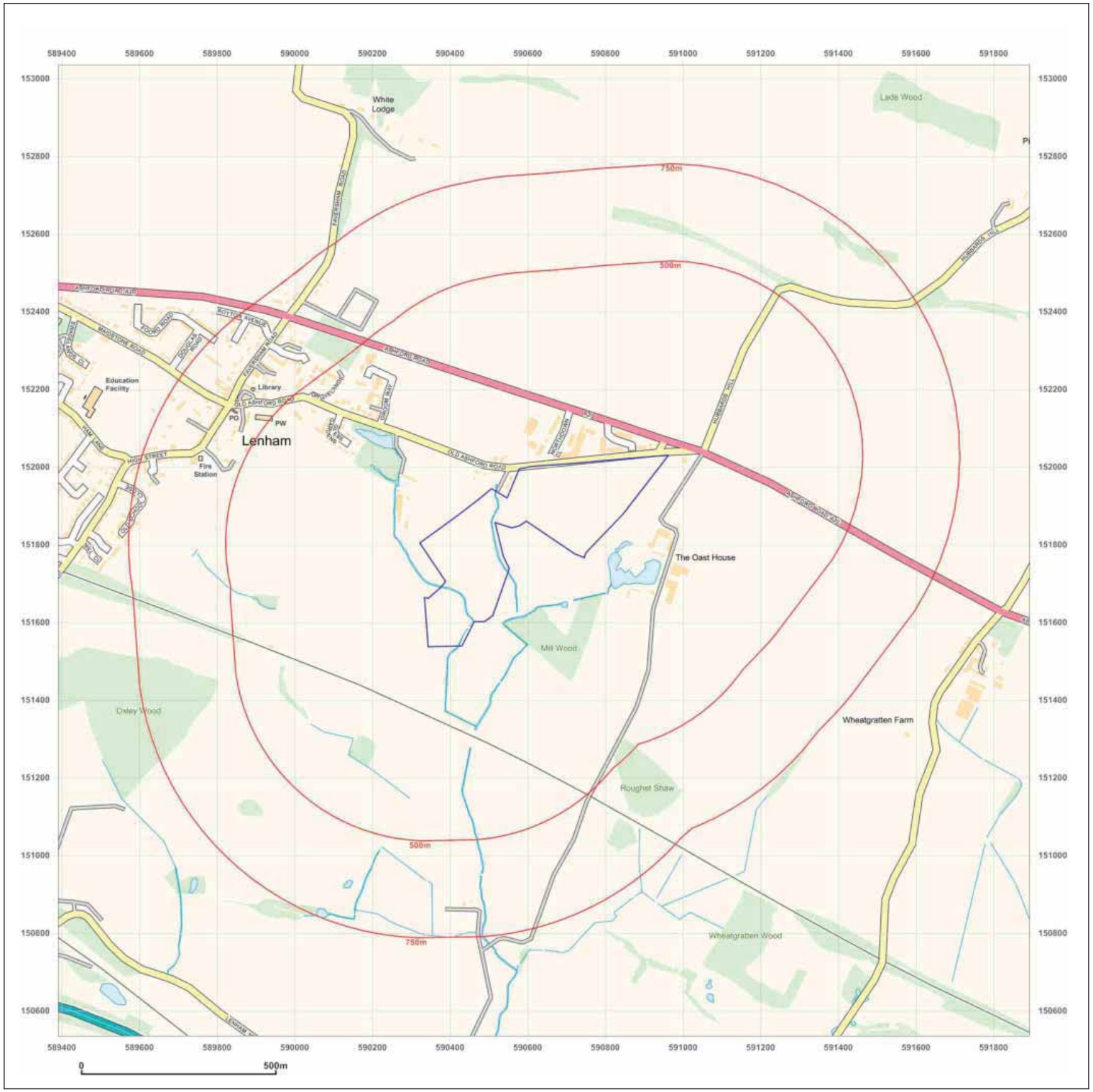

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Site Details:

Old Ashford Road, Lenham,Old Ashford Road,,Lenham,ME172QA

Client Ref: EMS_528124_710281
Report Ref: EMS-528124_710281
Grid Ref: 590642, 151785

Map Name: National Grid
Map date: 2014
Scale: 1:10,000
Printed at: 1:10,000

N
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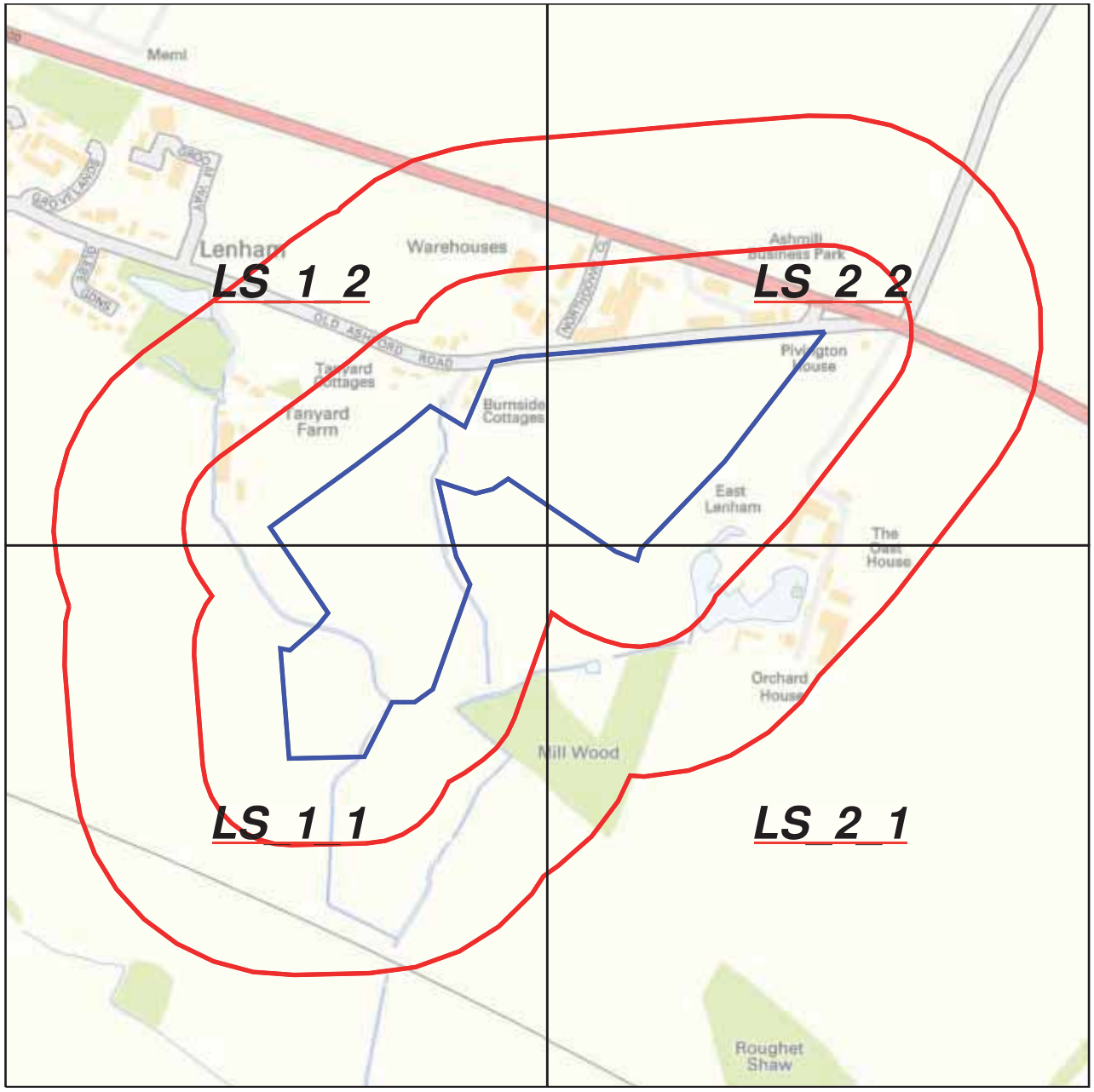

Groundsure INSIGHTS

N
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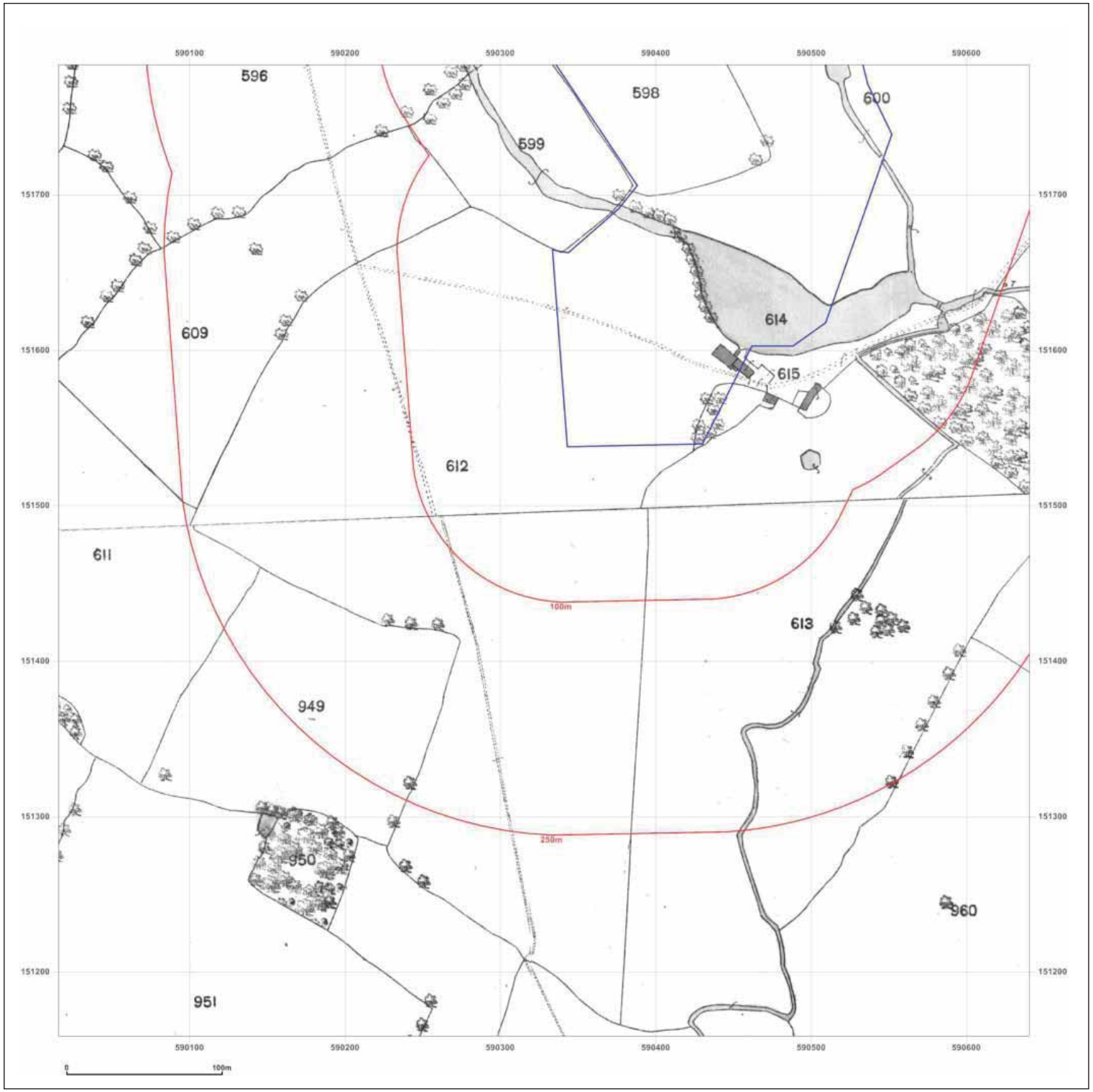
1:2500 Scale Grid Index



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Site Details:

Old Ashford Road, Lenham,Old Ashford Road,,Lenham,ME172QA

Client Ref: EMS_528124_710281
Report Ref: EMS-528124_710281_LS_1_1
Grid Ref: 590328, 151471

Map Name: County Series
Map date: 1868
Scale: 1:2,500
Printed at: 1:2,500

N
W E
S

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

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

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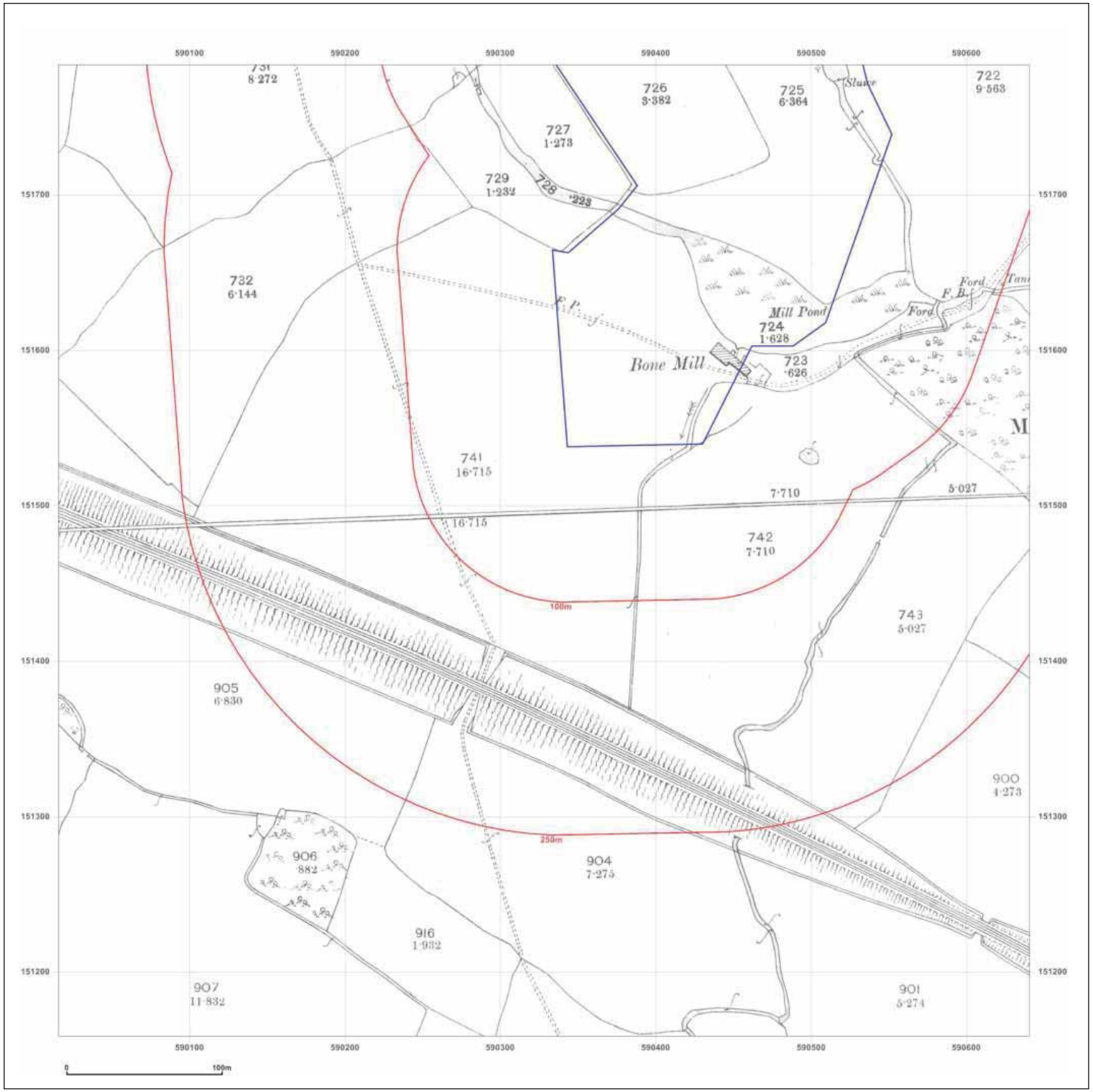

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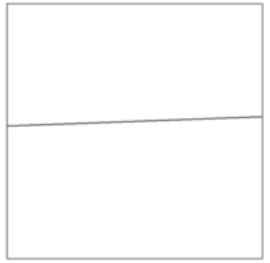
Site Details:

Old Ashford Road, Lenham,Old Ashford Road,,Lenham,ME172QA

Client Ref: EMS_528124_710281
Report Ref: EMS-528124_710281_LS_1_1
Grid Ref: 590328, 151471

Map Name: County Series
Map date: 1897
Scale: 1:2,500
Printed at: 1:2,500

N
W E
S



Surveyed 1897
Revised 1897
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1897
Revised 1897
Edition N/A
Copyright N/A
Levelled N/A

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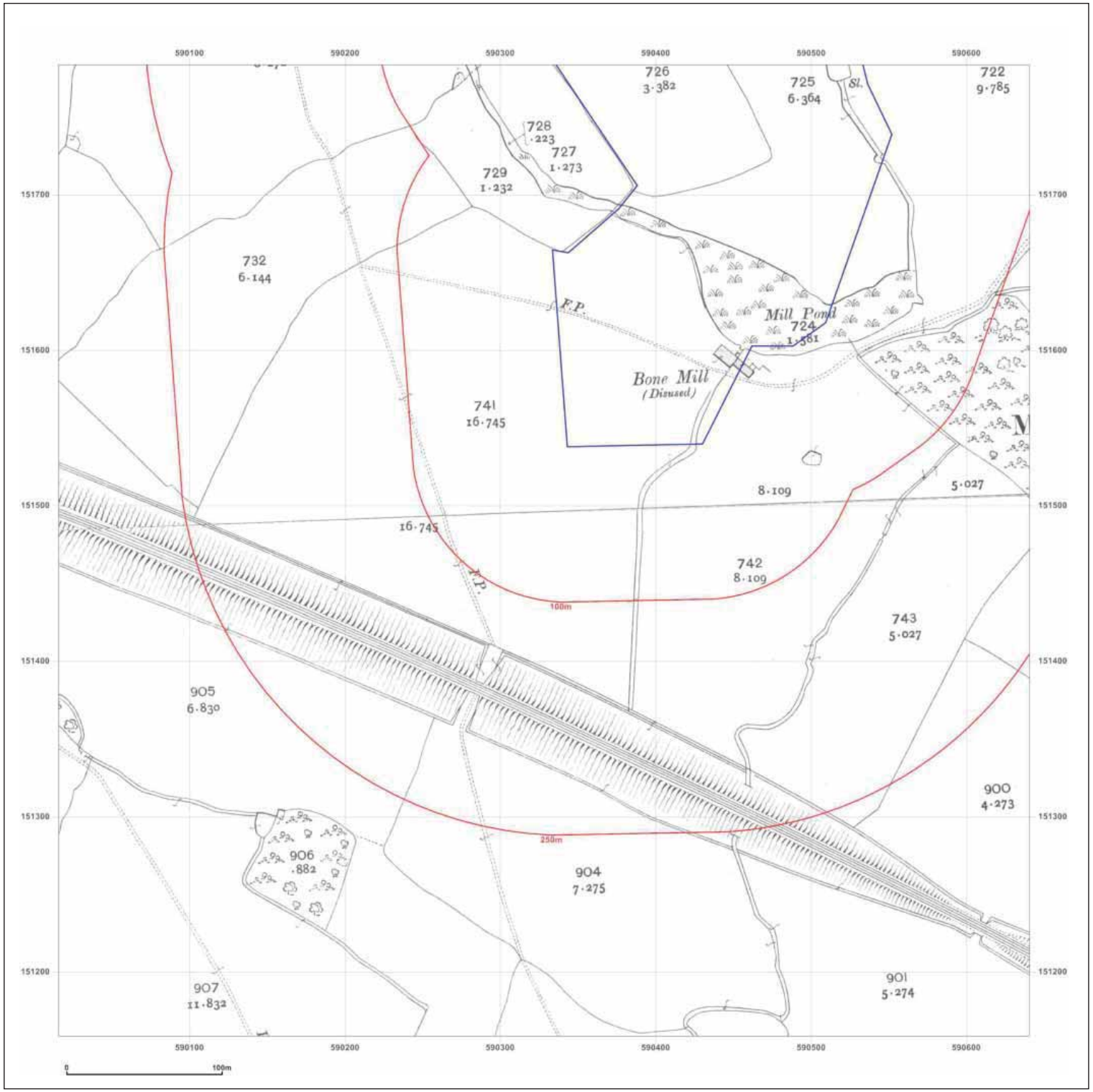

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Site Details:

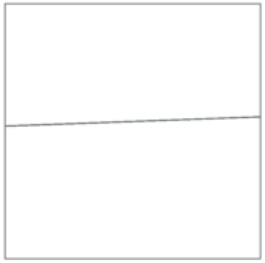
Old Ashford Road, Lenham,Old Ashford Road,,Lenham,ME172QA

Client Ref: EMS_528124_710281
Report Ref: EMS-528124_710281_LS_1_1
Grid Ref: 590328, 151471

Map Name: County Series
Map date: 1908
Scale: 1:2,500
Printed at: 1:2,500

N
W E
S

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



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

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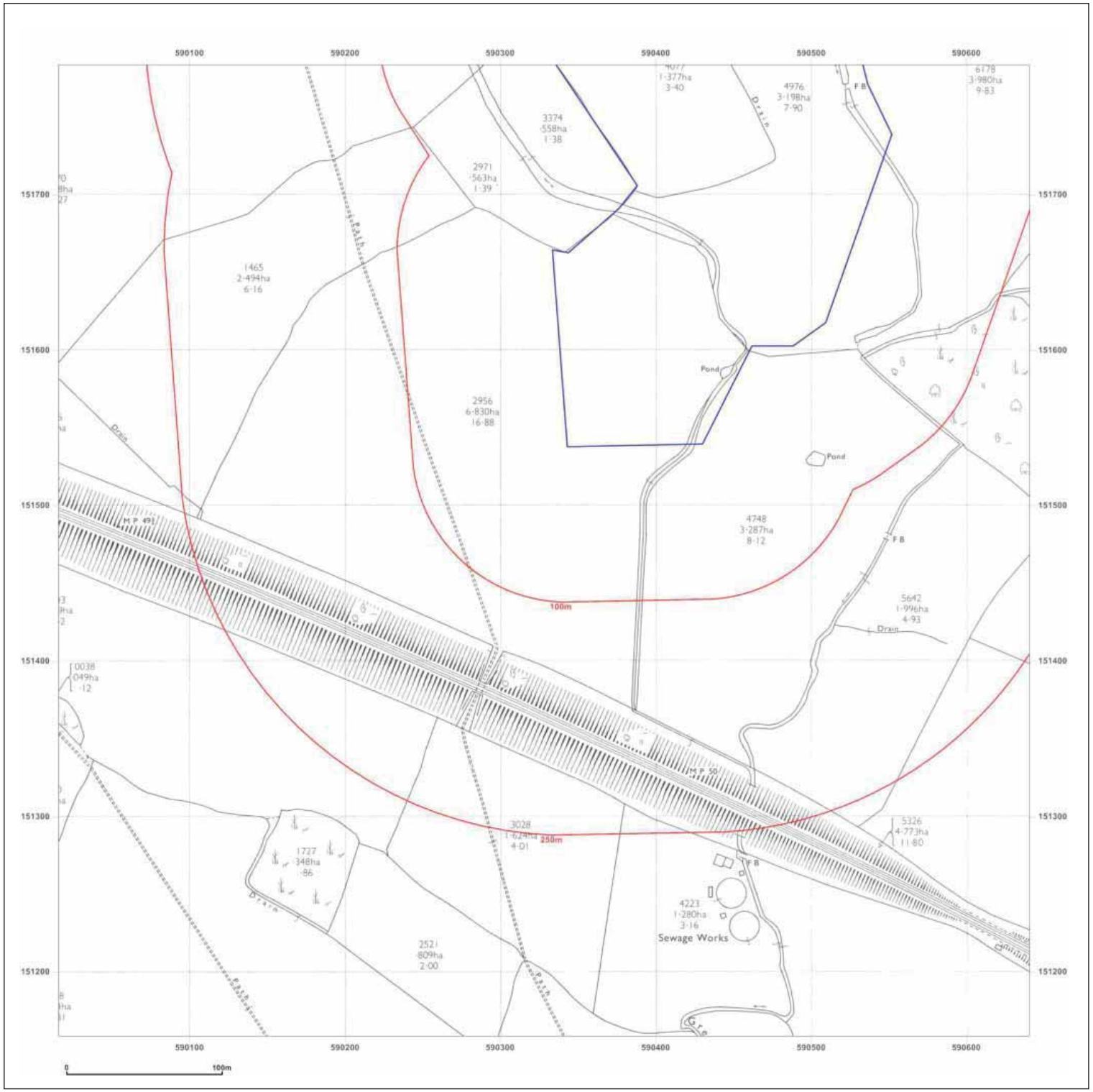

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Site Details:

Old Ashford Road, Lenham,Old Ashford Road,,Lenham,ME172QA

Client Ref: EMS_528124_710281
Report Ref: EMS-528124_710281_LS_1_1
Grid Ref: 590328, 151471

Map Name: National Grid
Map date: **1969**
Scale: 1:2,500
Printed at: 1:2,500

N
W E
S

Surveyed 1969
Revised 1969
Edition N/A
Copyright 1970
Levelled 1951

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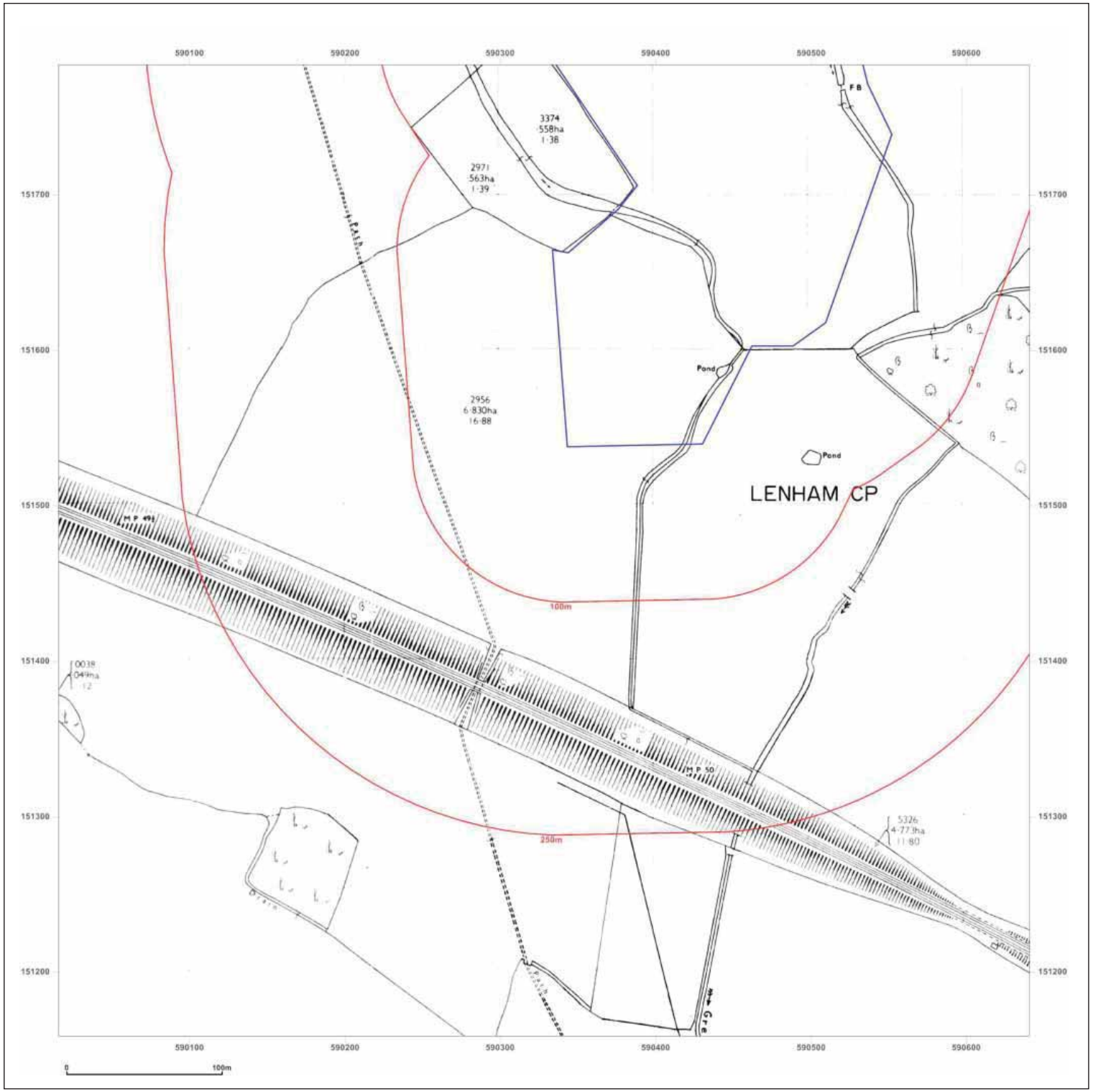

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Site Details:

Old Ashford Road, Lenham,Old Ashford Road,,Lenham,ME172QA

Client Ref: EMS_528124_710281
Report Ref: EMS-528124_710281_LS_1_1
Grid Ref: 590328, 151471

Map Name: National Grid
Map date: 1988
Scale: 1:2,500
Printed at: 1:2,500

N
W E
S

Surveyed 1972
Revised 1988
Edition N/A
Copyright 1988
Levelled 1972

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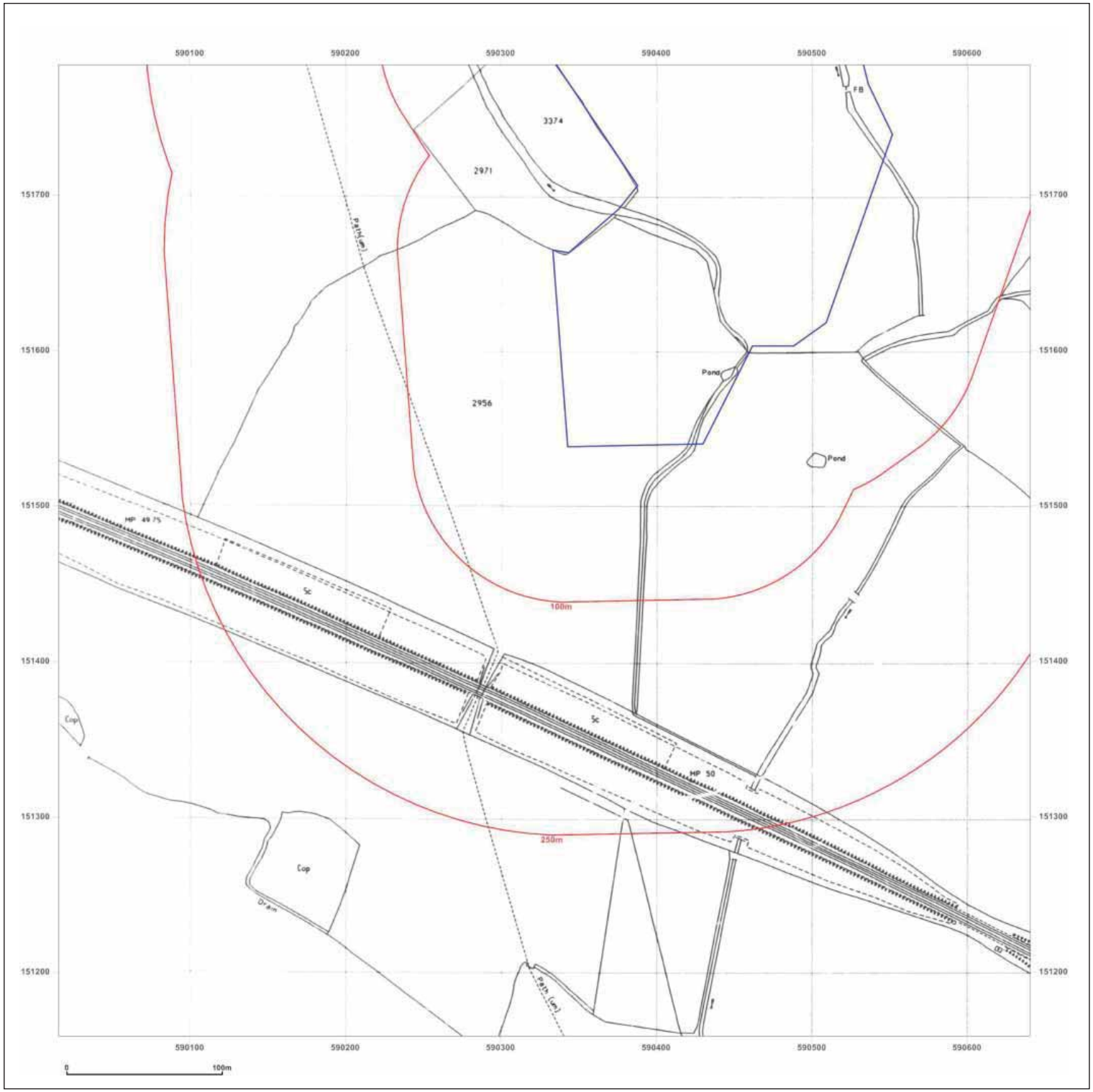

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Site Details:

Old Ashford Road, Lenham,Old Ashford Road,,Lenham,ME172QA

Client Ref: EMS_528124_710281
Report Ref: EMS-528124_710281_LS_1_1
Grid Ref: 590328, 151471

Map Name: National Grid
Map date: 1993
Scale: 1:2,500
Printed at: 1:2,500

N
W E
S

Surveyed 1993
Revised 1993
Edition N/A
Copyright N/A
Levelled N/A

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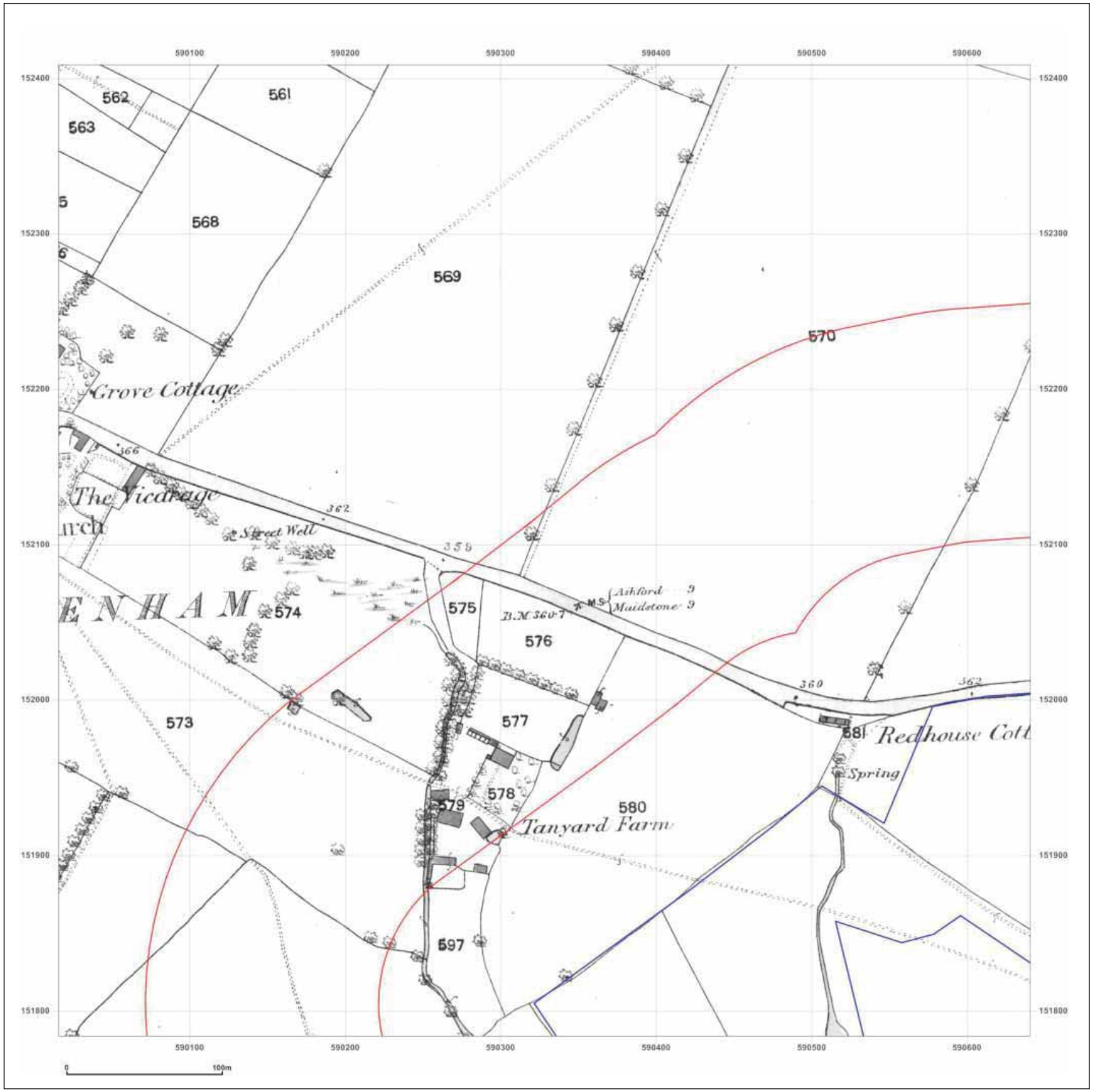

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Site Details:

Old Ashford Road, Lenham,Old Ashford Road,,Lenham,ME172QA

Client Ref: EMS_528124_710281
Report Ref: EMS-528124_710281_LS_1_2
Grid Ref: 590328, 152096

Map Name: County Series
Map date: 1868
Scale: 1:2,500
Printed at: 1:2,500

N
W E
S

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

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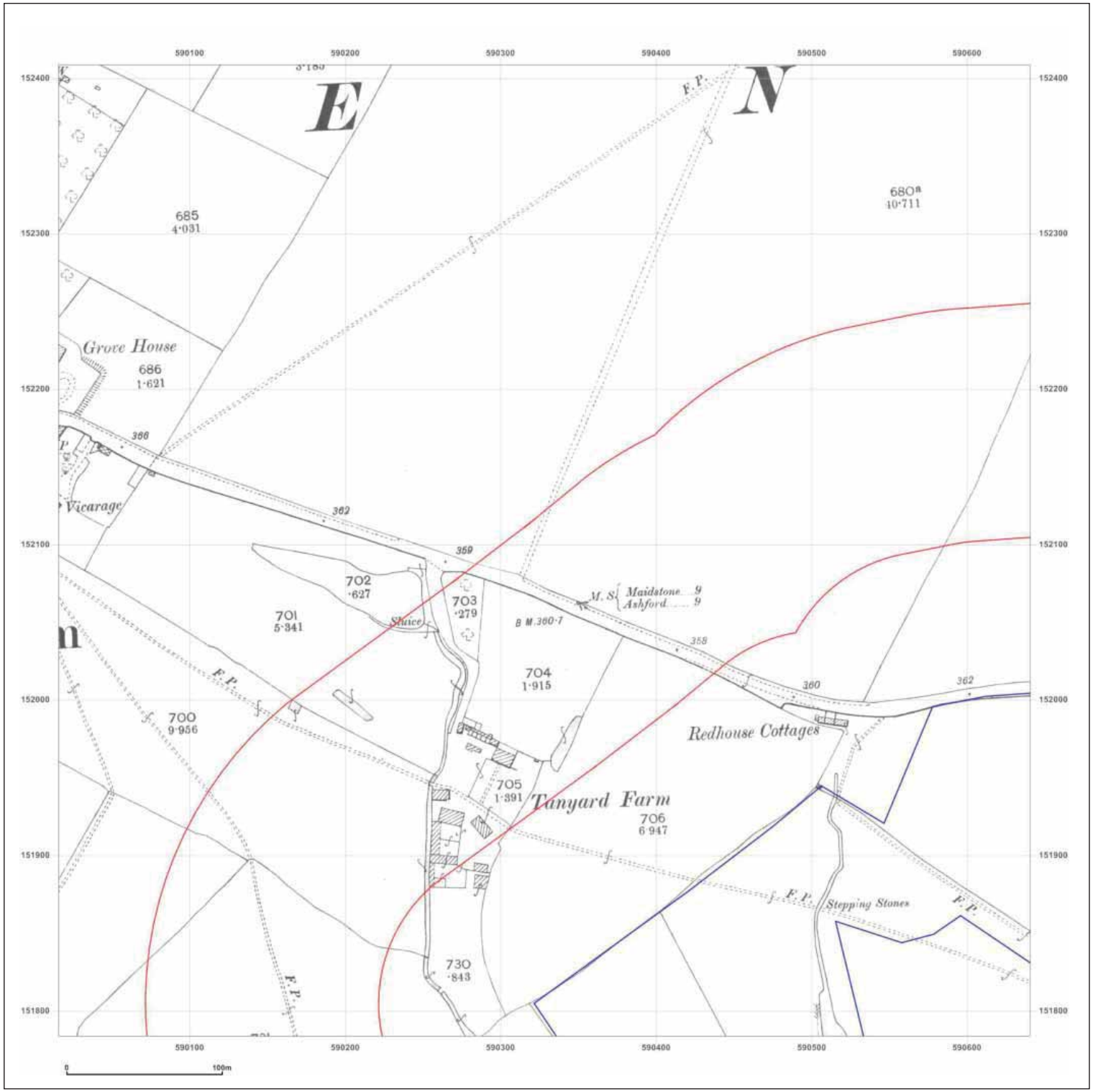

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Site Details:

Old Ashford Road, Lenham,Old Ashford Road,,Lenham,ME172QA

Client Ref: EMS_528124_710281
Report Ref: EMS-528124_710281_LS_1_2
Grid Ref: 590328, 152096

Map Name: County Series
Map date: 1897
Scale: 1:2,500
Printed at: 1:2,500

N
W E
S

Surveyed 1897
Revised 1897
Edition N/A
Copyright N/A
Levelled N/A

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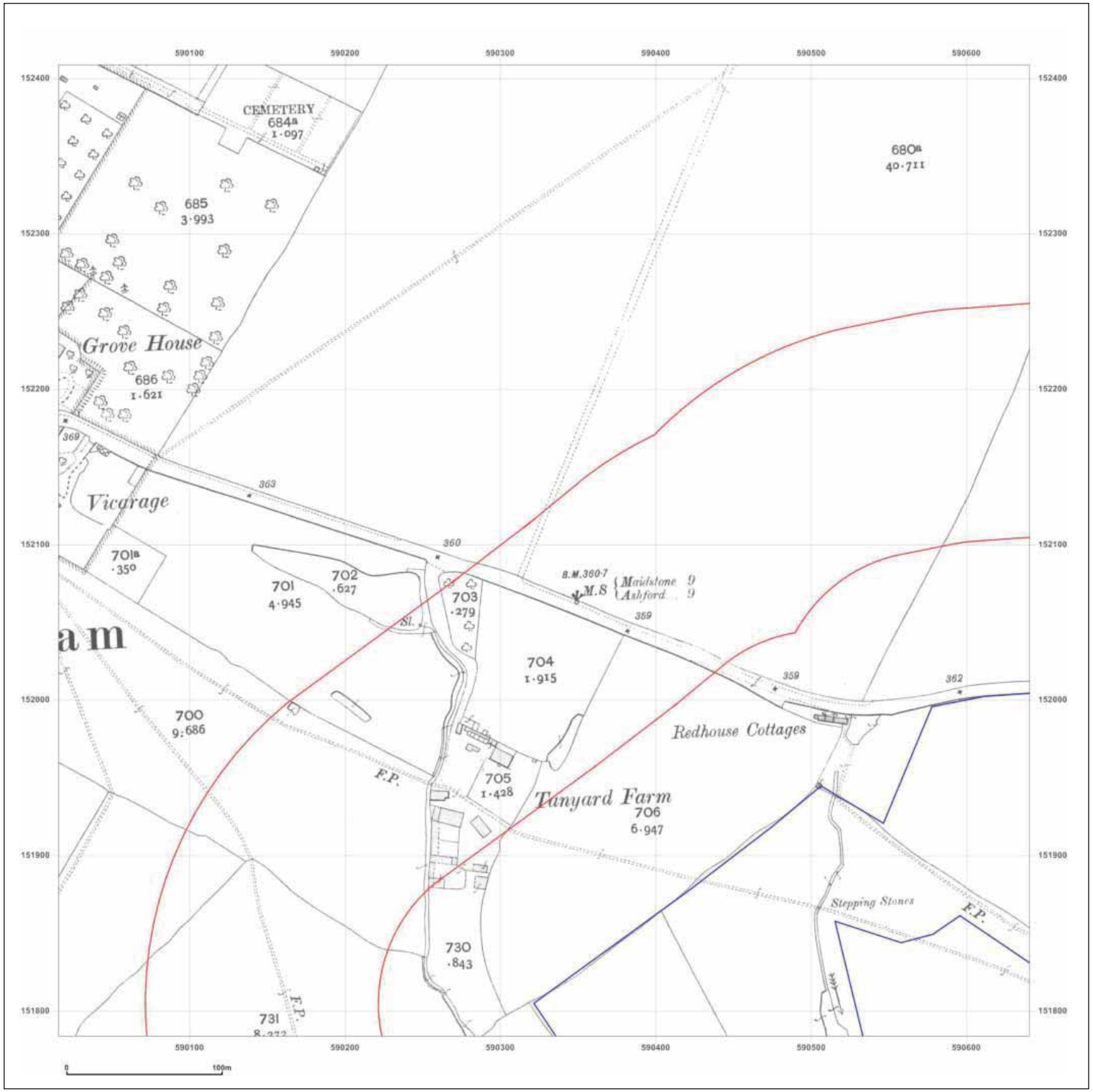

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Site Details:

Old Ashford Road, Lenham,Old Ashford Road,,Lenham,ME172QA

Client Ref: EMS_528124_710281
Report Ref: EMS-528124_710281_LS_1_2
Grid Ref: 590328, 152096

Map Name: County Series
Map date: 1908
Scale: 1:2,500
Printed at: 1:2,500

N
W E
S

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

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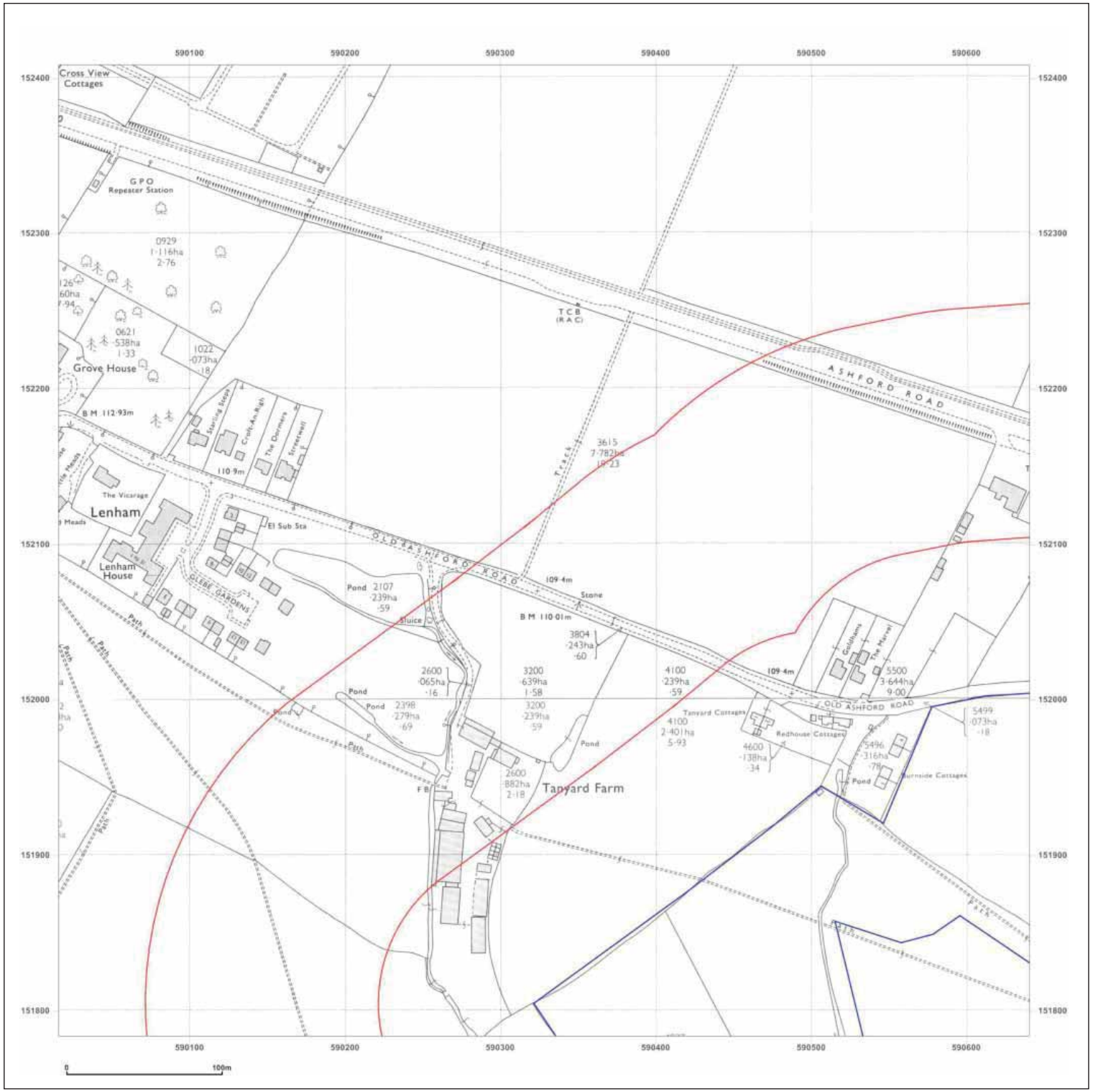

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Site Details:

Old Ashford Road, Lenham,Old Ashford Road,,Lenham,ME172QA

Client Ref: EMS_528124_710281
Report Ref: EMS-528124_710281_LS_1_2
Grid Ref: 590328, 152096

Map Name: National Grid
Map date: **1969**
Scale: 1:2,500
Printed at: 1:2,500

N
W E
S

Surveyed 1969
Revised 1969
Edition N/A
Copyright 1970
Levelled 1953

Surveyed 1969
Revised 1969
Edition N/A
Copyright 1970
Levelled 1951

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Site Details:

Old Ashford Road, Lenham,Old Ashford Road,,Lenham,ME172QA

Client Ref: EMS_528124_710281
Report Ref: EMS-528124_710281_LS_1_2
Grid Ref: 590328, 152096

Map Name: National Grid
Map date: 1988-1993
Scale: 1:2,500
Printed at: 1:2,500

N
W E
S

Surveyed 1972
Revised 1988
Edition N/A
Copyright 1988
Levelled 1972

Surveyed 1993
Revised 1993
Edition N/A
Copyright N/A
Levelled N/A

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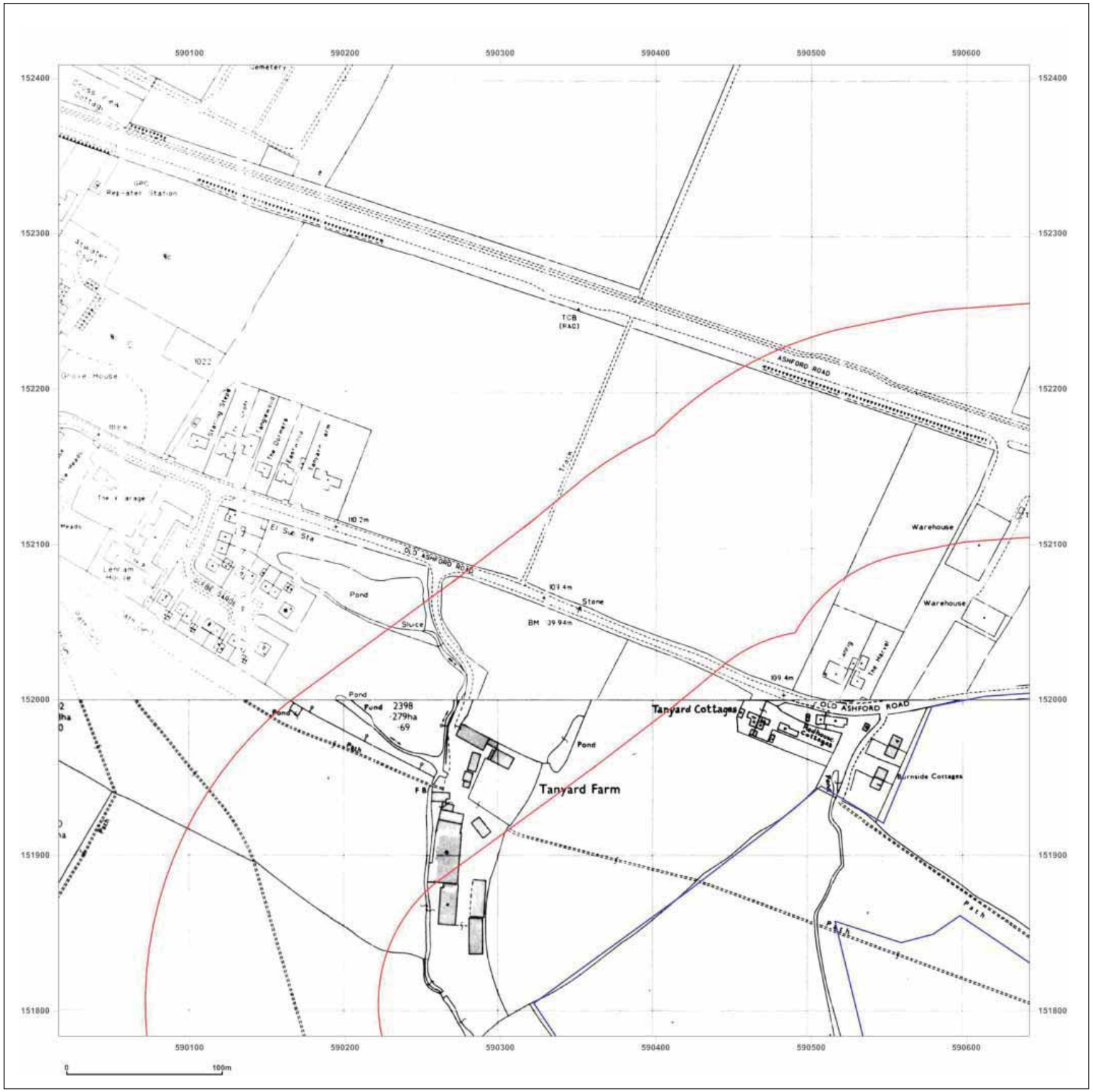

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Site Details:

Old Ashford Road, Lenham,Old Ashford Road,,Lenham,ME172QA

Client Ref: EMS_528124_710281
Report Ref: EMS-528124_710281_LS_1_2
Grid Ref: 590328, 152096

Map Name: National Grid
Map date: 1988-1993
Scale: 1:2,500
Printed at: 1:2,500

N
W E
S

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

Surveyed 1972
Revised 1988
Edition N/A
Copyright 1988
Levelled 1972

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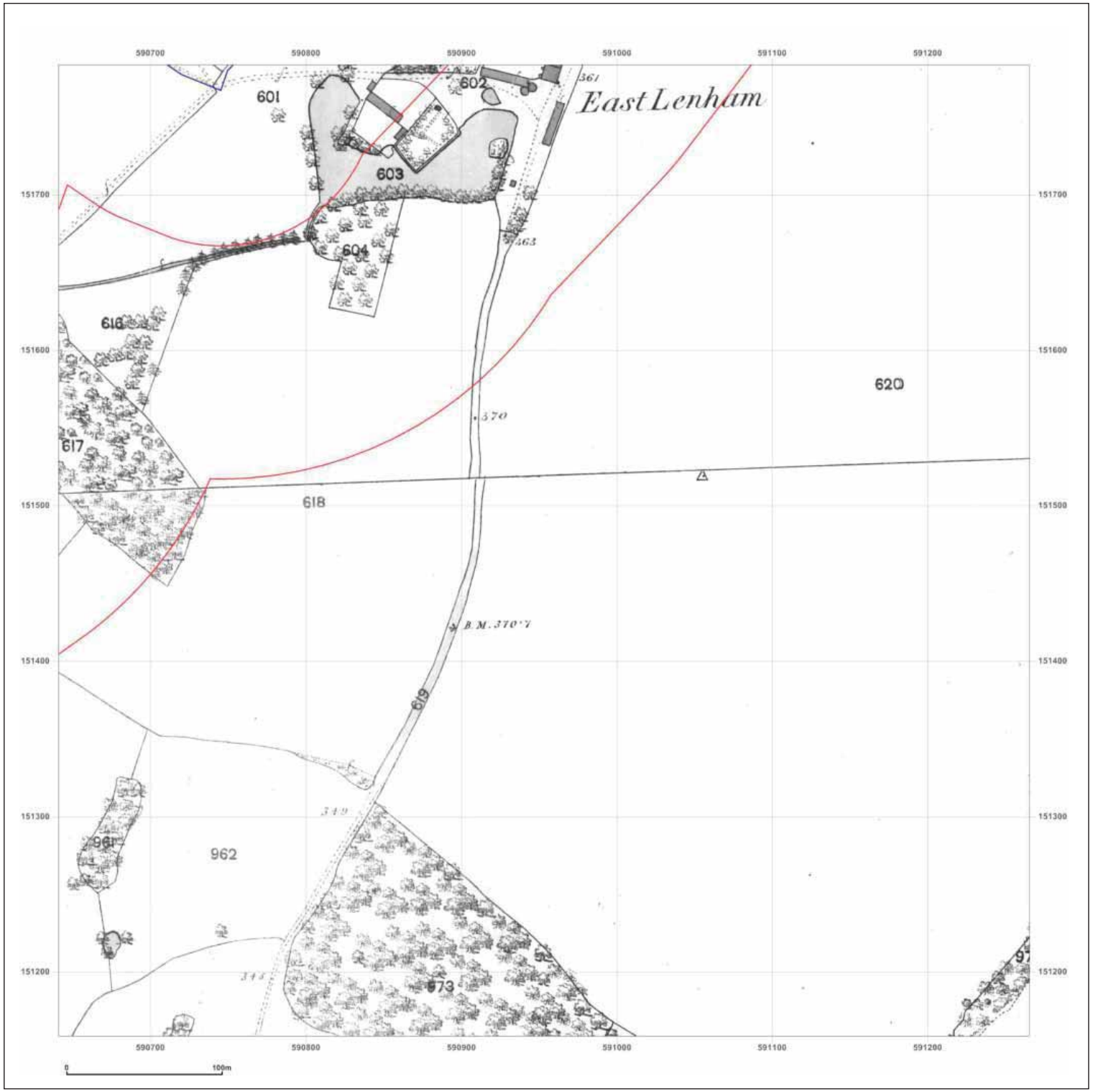

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Site Details:

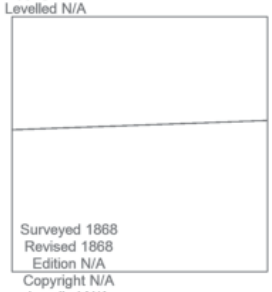
Old Ashford Road, Lenham,Old Ashford Road,,Lenham,ME172QA

Client Ref: EMS_528124_710281
Report Ref: EMS-528124_710281_LS_2_1
Grid Ref: 590953, 151471

Map Name: County Series
Map date: 1868
Scale: 1:2,500
Printed at: 1:2,500

N
W E
S

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



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

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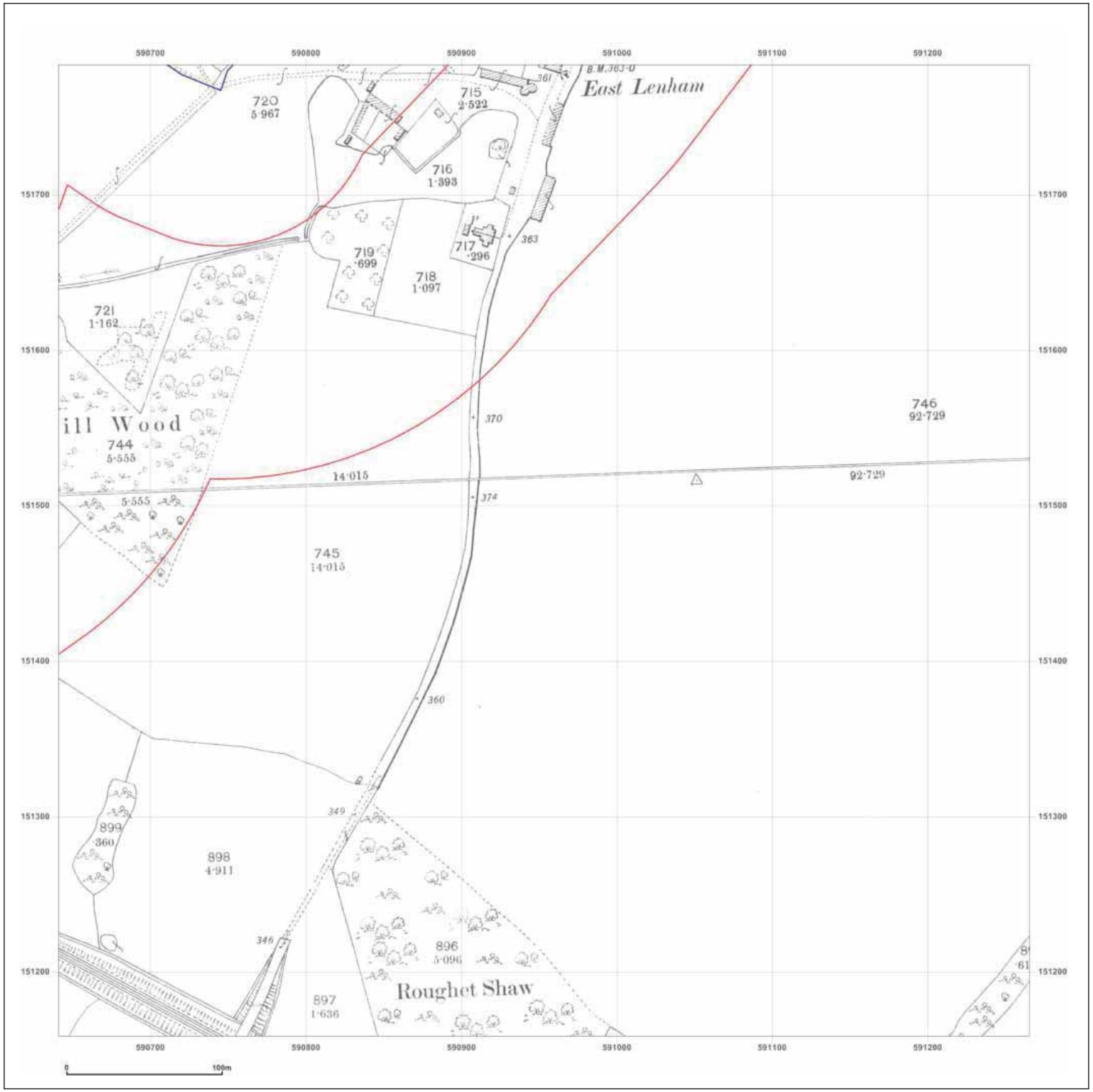

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Site Details:

Old Ashford Road, Lenham,Old Ashford Road,,Lenham,ME172QA

Client Ref: EMS_528124_710281
Report Ref: EMS-528124_710281_LS_2_1
Grid Ref: 590953, 151471

Map Name: County Series
Map date: 1897
Scale: 1:2,500
Printed at: 1:2,500

N
W E
S

Surveyed 1897
Revised 1897
Edition N/A
Copyright N/A
Levelled N/A

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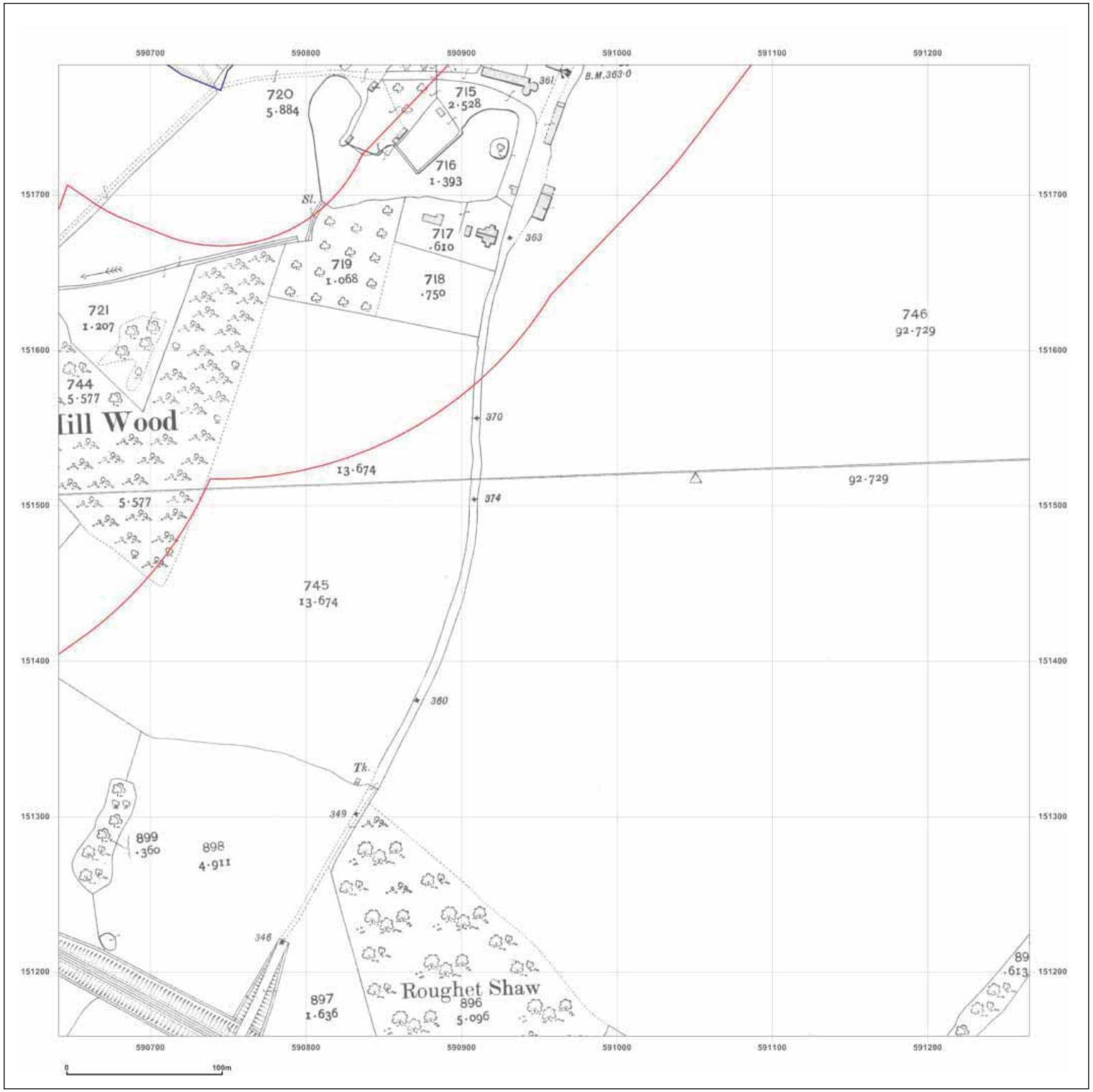

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Site Details:

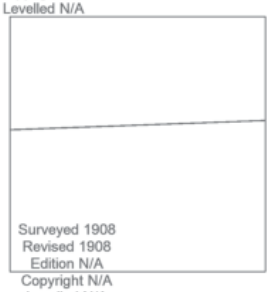
Old Ashford Road, Lenham,Old Ashford Road,,Lenham,ME172QA

Client Ref: EMS_528124_710281
Report Ref: EMS-528124_710281_LS_2_1
Grid Ref: 590953, 151471

Map Name: County Series
Map date: 1908
Scale: 1:2,500
Printed at: 1:2,500

N
W E
S

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



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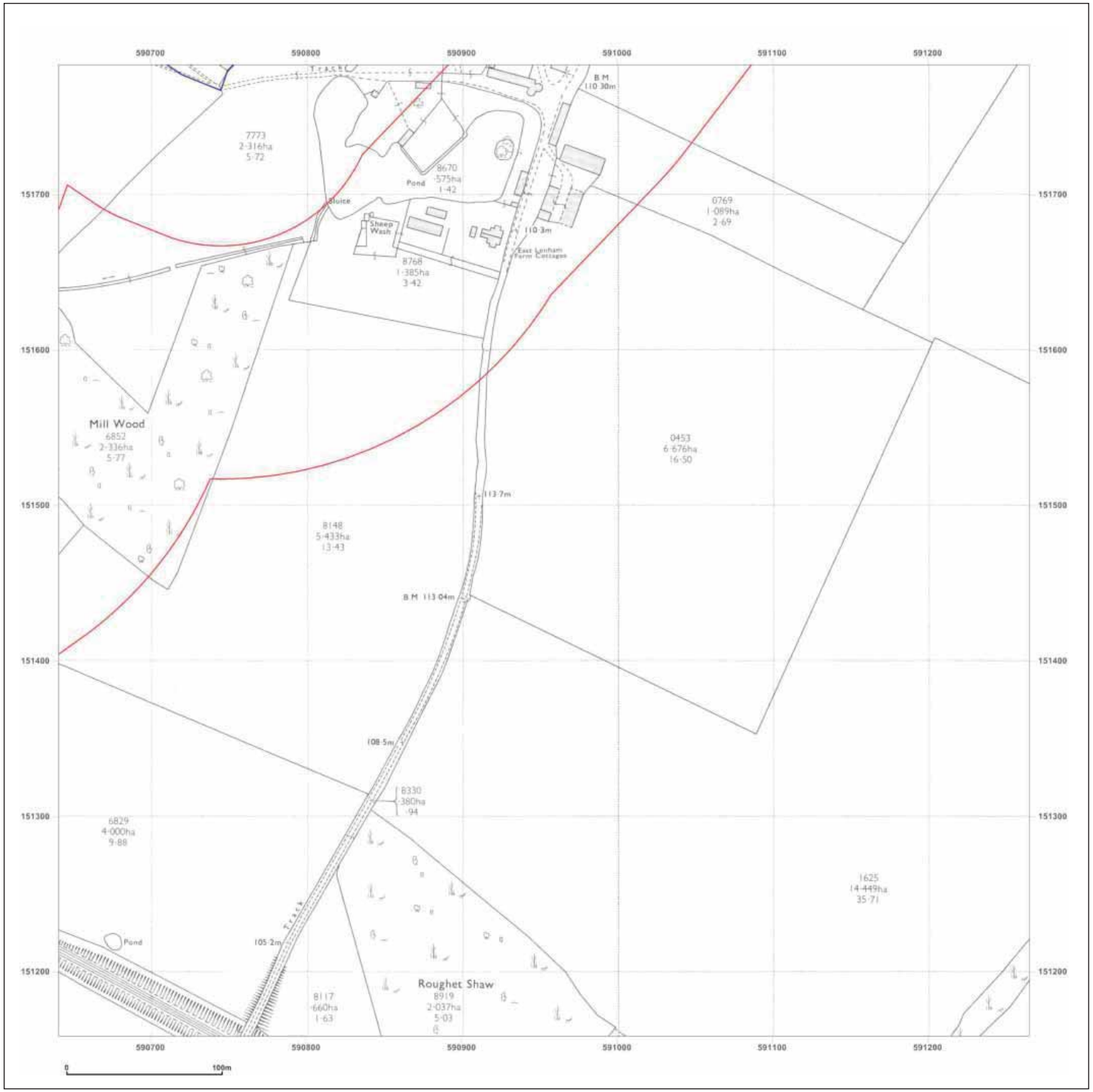

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Site Details:

Old Ashford Road, Lenham,Old Ashford Road,,Lenham,ME172QA

Client Ref: EMS_528124_710281
Report Ref: EMS-528124_710281_LS_2_1
Grid Ref: 590953, 151471

Map Name: National Grid

Map date: **1969**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1969
Revised 1969
Edition N/A
Copyright 1970
Levelled 1951

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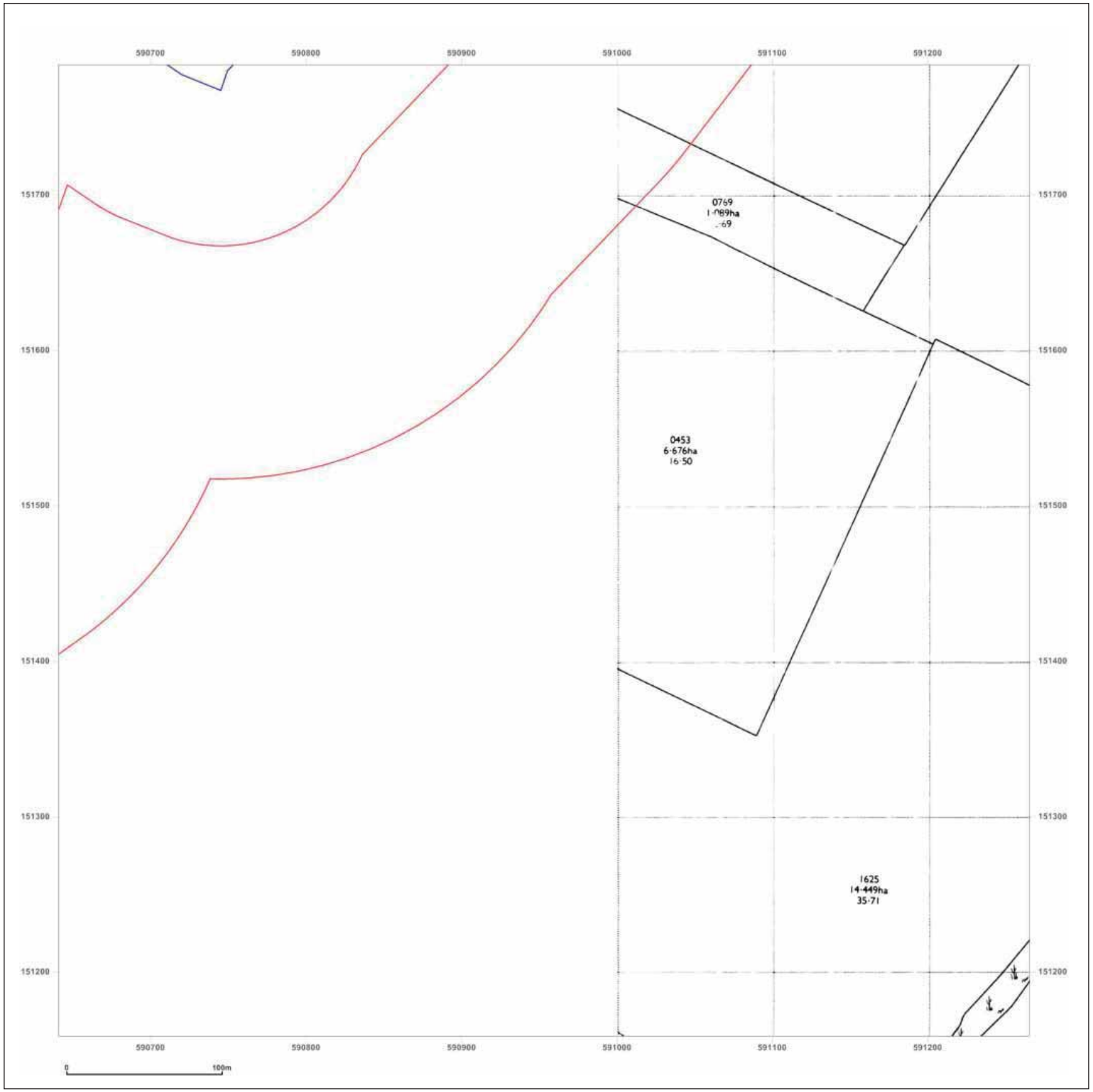

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Report Ref: EMS-528124_710281_LS_2_1
Grid Ref: 590953, 151471

Map Name: National Grid
Map date: 1970
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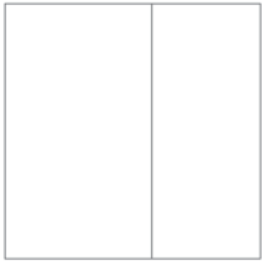

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Edition N/A
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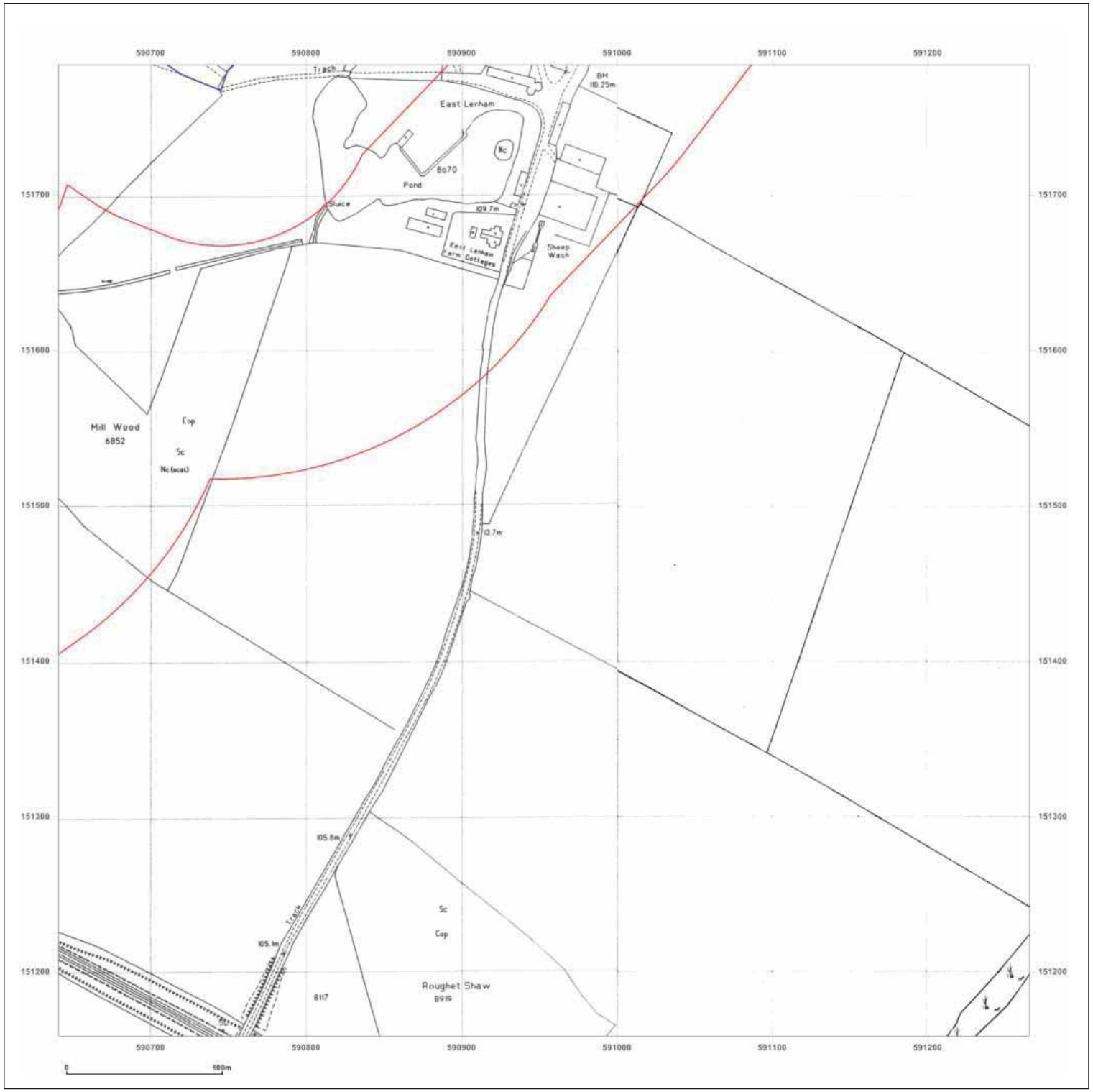

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Report Ref: EMS-528124_710281_LS_2_1
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Map Name: National Grid
Map date: 1988-1993
Scale: 1:2,500
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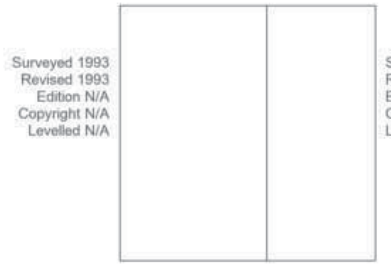

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Scale: 1:2,500
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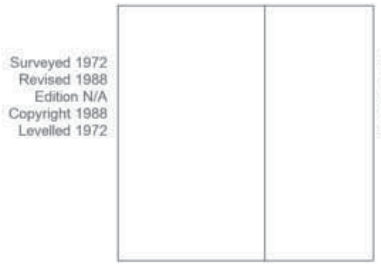

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Edition N/A
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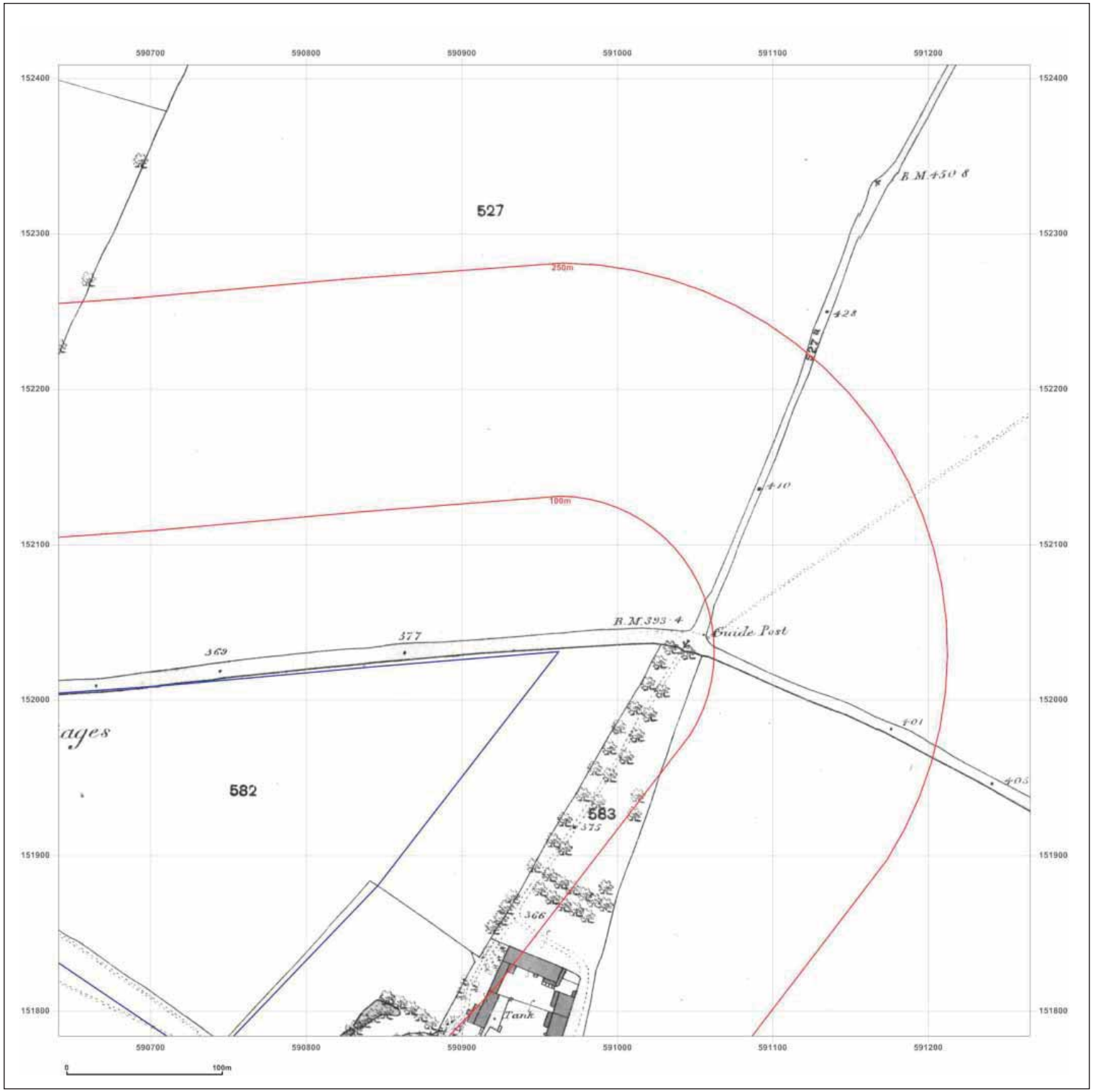

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Grid Ref: 590953, 152096

Map Name: County Series
Map date: 1868
Scale: 1:2,500
Printed at: 1:2,500

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Revised 1868
Edition N/A
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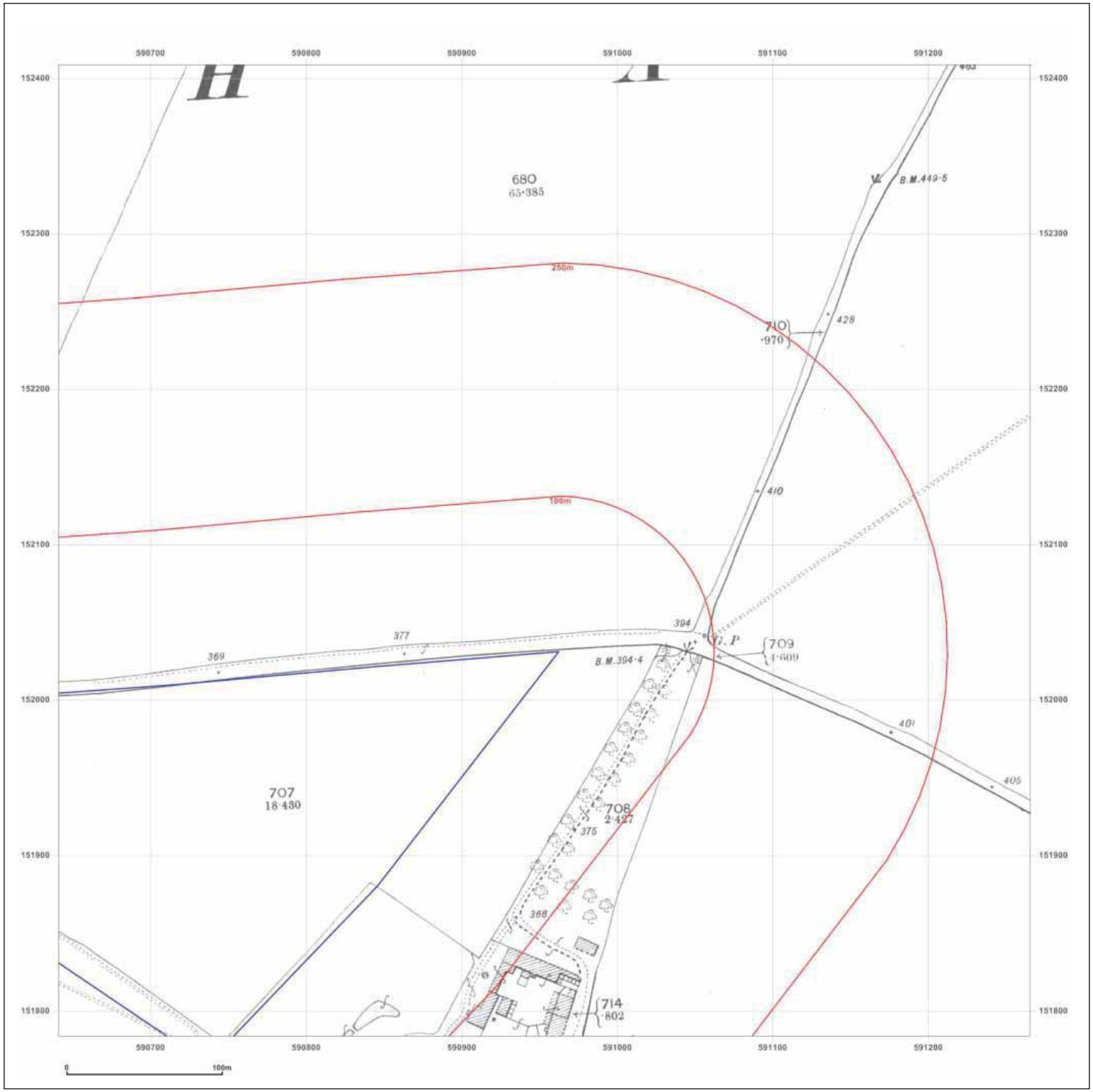

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Map Name: County Series
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Scale: 1:2,500
Printed at: 1:2,500

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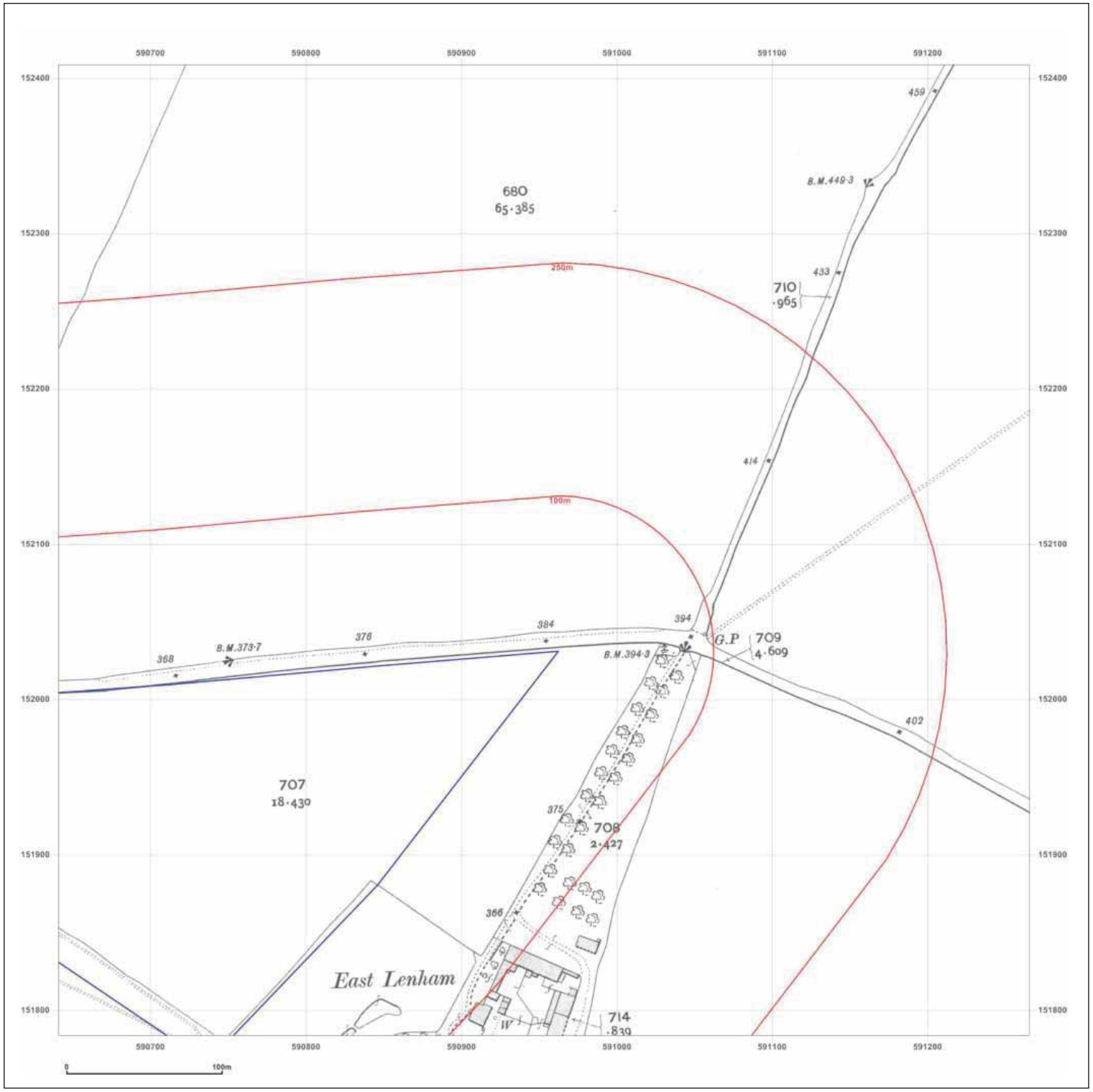

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Grid Ref: 590953, 152096

Map Name: County Series
Map date: 1908
Scale: 1:2,500
Printed at: 1:2,500

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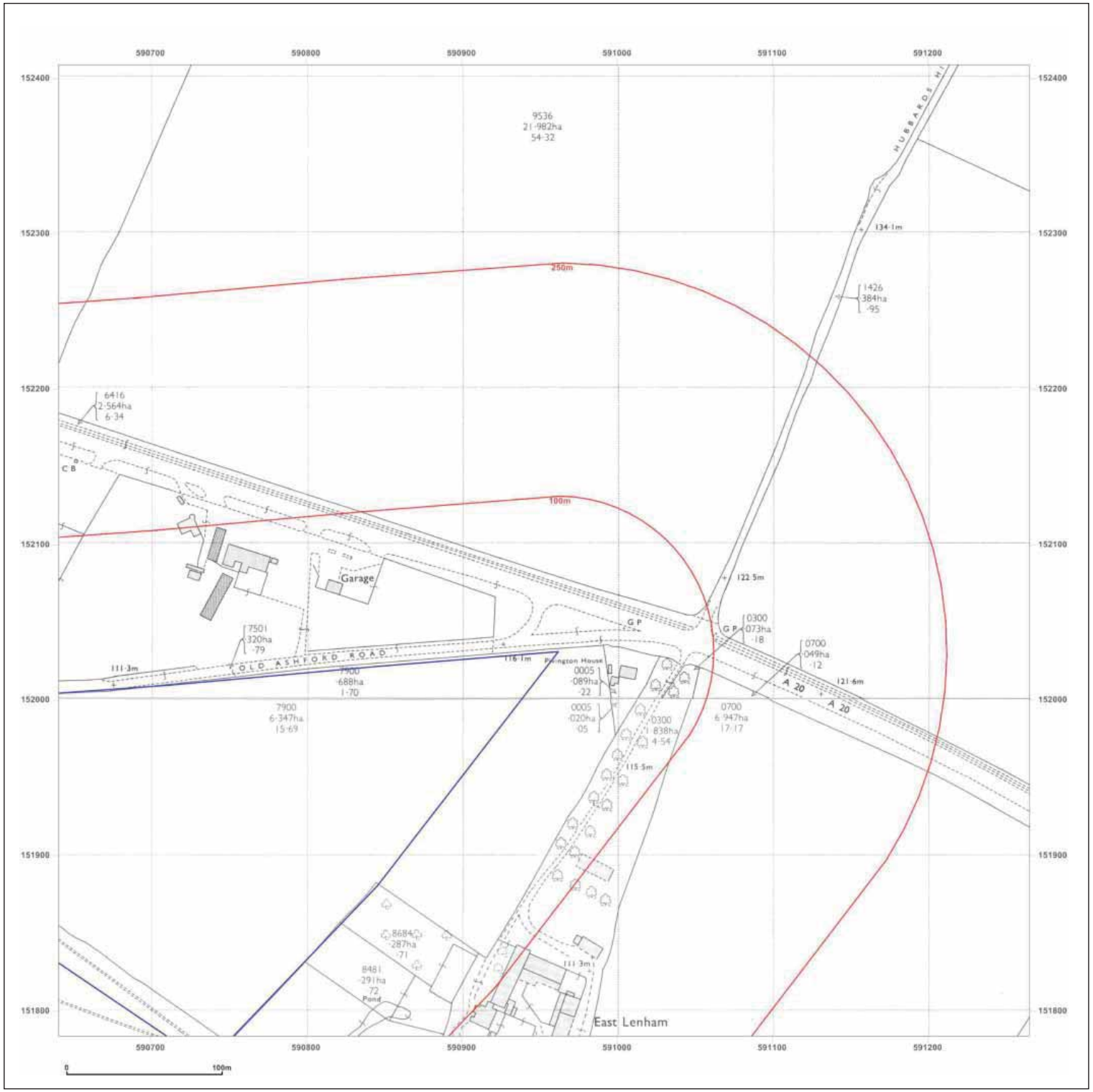

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Map Name: National Grid
Map date: **1969**
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Edition N/A
Copyright 1970
Levelled 1953

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Revised 1969
Edition N/A
Copyright 1970
Levelled 1951

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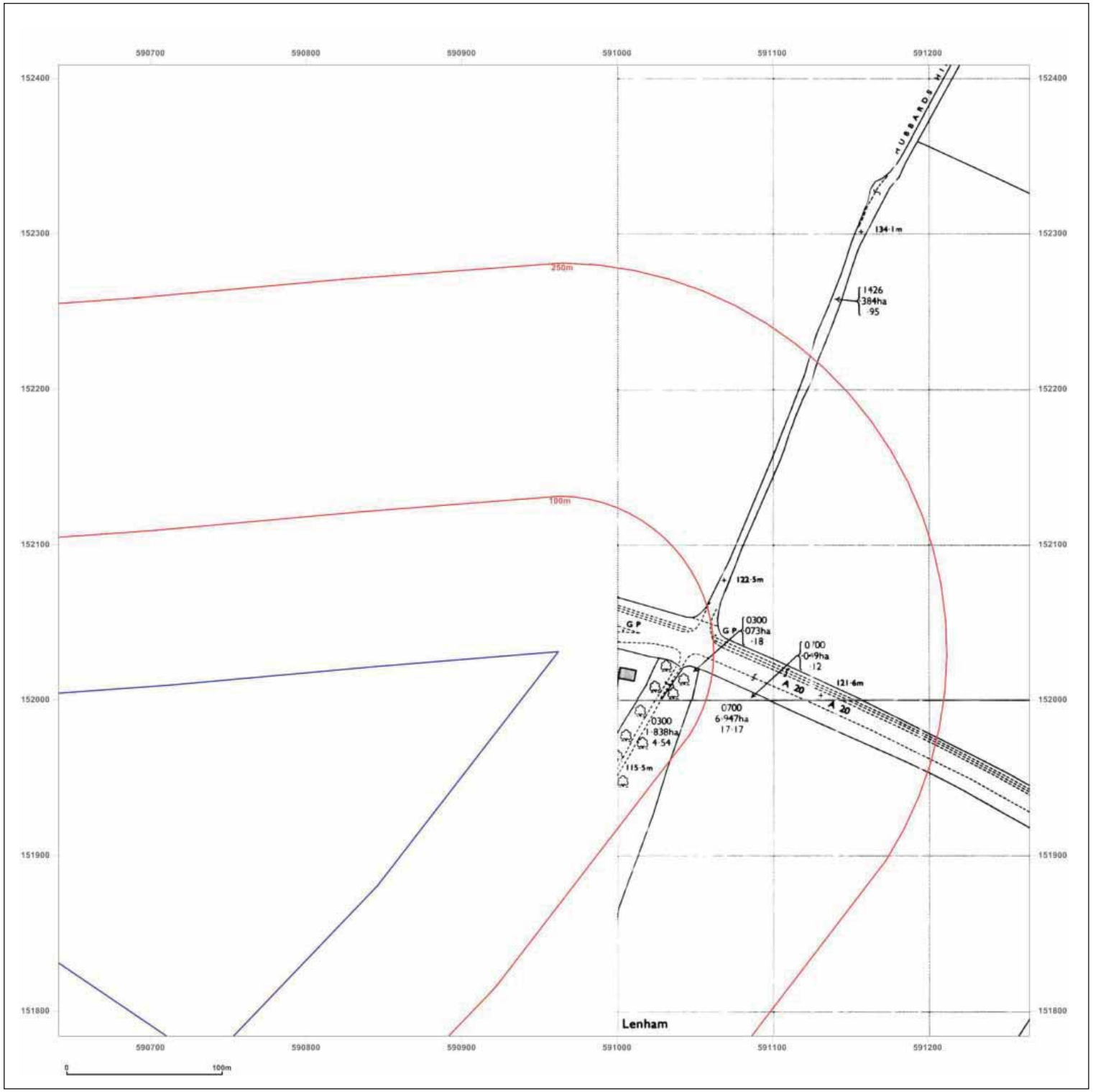

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Report Ref: EMS-528124_710281_LS_2_2
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Map Name: National Grid
Map date: **1970**
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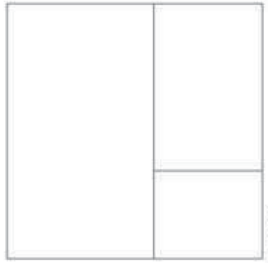

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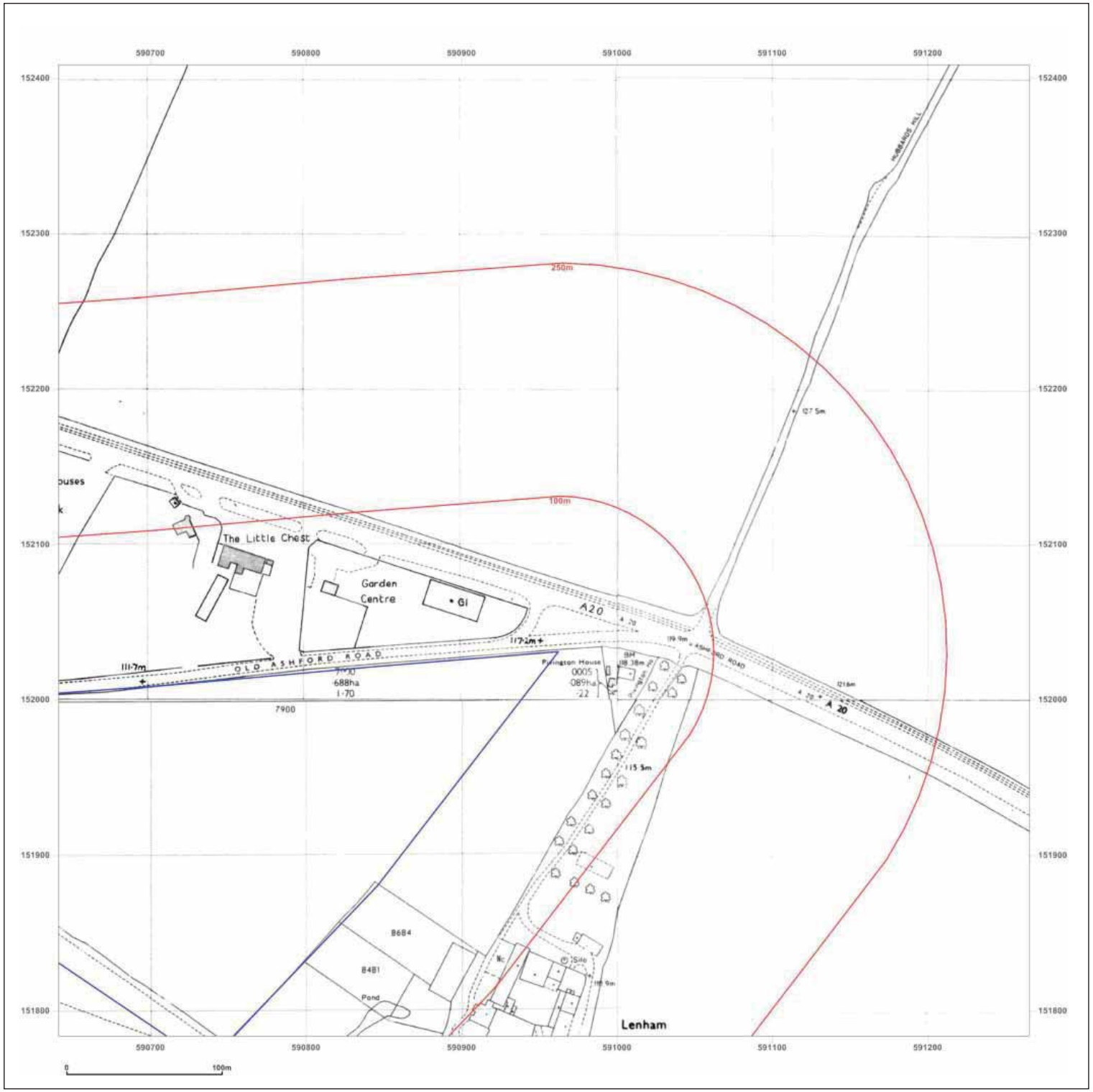

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Grid Ref: 590953, 152096

Map Name: National Grid
Map date: 1988-1993
Scale: 1:2,500
Printed at: 1:2,500

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Surveyed 1972
Revised 1988
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Copyright 1988
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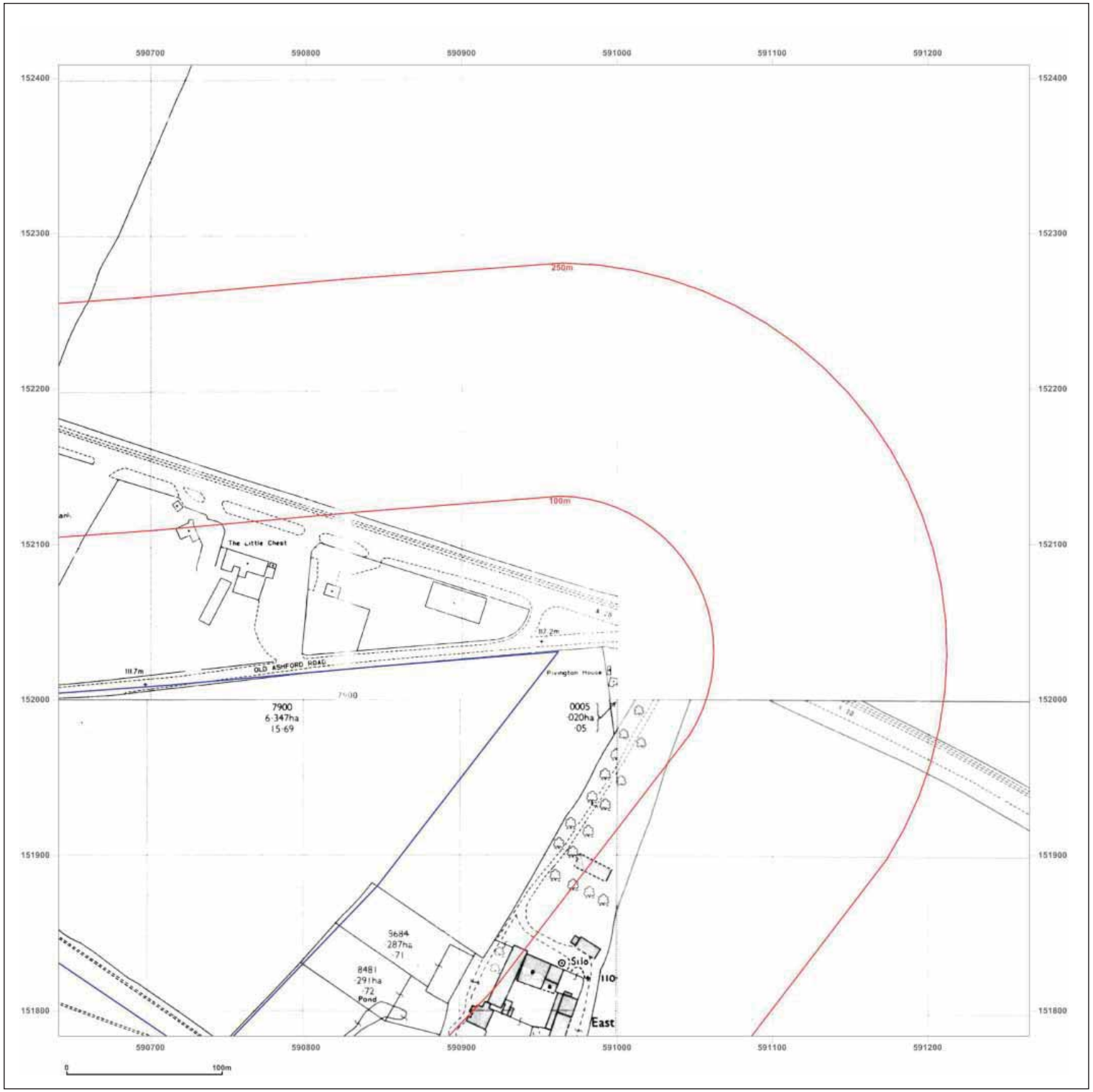

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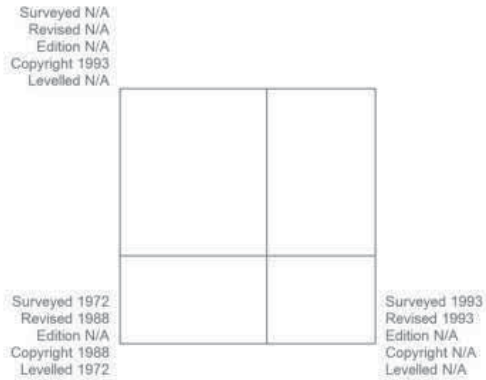

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Production date: 20 February 2019

Map legend available at:
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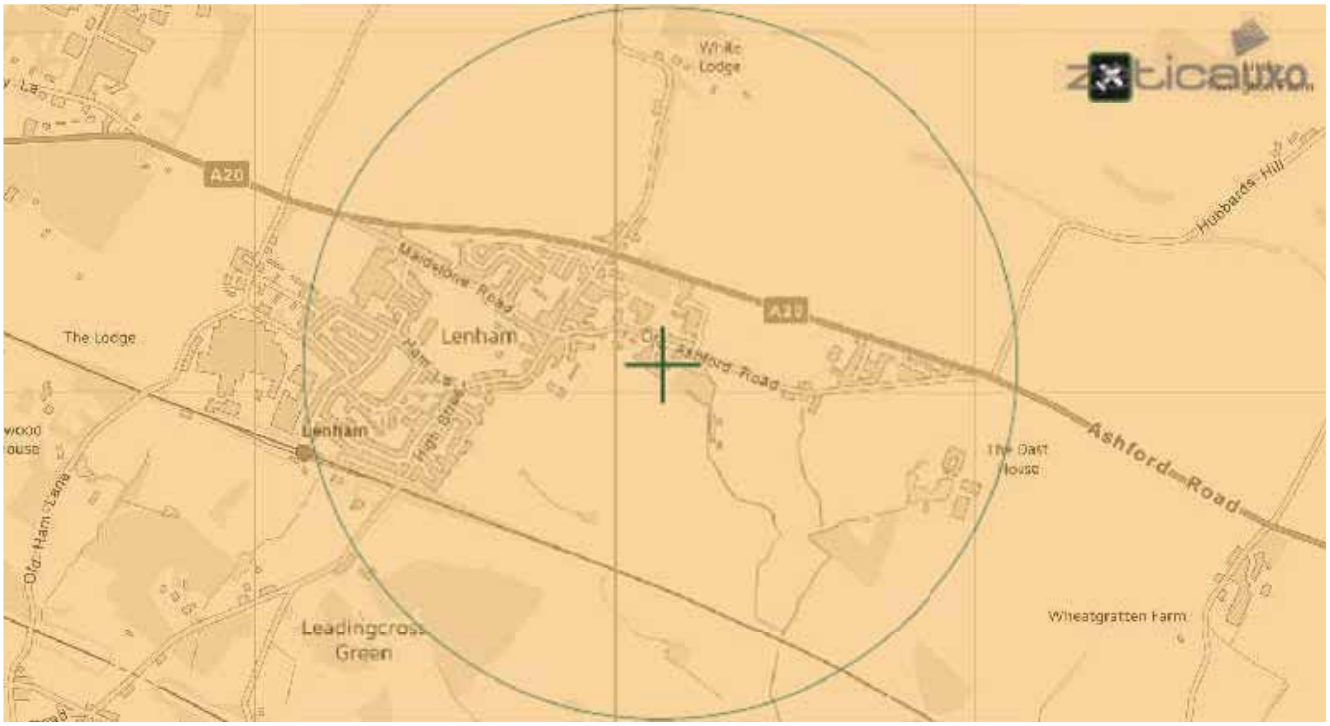
Appendix 2 – UXO Desk Study

UNEXPLODED BOMB RISK MAP

zeticauxo

SITE LOCATION

Location: ME17 2QA,
Map Centre: 590138,152079



LEGEND

- **High:** Areas indicated as having a bombing density of 50 bombs per 1000acre or higher.
- **Moderate:** Areas indicated as having a bombing density of 15 to 49 bombs per 1000acre.
- **Low:** Areas indicated as having 15 bombs per 1000acre or less.

miltary | **industry** | **UXO find**
transport | **dock** | **Luftwaffe targets**
utilities | **other**

How to use your Unexploded Bomb (UXB) risk map?

The map indicates the potential for Unexploded Bombs (UXB) to be present as a result of World War Two (WWII) bombing.

You can incorporate the map into your preliminary risk assessment* for potential Unexploded Ordnance (UXO) for a site. Using this map, you can make an informed decision as to whether more in-depth detailed risk assessment* is necessary.

What do I do if my site is in a moderate or high risk area?

Generally, we recommend that a detailed UXO desk study and risk assessment is undertaken for sites in a moderate or high UXB risk area.

More often than not, this further detailed research will conclude that the potential for a significant UXO hazard to be present on your site is actually low.

Never plan site work or undertake a risk assessment using these maps alone. More detail is required, particularly where there may be a source of UXO from other military operations which are not reflected on these maps.

If my site is in a low risk area, do I need to do anything?

If both the map and other research confirms that there is a low potential for UXO to be present on your site then, subject to your own comfort and risk tolerance, works can proceed with no special precautions.

A low risk really means that there is no greater probability of encountering UXO than anywhere else in the UK.

If you are unsure whether other sources of UXO may be present, you can ask for one of our **pre-desk study assessments (PDSA)**

If I have any questions, who do I contact?

tel: **+44 (0) 1993 886682**

email: **uxo@zetica.com**

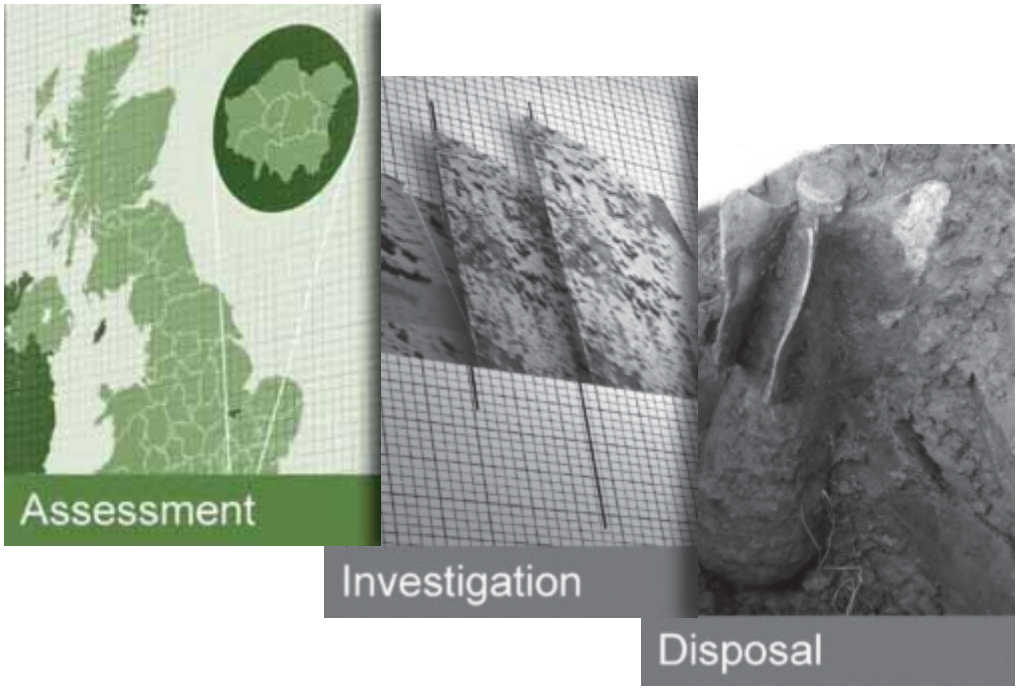
web: **www.zeticauxo.com**

The information in this UXB risk map is derived from a number of sources and should be used in conjunction with the accompanying notes on our website: **(https://zeticauxo.com/downloads-and-resources/risk-maps/)**

It is important to note that this map is not a UXO risk assessment and should not be reported as such when reproduced.

*Preliminary and detailed UXO risk assessments are advocated as good practice by industry guidance such as CIRIA C681 'Unexploded Ordnance (UXO), a guide for the construction industry'.

zeticaUXO



Land off Old Ashford Road, Kent - UXO Desk Study & Risk Assessment

Drafted by Alex Seddon
Checked by Lucy Warwick
Authorised by Stefan Lang

Document Title	**UXO Desk Study & Risk Assessment**
Document Ref.	**P8460-19-R1**
Revision	**A**
Project Location	**Land off Old Ashford Road, Kent**
Client	**Enzygo**
Date	**15th March 2019**

UXO DESK STUDY & RISK ASSESSMENT

Land off Old Ashford Road, Kent

EXECUTIVE SUMMARY

Zetica Ltd was commissioned by Enzygo to carry out an Unexploded Ordnance (UXO) Desk Study and Risk Assessment for an area of approximately 11.5 hectares (ha) at Old Ashford Road, Lenham, Kent ('the Site').

The aim of this report is to gain a fair and representative view of the UXO hazard for the Site and its immediate surrounding area in accordance with the Construction Industry Research and Information Association (CIRIA) C681 'Unexploded Ordnance (UXO), a Guide for the Construction Industry'.

Records indicate that during World War Two (WWII) 3No. High Explosive (HE) bombs fell on the southern part of the Site and exploded.

No records of further HE bombing on the Site have been found and the bombing density in the immediate vicinity was low.

No records of other military activity on the Site have been found.

Given this, it is considered that the Site has a low UXO hazard level as shown in the following Figure, reproduced as Figure 5 in the main report.

Figure	UXO hazard zone plan of the Site

Source: Client *Not to Scale*

Legend					
	Very Low		Low		Moderate	
	High		Very High		Site boundary	

The main findings of the report are summarised below.

- No records of bombing or military activity on the Site during World War One (WWI) have been found.
- During WWII the main strategic targets in the vicinity of the Site were military camps, transport infrastructure and commercial property.
- Records have been found indicating that 3No. HE bombs fell on the southern part of the Site during WWII and exploded. 1No. HE bomb fell adjacent to the northwest of the Site. This was recorded as an Unexploded Bomb (UXB).
- Records indicate that an Auxiliary Unit Operational Base (OB) was located in close proximity to the Site during WWII.
- No records of post-WWII military activity on the Site have been found.

The Table below, reproduced as Table 5 in the main report, provides a UXO risk assessment for potential work on the Site.

Further details on the methodology for the risk assessment are provided in Section 10.1 of the main report.

Table UXO risk assessment for the Site

Potential UXO Hazard	Anticipated Works	PE	PD	P = PE x PD	Likelihood	Severity	Risk Rating	UXO Risk
UXB	Shallow Excavations	1	1	1	1	5	5	Low
	Deep Excavations	1	1	1	1	5	5	Low
	Piling/Boreholes	1	1	1	1	4	4	Low
Other UXO	Shallow Excavations	1	1	1	1	4	4	Low
	Deep Excavations	1	1	1	1	4	4	Low
	Piling/Boreholes	1	1	1	1	3	3	Low

PE (Probability of Encounter), PD (Probability of Detonation), P (Overall Probability)

Shallow Excavations defined as <1.0m below ground level (bgl).

Risk Mitigation Recommendations

To ensure that the UXO risk is reduced to As Low As Reasonably Practicable (ALARP) the following mitigation is advised:

Excavations

Where a low risk of UXO encounter is anticipated, industry good practice is to raise the awareness of those involved in excavations so that in the unlikely event that a suspect item is discovered, appropriate action is taken. This can be achieved through UXO awareness briefings to site staff.

Typically ~1hour in duration, these briefings will be expected to provide site workers with:-

- Background to the potential UXO hazards that could be encountered.
- Awareness of how the UXO hazard could present a risk.
- Knowledge of what to do in the event that a suspect item is encountered.

The briefing is to be provided along with back-up materials such as UXO awareness posters, emergency contact numbers and other background information to assist site workers in becoming familiar with what potential UXO can look like.

The materials can also be used by key staff to pass on the relevant points of the briefing to others who visit or work on the Site.

By providing the UXO awareness briefing, it ensures that in the unlikely event that UXO is encountered:-

- All site staff take appropriate action.
- A support mechanism and points of contact are established.
- The likelihood of harm to people or property is reduced.
- Significant delays to site work are prevented.

Boreholes/Piles

Clearance certification for borehole or pile locations is considered prudent only if a zero tolerance to risk is adopted. Zero tolerance is commonly adopted for sites that have safety critical infrastructure such as nuclear establishments and oil refineries.

Table 6 in the main report gives recommended actions in relation to the potential UXO risk level and the anticipated Site activity.

Further advice on the mitigation methods can be provided by Zetica on request.

CONTENTS

Figures, Plates & Tables

Appendices

UXO DESK STUDY & RISK ASSESSMENT

Land off Old Ashford Road, Kent

Note: To aid the reader of this report, Zetica has colour coded each paragraph. Paragraphs with black text on a white background are paragraphs that provide site-specific information or information specifically researched as part of this project.

Paragraphs in a dark green text with a green background are paragraphs containing background information or explanations which may appear as standard text in all similar reports.

1 INTRODUCTION

1.1 Project Outline

Zetica Ltd was commissioned by Enzygo to carry out an Unexploded Ordnance (UXO) Desk Study and Risk Assessment for an area of approximately 11.5 hectares (ha) at Old Ashford Road, Lenham, Kent ('the Site').

The aim of this report is to gain a fair and representative view of the UXO hazard for the Site and its immediate surrounding area in accordance with the Construction Industry Research and Information Association (CIRIA) C681 'Unexploded Ordnance (UXO), a Guide for the Construction Industry'. This hazard assessment includes:

This hazard assessment includes:

- Likelihood of ordnance being present.
- Type of ordnance (size, filling, fuze mechanisms).
- Quantity of ordnance.
- Potential for live ordnance (UXO).
- Probable location.
- Ordnance condition.

It should be noted that some military activity providing a source of UXO hazard may not be readily identifiable and therefore there cannot be any guarantee that all UXO hazards within the Site have been identified in this report.

1.2 Historical Information

With most locations, the potential presence of UXO as a result of enemy action, unauthorised disposal or unrecorded military activity can never be totally discounted.

Detailed records of military activity are rarely released into the public domain. Even when military information is made public there may be gaps in the records because files have been lost or destroyed.

Records for periods such as WWII are only as detailed and accurate as the resources and working conditions would allow at the time. Densely populated areas tend to have a greater number of records than rural areas. Such records may be inaccurate due to the confusion surrounding continuous air raids.

Press records can supplement local information, although this source of information must be treated with caution, as inaccuracies do exist, either inadvertently or intentionally in order to confuse enemy intelligence. Classified official records can sometimes be considered inaccurate for the same reason.

Recent research indicates that England alone had 17,434No. recorded defence sites, of which 12,464No. were classified as defensive anti-invasion sites. The precise locations of many of these sites are still to be identified, illustrating the scale of the problem when establishing potential risks from limited historical data.

1.3 Sources of Information

Zetica Ltd researched the military history of the Site and its surrounding area utilising a range of information sources. The main sources of information are detailed in the following sections and referenced at the end of this report.

1.3.1 Zetica Ltd Defence Related Site Records

Zetica Ltd's in-house records were consulted, including reference books and archived materials from past work in the region. Relevant documents have been cited within the bibliography of this report.

1.3.2 Zetica Ltd Bombing Density Records and Maps

Reference has been made to the Zetica Ltd bomb risk maps located on Zetica Ltd's website (http://zeticauxo.com/downloads-and-resources/risk-maps/).

1.3.3 Ministry of Defence and Government Records

Various government departments and units within the Ministry of Defence (MoD) were approached for information of past and present military activity in the area. These included the Home Office records of abandoned bombs.

1.3.4 Other Historical Records, Maps and Drawings

Numerous reference documents including historical maps, aerial photographs and drawings have been consulted from sources such as the National Archives, the US National Archives and Records Administration (NARA), the National Collection of Aerial Photograph (NCAP), Historic England and the Defence of Britain Project.

The British Geological Survey (BGS) was consulted for borehole information.

1.3.5 Local Authority Records

Information has been obtained from Kent County Council.

1.3.6 Local Record Offices and Libraries

The Kent History and Library Centre was consulted.

1.3.7 Local Historical and Other Groups

Local history groups and archaeological societies were consulted, including the Kent Archaeological Society and the Kent Historic Environment Record (HER).

1.4 Data Confidence Level

In general, there is a high level of confidence in the researched information sources used for this report. Any exceptions to this are specifically detailed in the text of this report.

2 THE SITE

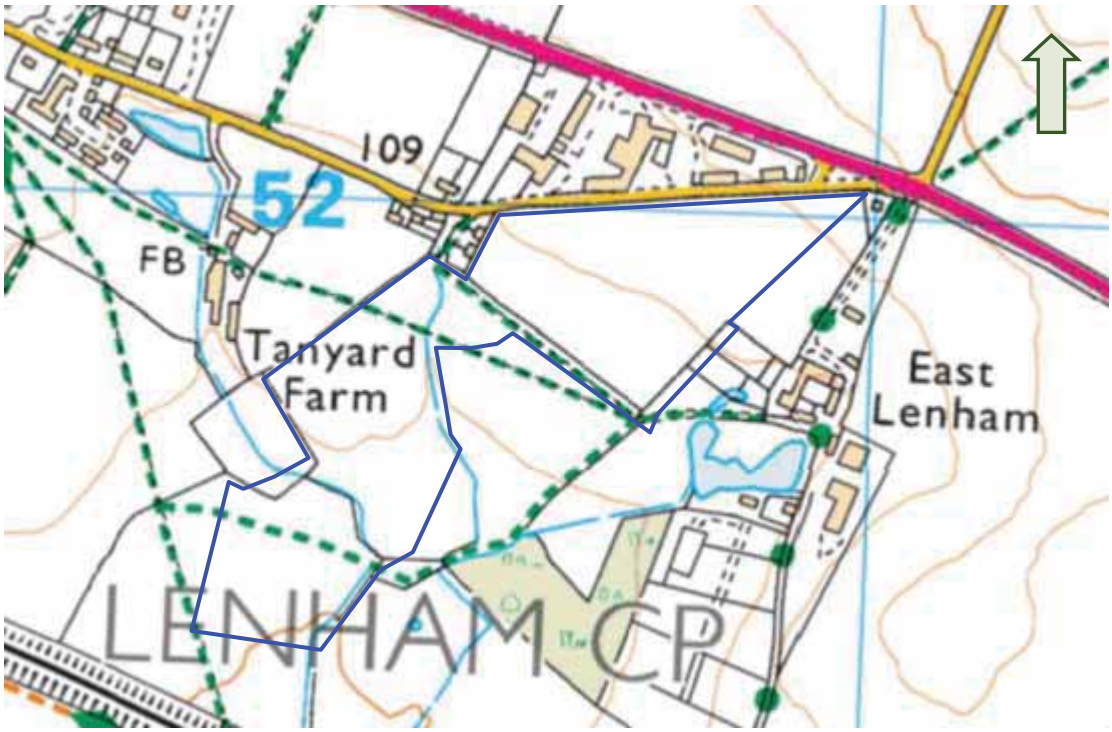
2.1 Site Location

The Site is centred on Ordnance Survey National Grid Reference (OSNGR) TQ905519 It is located south of Old Ashford Road, approximately 0.9km southeast of Lenham village and 14.7km southeast of Maidstone town centre.

The Site comprises agricultural land. It is bounded to the north by Old Ashford Road and commercial properties. It is bounded to the east, west and south by agricultural land.

Figure 1 is a Site location map and Plate 1 is a recent aerial photograph of the Site.

Figure 1 Site location map



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Legend Site boundary

Plate 1	Recent aerial photograph of the Site

Source: Google Earth *Not to Scale*

Legend	Site boundary

2.2 Proposed Works

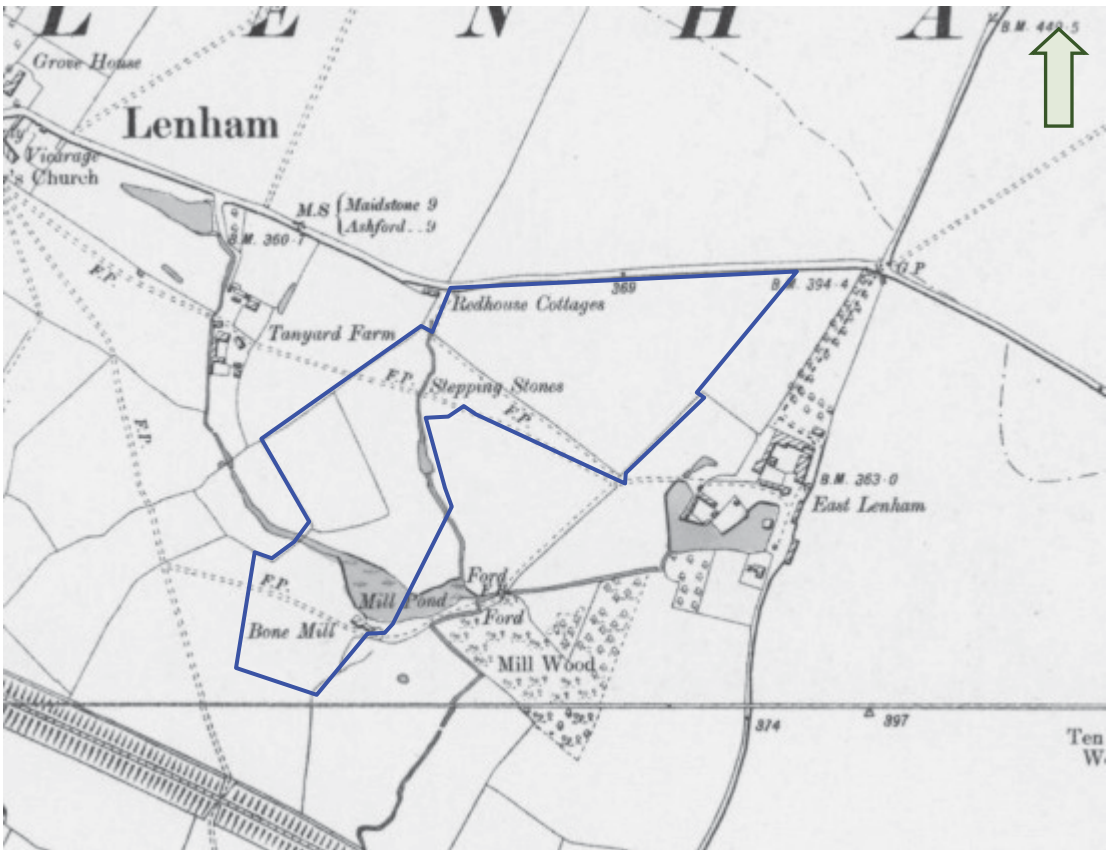
It is understood that initial works on the Site include trial pits to 2m below ground level.

Future works on the Site may include further intrusive ground investigations, excavations and piling.

2.3 Site History

The historical map of 1898 (Figure 2) shows that at the end of the 19th century the Site comprised agricultural land and part of Mill Pond.

Figure 2	Historical map, 1898



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Legend	Site boundary

By 1940 residential property had been constructed adjacent to the north-western boundary of the Site. No further significant development had occurred on or in the vicinity of the Site.

This is shown on Plate 2, an aerial photograph dated the 15th August 1940.

Plate 2	Aerial Photograph, 15th August 1940

Source: NCAP *Not to Scale*

Legend	Site boundary

Plate 3 is an aerial photograph dating from 1990. No significant development has occurred on the Site. Commercial property had been constructed to the north of the Site.

Plate 3	Aerial photograph, 1990

Source: Google Earth *Not to Scale*

Legend	Site boundary

Since 1990 no significant development has occurred on the Site (see Plate 1).

2.4 Pre-WWI Military Activity

No records of any significant pre-WWI military activity on or in close proximity to the Site have been found.

2.5 WWI Military Activity

No records of any significant WWI military activity on or in close proximity to the Site have been found.

During WWI an estimated 9,000No. German bombs were dropped over Britain. It was the first time that strategic aerial bombing had been used.

No records have been found indicating that the Site was bombed during WWI.

In response to the air raids, Anti-Aircraft (AA) guns were established. These were potential sources of Unexploded AA (UXAA) shells which could land up to 13km from the firing point, although more typically fell within 10km during WWI.

No records have been found indicating that any AA guns were located within 10km of the Site during WWI.

WWI military activity is not considered to provide a source of UXO hazard to the Site.

2.6 WWII Military Activity

Kent was located on Luftwaffe flight paths to London and was consequently subject to 'tip and run' raids and jettisoned bombs throughout WWII. Details for recorded air raids in the vicinity of the Site are provided in Section 3.

Numerous defensive and offensive military structures were built in the vicinity of the Site. These included lines of defence (Stop Lines), pillboxes, bombing decoys and AA guns. Further details are given in Section 4.

Other military establishments in the vicinity of the Site are described in Sections 5 to 7.

2.7 Post-WWII Military Activity

No records of any significant post-WWI military activity on or in close proximity to the Site have been found.

3 WWII BOMBING

Bombing raids began in the summer of 1940 and continued until the end of WWII. Bombing densities generally increased towards major cities or strategic targets such as docks, industrial premises, power stations and airfields.

The German bombing campaign saw the extensive use of both High Explosive (HE) bombs and Incendiary Bombs (IBs). The most common HE bombs were the 50kg and 250kg bombs, although 500kg were also used to a lesser extent. More rarely 1,000kg, 1,400kg and 1,800kg bombs were dropped.

The HE bombs tended to contain about half of their weight in explosives and were fitted with one or sometimes two fuzes. Not all HE bombs were intended to explode on impact. Some contained timing mechanisms where detonation could occur more than 70 hours after impact.

Incendiary devices ranged from small 1kg thermite filled, magnesium bodied bombs to a 250kg 'Oil Bomb' (OB) and a 500kg 'C300' IB. In some cases the IBs were fitted with a bursting charge. This exploded after the bomb had been alight for a few minutes causing burning debris to be scattered over a greater area. The C300 bombs were similar in appearance to 500kg HE bombs, although their design was sufficiently different to warrant a specially trained unit of the Royal Engineers to deal with their disposal.

Anti-Personnel (AP) bombs and Parachute Mines (PMs) were also deployed. 2No. types of anti-personnel bombs were in common use, the 2kg and the 12kg bomb. The 2kg bomb could inflict injury across an area up to 150m away from the impact, within 25m of this, death or fatal injury could occur.

PMs (which were up to 4m in length) could be detonated either magnetically or by noise/vibration. Anti-shipping parachute mines were commonly dropped over navigable rivers, dockland areas and coastlines. The Royal Navy was responsible for ensuring that the bombs were made safe. Removal and disposal was still the responsibility of the Bomb Disposal Unit of the Royal Engineers.

WWII bomb targeting was inaccurate, especially in the first year of the war. A typical bomb load of 50kg HE bombs mixed with IBs which was aimed at a specific location might not just miss the intended target but fall some considerable distance away.

It is understood that the local Civil Defence authorities in urban areas had a comprehensive system for reporting bomb incidents and dealing with any UXO. In more rural areas, fewer bombing raids occurred. It is known that ARP records under-represent the number and frequency of bombs falling in rural and coastal areas.

Bombs were either released over targets or as part of 'tip and run' raids where bomber crews would drop their bombs to avoid Anti-Aircraft fire or Allied fighter aircraft on the route to and from other strategic targets. Bombs dropped as a result of poor targeting or 'tip and run' raids on rural, river, marsh or coastal areas were often unrecorded or entered as 'fell in open country', 'fell in the sea' or 'fell in the river' and left little evidence of the fall.

3.1 Bombing in East Kent

There were many strategic targets in the East Kent area during WWII and the region was also prone to 'tip and run' raids, where bomber crews would drop their bombs to avoid AA fire or Allied fighter aircraft.

The first air raids took place during July 1940 when small numbers of German aircraft bombed Ashford and surrounding areas. From mid-September until the end of that year, Kent was bombed on most nights. The air raids continued through the early months of 1941 becoming less frequent, although often more intense.

From July 1941 the bombing campaign against the Kent region entered a period of relative inactivity. Air raids still took place but tended to be relatively minor. Manned bomber raids returned to Kent in the first few months of 1944. After a brief respite, these were followed by the start of the V1 (pilotless aircraft) offensive in June 1944.

The V1 offensive was nearly over by September 1944, although some continued to fall until March 1945.

In September 1944 the V2 (long range rocket) offensive began. Falling from a height of some 80km above the city, these ballistic missiles caused larger craters and greater damage to underground utilities than the V1s, although their surface blast effect was generally less.

Approximately 29,272No. HE bombs and 777,784No. IBs fell on Kent during WWII. 1,422No. V1s, 67No. V2s and 3,513No. shells also fell across the county.

3.2 Strategic Targets

The presence of strategic targets significantly increased the likelihood of bombing within the local area. Airfields, docks, industrial facilities, transport infrastructure and anti-invasion defences were all targeted by Luftwaffe bombers. The inherent bombing inaccuracies at the time meant that areas surrounding the targets were often subjected to bombing.

During WWII the Site was located in a predominantly rural area with few significant strategic targets.

Details of potential targets in the vicinity of the Site are described below.

3.2.1 Transport Infrastructure

Transport infrastructure was frequently targeted by the Luftwaffe in order to disrupt logistical supply lines.

The Southern Railway (SR) Maidstone Line ran approximately 0.2km south of the Site.

Lenham railway station was located approximately 1.2km west of the Site.

3.2.2 Military Targets

A military camp was located near Woodside Green, approximately 1.7km northwest of the site.

An ‘Operation Overlord’ Military camp was located at Chilston park, approximately 1.7km southwest of the Site.

3.2.3 Industrial and Commercial Targets

Minor industrial and commercial targets including a bacon factory and a basket factory were located in Lenham, approximately 1.3km west of the Site.

3.3 Bombing Density and Incidents

Table 1 gives details of the overall bombing statistics recorded for the Local Authority Districts of the Site and surrounding districts. These were categorised as County Boroughs (CB), Municipal or Metropolitan Boroughs (MB), Urban Districts (UD) and Rural Districts (RD).

WWII bomb density levels are defined below:

<5 bombs per 405ha is a Very Low regional bombing density.

5-15 bombs per 405ha is a Low regional bombing density.

15-50 bombs per 405ha is a Moderate regional bombing density.

50-250 bombs per 405ha is a High regional bombing density.

>250 per 405ha is a Very High regional bombing density.

The Site was located in Hollingbourn RD.

Table 1 Bombing statistics

Area	Bombs Recorded				
	High Explosive	Parachute Mines	Other	Total	Bombs per 405ha (1,000 acres)
Hollingbourn RD	**894**	**2**	**19**	**915**	**16.1**
Cranbrook RD	2,491	18	94	2,603	76.3
Chatham MB	262	2	0	264	60.6
Maidstone MB	258	0	5	263	44.0
Malling RD	1,812	16	39	1,867	40.9
Gillingham MB	271	1	8	280	33.5
Maidstone RD	569	2	15	586	16.9
Swale RD	865	17	18	900	14.9
West Ashford RD	351	0	3	354	9.0
Tenterden RD	312	3	12	327	8.6

Note that Table 1 excludes the figures for V1s (Pilotless Aircraft, also known as 'Doodlebugs'), V2s (Long Range Rockets) and IBs. Discrepancies between this list and other records, such as bomb clearance records, demonstrate that this data is likely to under-represent actual bombing.

The nearest recorded incidents to the Site are described in the Section below.

It should be noted that some WWII Air Raid Precautions (ARP) reports give military grid references to indicate the locations of bomb falls. When these are converted into modern OS grid references there can be an offset in position of up to 0.3km. If no further description of the location is given, then the position of the bomb fall is marked as approximate only.

21st June 1940

3No. HE bombs fell near Pivington Farm, approximately 1.3km northeast of the Site.

5th July 1940

1No. HE bomb fell on Tanyard Farm, adjacent to the north-western boundary of the Site. This was recorded as an Unexploded Bomb (UXB).

1No. HE bomb fell on Chapel Farm, approximately 1.1km south-southeast of the Site. This was recorded as UXB.

Incendiary Bombs (IBs) fell on Tophill farm, approximately 1.4km northwest of the Site.

IBs fell on Woodside Green, approximately 1.7km northwest of the Site.

IBs fell on Lenham Forstal, approximately 1.7km southeast of the Site.

1No. HE bomb fell on Sandway, approximately 1.8km southwest of the Site. This was recorded as UXB.

5th September 1940

1No. HE bomb fell on Tanyard Farm, within 0.1km east of the Site. This was recorded as UXB.

16th September 1940

2No. HE bombs and 1No. Delayed Action Bomb (DAB) fell near the bacon factory at Lenham, in the vicinity of Ham Road and Station Road, Lenham, approximately 1.3km west of the Site.

29th October 1940

3No. HE bombs fell 300 yards north of the railway line, 1 mile east of Lenham Station, on the Site.

1No. HE bomb fell on Pound Meadow at East Lenham Farm, within approximately 0.7km east of the Site.

1No. HE bomb fell on Chapel Farm, approximately 1.2km south-southeast of the Site.

4No. HE bombs fell near Lenham Sanatorium, approximately 1.4km northeast of the Site.

1No. HE bomb fell on Little Pivington Farm, approximately 1.4km northeast of the Site.

3No. HE bombs fell on Chilstone Park, approximately 1.6km south-southwest of the Site.

2No. HE bombs fell near Lenham Forstal, approximately 1.8km southeast of the Site.

2No. HE bombs fell south of Warren Street, approximately 2km northeast of the Site.

4th November 1940

The basket factory at Lenham and a goods train in Lenham station were machine-gunned by enemy aircraft, within approximately 1.2km southwest of the Site.

1No. HE bomb fell near the bacon factory in Lenham, approximately 1.3km west of the Site.

17th April 1943

1No. HE bomb fell west of Lenham Heath, approximately 2km southeast of the Site.

29th January 1944

IBs fell on Lenham bye-pass, approximately 0.1km north of the Site.

IBs fell near farm buildings, approximately 0.3km east of the Site. Several were recorded as Unexploded Incendiary Bombs (UXIBs).

19th July 1944

1No. V1 was shot down and fell northwest of Lenham, approximately 1.6km northwest of the Site.

22nd August 1944

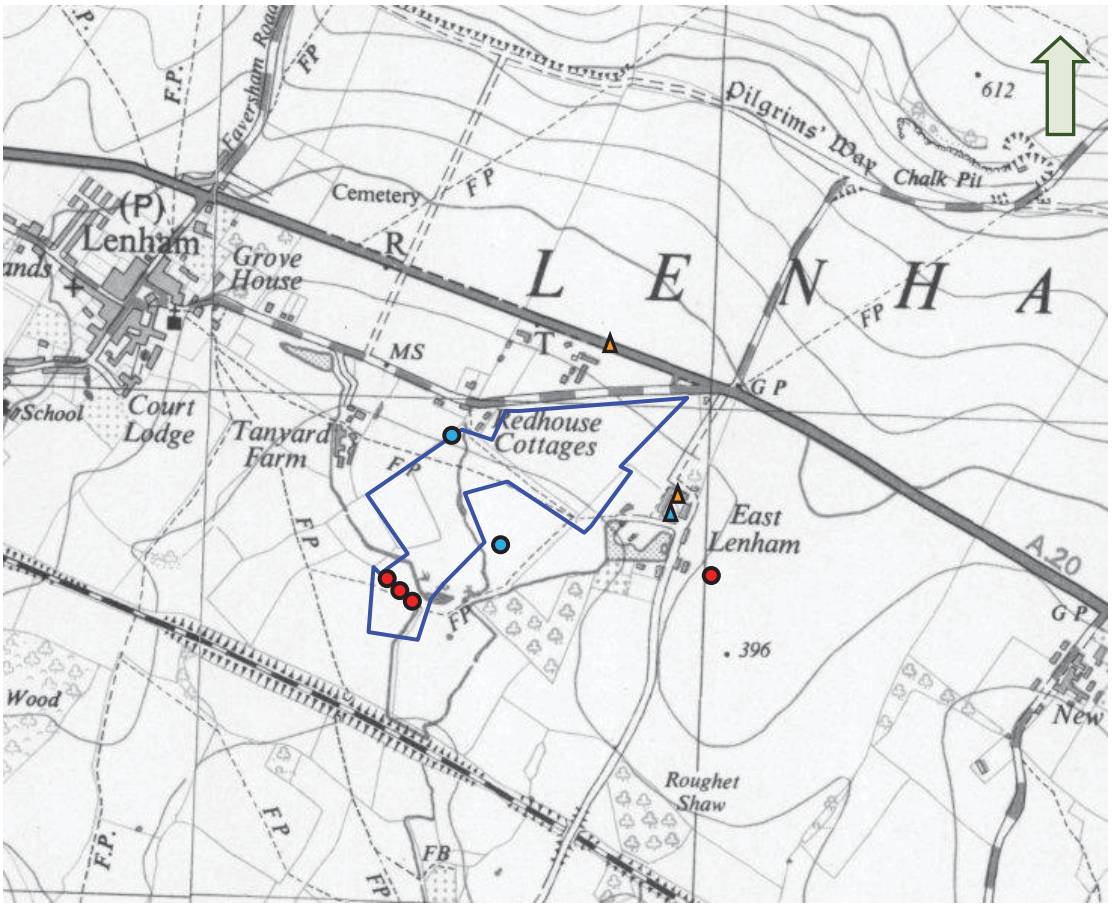
1No. V1 fell on Top Hill Farm, approximately 1.4km north of the Site.

It should be noted that during WWII, many UXB were mapped and subsequently removed as and when conditions and demands on Bomb Disposal teams allowed. Their removal was not always accurately recorded and sometimes records were later destroyed. In practice, most UXB were probably removed and only a much smaller number were actually registered as officially abandoned bombs.

Figure 3 is a map showing the approximate locations of bomb impacts in the vicinity of the Site. IBs shown are indicative of large numbers of these devices that fell within the given area. The map has been compiled from a number of different sources, including air raid incident reports, bomb census maps and historical aerial photographs.

Note that air raid incident reports did not always record precise locations, often only indicating on which street or area a bomb fell.

Figure 3	Compiled bomb impact map for the vicinity of the Site

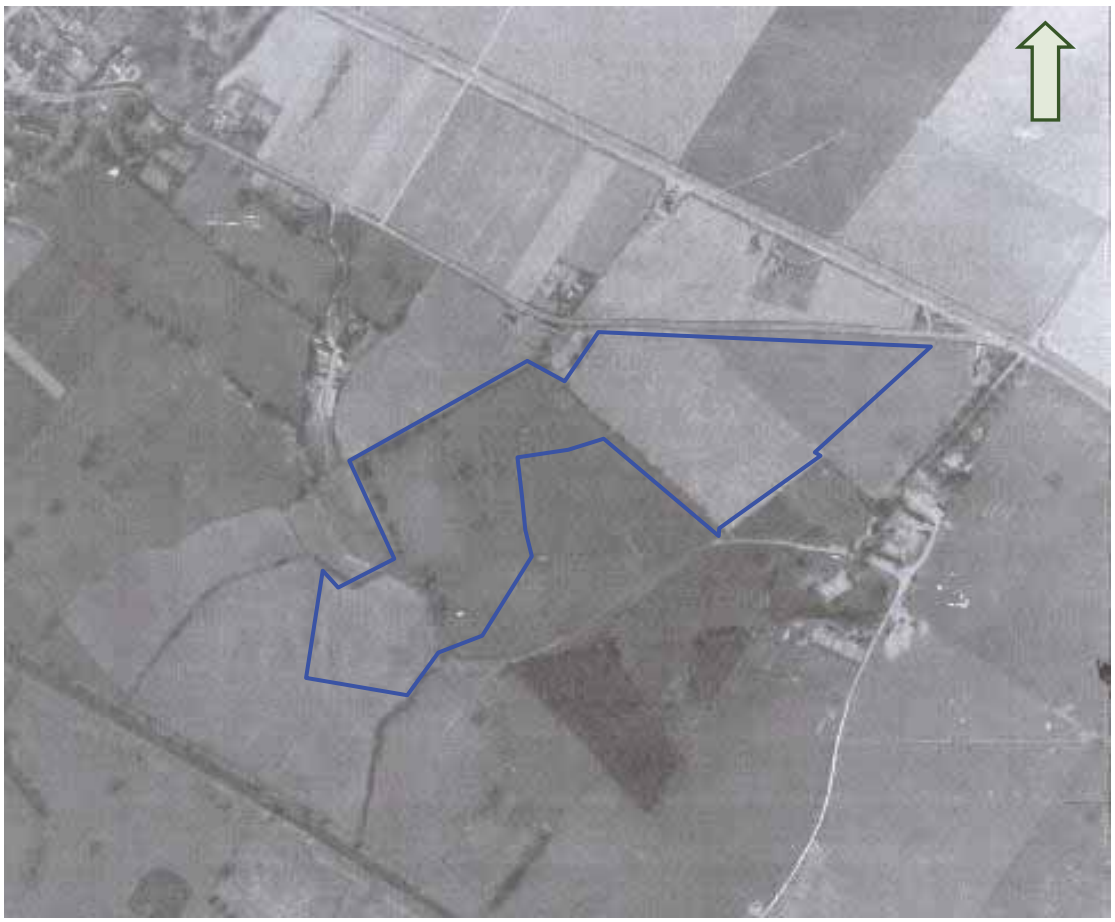


Source: © Crown Copyright 2019. Reproduced by permission of Ordnance Survey *Not to Scale*

Legend	Site boundary	HE bomb	UXB	IBs	UXIBs

Plate 4 is an aerial photograph dated the 10th April 1946. No residual bomb damage or cratering has been identified on the Site or in the surrounding area.

Plate 4	Aerial photograph, 10th April 1946



Source: Historic England *Not to Scale*

Legend	Site boundary

Potential UXO Hazard

Records indicate that 3No. HE bombs fell on the southern part of the Site and exploded. 1No. additional HE bomb fell adjacent to the north-western boundary of the Site. This was recorded as UXB and removed.

No further records of bombing on the Site have been found and no bomb damage or cratering has been identified on the Site on historical aerial photography.

Given this, and the lack of heavy air raids in the vicinity, it is considered unlikely that a UXB would have fallen unnoticed on the Site.

WWII bombing is not considered to provide a source of UXO hazard to the Site.

3.4 Geology and Bomb Penetration Depths

It is important to consider the geological materials present on the Site at the time that a bomb was dropped in order to establish its maximum penetration depth. British Geological Survey (BGS) 1:50,000 Sheet 288, Maidstone (Solid and Drift) and BGS borehole records were consulted.

During WWII the northern part of the Site was underlain by the West Melbury Marly Chalk Formation.

Table 2 provides an estimate of average maximum bomb penetration depths for the northern part of the Site, assuming WWII ground conditions of 3m of weathered chalk over more than 10m of weak to moderately weak chalk.

Table 2	Estimated average maximum bomb penetration depths (northern part of the Site)	
Estimated average bomb penetration depths for anticipated geology		
Bomb Weight	50kg	4.5m
	500kg	8.5m

During WWII the geology of the southern part of the Site comprised a thin veneer of sporadic Head Deposits over some areas of Alluvium, overlying Gault Clay.

Table 3 provides an estimate of average maximum bomb penetration depths for the southern part of the Site, assuming WWII ground conditions of 1m of sand, overlying 1m of soft to firm clay and 2m of stiff to very stiff clay, overlying 1m of weather mudstone over more than 10m of weak mudstone.

Table 3	Estimated average maximum bomb penetration depths (southern part of the Site)	
Estimated average bomb penetration depths for anticipated geology		
Bomb Weight	50kg	5.0m
	500kg	9.0m

The estimated bomb penetration depths given in Tables 2 and 3 are from the WWII ground level and are based on the following assumptions:

a) High level release of the bomb resulting in an impact velocity of 260m/s (>5,000m altitude).

b) A strike angle of 10 to 15 degrees to the vertical.

c) That the bomb is stable, both in flight and on penetration.

d) That no retarding units are fitted to the bomb.

e) That the soil type is homogenous.

A high altitude release of a bomb will result in ground entry at between 10° and 15° to the vertical with the bomb travelling on this trajectory until momentum is nearly lost. The bomb will then turn abruptly to the horizontal before coming to rest. The distance between the centre of the entry hole and the centre of the bomb at rest is known as the 'offset'. A marked lateral movement from the original line of entry is common.

Low-level attacks may have an impact angle of 45° or more, which will frequently lead to a much greater amount of offset movement during soil penetration.

In low level attacks over deep water bodies, the offset distances from the point of entry at the water surface may be considerably enhanced due to hydrodynamic effects before the bomb penetrates or settles on the sea bed. Shallow water has little effect on bomb penetration depths during high level attacks.

4 WWII DEFENCES

4.1 Bombing Decoys

In order to draw enemy aircraft away from towns and other strategically important targets, a series of decoys were developed between 1940 and 1941.

They were estimated to have drawn at least 5% of the total weight of bombs away from their intended targets. Approximately 792No. static decoy sites were built at 593No. locations in England. In addition, numerous temporary and mobile decoys were deployed.

Several different types of decoy were devised:

- Night time dummy airfields (Q sites).
- Daytime dummy airfields (K sites).
- Diversionary fires to simulate successful bombing raids on airfields (QF sites), petroleum depots (P sites) and major towns and cities (Starfish or SF sites).
- Simulated urban lighting (QL sites).
- Dummy Heavy Anti-Aircraft (HAA) batteries, factories and buildings (C series).
- Mobile decoys representing 'hards' for troop embarkation (MQLs), tanks and other vehicles.

Machine gun emplacements and Light Anti-Aircraft (LAA) guns were used to prevent possible enemy landings at decoy airfields.

By their nature, decoy sites provide a potential risk from Unexploded Bombs (UXB), both within the decoy site boundary and in the surrounding areas.

The nearest recorded bombing decoy was located northeast of Lenham (TQ 920534), approximately 0.6km north of the Site. This is described below.

4.1.1 Lenham Bombing decoy (Q/K/QF49(a))

Records indicate that this decoy was built to deflect enemy bombing from Royal Air Force (RAF) Detling and also serve as a decoy for Maidstone.

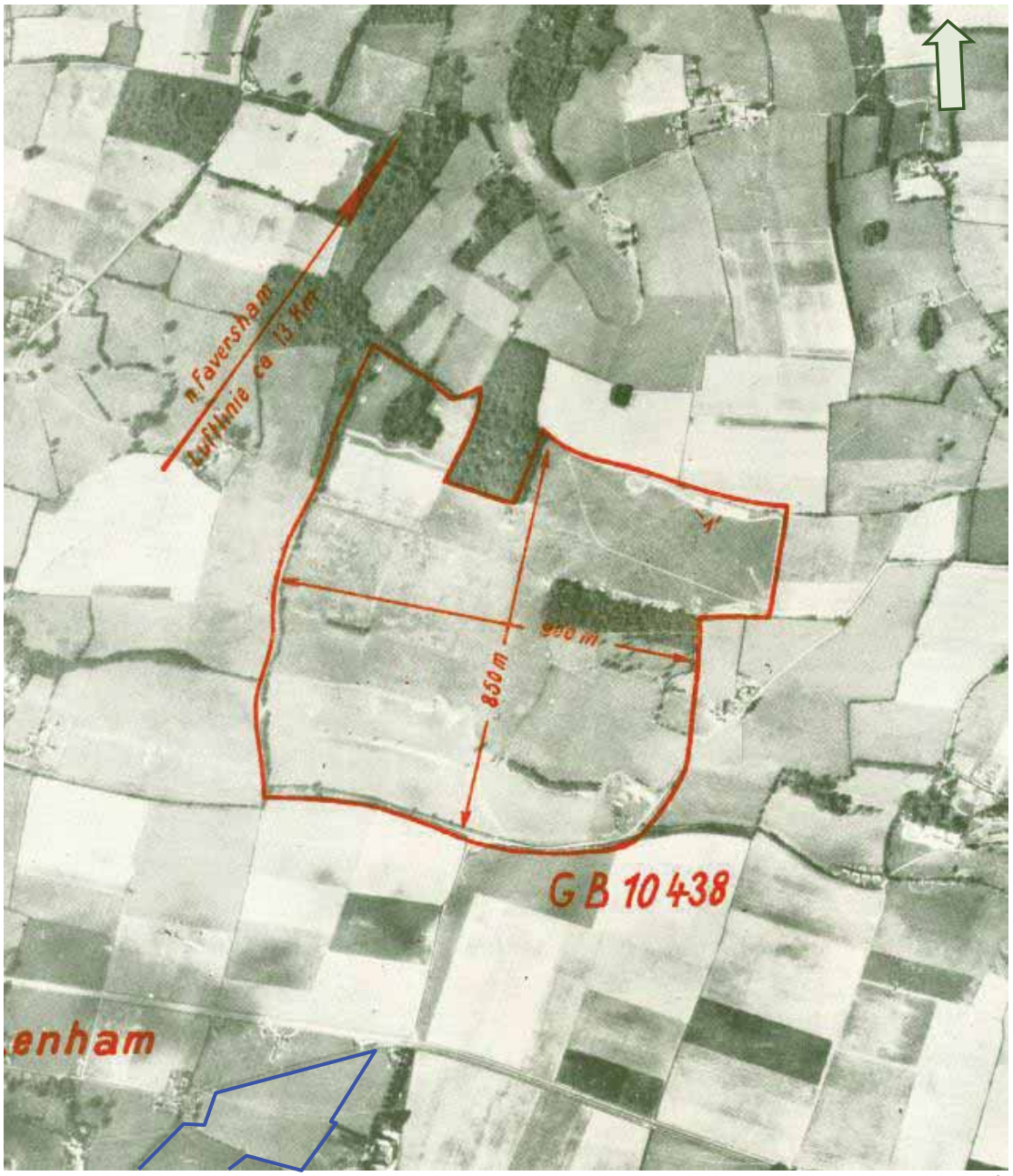
A 'K-type' day decoy was operational at this site, consisting of a replica airfield equipped with dummy Blenheim aircraft. It was operational from early 1940 until mid-1941.

Lenham bombing decoy also operated a 'Q-type' night decoy which featured a series of lights, which when viewed at night resembled an active airfield. This decoy was in operation between 1940 and 1942.

By 1942, the Lenham site also functioned as a 'QF' site for Royal Air Force Detling, and as a 'Temporary Starfish' site for the town of Maidstone. Controlled fires were lit at night during an air raid to simulate an airfield or town targeted by bombs.

Plate 5 is a Luftwaffe target photograph dated the 24th August 1940. The decoy airfield is designated Target GB 10 438.

Plate 5	Luftwaffe target photo of Lenham bombing decoy, 24th August 1940



Source: NARA *Not to Scale*

Legend	Site boundary

Records indicate that this decoy was successful on at least 1No. occasion.

After WWII, the decoy was decommissioned, and the land returned to agricultural use.

Potential UXO Hazard

Records indicate that the decoy was only bombed on 1No. occasion during a minor raid.

No evidence of any cratering on or surrounding the bombing decoy has been identified on historical aerial photographs to indicate that further raids took place.

Bombing Decoys are not considered to provide a source of UXO hazard to the Site.

4.2 Anti-Aircraft Defences

Anti-Aircraft (AA) gun batteries were targeted by the Luftwaffe. They were also a source of Unexploded AA (UXAA) shells which could land up to 27km from the firing point during WWII, although more typically fell within 15km. These could be distributed over a wide area.

AA batteries present a potential source of UXO hazard as a result of the storage, use and disposal of ordnance associated with the armaments used. They may have a risk from small caches of ammunition buried locally to them. 3No. types of AA batteries existed:

- Heavy Anti-Aircraft (HAA) batteries of large guns designed to engage high flying bomber aircraft. These tended to be relatively permanent gun emplacements.
- Light Anti-Aircraft (LAA) weaponry, designed to counter low flying aircraft. These were often mobile and were moved periodically to new locations around strategic targets such as airfields.
- Rocket batteries (ZAA) firing 3" or 3.7" AA rockets with a maximum altitude of 5,800m and a ground range of 9km were also relatively permanent emplacements.

Many AA batteries were associated with searchlights and consequently 'visible' at night, providing clear targets to the Luftwaffe bombers and a potential for UXB.

No records have been found indicating that there were any static HAA batteries within 10km of the Site.

Towards the end of WWII, many mobile HAA and 40mm Bofors gun batteries were moved into Kent as part of 'Operation Diver', designed to combat the V1 offensive against London.

Table 4 is a list of recorded Operation Diver gun batteries within 3km of the Site.

Table 4 WWII 'Operation Diver' batteries within 3km of the Site

Grid Reference	Serial No.	Location	Armament	Approximate Distance and Direction from Site
TQ 898533	A31 (X10)	Lea Farm	8 x 3.7" guns	1.7km NW
TQ 918501	-	Lenham Heath	1 x 40mm gun	2km SE
TQ 929529	-	Waterditch	1 x 40mm gun	2.1km NE
TQ 892537	A31	Marlow Farm	8 x 3.7" guns	2.2km NW
TQ 881514	-	Harrietsham	1 x 40mm gun	2.3km W
TQ 904544	-	West Street	1 x 40mm gun	2.4km N
TQ 904489	E13	Field Farm	8 x 3.7" guns	2.7km S

It should be noted that the lack of official records of HAA batteries or armaments cannot be taken to imply their absence because many units were mobile and were moved around as operational requirements dictated.

The nearest recorded incidents of an AA shell falling in the vicinity of the Site during WWII are described below.

5th November 1940

1No. Unexploded Anti-Aircraft (UXAA) shell fell near Lenham Sanatorium, approximately 1.7km northeast of the Site

20th January 1943

1No. UXAA shell fell on a military camp near Woodside Green north of Lenham, approximately 1.4km northwest of the Site.

20th December 1943

1No. AA shell fell near Warren Street, approximately 2.5km northeast of the site.

19th July 1944

1No. UXAA shell fell north of Ashford Road, approximately 0.8km northeast of the Site.

Given the number of gun batteries in the area, the potential for a UXAA shell to have fallen unnoticed on the Site, whilst unlikely, cannot be discounted.

4.3 Barrage Balloons and Anti-Landing Obstacles

Balloon barrages were flown in many British towns and cities to protect against air raids. Their presence deterred low flying aircraft, making it more difficult for bombs to reach their intended targets. Barrage balloon sites can be a source of UXO as they were targeted by the Luftwaffe. They also often had a small explosive charge fitted with tilt fuzes attached approximately 50m from each end of the balloon cables and designed to detonate if the cables were hit by an aircraft.

Measures were also taken to prevent enemy aircraft landing in the event of invasion. Obstructions were constructed around airfields and on other open sites deemed fit for use as landing grounds. Solid obstructions (such as concrete blocks), posts or stakes, felled trees, haystacks, scaffolding with wire and trenching were the main measures used.

No records of any barrage balloons or anti-landing obstacles on or in close proximity to the Site have been found.

4.4 Anti-Invasion Defences

Defence structures are a potential source of UXB as they were especially targeted by low flying enemy aircraft, particularly during 'tip and run' raids which were common in industrialised regions. These defences may also be associated with small caches of UXO in the form of small arms, used by the troops manning the emplacement.

The rapid advance of German Troops into France, Holland and Belgium after the start of WWII prompted the War Office to review the vulnerability of the UK to invasion and a decision was taken to begin work on a national plan of anti-invasion defences. Static defences were built to interrupt and delay the progress of any invading force.

Coastal defences were strengthened (the 'Coastal Crust'). These defences included barbed wire entanglements and minefields, which were often combined to give defence in depth.

Inland, lines of defence structures were constructed along 'Stop Lines' in order to impede enemy progress for long enough to allow mobile defending forces to counter-attack.

Stop Lines included the fortification of key 'centres of resistance', such as river crossings and important road or rail junctions that could seriously hamper the enemy's advance across country. Bridges were mined for demolition and tank traps installed.

Stop Lines were further integrated into a network of fortified nodal points and 'Anti-Tank (AT) Islands'.

No records of any anti-invasion defences on or in close proximity to the Site have been found.

4.5 Pillboxes, Mortar and Gun Emplacements

Defences also included spigot mortar positions and gun emplacements.

Spigot mortars, also known as Blacker Bombards, were used primarily in an anti-tank role at road blocks or to defend airfields. Typically they fired a 20 pound (lb) HE mortar bomb. The fixed positions, in weapons pits with ammunition lockers, were frequently positioned near pillboxes.

Spigot mortar positions could be either fixed or mobile.

No records of any gun emplacements on or in close proximity to the Site have been found.

Pillboxes provide a potential UXO hazard both from the storage, use and disposal of ordnance associated with them and from UXB because they were targeted by enemy aircraft.

Pillboxes were common along Stop Lines, perimeters of airfields, potential land invasion sites and around important civil sites. Several different designs existed including Seagull Trenches (semi-buried structures), Alan Williams and Tett Turrets (small prefabricated pillboxes). Fortified sites, buildings or loop-holed walls also functioned as pillboxes.

No records of any pillboxes on or in close proximity to the Site have been found.

4.6 Home Guard and Auxiliary Units

Local Defence Volunteers (LDV) units, later known as the Home Guard, were located in all cities, towns and large villages. Anti-invasion defences were to be defended by the Home Guard and regular Army troops for as long as possible in the event of an invasion. The troops were issued with 'No Withdrawal' orders.

Important elements of the ordnance supply for the use of the Home Guard included substantial supplies of Mills bombs (fragmentation grenades) and Self Igniting Phosphorus (SIP) grenades as well as machine gun and small arms ammunition.

Records of Home Guard activities and related sites are rarely preserved. Storage and disposal of munitions by the Home Guard was poorly documented and surplus supplies were either buried or dumped in lakes and ponds.

Given the irregular nature of this activity, the possibility of items of UXO being discovered at any locations occupied or used for training by the Home Guard can never be totally discounted.

In addition to the regular Home Guard, Auxiliary Units existed which were made up of guerrilla troops trained in sabotage and assassination in case of invasion. Sites used by these Units were Top Secret and many locations are still unknown.

No records of any Home Guard activity on or in close proximity to the Site have been found.

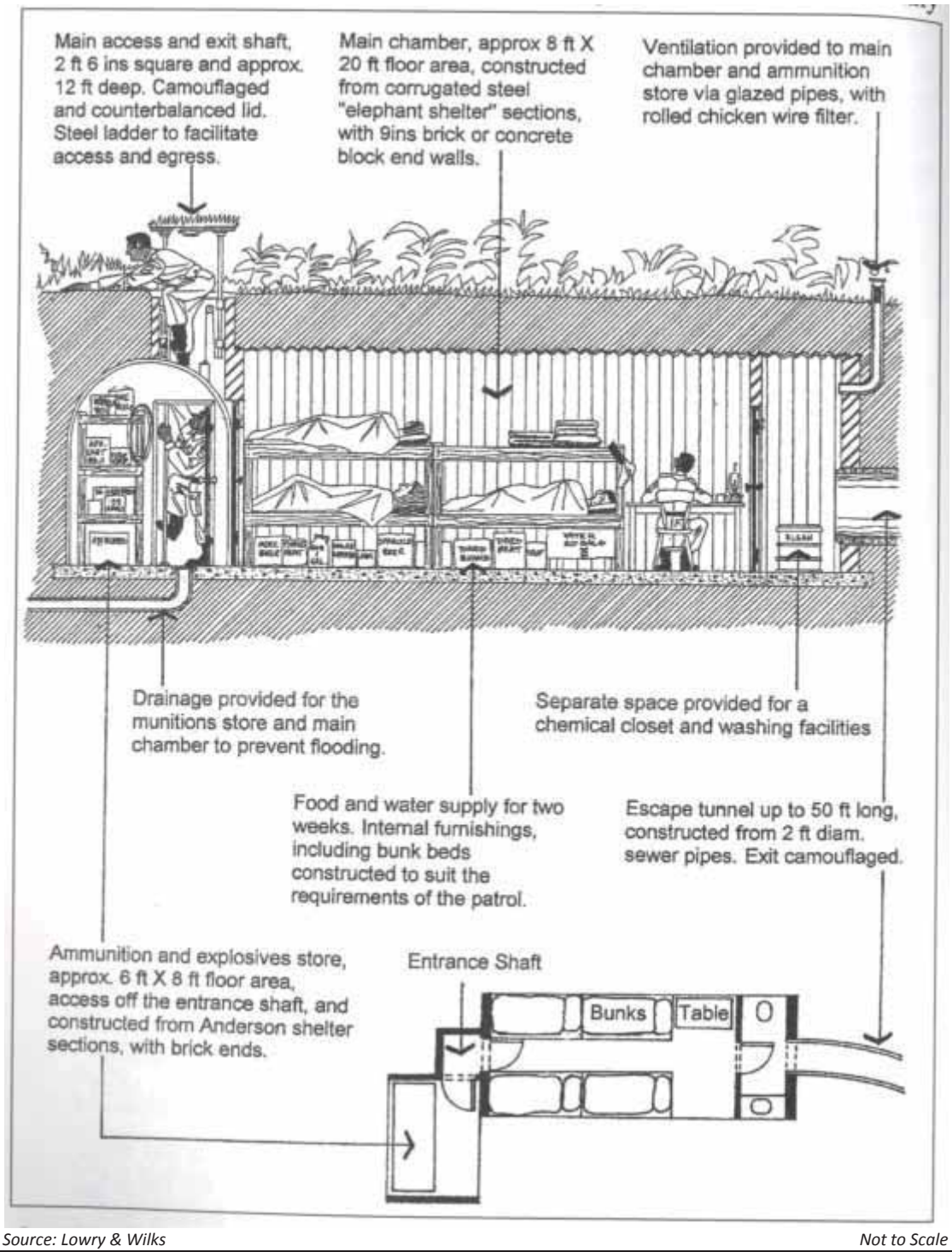
Records have been found indicating that an Auxiliary Unit Operational Base (OB) or Observation Point (OP) was established near to the north-eastern boundary of the Site. Its precise location is unknown.

Auxiliary Units were generally equipped with small arms, grenades and various types of explosives and detonators including HE and incendiary devices.

OBs were concealed, generally underground, hideouts for Auxiliary Units to use as bases to conduct guerrilla warfare from in the event of invasion. No two OBs were identical, but most were large enough to house six or seven men, and equipped with multiple entrances, including an emergency escape tunnel. Many had dedicated spaces to store weapons and explosives either inside or in the immediate vicinity of the main bunker.

Figure 4 is a cross-section of a typical Auxiliary Unit OB.

Figure 4	Cross section of a typical Auxiliary patrol Operational Base in Worcestershire



Source: Lowry & Wilks *Not to Scale*

OPs were similar to OBs but smaller and intended to be used for reconnaissance purposes, often consisting of a single chamber with a concealed way of observing the surrounding area.

Knowledge of the location of OBs was on a 'need to know' basis and usually restricted to members of the patrols that used them. Consequently, the locations of OBs were rarely recorded and much of our knowledge of them is based on anecdotes from former members of Auxiliary Units.

When the Auxiliary Units were disbanded at the end of WWII their stores of arms and munitions were supposedly returned to military hands and their OBs were intended to be sealed or demolished. However these processes were imperfect with records suggesting that some caches of explosives were still in the hands of patrol members decades after the end of the war. Meanwhile many OBs were so well concealed and knowledge of their locations so restricted that demolition crews were unable to find them.

There are no records to indicate that the Lenham OB was located on the Site and there is considered to be a low probability of ordnance remaining inside the OB.

Home Guard and Auxiliary Unit activity is not considered to provide a source of UXO hazard to the Site.

4.7 Minefields and Mined Locations

Minefields were laid along the coast, in estuaries and along the banks of major rivers to deter infantry invasion. Strategic points such as bridges and gaps in cliffs were mined to impede enemy advance. Most of the mined locations in the UK have been cleared and the risk of finding UXO in these areas is considered to be low.

No records of any minefields or mined locations on or in close proximity to the Site have been found.

5 MILITARY AIRFIELDS

Military airfields offer the potential for significant UXO hazards due to the use, storage and disposal of ordnance and as a result of enemy bombing during WWI and WWII.

Airfields active during WWII were targeted by the Luftwaffe, providing a potential source of UXB on the airfield.

As bombing accuracy was so poor during WWII, it is likely to find UXB in the surrounding areas. Aircraft crashes are also associated with operational airfields.

No records of any military airfields on or in close proximity to the Site have been found.

During WWI the nearest operational airfield was Royal Flying Corps (RFC) Harrietsham, located at Frinstead, approximately 5.3km north-northwest of the Site. RFC Harrietsham was used as a fighter base from 1916 to 1918.

During WWII the nearest operational military airfield was Royal Air Force (RAF) Headcorn (TQ 882460), approximately 5.9km southwest of the Site. RAF Headcorn was a prototype Advanced Landing Ground (ALG) constructed in 1943. The airfield served as a base for Spitfires and P47 Thunderbolts. RAF Headcorn closed in 1945 and the land was returned to agriculture.

Military airfields are not considered to provide a source of UXO hazard to the Site.

5.1 Aircraft Crashes

Aircraft crash sites are a known UXO hazard. The MoD advises that if crashed aircraft are found, the safest policy is to leave them alone where possible. Unless disturbed there is no statutory requirement for the MoD to clear such sites.

No records of any military aircraft crashes on or in close proximity to the Site have been found. The nearest are described below.

18th August 1940

1No. Hawker Hurricane I fighter aircraft (N2617) crashed near Lenham, approximately 1.6km west of the Site.

1No. Messerschmitt Bf110C 3U+xx heavy fighter aircraft crashed at Platt's Heath, approximately 2.5km southwest of the Site.

11th September 1940

1No. Messerschmitt Bf110C-3 (1372) U8+HL heavy fighter aircraft crashed in a field at Cobham Farm, approximately 2.6km east of the Site.

29th October 1940

1No. Supermarine Spitfire (P9318) fighter aircraft crashed on the decoy airfield at Lenham, approximately 1.8km northeast of the Site.

Aircraft crashes are not considered to provide a source of UXO hazard to the Site.

6 EXPLOSIVES AND MUNITIONS ESTABLISHMENTS AND DEPOTS

Explosives and munitions manufacturing or storage sites offer a particularly high risk from both explosive substances and UXO. Standard procedures of explosive/ordnance disposal through burial or burning means that explosive and UXO hazards will be present in some areas of such establishments.

In addition, UXB hazards may be present as a result of enemy bombing during WWI and WWII.

6.1 Explosives and Ordnance Factories

No records of any explosives or ordnance factories on or in close proximity to the Site have been found.

6.2 Munitions Stores

Local ammunition caches would have been present near to defended road blocks, pillboxes, HAA and LAA sites. Most of those associated with the anti-invasion sites are understood to have been cleared.

No records of any munitions stores on or in close proximity to the Site have been found.

6.3 Informal Munitions Depots

Informal munitions depots, often made by requisitioning roadside lay-bys or parks. Other informal munitions depots were commonly located in areas of woodland or on train wagons along sidings in marshalling yards.

No records of any informal munitions depots on or in close proximity to the Site have been found.

6.4 Munitions Disposal Areas and Bomb Cemeteries

Munitions disposal areas were often made by requisitioning open areas of land, usually away from habitation. Marshland, beaches or sand dunes were frequently used for this purpose. Disposal of munitions was carried out in many different ways, ranging from destruction to burial. Full records were not necessarily maintained for these locations, and so they can potentially be a source of UXO.

No records of any munitions disposal areas or bomb cemeteries on or in close proximity to the Site have been found.

7 FIRING RANGES AND MILITARY TRAINING AREAS

By their nature, firing ranges and military training areas represent a potential source of UXO due to associated training activities. The training will involve both practice and live munitions and will offer a significant risk from a very wide range of potential UXO.

7.1 Small Arms Ranges

Small arms ranges (such as rifle ranges) and close combat ranges (such as mortar and grenade ranges) are likely to provide a significant source of UXO. It should be noted that even on small arms ranges, larger munitions such as mortars or grenades cannot be discounted.

No records of any small arms ranges on or in close proximity to the Site have been found.

7.2 Artillery Ranges

Artillery ranges will have utilised a wide range of munitions, predominantly shells, although close combat munitions such as mortars, or larger munitions such as bombs, cannot be discounted.

No records of any artillery ranges on or in close proximity to the Site have been found.

7.3 Bombing Ranges

Bombing ranges will have primarily used bombs, although other munitions such as shells and close combat munitions such as mortars cannot be totally discounted.

No records of any bombing ranges on or in close proximity to the Site have been found.

7.4 Training Areas

Training areas will have primarily used blank ammunition or practice shells in 'dry' areas, although live munitions such as shells and close combat munitions such as mortars cannot be discounted in any training area.

No records of any military training areas on or in close proximity to the Site have been found.

Records indicate that WWI practice trenches were located north of Lenham, approximately 1.5km northwest of the Site.

Training areas are not considered to provide a source of UXO hazard to the Site.

8 EXPLOSIVE ORDNANCE CLEARANCE ACTIVITIES

Official UK bombing statistics have been compiled from both British and German sources. There were differences in the way the figures were originally reported and collated which has led to discrepancies in the summary data.

Based on data from 1939 to 1945, War Office statistics indicate that 200,195No. HE bombs exploded within Great Britain. Additionally, 25,195No. HE bombs (representing 11%) were recorded as UXBs. However, records from the Royal Engineers who were responsible for bomb disposal at the time indicate that as of 27th February 1946 upwards of 45,000No. UXBs were disposed of.

On average 8.5% UXBs later self-exploded. In some cases the bombs had delayed action fuzes or were never intended to explode, their purpose being to cause inconvenience and fear.

Given the discrepancy in records and the fact that UXBs are still being found unexpectedly, it is clear that the original figures are understated and provide only an approximation of the number of potential UXBs in the UK.

War Office statistics also show that between October 1940 and May 1941 most of the UXBs (93%) were either 50kg or 250kg. It should be noted that details of the recovery and the size of the UXB were not always accurately reported.

The larger WWII UXBs are often difficult to recover due to both penetration depths and the presence of two or more fuzes, combined with more sensitive fillings of explosive mixtures including Amatol and Trialen.

8.1 Abandoned Bombs

No records of any officially abandoned bombs on the Site have been found.

8.2 EOC Tasks

Zetica Ltd holds no records of post-WWII EOC tasks being undertaken in the vicinity of the Site.

The MoD has provided no additional information on official EOC tasks on the Site.

9 UXO HAZARD ASSESSMENT

9.1 UXO Hazard Level

The definitions for the levels of UXO hazard are provided below.

Definitions of UXO Hazard Level for a Site	
Hazard Level	**Definition**
Very Low	There is positive evidence that UXO is not present, e.g. through physical constraints or removal.
Low	There is no positive evidence that UXO is present, but its occurrence cannot be totally discounted.
Moderate	There is positive evidence that ordnance was present and that other uncharted ordnance may be present as UXO.
High	There is positive evidence that UXO is present.
Very High	As high, but requires immediate or special attention due to the potential hazard.

Records indicate that during WWII 3No. HE bombs fell on the southern part of the Site and exploded.

No records of further HE bombing on the Site have been found and the bombing density in the immediate vicinity was low.

No records of other military activity on the Site have been found.

Given this, it is considered that the Site has a low UXO hazard level, as shown in Figure 5, below.

Figure 5	UXO hazard zone plan of the Site

Source: Client *Not to Scale*

Legend			
	Very Low	Low	Moderate
	High	Very High	Site boundary

10 UXO RISK ASSESSMENT

10.1 UXO Risk Level

A UXO risk assessment has been undertaken for the proposed works, taking into consideration the identified UXO hazard.

Firstly, the probability of encountering UXO (PE) has been considered and rated for the different construction techniques, as detailed below.

Probability of Encounter (PE)	Rating
Frequent, highly likely, almost certain.	5
Probable, more likely to happen than not.	4
Occasional, increased chance or probability.	3
Remote, unlikely to happen but could.	2
Improbable, highly unlikely.	1
Impossible	0

Secondly, the probability of detonating a UXO (PD) has been considered and rated for the different construction techniques, as detailed below.

Probability of Detonation (PD)	Rating
Frequent, highly likely, almost certain.	5
Probable, more likely to happen than not.	4
Occasional, increased chance or probability.	3
Remote, unlikely to happen but could.	2
Improbable, highly unlikely.	1
Impossible	0

Next, the probability of encountering and detonating the UXO (PE x PD) have been used to generate an overall likelihood rating (P).

P = PE x PD	LIKELIHOOD of Encounter and Detonation	Rating
21 to 25	Frequent, highly likely, almost certain.	5
16 to 20	Probable, more likely to happen than not.	4
6 to 15	Occasional, increased chance or probability.	3
2 to 5	Remote, unlikely to happen but could.	2
1	Improbable, highly unlikely.	1
0	Impossible	0

P ranges from 25, a certainty of UXO being encountered and detonated on the Site by engineering activity, to 0, a certainty that UXO does not occur on the Site and will not be detonated by engineering activity.

The likelihood of encountering and detonating UXO during site works is multiplied by the severity of such an event occurring (P x S), in order to provide a risk level using the following matrix.

Severity (S)	Rating
Multiple fatalities	5
Major injury, long term health issues, single fatality.	4
Minor injury, short term health issues, no fatalities.	3
First aid case but no lost time or ill health.	2
Minor injuries, no first aid.	1
No injuries.	0

UXO Risk Matrix

		SEVERITY (S)					
LIKELIHOOD (P)		5	4	3	2	1	0
	5	25	20	15	10	5	0
	4	20	16	12	8	4	0
	3	15	12	9	6	3	0
	2	10	8	6	4	2	0
	1	5	4	3	2	1	0
	0	0	0	0	0	0	0

The final risk assessment for the Site is given in Table 5.

Table 5 UXO risk assessment for the Site

Potential UXO Hazard	Anticipated Works	PE	PD	P = PE x PD	Likelihood	Severity	Risk Rating	UXO Risk
UXB	Shallow Excavations	1	1	1	1	5	5	Low
	Deep Excavations	1	1	1	1	5	5	Low
	Piling/Boreholes	1	1	1	1	4	4	Low
Other UXO	Shallow Excavations	1	1	1	1	4	4	Low
	Deep Excavations	1	1	1	1	4	4	Low
	Piling/Boreholes	1	1	1	1	3	3	Low

PE (Probability of Encounter), PD (Probability of Detonation), P (Overall Probability)

Shallow Excavations defined as <1.0m below ground level (bgl).

UXO Risk	Matrix Rating	Definition
Very Low	0-1	Little action is required by the client provided that suitable records and procedures are in place to ensure appropriate action is undertaken should the UXO risk level change.
Low	2-5	Tolerable to the client as engineering activity need not alter if UXO related procedures and controls are strictly adhered to.
Moderate	6-15	May be tolerable for the client, but it is prudent to reduce the risk where cost effective and reasonably practicable.
High	16-20	Tolerable to the client only where further risk reduction is impracticable or disproportionate to the risk involved. Essential that all practicable measures are taken to reduce the level of risk.
Very High	21-25	Unacceptable to the client except in extraordinary circumstances. Imperative that all control measures are taken.

10.2 Risk Mitigation Recommendations

To ensure that the UXO risk is reduced to As Low As Reasonably Practicable (ALARP) the following mitigation is advised:

Excavations

Where a low risk of UXO encounter is anticipated, industry good practice is to raise the awareness of those involved in excavations so that in the unlikely event that a suspect item is discovered, appropriate action is taken. This can be achieved through UXO awareness briefings to site staff.

Typically ~1hour in duration, these briefings will be expected to provide site workers with:-

- Background to the potential UXO hazards that could be encountered.
- Awareness of how the UXO hazard could present a risk.
- Knowledge of what to do in the event that a suspect item is encountered.

The briefing is to be provided along with back-up materials such as UXO awareness posters, emergency contact numbers and other background information to assist site workers in becoming familiar with what potential UXO can look like.

The materials can also be used by key staff to pass on the relevant points of the briefing to others who visit or work on the Site.

By providing the UXO awareness briefing, it ensures that in the unlikely event that UXO is encountered:-

- All site staff take appropriate action.
- A support mechanism and points of contact are established.
- The likelihood of harm to people or property is reduced.

Boreholes/Piles

Clearance certification for borehole or pile locations is considered prudent only if a zero tolerance to risk is adopted. Zero tolerance is commonly adopted for sites that have safety critical infrastructure such as nuclear establishments and oil refineries.

Table 6 below gives recommended actions in relation to the potential UXO risk level and the anticipated Site activity.

Further advice on the mitigation methods can be provided by Zetica on request.

Table 6	Risk mitigation for assumed Site activities			
Risk Level	**Typical Future Activity on the Site**			
	None	**Shallow Excavations (<1.0m)**	**Deep Excavations (>1.0m)**	**Boreholes or Pile Construction**
Very low	Ensure suitable records and procedures are in place to highlight the risk should future development be planned.	Ensure site staff, are informed as part of the site safety induction that the potential presence of UXO cannot be discounted. Appropriate action is required to be detailed within site procedures.	Ensure site staff, are informed as part of the site safety induction that the potential presence of UXO cannot be discounted. Appropriate action is required to be detailed within site procedures.	Ensure site staff, are informed as part of the site safety induction that the potential presence of UXO cannot be discounted. Appropriate action is required to be detailed within site procedures.
Low	**As very low.**	**As very low.** **+ It is considered prudent to include some UXO awareness training in site inductions.**	**As very low.** **+ It is considered prudent to include some UXO awareness training in site inductions.**	**As very low.** **+Clearance certification for borehole or pile locations would be considered prudent only if a zero tolerance to risk is adopted.** **Zero tolerance is commonly adopted for sites that have safety critical infrastructure such as nuclear establishments and oil refineries.**
Moderate	As very low.	As low. +Non-intrusive investigation methods considered prudent where practical. +Alternatively, EOC Engineer supervision is considered prudent.	As low. +Non-intrusive investigation methods considered prudent where practical. +Alternatively, EOC Engineer supervision is considered prudent.	As low. +Clearance certification for borehole or pile locations is considered essential.
High	As very low.	As moderate. +Non-intrusive investigation methods considered essential where practical. + Alternatively, EOC Engineer supervision is considered essential.	As moderate. +Non-intrusive investigation methods considered essential where practical. + Alternatively, EOC Engineer supervision is considered essential.	As moderate.
Very High	Requires immediate or special attention.	Requires immediate or special attention.	Requires immediate or special attention.	Requires immediate or special attention.
The above table is for guidance only.				

APPENDICES

Appendix 1 UXO Hazard and Ordnance Types

When assessing the risk from UXO including UXB, it is important to be aware of ordnance type and function. The following Section briefly describes the more common types of UXO. More data on these can be found at http://zeticauxo.com/downloads-and-resources/ordnance-data-sheets/.

A1.1 Small Arms Ammunition

Small Arms Ammunition (SAA) is one of the more recognisable categories of ordnance which is primarily designed for anti-personnel use. SAA include items such as bullets, generally up to a calibre (diameter) of 20mm.

Larger calibre small arms munitions can contain fuze mechanisms and high explosives or pyrotechnic fillings and may have been used for anti-aircraft or anti-vehicle purposes.

Generally small arms ordnance has a relatively low risk as UXO, although the larger calibre categories may have the same detonation risk as larger high explosive ordnance. SAA is often associated with discarded ammunition boxes around firing practice ranges. The Plate below illustrates some common SAA.

Plate	Photograph of typical WWII small arms ammunition

Source: Google Images

A1.2 Hand Grenades

Hand grenades can be filled with explosives or chemicals and have 3No. main parts, a body, a fuze with a pull ring and a safety-clip assembly. Fragmentation grenades are the most common and have a metal or plastic body filled with an explosive. Most use a burning delay fuze that functions for 3 to 5 seconds after the safety lever is released. Some, such as smoke grenades, are activated instantly when the lever is released.

The Plate below illustrates the typical character and condition of the most commonly found No. 36 hand grenades (Mills Bombs).

Plate	Photographs of a typical and an excavated WWII No. 36 hand grenade

Source: IWM

Source: Zetica Ltd

A1.3 Projected Grenades

Projected grenades are among the most commonly found UXO items, particularly the 40mm type. These contain high explosives and use a variety of fuzes, including some of the most sensitive internal impact-fuzing systems. They are extremely dangerous and can explode if moved or handled.

A1.4 Mortars

A mortar is a short tube designed to fire a projectile at a steep angle. Mortars can range from approximately 50mm to 280mm in diameter and can be filled with explosives, toxic chemicals, white phosphorous or illumination flares. They generally have a thinner metal casing than projectiles, but use the same types of fuzing and stabilisation.

During WWII there are records that the target areas of RAF practice bombing ranges were occasionally used for mortar training.

The Plate below shows typical 2-inch (left) and 3-inch (right) mortar bombs.

Plate	Photographs of WWII 2-inch and 3-inch mortars

Source: IWM

A1.5 Shells

Shells are a projectile containing an explosive charge designed to burst the casing that can contain High Explosives, pyrotechnic compounds or other chemicals.

Shells can be found in a range of sizes, from <20mm to several times this size. The most likely shells to be found on the Site are Small Arms Ammunition (SAA) or UXAA shells that have fallen back to the ground unexploded.

Most commonly used anti-aircraft shells were 2" and 3.7" HE shells.

If fired and found as UXO, shells can offer a particular hazard from accidental detonation as they can have sensitive fuze mechanisms. A fuze is a device which incorporates mechanical, electrical, chemical or hydrostatic components to initiate a train of fire or detonation.

The Plate below is a photograph of a 3.7" UXAA shell found in Camberwell, London.

Plate	Photograph of a recently excavated 3.7" AA shell

Source: Zetica Ltd

A1.6 Incendiary Bombs

Incendiary Bombs (IBs) ranged from small 1kg thermite filled, magnesium bodied bombs to a 250kg 'Oil Bomb' (OB) and a 500kg 'C300' IB. By far the most common air dropped devices across the UK during WWII were small 1kg to 2kg IBs.

In some cases the IBs were fitted with a very small High Explosive (HE) bursting charge. This exploded after the bomb had been alight for a few minutes causing burning debris to be scattered over a greater area. The C300 bombs were similar in appearance to 500kg HE bombs.

The small amount of HE, if any, and the almost negligible potential for IBs to remain active after more than 65 years in the ground means that these items have very little prospect of causing damage. In the majority of cases if IBs are found in the ground, the incendiary materials have deteriorated to such an extent that they are considered to provide a low UXO hazard level.

However, since magnesium and phosphorus were common components in IBs, some localised chemical contamination may occur where the contents have leached out of the IB into the surrounding soil.

The Plate below shows a 1kg IB and a variety of fragmentary remains of IBs recovered by the Civil Defence during WWII.

Plate	Photographs of a 1kg IB and IB fragments

Source: IWM

Source: Swansea Museum

A1.7 German High Explosive Bombs

Probably the most common and certainly most publicised UXOs to be found in the UK are bombs. Air dropped bombs, as a result of WWII enemy action, are found on a relatively frequent basis as UXO. They tend to be highly publicised (at least on a local basis) due to the common disruption where an evacuation of the potentially affected area is put in place.

The amount of High Explosive and the potential for a fuze to still be activated means that these devices have the prospect of causing some of the most widespread damage. WWII bombs were particularly sophisticated for their time, with anti-tamper fuzes.

Many German bombs were designed to not explode on impact and instead to cause disruption as a UXB. Some fuzes were set with a delay time of over 70 hours. During this time, an anti-tamper fuze could also be activated to detonate should it be disturbed.

The most commonly used bombs during WWII were the 50kg and 250kg sized general purpose bombs. Less frequently, the 500kg bomb was also used. Larger bombs were used, but so infrequently that any assessment of hazard is more typically based on bombs ranging up to 500kg only.

It should be noted that the June 2008 find of a 1000kg bomb in London, does demonstrate that larger bombs can be found and any risk mitigation measures should consider this.

The Plate below shows the variety of UXB recovered by the Civil Defence during WWII.

Plate	Photograph of a variety of UXB recovered by the Civil Defence during WWII

Source: IWM

A1.8 Detonators, Gaines and Fuzes

Bomb components such as detonators, gaines and fuzes were stored at operational airfields during WWII and typically contained some type of explosive charge to initiate the detonation of a munition.

A wide variety of these components were used and examples of some common fuzes are shown in the Plate below.

Plate	Photographs showing examples of WWII fuzes

Source: Zetica Ltd

A1.9 Land Mines

Wartime activities provide numerous sources of UXO within the land environment. Whilst efforts have been made to clear the known British minefields, it was common for mines to become lost for a variety of reasons and so not recovered. Additionally, such munitions might have been disposed of on an unofficial basis and so no records were kept.

Most of the mined beaches and other land areas in the UK have been cleared by the MoD. Occasionally, wave action or activities such as bombing caused mines to become displaced and these were missed as part of any past clearance activities.

The Plate below is a photograph of a typical WWII land mine used on the land area, beaches and cliffs around Britain. The example on the right was found at Gatwick Airport, formerly RAF Gatwick.

Plate	Photographs of original and recently excavated WWII land mines

Source: IWM

Source: Zetica Ltd

A1.10 Home Guard Weapons

Initially, the Home Guard's armoury was largely second-hand and much of it was of WWI vintage. Personal weapons (such as shotguns) and home-made devices were also employed.

By the end of WWII, some units were well equipped with a wide variety of small arms and munitions.

These included .32, .38 and .455 revolvers, .303 P14, .300 P17 and .303 Canadian Ross rifles, anti-tank rifles and a variety of Sub- Machine Guns (SMG) such as the .45 Thompson and 9mm Sten Guns.

Other heavier Machine Guns (MG) at their disposal included Browning, Hotchkiss, Lewis, Vickers and Marlin MG. Sub-artillery weapons were developed for them, including grenade throwers (the Northover Projector) and spigot mortars (the Blacker Bombard). 2-pdr anti-tank guns and Projector, Infantry Anti Tank (PIAT) weapons were in circulation amongst some units, and the Home Guard also manned AA guns later in WWII.

Explosives were available to some Home Guard units and were used and stored by all Auxiliary Unit patrols. As well as the flame fougasse and hand grenades detailed in this Appendix, the Home Guard had stocks of Molotov Cocktails, Sticky Bombs and SIP grenades.

In October 2006 a cache of 76No. SIP grenades was found in a garden at Seend, Wiltshire. In October 2008, a further 26No. SIP grenades were discovered in a garden in Wimborne, Dorset. Similar caches were discovered in October 2009 in Hove, Sussex and during May 2010 in Halesowen in the West Midlands, and a further cache of 20No. was uncovered on a construction site at Birdlip, Gloucestershire, in July 2010.

Also in July 2010, a box of 24No. SIP grenades was found on Cogden Beach, Dorset. In April 2012, more than 8No. SIP grenades were found on a construction site in Banbury and destroyed by members of the Army Royal Logistic Corps (RLC).

In March 2015, 80No. SIP grenades were found at a building site in Eastbourne, some of which exploded before they could be made safe by a Bomb Disposal unit. In all 8No. cases, the bottles were in good condition and exploded in flames when broken.

Most recently, in May 2016, 1No. No. 76 SIP grenade was found during excavation at Chapel Point, Lincolnshire forcing works to be delayed. During WWII, the site was occupied by a pillbox and gun emplacement associated with the heavily-defended 'Coastal Crust', manned by Home Guard units. The device was removed safely.

In January 2017, a cache of 24No. SIP grenades was discovered at Derriford, Plymouth and made safe by a Royal Navy Bomb Disposal Unit.

The Plate below shows 2No. recently discovered SIP grenades.

Plate	Photograph of No. 76 SIP grenades

Source: Zetica Ltd

Given the irregular nature of Home Guard activity, the possibility of items of UXO or weapons being discovered at any locations occupied or used for training by them can never be totally discounted.

A1.11 UXO Migration

It is possible for explosive material, UXO or ordnance scrap to migrate to a site during landfill or dredging operations or other ground works which import Made Ground or natural materials already containing UXO. It is important to understand the nature and age of such landfill or dredging operations when assessing the potential UXO hazard level on the site.

A1.12 Effects and Consequences

In the UK, there are no recorded incidents since the decade after WWII of a UXB accidentally detonating. In recent years, bombs have been found that have fuze mechanisms that have started to operate indicating that given the right conditions a UXB may still function.

In June 2008 the UXB uncovered in the Lea Valley caused difficulty to No. 33 Regiment (Explosive Ordnance Disposal) Royal Engineers because the fuze mechanism started to operate.

The 1,000kg 'Hermann' bomb, the first of this size to be found in over 30 years, took 5 days to deactivate. This demonstrates that larger bombs can be found and any risk mitigation measures should provide the option to deal with this size of device. Since WWII, UXBs have been found on a regular basis in London.

Since WWII, UXB have been found on a regular basis throughout Britain. Some of the most recent cases are described below.

In January 2016, Zetica discovered 3No. 500lb British UXB at a former airfield in Cambridgeshire. These were destroyed in controlled explosions. The Plate below is a photograph of one of the bombs.

Plate	Photograph of a recently excavated WWII British 500lb GP bomb

Source: Zetica Ltd

On the 12th May 2016, 1No. 250kg UXB was found on a building site in Bath. It was made safe and then taken to a local quarry for demolition.

In September 2016 1No. 500kg UXB and 1No. torpedo were discovered during dredging works in Portsmouth Harbour. An additional 250kg HE bomb was discovered on the 16th November 2016. These devices were towed out to sea and destroyed in controlled explosions.

On the 19th January 2017, 1No. 50kg UXB was found during dredging works along the River Thames Victoria Embankment in Central London. The device was towed to Tilbury in Essex where it was destroyed in a controlled explosion.

On the 25th January 2017, 1No. 500lb British UXB and 1No. mortar shell were found in King's Forest, Thetford. They were destroyed in a controlled explosion.

On the 2nd March 2017, 1No. 250kg German UXB was found on a building site in Brondesbury Park in the London Borough of Brent. It was defuzed by an EOD team and removed to a safe location where it was destroyed in a controlled explosion.

On the 31st August 2017, 1No. 50kg German UXB was found in a quarry in Kings Hill, West Malling, Kent. It was destroyed in a controlled explosion.

During October and November 2017, approximately 150No. canisters of Mustard Gas were found in a lake and adjacent woodland near the former WWII military airfield RAF Woodhall Spa, Lincolnshire. The canisters were removed to the DSTL at Porton Down for safe disposal.

On the 11th February 2018, 1No. 500kg UXB was found in King George V Dock, adjacent to London City Airport, during construction work. The airport was closed for two days while the UXB was made safe by an EOD team from the Royal Navy. It was removed and destroyed in a controlled explosion off Shoesburyness on the 14th February 2018.

On the 26th February 2018, an EOD team destroyed numerous items of ordnance including shells and 20mm ammunition which had been exposed by storms on Selsey Beach.

On the 3rd April 2018, 1No. WWI shell was found in Steeton near Bradford. It was destroyed in a controlled explosion after being made safe and moved to a nearby field.

On the 20th May 2018, a 1,000kg German sea mine washed ashore at Elmer beach near Bognor Regis, West Sussex. A 1 mile exclusion zone was enforced before an EOD team towed the device out to sea for a controlled explosion.

On the 24th May 2018, numerous ordnance-related items were found on a proposed residential development in Burntwood, Staffordshire.

On the 10th July 2018, a suspected 1,000kg German UXB was found by scuba divers near Teignmouth Pier in Devon. The UXB was towed out into open sea by a RN EOD team for a controlled explosion.

On the 20th August 2018, an EOD team undertook a controlled explosion on Berrow beach, Somerset, after a cache of munitions – including shells, bullets, grenades and incendiary devices – was found by residents digging up a tree stump in their garden in Burnham-on-Sea.

On the 30th August 2018, a 2,000lb German PM was trawled up by a fishing vessel off Mersea in Essex. The PM was moved to an area of open sea where it was destroyed in a controlled explosion by a RN EOD team.

On the 29th November 2018 a large naval projectile was found at Wembury Point, Plymouth. It was destroyed in a controlled explosion.

Overseas

There is a long list of incidents during construction work in Germany that in some cases have led to casualties.

In June 2010, 3No. members of a bomb disposal team were killed, and 6No. others injured, whilst attempting to defuze an unexploded WWII bomb in Goettingen, Central Germany.

The bomb, the second found in Goettingen in the space of a few days, was unearthed at a depth of 7.5m during excavations for a sports stadium.

In September 2008, 17No. people were injured and considerable damage occurred to adjacent buildings when a bomb exploded on a construction site in Hattingen, Germany.

In October 2006 during road works on a motorway near Aschaffenburg in Bavaria, southern Germany, a bomb was struck by a machine and detonated. The plant driver was killed and 5No. others injured, including passing motorists.

In a similar incident in October 2004 in Linz, Austria a bomb exploded injuring 3No. workers and causing considerable damage to plant. In the same month, a WWII bomb under a back garden in Vienna, Austria, was detonated without warning by a minor earth tremor, after remaining undiscovered for over 60 years.

Further details of recent similar finds can be found at http://zeticauxo.com/news/.

The effects of a partial or full detonation of ordnance are usually shock, blast, heat and shrapnel damage. A 50kg buried bomb can damage brick / concrete structures up to a distance of approximately 16m away. Unprotected personnel on the surface up to 70m away from the blast could also be seriously injured. Larger ordnance would obviously be more destructive.

Explosives rarely lose effectiveness with age, although over time mechanisms such as fuzes and gaines can become more sensitive and therefore more prone to detonation, regardless of whether the device has been submersed in water or embedded in silt, clay or similar materials.

The effects of a detonation of explosive ordnance are usually extremely fast, often catastrophic and invariably traumatic to any personnel involved.

Appendix 2 Abbreviations	
AA	Anti-Aircraft
ACPO	Association of Chief Police Officers
ALG	Advanced Landing Ground
ALARP	As Low As Reasonably Practicable
ARP	Air Raid Precaution
ATVC	Army Training Vocational Centre
AXO	Abandoned Explosive Ordnance
BD	Bomb Disposal
BDO	Bomb Disposal Officer
BDU	Bomb Disposal Unit
CBRN	Chemical, Biological, Radiological and Nuclear
CMD	Conventional Munitions Disposal
DAB	Delayed Action Bomb
DCLG	Department of Communities and Local Government
EO	Explosive Ordnance
EOC	Explosive Ordnance Clearance
EOR	Explosive Ordnance Reconnaissance
ERW	Explosive Remnants of War
ESA	Explosive Substances and Articles
FFE	Free From Explosives
HAA	Heavy Anti-Aircraft
HE	High Explosive
HSE	Health and Safety Executive
JSEODOC	Joint Services EOD Operations Centre

IB	Incendiary Bomb
IED	Improvised Explosive Device
IEDD	Improvised Explosive Device Disposal
OB	Operational Base
OP	Observation Post
LAA	Light Anti-Aircraft
MoD	Ministry of Defence
PUCA	Pick Up and Carry Away
RAF	Royal Air Force
SIP	Self-Igniting Phosphorous
SR	Southern Railway
TEP	Time Expired Pyrotechnics
USAAF	United States Army Air Forces
UXB	Unexploded Bomb
UXO	Unexploded Ordnance

Appendix 4 Glossary & Definitions	
Abandoned Explosive Ordnance (AXO)	Abandoned Explosive Ordnance is explosive ordnance that has not been used during an armed conflict, that has been left behind or disposed of by a party to an armed conflict, and which is no longer under control of that party. Abandoned explosive ordnance may or may not have been primed, fuzed, armed or otherwise prepared for use.
Camouflet	The type of cavity produced when a charge explodes underground without breaking the surface of the earth to form a crater.
Demil	Derived from the term 'Demilitarisation', it refers to the break down and the recycling or disposal of ordnance components.
Detonation	The high-speed chemical breakdown of an energetic material producing heat, pressure, flame and a shock wave.
Device	This term is used for any component, sub-assembly or completed ordnance, which may or may not have an explosive risk. It can apply to detonators, primers, gaines, fuzes, shells or bombs.
Explosive	The term explosive refers to compounds forming energetic materials that under certain conditions chemically react, rapidly producing gas, heat and pressure. Obviously, these are extremely dangerous and should only be handled by qualified professionals.
Explosive Ordnance (EO)	Explosive Ordnance is all munitions containing explosives, nuclear fission or fusion materials and biological and chemical agents. This includes bombs and warheads, guided and ballistic missiles, artillery, mortar, rocket, small arms ammunition, mines, torpedoes, depth charges, pyrotechnics, cluster bombs & dispensers, cartridge & propellant actuated devices, electro-explosive devices, clandestine & improvised explosive devices, and all similar or related items or components explosive in nature.
Explosive Ordnance Clearance (EOC)	Explosive Ordnance Clearance is a term used to describe the operation of ordnance detection, investigation, identification and removal, with EOD being a separate operation.
Explosive Ordnance Disposal (EOD)	Explosive Ordnance Disposal is the detection, identification, on-site evaluation, rendering safe, recovery and final disposal of unexploded explosive ordnance.
Explosive Ordnance Reconnaissance (EOR)	Explosive Ordnance Reconnaissance is the detection, identification and on-site evaluation of unexploded explosive ordnance before Explosive Ordnance Disposal.
Explosive Remnants of War (ERW)	Explosive Remnants of War are Unexploded Ordnance (UXO) and Abandoned Explosive Ordnance (AXO), excluding landmines.

Explosive Substances and Articles (ESA)	Explosive substance are solid or liquid substances (or a mixture of substances), which are either: • capable by chemical reaction in itself of producing gas at such a temperature and pressure and at such a speed as to cause damage to the surroundings. • designed to produce an effect by heat, light, sound, gas or smoke, or a combination of these as a result of a non-detonative, self-sustaining, exothermic reaction. Explosive article is an article containing one or more explosive substances.
Fuze	A fuze is the part of an explosive device that initiates the main explosive charge to function. In common usage, the word fuze is used indiscriminately, but when being specific (and in particular in a military context), fuze is used to mean a more complicated device, such as a device within military ordnance.
Gaine	Small explosive charge that is sometimes placed between the detonator and the main charge to ensure ignition.
High Explosive	Secondary explosives (commonly known as High Explosives (HE)) make up the main charge or filling of an ordnance device. They are usually less sensitive than primary explosives. Examples of secondary explosives are: Nitro glycerine (NG), Trinitrotoluene (TNT), AMATOL (Ammonia nitrate + TNT), Gunpowder (GP), and Cyclotrimethylenetrinitramine (RDX).
Munition	Munition is the complete device charged with explosives, propellants, pyrotechnics, initiating composition, or nuclear, biological or chemical material for use in military operations, including demolitions. This includes those munitions that have been suitably modified for use in training, ceremonial or non-operational purposes. These fall into three distinct categories:- • inert - contain no explosives whatsoever. • live - contain explosives and have not been fired. • blind - have fired but failed to function as intended.
Primary Explosive	Primary explosives are usually extremely sensitive to friction, heat, and pressure. These are used to initiate less sensitive explosives. Examples of primary explosives are: Lead Azide, Lead Styphnate, and Mercury Fulminate. Primary explosive are commonly found in detonators.
Propellants	Propellants provide ordnance with the ability to travel in a controlled manner and deliver the ordnance to a predetermined target. Propellants burn rapidly producing gas, pressure and flame. Although usually in solid form they can be produced in liquid form. Examples of propellants are: Ballistite often found in a flake form and Cordite used in small arms ammunition.
Pyrotechnic	A pyrotechnic is an explosive article or substance designed to produce an effect by heat, light, sound, gas or smoke, or a combination of any of these, as a result of non-detonative, self-sustaining, exothermic chemical reactions.

Small Arms Ammunition (SAA)	SAA includes projectiles around 12mm or less in calibre and no longer than approximately 100mm. They are fired from a variety of weapons, including rifles, pistols, shotguns and machine guns.
Unexploded Anti-Aircraft (UXAA) Shell	UXAA shells are army ordnance commonly containing HE, though they can also contain pyrotechnic compounds that produce smoke. Most commonly, these were 3.7" and 4.5" HE shells, although they ranged from 2" to 5.25" calibre.
Unexploded Bomb (UXB)	UXB is a common term for unexploded air-dropped munitions.
Unexploded Ordnance (UXO)	UXO is explosive ordnance that has been either primed, fuzed, armed or prepared for use and has been subsequently fired, dropped, launched, projected or placed in such a manner as to present a hazard to operations, persons or objects and remains unexploded either by malfunction or design.
V1	The Vergeltungswaffe-1, V-1, also designated Fieseler Fi 103/FZG-76, known colloquially in English as the Flying Bomb, Buzz Bomb or Doodlebug, was the first guided missile used in WWII and the forerunner of today's cruise missile.
V2	The Vergeltungswaffe 2 (V-2) ('Reprisal Weapon 2') was the first ballistic missile. It was used by the German Army primarily against Belgian and British targets during the later stages of WWII. The V-2 was the first manmade object launched into space, during test flights that reached an altitude of 189km (117 miles) in 1944.

Appendix 5 Bibliography

Airfield Research Group, Munitions 1915 – 1919, Airfield Research Publishing, June 1996

Baxter G G, Aircraft Casualties in Kent Part I: 1939 to 1940, 1990

Birtles P, World War 2 Airfields, 1999

Bulloch G, Steeds J E, Green K, Sainsbury M G, Brockwell J S & Slade N J, Land Contamination: Technical Guidance on Special Sites: MoD Land

Bulloch G, Steeds J E, Green K, Sainsbury M G, Brockwell J S, & Slade N J, R&D Technical Report P5-042/TR/03, Land Contamination: Technical Guidance on Special Sites: Explosives Manufacturing & Processing Sites

CIRIA C681, Unexploded Ordnance (UXO), a Guide for the Construction Industry, 2009

Clarke N J, Luftwaffe Target Reconnaissance, German Aerial Photography 1939-1942, 1995

Clarke N J, Adolf's British Holiday Snaps: Luftwaffe Aerial Reconnaissance Photographs of England, Scotland and Wales, 2012

Cocroft W D & Thomas R J, Cold War, 2003

Collier B, The Defence of the United Kingdom, 1957

Dobinson C S, Twentieth Century Fortifications in England, Volume I 1, Anti-Aircraft artillery, England's air defence gun sites. 1914 – 46. Council for British Archaeology, 1996

Dobinson C S, Twentieth Century Fortifications in England, Volume I 2, Anti-Aircraft artillery, Site gazetteer, WWI. Council for British Archaeology, 1996

Dobinson C S, Twentieth Century Fortifications in England, Volume I. 3. Anti-Aircraft artillery, 1914-46, Site gazetteer, WWII HAA & ZAA. Council for British Archaeology, 1996

Dobinson C S, Twentieth Century Fortifications in England, Volume I 4, Anti-Aircraft artillery, Site gazetteer, WWII LAA. Council for British Archaeology, 1996

Dobinson C S, Twentieth Century Fortifications in England, Volume I 5, Anti-Aircraft artillery, Sources. Council for British Archaeology, 1996

Dobinson C S, Twentieth Century Fortifications in England, Volume II, Anti-Invasion defences of WWII. Council for British Archaeology, 1996

Dobinson C S, Twentieth Century Fortifications in England, Volume III, Bombing decoys of WWII, England's passive air defence 1939-45. Council for British Archaeology, 1996

Dobinson C S, Twentieth Century Fortifications in England, Volume VIII, Civil defence in WWII, Protecting England's Civil Population. Council for British Archaeology, 1996

Dobinson C S, Twentieth Century Fortifications in England, Supporting paper AA/1 Searchlight sites in WWII. Council for British Archaeology, 1996

Dobinson C S, Fields of Deception, Britain's Bombing Decoys of World War II, 2000

Dobinson C S, AA Command, 2001

Evans M, Forrest H, Haynes D, Young R, Draper R, Sarangi J & Murray V, Discovery of WWII Special Incendiary Phosphorous (SIP) Grenades in a Wiltshire garden, Chemical Hazards and Poisons Report, 2007

Gulvin K R, Kent Home Guard: A History, 1980

Halpenny B B, Action Stations: Military Airfields of Greater London, 1993

Lowry B & Wilks M, The Mercian Maquis: The Secret Resistance Organisation in Herefordshire and Worcestershire during World War II, 2002

Morris J, German Air Raids on Britain 1914-1918, 1993

Osborne M, Defending Britain, Twentieth-Century Military Structures in the Landscape, 2004

Price A, Blitz on Britain 1939-45, 2000

Ramsey W, The Blitz Then and Now, Vol 1, 1987

Ramsey W, The Blitz Then and Now, Vol 2, 1988

Ramsey W, The Blitz Then and Now, Vol 3, 1990

Storey N R, Zeppelin Blitz: The German Air Raids on Great Britain During the First World War, 2015

Warwicker J, Churchill's Underground Army: A History of the Auxiliary Units in World War II, 2013

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