

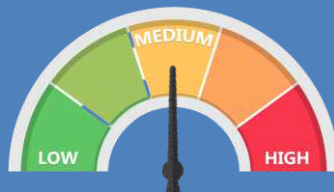
Geo-Environmental Assessment
Porters End House Barns
Kimpton, Hertfordshire
SG4 9ER

Client: Ms Carly Procter

Issue Date: June 2024
Report Ref: 21301R1 (Issue A)



CONTAMINATION



FOUNDATIONS



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	Prepared by	Checked by	Quality Check	Approved by
Name	Ryan Saint	Jason Fitzgerald	Corrienne Ainscough	Simon Ware
Position	Consultant	Principal Consultant	Business Manager	Managing Director
Date	June 2024	June 2024	June 2024	June 2024

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APPENDIX A

Relevant Guidance and Legislation

APPENDIX B

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Environmental Database

APPENDIX D

Field Logs

APPENDIX E

Analytical Test Results

APPENDIX F

Geotechnical Test Results

1.0 EXECUTIVE SUMMARY

Phase 1 Desk Study	Comments	Risk Rating
Site Setting and description	The site is situated off Porter's End Lane, Kimpton at SG4 9ER and is located within a semi-residential setting. Site comprises workshops/barns to the southern portion and open land in the central and northern portion. Disused AST (10,000L) present to north of workshop/barn.	Low/Moderate
Published Geology and Hydrogeology	Bedrock geology consists of Lewes and Seaford Chalk Formation and is deemed a Principal aquifer, overlain with superficial Clay-with-flints (unproductive). The site lies within a SPZ 3.	Moderate
Hydrology/Flood Risk	No major river within 3km radius. Outside of Flood Risk 2 and 3.	Low
Historical land use	Land use remain unchanged from 1884 with barn present in southern portion. Gasometer present 150m SE between 1881 – 1960. Chalk pits present between 50-150m distance to west between 1881 – 1898.	Low/Moderate
Landfill/Infilled land	None within 250m	Low
Radon Risk	Less than 1%	Low
UXO	Low risk	Low
Phase 2 Intrusive	Comments	Risk Rating
Proven Ground Conditions	Made ground/topsoil to 0.29m, overlying very stiff gravelly clay to ~2.5m, with white Chalk Dm proven to 4.0m	
Groundwater/Drainage	Groundwater encountered at 4m depth in one location, all others dry. Impermeable clay is unlikely to be suitable for shallow soakaways. BRE365 soakage testing within chalk required to confirm drainage design.	Moderate
Ground Gas	Max TOC of 1.2%. Max made ground thickness of 0.4m. No potential sources for groundgas generation identified.	Low
Contamination	Minor exceedances of GAC in shallow soils with upper 1m (made ground and clay) for non-volatile PAHs, and Beryllium.	Low/Moderate
Ground Engineering	Rebuilding of barns as dwellings is likely to require piled foundations	Moderate
Recommendations	- BRE365 Soakage Testing for drainage design - Deep borehole to 15m depth for pile design (if required) - Remedial Strategy/MMP	

2.0 INTRODUCTION

WDE Consulting Limited (WDE) was appointed by Ms Carly Procter (the *client*) to conduct a Geo-Environmental Assessment at Porters End House Barns, Kimpton, Hertfordshire, SG4 9ER (Figure 1). The current site comprises workshops/barns with open grassed field and is situated at TL 16237 17186, What 3 Words ///scars.works.exile (Figure 2).

2.1 Context

It is understood that the proposed development is to comprise the conversion of the existing barns into new residential dwellings. (Figure 3).

The works have been completed in line with the current regulations, guidance and good practice presented in Appendix A.

2.2 Agreed Scope of Works and Objectives

The scope of work that was agreed with client is presented in Table 1.

Table 1 – Agreed Scope of Works and Objectives

Item	Scope of Works	Objectives
1	Site walkover	To identify any areas of potential contamination.
2	Intrusive site investigation	- To identify whether there is any contamination onsite which is considered to pose an unacceptable risk to human health, controlled waters or the environment. - To identify the geotechnical properties of the ground to enable design parameters for foundations.
3	Laboratory Analysis	Contamination and geotechnical soil samples are analysed at a laboratory.
4	Reporting	- Complete a Phase 1 desk-based study of the site to ascertain information on the site geology, hydrology, and surrounding land uses. - Compare onsite soil concentrations with generic UK based assessment criteria. - Provide recommendations on contamination and foundations in the event that the existing buildings are unsuitable for conversion and require replacement with new dwellings.

3.0 PHASE 1 DESK STUDY

3.1 Information Sources

The sources of information that were used during the desk study included the following items:

- Site walkover (photos presented in Appendix [B](#))
- Environmental database information (Appendix [C](#))
- Publicly available information

3.2 Site Description and Walkover

The site is located off Porters End Lane, Kimpton, SG4 8ER at National Grid reference TL 16237 17186 (Figure 1) and measures ~65m from N to S, ~30m from E to W and a total area of 0.29 hectares (Figure 2). The site consists of a three barns in the southern portion of the site, with open grass land in the central northern of site (Photo 1).

A summary of the site surroundings are as follows:

- Northern/Western boundary – Semi-residential/Porters End Lane
- Southern boundary – Farm buildings/farmland
- Eastern boundary – Open farmland

A steel un-bunded ~10,000L capacity above ground storage tank (AST) was situated outside the barn (Photo 2) nearest to the open field (Figure 2). It would appear that the tank was no longer in use, as the tank was covered by substantial vegetation growth. There was no signs of surface staining or odour to the ground in the vicinity of the tank.

Numerous mature trees, mainly deciduous, border the sites' eastern and western boundaries, some up to ~20m in height. (Photo 3), comprising willow, poplar and field maple and with a mature willow tree ~15m east of the barns.

3.2.1 Key Findings of Desk Study

The key findings from the desk study are presented in Table 2.

Table 2 – Key Findings of Desk Study

Item	Details
Published Geology	Clay-with-flints Formation (Superficial), Lewes and Seaford Chalk Formation (Bedrock)
Geological Hazards	All low except ground dissolution of soluble rocks (moderate). Potential for dissolution features in Chalk rock.
Hydrogeology	Principal Bedrock aquifer situated within Agency SPZ3. No licenced groundwater abstractions within 500m of site.
Hydrology	Low risk of flooding. No major rivers within 3km of site.
Current Land Use on site	Agricultural (Grade 3 – Good to moderate agricultural designation).
Current Land Use within 250m radius	No current industrial land use within 250m
Radon Risk	<1% properties affected. Low risk area
Historical land use on site	Site first developed in 1884 with building to south (use not stated), prior to which land was open fields. A second rectangular building was present from 1946 within the central portion. By 1995 the building to south had been replaced with another rectangular buildings, which represents the current configuration.
Historical land use with 250m radius	1881 – 1960 gasometer/associated buildings located in The Dell ~150m SE 1881-1898 3no Chalk pits present to west ~50 to 150m distance Porter's End to south in 1881 with Beanswick Cottages shown from 1898.
Landfills/Infilled Land	There are no licensed landfills situated within 250m radius, with nearest being 344m SE associated with waste exemption for storage of sludge
Identified potential areas of concern	- A: Above Ground Fuel Tank (AST) of ~10,000L capacity - B: High water demand trees - C: Former Gasometer and buildings to SE - D: Infilled chalk pits
Pollution Incidents	None recorded
UXO Risk	Low – No further actions likely
Environmental Sensitive Land Uses	Ancient woodland 931m NW of site.

3.3 Preliminary Risk Assessment

3.3.1 Identification of Critical Receptors

The identified potentially critical receptors are presented in Table 3.

Table 3 – Identification of Potential Receptors

Receptor Type	Current/Future	Receptor Details	Active
Human Health	Future	Residential receptors onsite	Yes
	Current	Residential/Commercial receptors offsite	Yes
Controlled waters	Current	Groundwater within aquifer	Yes
	Current	Groundwater within SPZ/licensed abstraction	Yes
	Current	Surface water body	No

The risks to onsite workers can be minimised by following appropriate health and safety guidance on site (i.e. wearing protective clothing and washing).

3.3.2 Identification of Potential Areas of Concern

The list of potential areas of concern on site and in the surrounding area are summarised in Table 4, and presented on Figure 2.

Table 4 – Identification of Potential Areas of Concern

Ref Area of Concern	Location	Potential Risk	Comments
A	Onsite	Above ground storage tank	Hydrocarbons (TPH, BTEX, PAH).
B	Onsite	Trees	High water demand tree 15 - 20m in height.
C	Onsite	Potentially imported made ground	Hydrocarbons (TPH, BTEX, PAH), heavy metals, inorganics, asbestos, cyanide, phenols, ground gas
D	Offsite	Former gasometer/gas works to SE	
E	Offsite	Infilled chalk pits	

The potential contaminants of PCBs arising from the electricity substation located offsite have been discounted as PCBs are not considered to be sufficiently mobile or soluble¹.

3.3.3 Identified Potential Pathways

Human Health Pathways

The potential human health exposure pathways for a residential/commercial receptor are indicated in Table 5.

Table 5 – Identification of Potentially Active Human Health Exposure Pathways

Potential Pathway	Active/Inactive	Notes
Ingestion of soil and dusts	Active	Qualitative Risk Assessment required.
Ingestion of home grown produce	Active	Qualitative Risk Assessment required.
Dermal contact with soils and dust	Active	Qualitative Risk Assessment required.
Inhalation of dusts	Active	Qualitative Risk Assessment required.
Inhalation of organic vapours (generated by shallow soils) in external areas or inside buildings	Active	Qualitative Risk Assessment required.
Inhalation of organic vapours generated by dissolved phase groundwater migrating offsite to neighbouring residential properties	Active	Qualitative Risk Assessment required.
Inhalation of organic vapours generated by dissolved phase groundwater migrating onto site from surrounding offsite sources	Active	Qualitative Risk Assessment required.
Contaminants from site entering groundwater and migrating into public water abstraction borehole for human consumption	Inactive	No potable abstractions within 500m. No further assessment required.

¹ Department of the Environment, 1996, Industry Profile: Engineering works. P.14 Sect 3.2.1

Controlled Waters Pathways

The potentially active controlled waters migration pathways are indicated in Table 6.

Table 6 – Identification of Potentially Active Controlled Water Pathways

Potential Pathway	Active/ Inactive	Notes
Impacted soils leaching to groundwater within Principal Aquifer	Active	Qualitative Risk Assessment required.
Impacted soils leaching to groundwater and migration to surface water	Inactive	No further assessment required.

Ground Gas Pathways

The potential for ground gas risk depends on source-pathway-receptor linkages, with the age of infilling and type of waste as controlling factors. The potentially active migration pathways for ground gas are indicated in Table 7, along with a qualitative risk assessment.

Table 7 – Identification of Potentially Active Ground Gas Pathways

Potential Pathway	Active/ Inactive	Qualitative Risk Assessment	Notes
Potential for natural materials with high organic content, such as peat (>4% TOC)	Active	Low/moderate	Further assessment required.
Availability of readily degradable material, such as vegetable matter and food waste	Inactive	Low	No landfills recorded within 500m. No further assessment required.
Nature of fill material - depth of fill >1m, incohesive materials, poorly compacted and within unsaturated zone.	Inactive	Low/Moderate	Further assessment required.
Age of Materials - Ground gas generated from current/historical landfills <25yrs old	Inactive	Low	Former chalk pits infilled over 100yrs previously. No further assessment required.
Distance from receptor – a higher distance reduces the potential risk for offsite migration. High risk generally limited to within 100m distance.	Active	Moderate	Residential dwellings <100m from proposed dwellings.
Presence of Preferential Pathways – fissures/fractures in bedrock or permeable strata beneath an impermeable cover	Active	Low/Moderate	Further assessment required.
Chemical storage/spillages with potential for hydrocarbon vapours	Active	Moderate/High	AST on site. Further assessment required.
Shallow or deep mine workings	Inactive	Low	No further assessment required.
Radon gas protective measures required	Inactive	Low	Less than 1%.

3.3.4 Qualitative Risk Assessment

A summary of the relevant pollutant linkages based on a source-pathway-receptors analysis is provided in Table 8.

Table 8 – Summary of Potentially Active Source-Pathway-Target Assessment

Sources	Potential Pathway	Potential Receptor	Risk Classification
Onsite Sources (A to C in Table 4)	Dermal contact, outdoor and indoor inhalation, ingestion, homegrown produce	Human Health (Onsite Residential)	Low/Moderate
	Vapour inhalation from dissolved phase groundwater migrating from site to neighbouring properties	Human Health (Offsite Residential)	Low
	Impacted soil leaching to groundwater within Principal Aquifer	Controlled Waters (Groundwater)	Moderate
Offsite Source (D to E in Table 4)	Vapour inhalation from dissolved phase migration from offsite sources	Human Health (Onsite Residential)	Low/Moderate
Historical landfill and infilled land	Source for ground gas generation	Human Health (Onsite Residential)	Low/Moderate

4.0 PHASE II INVESTIGATION WORKS

4.1 Summary Of Works

The locations of the intrusive investigation are presented on Figure 4 and comprised the following:

Table 9 – Summary of Phase II Intrusive Works

Item	Details	Appendix
Shallow Boreholes	4no. BH's to 4m bgl using a mechanical window sampler (Photo 4)	D
Analytical Testing	Standard QRA and WAC tests were carried out on all representative soil samples within the upper 1m. (4no. standard QRA suite tests and 1no. WAC test).	E
Geotechnical Testing	Atterberg Limits, soil moisture content and undrained triaxial tests were carried out on representative soil samples.	G

4.2 Constraints/Selection of Intrusive Locations

There were no constraints on the selection of the intrusive locations.

4.3 Rationale for Selection of Intrusive Locations

The intrusive locations are indicated on Figure 4, with rationale used for the selection of locations presented in Table 10.

Table 10 – Rationale for Exploratory Hole Locations

Ref Area of Concern	Location	Potential Risk	Intrusive Locations
A	Onsite	Above ground storage tank	BH1 and BH2
B	Onsite	Trees	BH3 and BH4
C	Onsite	Potentially imported made ground	All
D	Offsite	Former gasometer/gas works to SE	All
E	Offsite	Infilled chalk pits	All

4.4 Field Results

4.4.1 Geology

A summary of the geology encountered during the intrusive investigation is summarised in Table 11 and are presented in full Appendix D.

Table 11 – Summary of Geology Proved Onsite

Strata	Description	Min – Max Depth Base (m bgl)	Average Depth (m bgl)	Locations
Topsoil		Absent - 0.15	0.00 – 0.15	BH3,BH4
Made Ground	Concrete slab/Silty gravelly clay with occasional brick fragments	Absent – 0.40	0.00 – 0.29	BH1,BH2
Gravelly Silty Clay	Very stiff reddish brown gravelly silty Clay	2.00 – 4.00+	0.22 – 2.53	All
Dm Chalk	Cream/white putty Chalk (Dm)	Absent - 4.00+	2.53 – 4.00+	All except BH4

- The concrete slab within the existing barn was 0.18m thick and did not appear to have any reinforcement (Photo 5).

4.4.2 Contamination Observations

No grossly contaminated materials were identified during the intrusive investigation.

4.4.3 Groundwater Observations

Groundwater was observed in BH3 at 4.0m, with all other boreholes dry.

5.0 CONTAMINATION ASSESSMENT

5.1 Soil Analytical Test Results

Based on the context of the assessment, the proposed land use is assumed to be residential with home grown produce. A comparison of the soil analytical test results with the adopted GACs is presented in Appendix E, along with laboratory certificates of analyses.

The locations that have exceeded the adopted GACs are summarised below:

- Made Ground - BH2 at 0.30m bgl: Benzo(b)fluoranthene, Benzo(a)pyrene
- Natural Clay - BH1 at 0.60m bgl, BH3 at 0.40m bgl: Beryllium

5.2 Waste Classification/Onsite Reuse Options

Table 12 provides an overview of the likely waste classification for onsite materials, as well as onsite reuse options, with the waste classification sheets presented in Appendix E.

Table 12 – Likely Waste Classification/Reuse Options for Onsite Materials

Material	Waste Classification	Landfill Designation	Reuse Option
Topsoil	Inert	-	Retained for reuse
Made Ground	Non hazardous	-	Retained for reuse/disposed offsite
Natural Clay	Inert	Inert	

Reuse of site won materials is to be encouraged in line with a sustainable approach, which will require a CL:AIRE DoW:CoP Materials Management Plan (MMP) or U1 waste exemption form to be completed.

5.3 Updated Ground Gas Conceptual Site Model

An update to the ground gas conceptual model is presented in Table 13 which has incorporated the results obtained from this assessment.

Table 13 – Identification of Potentially Active Ground Gas Pathways

Potential Pathway	Active/ Inactive	Qualitative Risk Assessment	Notes
Potential for natural materials with high organic content, such as peat (>4% TOC)	Inactive	Very Low	Max TOC of 1.2%. No further assessment required.
Nature of fill material - depth of fill >1m, incohesive materials, poorly compacted and within unsaturated zone.	Inactive	Very Low	Max thickness of made ground 0.4m. No further assessment required.
Chemical storage/spillages with potential for hydrocarbon vapours	Active	Very Low	No elevated volatiles identified. No further assessment required.

The revised ground gas risk assessment indicates a very low risk from ground. There is unlikely to be a requirement for further ground gas monitoring visits.

5.4 Conclusions on Contamination

There have been some exceedances of the adopted GACs which are all non-volatile and likely to have a low solubility, which can therefore be managed via pathway control measures or hot spot removal. Further details of the pathway control measures, verification criteria, sampling frequency and discovery strategy will need to be presented within the Remedial Strategy in line with the likely planning conditions.

A revised *source-pathway-receptor* assessment is presented in Table 14.

Table 14 – Summary of Revised Active Source-Pathway-Target Assessment

Sources	Potential Pathway	Potential Receptor	Risk Classification
Onsite Sources (A to C in Table 4)	Dermal contact, outdoor and indoor inhalation, ingestion, homegrown produce	Human Health (Onsite Residential)	Moderate
	Vapour inhalation from dissolved phase groundwater migrating from site to neighbouring properties	Human Health (Offsite Residential)	Low
	Impacted soil leaching to groundwater within Principal Aquifer	Controlled Waters (Groundwater)	Low/Moderate
Offsite Source (D to E in Table 4)	Vapour inhalation from dissolved phase migration from offsite sources	Human Health (Onsite Residential)	Low
Historical landfill and infilled land	Source for ground gas generation	Human Health (Onsite Residential)	Low

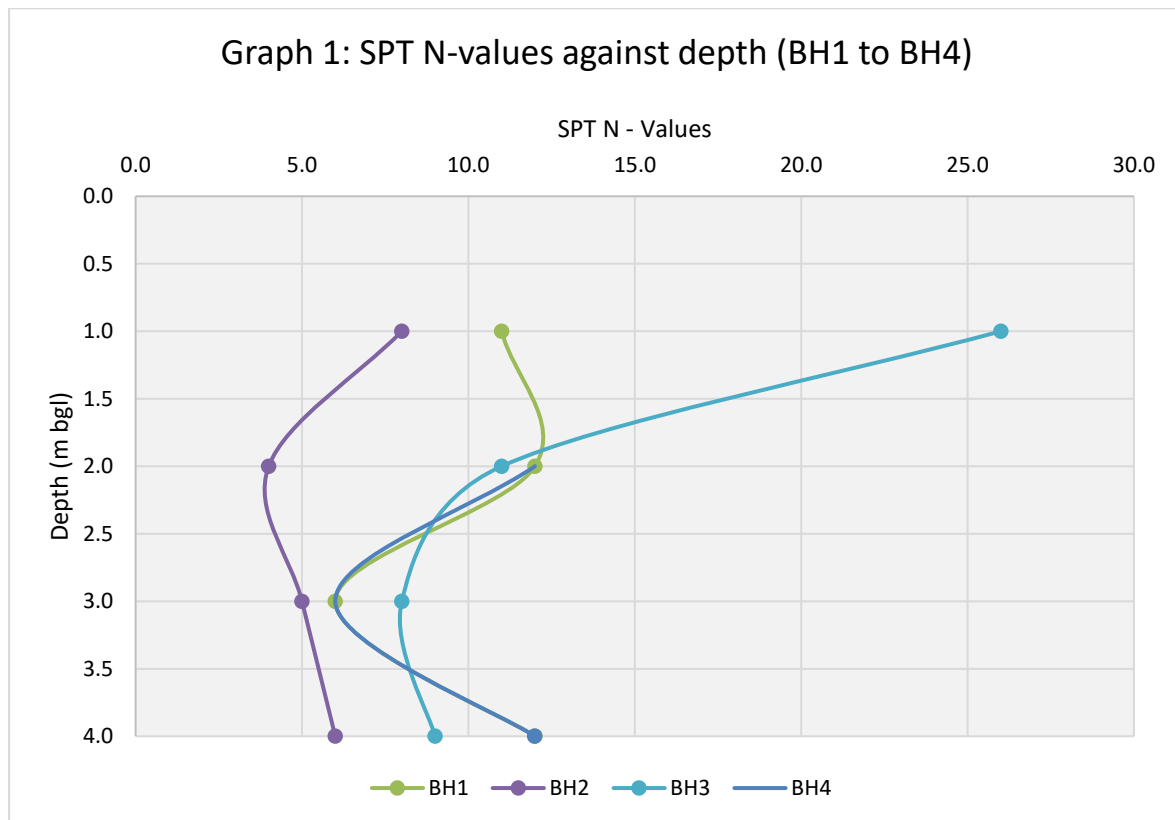
6.0 GROUND ENGINEERING

6.1 Field Testing Results

A summary of the ground engineering field testing results is provided in Table 15 and are presented in on the logs in Appendix D. This includes the calculated SPT N value and inferred shear strength (Cu) using a pocket penetrometer (PP). Graph 1 below shows the SPT N Value against depth for each borehole.

Table 15 – Field Geotechnical Results

Depth (m)	BH1		BH2		BH3		BH4	
	N Value	PP kPa	N Value	PP kPa	N Value	PP kPa	N Value	PP kPa
1	11	480	8	300	26	275	11	250
2	12	-	4	400	11	300	12	-
3	6	-	5	-	8	450	6	-
4	12	-	6	-	9	300	12	-



6.2 Geotechnical Testing

Soil moisture content (SMC), Triaxial undrained shear strength (Cu) and Atterberg limit (PI) testing of the encountered strata are summarised below in Table 16 with the full results presented in Appendix [G](#).

Table 16 – Summary of Geotechnical Test Results

Description	Average Depth (m bgl)	MC %	Liquid Limit	PL (%)	Modified PI(%)	Triaxial, Cu kPa
Gravelly Clay	0.22 – 2.53	21 - 41	59 - 110	22 - 42	25 - 66	130 - 329

Gravelly Clay

Testing of the gravelly clay between 1.00 – 3.00 m bgl returned medium to high plasticity values. The modified plasticity index of 25 - 66% indicates that there is a medium to high volume change potential of the gravelly clay. The gravelly clay recorded a shear strength of 130 – 329kPa indicating a high to very high strength.

6.3 Potential Desiccation

An assessment of potential desiccation has been undertaken and is presented in Appendix [G](#).

Potential desiccation has been identified within BH2, BH3 and BH4 between 1m and 2m which will need to be taken into account within the foundation design.

6.4 Concrete Design Parameters

A summary of the sulphate, pH and corresponding BRE concrete in aggressive ground parameters for concrete design are presented in Table 17.

Table 17 – Summary of BRE Concrete in Aggressive Ground Parameters

Location	Concrete Parameters
pH (pH Units)	7.5
Water Soluble Sulphate as (2:1 Leachate Equivalent) (mg/l)	263
ACEC Classification	AC -1s
Design Sulphate Class	DS-1

6.5 Comparison with Water UK Threshold Concentration Values

The soil laboratory results from the upper 1.35m have been compared to the UKWIR thresholds for the selection of water supply pipes in Table 18 with full results presented in Appendix E.

Table 18 - Comparison of Soil Laboratory Results from the upper 1.35m with UKWIR (mg/kg)

Contaminant of Concern	No. of Samples	UKWIR Threshold	Min	Max	No. Samples > GAC	Samples Exceeded
Total BTEX & MTBE	5	0.1	BDL	BDL	0	-
EC5-EC10 Aliphatic	5	2	BDL	BDL	0	-
EC10-EC16 Aliphatic	5	10	BDL	8.2	0	-
EC16-EC40 Aliphatic	5	500	BDL	75	0	-
EC5-EC10 Aromatic	5	2	BDL	BDL	0	-
EC10-EC16 Aromatic	5	10	BDL	BDL	0	-
EC16-EC40 Aromatic	5	500	20	93	0	-
Phenol	5	2	BDL	BDL	0	-
Cresols and chlorinated phenols	5	2	-	-	-	-
Corrosive	5	Various	7.5	8.2	0	-

There have been no exceedances of the UKWIR threshold values and therefore it is unlikely that additional mitigation measures in the form of protective pipe will be necessary. Further consultation should be sought with the water supply company.

6.6 Excavations, Groundwater Control and Services

Groundwater was encountered at 4m in BH3 and therefore dewatering of shallow excavations within the upper 2m is unlikely to be required. Excavations within cohesive materials are not likely to require support to prevent collapse.

6.7 Preliminary Road Design Parameters

This site has recorded a PI of 36 - 68% and therefore in accordance with the TRRL is considered to have frost susceptible soil. To prevent frost damage in line with current guidance, the foundation's underside in frost-susceptible soil should be at least 450mm below the finished ground level.

It is anticipated that the soils encountered at formation level will a mixture of cohesive and incohesive materials and will be above the water table. The amount of loading is unknown for the roads and pavements, but for poor to good construction conditions², a CBR design value of 2.5 to 3% is recommended for initial design.

² TRRL 1984 Structure Design of Bituminous Roads. Report LR1132

6.8 Preliminary Floor Design

The ground gas risk for the site has been characterised as a Very Low Risk. There is considered no requirement for enhancement of the membrane above the standard specification (CS1/NHBC Green). A block and beam vented subfloor should also be allowed for in the floor design which would also accommodate potential heave within the shallow clays.

6.9 Preliminary Foundation Design

Factors that will need to be considered when selecting the type and depth of foundations includes:

- Anticipated loads required by proposed development
- Depth of groundwater
- Depth of made ground
- Areas containing soft/loose or peaty materials identified during field testing
- Differences in founding materials to avoid differential settlement issues
- Type/height and types of trees in combination with volume change potential of soils
- Potential desiccation

It is understood that the proposed development comprises the conversion of the existing barns into residential dwellings. If this proves to be inappropriate, then construction of new dwellings will be required.

High to very high strength gravelly clay materials were found between 1m and 2m depth in all locations. Traditional strip foundations are likely to be appropriate with an allowable bearing capacity of 150kPa. Potential dessication has also been identified up to 2m depth, and the clay materials have a medium to high volume change potential with mature high water demand trees within 5m distance. Therefore, foundations will need to extend beyond 2.5m depth and will therefore require piled foundations, which may require an additional deep borehole (15m depth) for pile design.

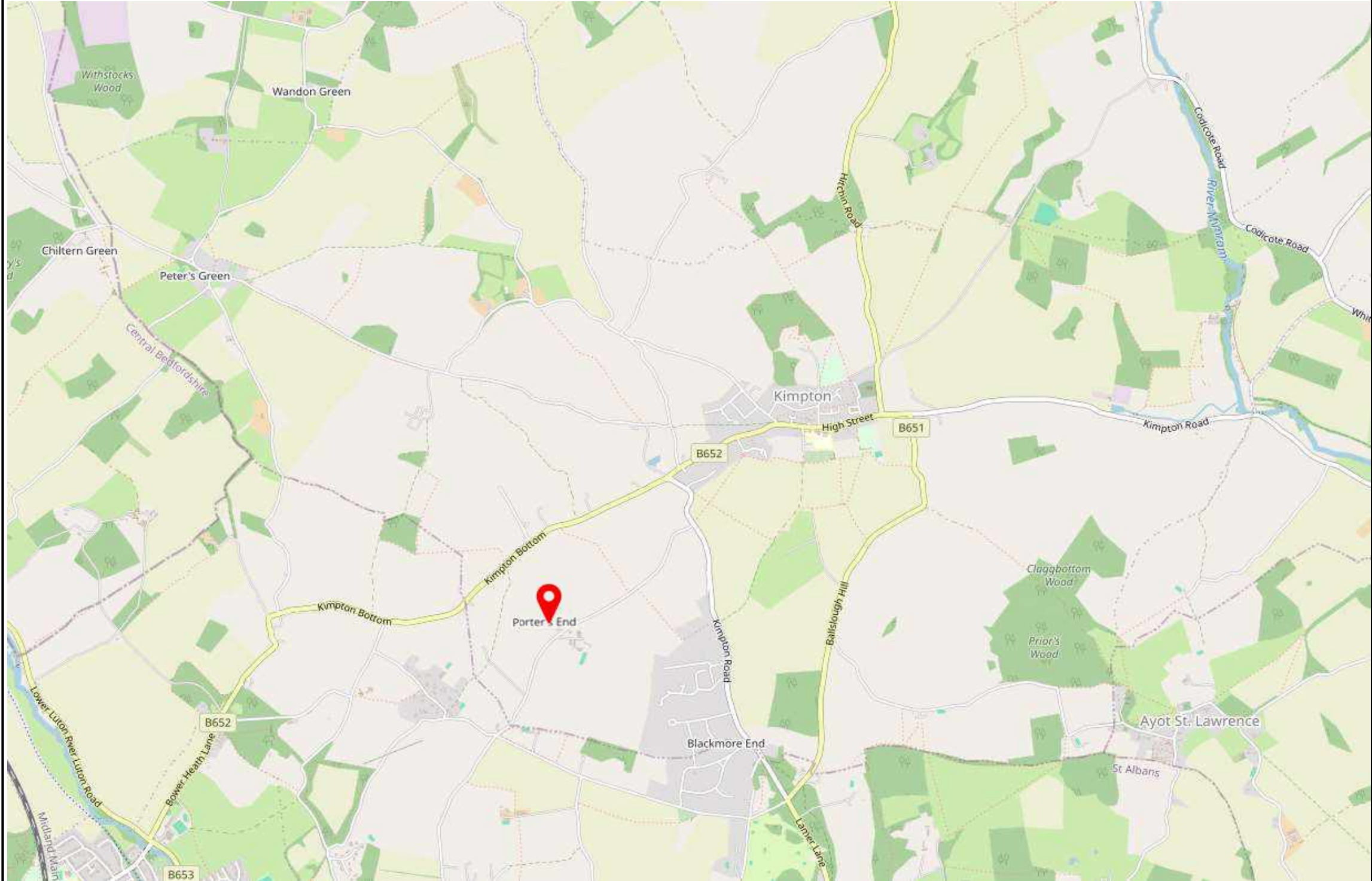
It is recommended that a structural engineer is consulted for the detailed foundation design.

7.0 RECOMMENDATIONS FOR FURTHER WORK

WDE recommends that the following items are undertaken:

- BRE365 soakage testing to further understand the drainage potential of the site
- Deep borehole for pile design in the event that current structures are unsuitable for conversion
- Remedial Strategy to detail pathway control measures, verification criteria and discovery strategy
- CL:AIRE Material Management Plan (MMP) to enable reuse of site won materials

FIGURES



62A Western Road
Tring
HERTS
HP23 4BB
T: 01442 825570

Client
Ms Carly Procter

Project
Porters End House Barns, Kimpton

Title
Figure 1: Site Location Plan

© OpenStreetMap contributors

LEGEND



Potential Areas of Concern

Client

Ms Carly Procter

Project

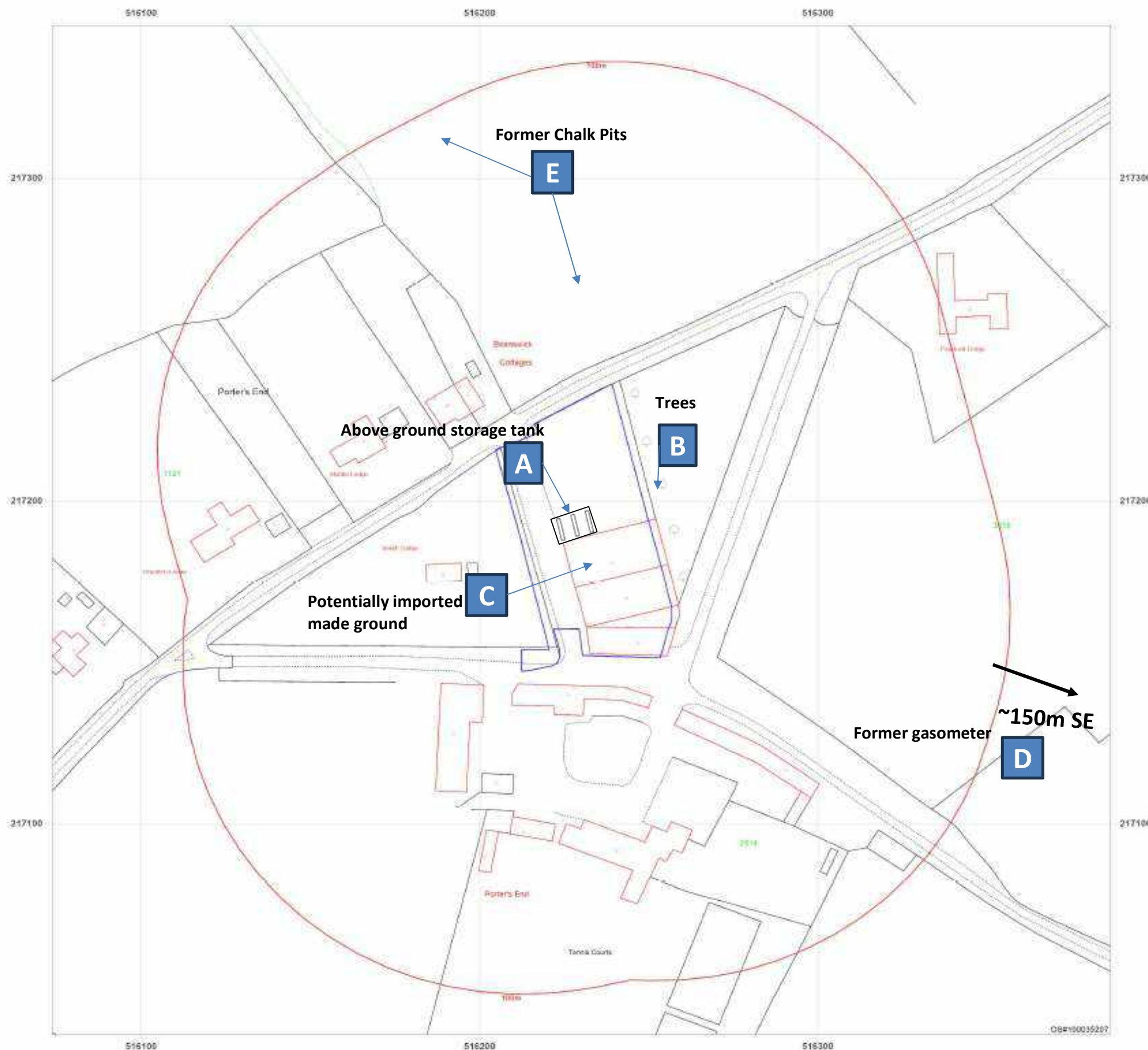
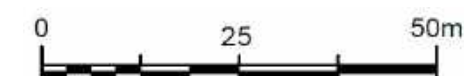
Porters End House Barns, Kimpton

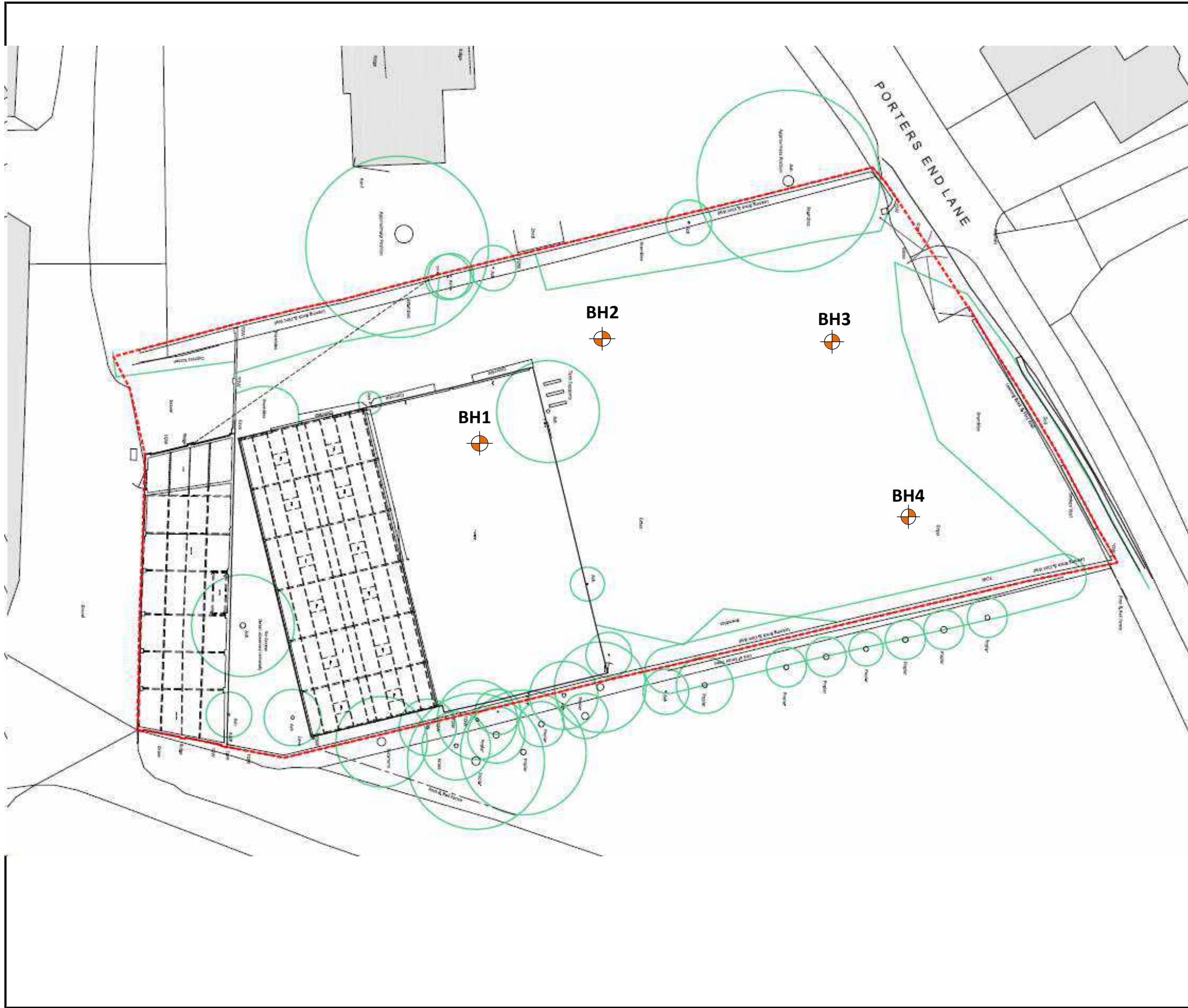
Title

Figure 2: Current Site Plan/Areas of Concern

Drawing supplied by client

Approximate Scale





LEGEND

 Borehole



Client

Ms Carly Procter

Project

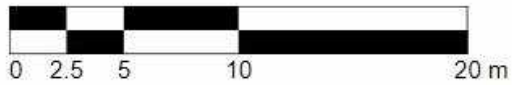
Porters End House Barns, Kimpton

Title

Figure 3: Intrusive Location Plan

Drawing supplied by client

Approximate Scale



APPENDIX A: RELEVANT GUIDANCE AND LEGISLATION

WDE Consulting has duly taken account of the recommendation contained within relevant guidance documents and legislation during the preparation of this report.

CONTAMINATION

Part IIa of the Environmental Protection Act 1990 defined contamination in relation to continued land use and introduced the “polluter pays” principal. The Groundwater Regulations 1998 defined List 1 and List 2 substances and the procedures for preventing them from entering groundwater. The Water Resources Act of 1991 introduced the term “controlled waters” and gave powers to the Environment Agency to require remediation where there was pollution of controlled waters.

The National Planning Policy Framework³ requires the following:

- The site is made suitable for its intended use, taking account of all ground conditions arising from natural and former activities, pollution arising from previous uses and proposals for mitigation including land remediation.
- After remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990.
- Adequate site information, prepared by a competent person, is presented.

The methodology adopted for this report follows the guidance and procedures for Land Contamination Risk Management (LCRM) produced by the Agency⁴. The LCRM process provides a reasoned and structured mechanism to identify potential risk issues and, where necessary, provide a way forward to develop a robust risk management strategy to address potentially unacceptable risks in an appropriate manner. Contained within the LCRM Framework are the following stages:

1. Stage 1 risk assessment
2. Stage 2 options appraisal
3. Stage 3 remediation and verification

British Standards has issued guidance for the Investigation of Potentially Contaminated Sites⁵ and for undertaking Site Investigations⁶ which have duly been considered. An update to the potential human health exposure pathways is provided in the Environment Agency Soil Science Report SR3⁷. In 2008 the Environment Agency and the National House-Building Council (NHBC), Chartered Institute of Environmental Health (CIEH) released a joint publication for the Safe Development of Housing on Land

³ Department of Communities and Local Government. March 2012

⁴ Environment Agency. 2020. Land Contamination Risk Management (LCRM)

⁵ British Standards 2011. Investigation of Potentially Contaminated Sites-Codes of Practice. BS10175:2011

⁶ British Standards. 2015. Code of Practice for Site Investigations. BS5930

⁷ Environment Agency, August 2008, Updated technical background to the CLEA model, Science Report - SC050021/SR3

Affected by Contamination⁸. Guidance is provided in the CLR Report No 4 on sampling strategies for contaminated land⁹.

QUALITATIVE RISK ASSESSMENT

The potentially active human health are based on the Agency Soil Science Report SR3¹⁰. The potential contaminants of PCBs arising from the electricity substation located offsite have been discounted as PCBs are not considered to be sufficiently mobile or soluble¹¹.

To assess the potential for risk, the Source → Pathway → Receptor relationships have been evaluated to determine whether there are potentially active pollutant linkages between sources and receptors. Only when there is an active pollutant linkage, can there be a potential risk to a receptor from a source via a particular pathway. Each active pathway has been assigned a qualitative assessment as to the level of risk as shown in the below table and as per R&D 66⁸.

Qualitative Risk Classification Scheme

		CONSEQUENCE			
		Severe	Medium	Mild	Minor
PROBABILITY (Likelihood)	High likelihood	Very High Risk	High risk	Moderate risk	Low risk
	Likely	High risk	Moderate risk	Moderate/low risk	Low risk
	Low likelihood	Moderate risk	Moderate/low risk	Low risk	Very low risk
	Unlikely	Moderate/low risk	Low risk	Very low risk	Very low risk

ADOPTED GACS

The Generic Assessment Criteria (GACs) that have been adopted are based on the Land Quality Management (LQM) Suitable for Use Levels (S4UL)¹². These published values are available for residential with/without home grown produce, commercial, allotment and public open space land use scenarios. As there is no current UK GAC for lead or cyanide, the Category 4 Screening Level (C4SL) will be adopted for lead and the Dutch Intervention Value (DIV) for cyanide. In the absence of any UK published value, the detection limits have been adopted.

⁸ Environment Agency, 2008. Guidance for the Safe Development of Housing on Land Affected by Contamination. R&D 66

⁹ DOE, 1994. Sampling Strategies for Contaminated Land. CLR Report No 4

¹⁰ Environment Agency, August 2008, Updated technical background to the CLEA model, Science Report - SC050021/SR3

¹¹ Department of the Environment, 1996, Industry Profile: Engineering works. P.14 Sect 3.2.1

¹² LQM/CIEH 2014. The LQM/CIEH S4ULs for Human Health Risk Assessment.

For asbestos, there are no current GAC for asbestos fibres in soils. For surface soils within a residential/allotments setting, it is best practice to take a conservative approach and to adopt the detection limit (0.001%) as the threshold. A *very low quantity* threshold for asbestos of 0.01% had been proposed by CL:AIRE²⁷, which is considered to be appropriate for adoption within a commercial/public open space scenario.

GACs For Various Land Uses (mg/kg)

Contaminant of Concern	Residential with HGP	Residential without HGP	Allotments	Commercial	Public Open Space Res
Asbestos	DL	DL	DL	DL	DL
Asbestos Quantification %	0.001	0.001	0.001	0.01	0.01
Total Cyanide	50	50	50	50	50
Total Phenols	280	750	66	760	760
Naphthalene	2.3	2.3	4.1	190	4900
Acenaphthylene	170	2900	28	83000	15000
Acenaphthene	210	3000	34	84000	15000
Fluorene	170	2800	27	63000	9900
Phenanthrene	95	1300	15	22000	3100
Anthracene	2400	31000	380	520000	74000
Fluoranthene	280	1500	52	23000	3100
Pyrene	620	3700	110	54000	7400
Benzo(a)anthracene	7.2	11	2.9	170	29
Chrysene	15	30	4.1	350	57
Benzo(b)fluoranthene	2.6	3.9	0.99	44	7.1
Benzo(k)fluoranthene	77	110	37	1200	190
Benzo(a)pyrene	2.2	3.2	0.97	35	5.7
Indeno(1,2,3-cd)pyrene	27	45	9.5	500	82
Dibenz(a,h)anthracene	0.24	0.31	0.14	3.5	0.57
Benzo(ghi)perylene	320	360	290	3900	640
Arsenic	37	40	43	640	79
Beryllium	1.7	1.7	35	12	2.2
Boron	290	11000	45	240000	21000
Cadmium	11	85	1.9	190	120
Chromium	910	910	18000	8600	1500
Copper	2400	7100	520	68000	12000
Lead	210	330	84	6600	760
Mercury	40	56	19	1100	120
Nickel	180	180	230	980	230
Selenium	250	430	88	12000	1100
Vanadium	410	1200	91	9000	2000
Zinc	3700	40000	620	730000	81000
Benzene	0.087	0.38	0.017	27	72
Toluene	130	880	22	56000	56000
Ethylbenzene	47	83	16	5700	24000
Xylenes (sum)	56	79	28	5900	41000
MTBE	49	73	23	7900	7900
TPH - Aliphatic >C5 - C6	42	42	730	3200	570000
TPH - Aliphatic >C6 - C8	100	100	2300	7800	600000
TPH - Aliphatic >C8 - C10	27	27	320	2000	13000
TPH - Aliphatic >C10 - C12	130	130	2200	9700	13000
TPH - Aliphatic >C12 - C16	1100	1100	11000	59000	13000
TPH - Aliphatic >C16 - C21	65000	65000	260000	1600000	250000
TPH - Aliphatic >C21 - C35	65000	65000	260000	1600000	250000
TPH - Aliphatic >C35 - C44	65000	65000	260000	1600000	250000
TPH - Aromatic >C5 - C7	70	370	13	26000	56000
TPH - Aromatic >C7 - C8	130	860	22	56000	56000
TPH - Aromatic >C8 - C10	34	47	8.6	3500	5000
TPH - Aromatic >C10 - C12	74	250	13	16000	5000

GROUNDSED SOLUTIONS

TPH - Aromatic >C12 - C16	140	1800	23	36000	5100
TPH - Aromatic >C16 - C21	260	1900	46	28000	3800
TPH - Aromatic >C21 - C35	1100	1900	370	28000	3800
TPH - Aromatic >C35 - C44	1100	1900	370	28000	3800

CONTROLLED WATER EALS

In the UK there are two published Environmental Assessment Levels (EALs) available for comparison with groundwater, the Water Framework Directive¹³ and the Water Supply Regulations¹⁴, apart from TPH fractions, Ethylbenzene and Xylenes where the DWS and EQS values has been adopted, respectively. Detection Limit (DL) is used where a standard has not been derived. SoBRA have calculated the risks from vapour inhalation from volatile dissolved phase contaminants for residential and commercial human health receptors.

Adopted Controlled Water Targets (mg/l)

Contaminant Concern	of	EAL	Source	SoBRA Res	SoBRA Comm
Total Phenols		0.0077	UK WFD	-	-
Cyanide		0.05	UK WSR	-	-
Naphthalene		0.002	UK WFD	-	-
Acenaphthylene		0.0001	UK WSR	-	-
Acenaphthene		0.0001	UK WSR	-	-
Fluorene		0.0001	UK WSR	-	-
Phenanthrene		0.0001	UK WSR	-	-
Anthracene		0.0001	UK WSR	-	-
Fluoranthene		0.0001	UK WSR	-	-
Pyrene		0.0001	UK WSR	-	-
Benzo(a)anthracene		0.0001	UK WSR	-	-
Chrysene		0.0001	UK WSR	-	-
Benzo(b)fluoranthene		0.0001	UK WSR	-	-
Benzo(k)fluoranthene		0.0001	UK WSR	-	-
Benzo(a)pyrene		0.00001	UK WSR	-	-
Indeno(1,2,3-cd)pyrene		0.0001	UK WSR	-	-
Dibenz(a,h)anthracene		0.0001	UK WSR	-	-
Benzo(ghi)perylene		0.0001	UK WSR	-	-
Arsenic		0.01	UK WSR	-	-
Boron		1	UK WSR	-	-
Cadmium		0.005	UK WSR	-	-
Chromium		0.05	UK WSR	-	-
Copper		2	UK WSR	-	-
Lead		0.01	UK WSR	-	-
Mercury		0.001	UK WSR	-	-
Nickel		0.02	UK WSR	-	-
Selenium		0.01	UK WSR	-	-
Zinc		0.0123	UK WFD	-	-
Benzene		0.001	UK WSR	0.21	20
Toluene		0.074	UK WFD	230	21000
Ethylbenzene		0.02	UK EQS	10	960
Xylenes (sum)		0.03	UK EQS	31.4	3020
MTBE		DL	WDE	-	-
TPH - Aliphatic >C5 - C6		0.01	UK DWS	1.9	190
TPH - Aliphatic >C6 - C8		0.01	UK DWS	1.5	150

¹³ The Water Framework Directive (Standards and Classifications) Directions (England and Wales). 2015.

¹⁴ The Water Supply (Water Quality) Regulations. 2016.

GROUNDED SOLUTIONS

TPH - Aliphatic >C8 - C10	0.01	UK DWS	0.057	5.7
TPH - Aliphatic >C10 - C12	0.01	UK DWS	0.037	3.6
TPH - Aliphatic >C12 - C16	0.01	UK DWS	-	-
TPH - Aliphatic >C16 - C21	0.01	UK DWS	-	-
TPH - Aliphatic >C21 - C35	0.01	UK DWS	-	-
TPH - Aromatic >C5 - C7	0.01	UK DWS	210	20000
TPH - Aromatic >C7 - C8	0.01	UK DWS	220	21000
TPH - Aromatic >C8 - C10	0.01	UK DWS	1.9	190
TPH - Aromatic >C10 - C12	0.01	UK DWS	6.8	660
TPH - Aromatic >C12 - C16	0.01	UK DWS	39	3700
TPH - Aromatic >C16 - C21	0.01	UK DWS	-	-
TPH - Aromatic >C21 - C35	0.01	UK DWS	-	-

GROUND GAS

The following relevant guidance will be used to assess the risks posed by ground gas:

- CIRIA Assessing risks posed by hazardous ground gases to buildings¹⁵
- NHBC: Guidance on evaluation of development proposals on sites where methane and carbon dioxide are present¹⁶
- NHBC: Technical Extra¹⁷
- The Building Regulations Site Preparation and resistance to contaminants and moisture. ¹⁸
- British Standard. Guidance on Investigations for Ground Gas¹⁹
- NHBC guidance on Hazardous ground gas²⁰

The 2007 CIRIA guidance calculates a gas screening value to identify the protective measures required, as shown below.

Summary of CIRIA 2007 Guidance

Characterisation Situation	Risk Classification	Gas Screening Value (l/hr)	Typical Factors	Protective Measure
1	Very Low	<0.07	Methane <1% or carbon dioxide <5%; otherwise increase to Situation 2	No special precautions (See recommendation)
2	Low	<0.7	Air Flow rate <70l/hr; otherwise increase to Situation 3	Block and beam with 2,000g, Cast in situ with 1,200g. All joints and penetrations sealed
3	Moderate	<3.5	-	As above but with gas resistant membranes and passively ventilated or positive pressured sub-floor void

¹⁵ CIRIA 2007. Assessing Risks Posed by Hazardous Ground Gases to Buildings. C665

¹⁶ NHBC 2007. Guidance on Evaluation of Development Proposals on Sites where methane and carbon dioxide are present

¹⁷ NHBC 2016. Technical Extra. Ground Gas Update. April 2016. Issue 20

¹⁸ Building Regulations 2004. Approved Document C, Site Preparation and resistance to contaminants and moisture.

¹⁹ British Standards 2013. Guidance on Investigation for Ground Gas. BS8576. 2013

²⁰ NHBC 2023. Hazardous Ground Gas – an essential guide for housebuilders. NF94

4	Moderate to High	<15	QRA recommended	As above but with oversight capping, in-ground venting layer and in ground wells or barriers
5 – 6	High to Very High	<70		Not suitable unless gas regime is reduced first and QRA completed

Summary of NHBC Traffic Light System

Gas Regime	Methane		Carbon Dioxide	
	Typical max %	Gas Screening Value (U/hr)	Typical max %	Gas Screening Value (U/hr)
Green	<1	<0.16	<5	<0.78
Amber 1	1 – 5	0.16 – 0.63	5 – 10	0.78 – 1.56
Amber 2	5 – 20	0.63 – 1.56	10 – 30	1.56 – 3.13
Red	20+	1.56+	30+	3.13+

UK WATER SUPPLY PIPES

The following guidance has been followed for the selection of water supply pipes:

- UKWIR Guidance for the selection of Water Supply Pipes²¹
- Water UK Contaminated Land Assessment Guidance²²

These mainly apply to brownfield sites, although may apply to greenfield sites should the preliminary risk assessment identify there is a potential for contamination to be present.

WASTE MANAGEMENT

The EU Waste Framework Directive 2008 presents the legislative framework for the collection, transport, recovery, and disposal of waste. This framework provides a five-step hierarchical plan for managing waste comprising prevention, preparing for re-use, recycling, recovery, and disposal, which have been made into UK law via the UK Waste Regulations 2011. This requires all businesses/organisations that either produces or handles waste to either prevent waste or to apply the waste hierarchy for the transfer of waste. The Environment Protection (Duty of Care) Regulations 1991 require that transfer notes are used to identify the type of waste, volume, source and intended destination along with the details of the licensed carrier.

²¹ UK Water Industry Research 2011. Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites. 10/WM/03/21.

²² Water UK 2014. Contaminated Land Assessment Guidance.

The Agency have published guidance on the classification of Hazardous Waste²³, which defines how man-made materials are classified as being hazardous by exceeding at least one of the fifteen hazardous properties (H1 to H15). Man Made materials can either be absolute hazardous, absolute non-hazardous or mirror and if mirror then an assessment needs to be made as to whether the materials poses any of the hazardous properties before classifying the materials as being either hazardous or non-hazardous. The Agency has also published guidance on the Waste Acceptance at Landfills²⁴. Landfills are classified as to whether they can accept hazardous, non-hazardous, or inert materials. Waste Acceptance Criteria (WAC) thresholds have been set to determine the class of landfill that can accept the materials. Disposal of hazardous materials requires pre-treatment. WAC limits are not to be used for determining whether waste is hazardous.

The CL:AIRE CoP of the Definition of Waste²⁵ was developed to provide clarity on when the reuse of site won materials will cease to be waste. It requires the development of Material Management Plan (MMP) that is specific to the site and the intended reuse of materials. The MMP will need to be based on a site-specific Remedial Strategy/Design Statement that will demonstrate that the reuse of the site won materials will not pose an unacceptable risk to sensitive receptors. There will then need to be a requirement for verification that the proposed reuse has been carried out as was planned.

CLIMATE CHANGE

The UK has signed up to achieving a net zero target by 2050 under the COP 21 Paris Agreement in 2015, which requires all industry to reduce its emissions by 78% by 2035 compared to 1990 levels. Approximately 1.25% of the UK total greenhouse gases are attributable to the built environment, with CO2 emissions amounting to 40-50million tonnes, more than for aviation and shipping combined²⁶. The use of low carbon materials, retrofitting old ones and the need for considering whole-life carbon of new buildings needs to be balanced with the need for additional housing.

The National Planning Policy Framework (NPPF) and LCRM advocates the adoption of sustainable development practices. The Sustainable Management Practices for the Management of Land Contamination issued in 2021 by CL:AIRE/SuRF-UK promote sustainability principles for all aspects of land contamination management, a summary of which is provided below.

²³ Environment Agency. 2013. Interpretation of the Definition and Classification of Hazardous Waste. Technical Guidance WM2

²⁴ Environment Agency. 2010 Waste Acceptance at Landfills. Version 1.

²⁵ CL:AIRE 2001. The Definition of Waste: Development Industry Code of Practice. Version 2.

²⁶ UK Parliament. Building to new zero: costing carbon in construction. First Report of Session 2022-23

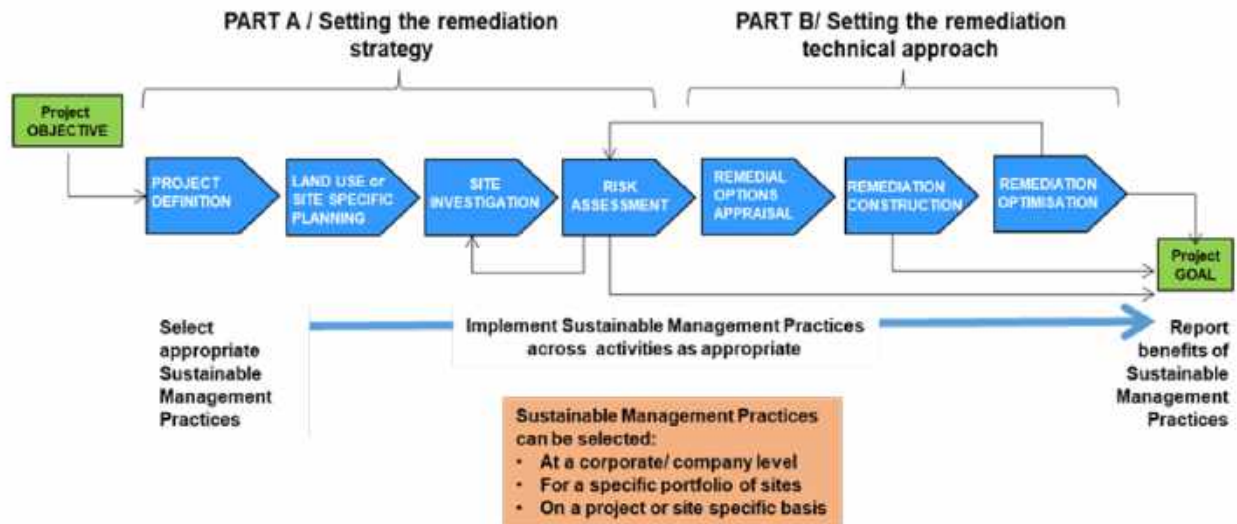


Figure 2.1: Application of sustainable management practices in context of life cycle of land contamination management and SuRF UK Framework

GROUND ENGINEERING

In accordance with BS-EN-1997-1 2004 Geotechnical Design: General Rules, engineering parameters for use in geotechnical design have been assessed using a three-step process:

1. Compilation of test data to determine a range of values for each relevant engineering parameter either by using direct results, geotechnical theory/correlations, or empiricism
2. Use of engineering judgement to determine a characteristic value for each parameter
3. Application of partial factors to give a design value for each parameter

Geotechnical site assessments were carried out in accordance where practical with the recommendations of BS EN 1997:2 2007 Eurocode 7 Geotechnical Design: Ground Investigation and Testing. This report has been written in line with the requirements of a Ground Investigation Report (GIR) as set out in BS EN 1997:2 and does not constitute a Geotechnical Design Report.

DESICCATION TESTING

There are a number of methods for determining desiccation in clay soils. These include:

Driscoll's Method

Following laboratory testing of cohesive soils, the most commonly accepted method for determining the degree of desiccation²⁷ is Richard Driscoll's method that significant desiccation has occurred when the moisture content is less than 0.4 x the liquid limit.

²⁷ BRE 1996. Desiccation in clay soils. Digest 412.

Weeks' Method

Another method for determining desiccation and first developed by Dr Alan Weeks, involves the use of a pocket penetrometer with measurements taken directly on borehole core samples²⁸. The depth and extent of desiccation is assessed by comparison of penetrometer readings against a control. An assessment of desiccation can be made by comparing the results of each borehole to the profile representing equilibrium conditions for London Clay, however the technique should equally be applicable to any stiff, over consolidated, shrinkable clay and has been used successfully for Gault, Weald and Wadhurst Clays.

Liquidity Index from BRE412²⁷

To overcome issues with control boreholes and local variations in soil, it may be possible to plot the results in terms of the soil's Liquidity Index and comparing profiles of the resulting values. A value of 0 means that the soil's water content is at the Plastic Limit, while negative values indicate that the soil is drier than the Plastic Limit. Apart from these difficulties, this method often works reasonably well, and the information obtained can be used to estimate the ground heave potential.

SOAKAGE TESTING AND DESIGN

The following guidance has been followed during the soakage testing:

- Falling Head Tests in boreholes – BS5930⁶
- BRE Digest 365 2003 Soakage testing

The CIRIA publication²⁹ provides guidance as to the required distance of buildings from soakages to ground in chalk as follows:

- 20m distance of soakaways from buildings where dissolution features are known to be prevalent
- 10m distance of soakaways from buildings where chalk is low density or unknown
- 5m distance of soakaways from buildings where chalk is of medium to high density

EFFECTS OF TREES AND SHRINKABLE MATERIALS ON FOUNDATION DEPTHS

The following guidance has been followed for determining the foundation depths:

- NHBC Standards 2010 Part 4 Foundations

²⁸ Proceedings of The Institute of Civil Engineers: Geotechnical Engineering. 1995, 113, 25-30

²⁹ CIRIA. 2002. Engineering in Chalk. C574.

This document includes guidance on likely foundation depth required when taking into account the volume change potential of materials in combination with the distance to different tree species (height and water demand status).

PRELIMINARY ROAD DESIGN PARAMETERS

The following guidance has been followed for the preliminary likelihood of frost susceptible soils affecting the site:

- Transport and Road Research Laboratory (1970) (TRRL)

Frost susceptibility tends to be a feature of silty and sandy clays, of low to medium plasticity. The table below gives an indication of frost susceptibility and permeability with grading and plasticity index for preliminary identification.

Likely Frost Susceptibility of Soil Materials (adapted from TRRL)

Permeability	Soil Texture	Frost Susceptible
High Permeability	Granular, <10% finer than 75 microns	No
Intermediate Permeability	Granular, >10% finer than 75 microns. Cohesive PI <20%	No
Low Permeability	Cohesive PI >20%	Yes

APPENDIX B: SITE PHOTOS

Photo 1 – View of Barns/Workshops from site entrance



Photo 2 – Steel un-bunded above ground storage tank



Photo 3 – Trees near eastern portion of site



Photo 4 – Window sampling rig operating at BH2



Photo 5 – Concrete Core from inside the barn (BH1)



APPENDIX C: ENVIRONMENTAL DATABASE

PORTERS END LANE, KIMPTON, HERTFORDSHIRE, SG4 8ER

Order Details

Date: 06/06/2024
Your ref: 24-231
Our Ref: GS-9BC-HGH-5XP-82F

Site Details

Location: 516231 217189
Area: 0.29 ha
Authority: [North Hertfordshire District Council](#) ↗



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Summary of findings

[p. 2 >](#) **Aerial image**

[p. 9 >](#)

OS MasterMap site plan

[p.14 >](#) [Insight User Guide](#) ↗

Summary of findings

Page	Section	Past land use >	On site	0-50m	50-250m	250-500m	500-2000m
15 >	1.1 >	Historical industrial land uses >	0	0	10	0	-
16 >	1.2 >	Historical tanks >	0	0	1	0	-
16 >	1.3 >	Historical energy features >	0	0	1	0	-
17	1.4	Historical petrol stations	0	0	0	0	-
17	1.5	Historical garages	0	0	0	0	-
17	1.6	Historical military land	0	0	0	0	-
Page	Section	Past land use - un-grouped >	On site	0-50m	50-250m	250-500m	500-2000m
18 >	2.1 >	Historical industrial land uses >	0	0	10	0	-
19 >	2.2 >	Historical tanks >	0	0	3	0	-
19 >	2.3 >	Historical energy features >	0	0	3	0	-
20	2.4	Historical petrol stations	0	0	0	0	-
20	2.5	Historical garages	0	0	0	0	-
Page	Section	Waste and landfill >	On site	0-50m	50-250m	250-500m	500-2000m
21	3.1	Active or recent landfill	0	0	0	0	-
21	3.2	Historical landfill (BGS records)	0	0	0	0	-
22	3.3	Historical landfill (LA/mapping records)	0	0	0	0	-
22	3.4	Historical landfill (EA/NRW records)	0	0	0	0	-
22	3.5	Historical waste sites	0	0	0	0	-
22	3.6	Licensed waste sites	0	0	0	0	-
22 >	3.7 >	Waste exemptions >	0	0	0	3	-
Page	Section	Current industrial land use >	On site	0-50m	50-250m	250-500m	500-2000m
24	4.1	Recent industrial land uses	0	0	0	-	-
24	4.2	Current or recent petrol stations	0	0	0	0	-
25	4.3	Electricity cables	0	0	0	0	-
25	4.4	Gas pipelines	0	0	0	0	-
25	4.5	Sites determined as Contaminated Land	0	0	0	0	-



25	4.6	Control of Major Accident Hazards (COMAH)	0	0	0	0	-
25	4.7	Regulated explosive sites	0	0	0	0	-
26	4.8	Hazardous substance storage/usage	0	0	0	0	-
26	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
26	4.10	Licensed industrial activities (Part A(1))	0	0	0	0	-
26	4.11	Licensed pollutant release (Part A(2)/B)	0	0	0	0	-
26	4.12	Radioactive Substance Authorisations	0	0	0	0	-
27 >	4.13 >	<u>Licensed Discharges to controlled waters ></u>	0	0	0	1	-
27	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
27	4.15	Pollutant release to public sewer	0	0	0	0	-
27	4.16	List 1 Dangerous Substances	0	0	0	0	-
28	4.17	List 2 Dangerous Substances	0	0	0	0	-
28	4.18	Pollution Incidents (EA/NRW)	0	0	0	0	-
28	4.19	Pollution inventory substances	0	0	0	0	-
28	4.20	Pollution inventory waste transfers	0	0	0	0	-
28	4.21	Pollution inventory radioactive waste	0	0	0	0	-
Page	Section	<u>Hydrogeology ></u>	On site	0-50m	50-250m	250-500m	500-2000m
29 >	5.1 >	<u>Superficial aquifer ></u>	Identified (within 500m)				
30 >	5.2 >	<u>Bedrock aquifer ></u>	Identified (within 500m)				
31 >	5.3 >	<u>Groundwater vulnerability ></u>	Identified (within 50m)				
32 >	5.4 >	<u>Groundwater vulnerability- soluble rock risk ></u>	Identified (within 0m)				
32	5.5	Groundwater vulnerability- local information	None (within 0m)				
33 >	5.6 >	<u>Groundwater abstractions ></u>	0	0	0	0	5
35 >	5.7 >	<u>Surface water abstractions ></u>	0	0	0	0	1
35	5.8	Potable abstractions	0	0	0	0	0
36 >	5.9 >	<u>Source Protection Zones ></u>	1	0	0	1	-
36	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-
Page	Section	<u>Hydrology ></u>	On site	0-50m	50-250m	250-500m	500-2000m
37	6.1	Water Network (OS MasterMap)	0	0	0	-	-



37	6.2	Surface water features	0	0	0	-	-
38 >	6.3 >	WFD Surface water body catchments >	1	-	-	-	-
38 >	6.4 >	WFD Surface water bodies >	0	0	0	-	-
39 >	6.5 >	WFD Groundwater bodies >	1	-	-	-	-
Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
40	7.1	Risk of flooding from rivers and the sea	None (within 50m)				
40	7.2	Historical Flood Events	0	0	0	-	-
40	7.3	Flood Defences	0	0	0	-	-
41	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
41	7.5	Flood Storage Areas	0	0	0	-	-
42	7.6	Flood Zone 2	None (within 50m)				
42	7.7	Flood Zone 3	None (within 50m)				
Page	Section	Surface water flooding >					
43 >	8.1 >	Surface water flooding >	1 in 1000 year, 0.3m - 1.0m (within 50m)				
Page	Section	Groundwater flooding >					
45 >	9.1 >	Groundwater flooding >	Low (within 50m)				
Page	Section	Environmental designations >	On site	0-50m	50-250m	250-500m	500-2000m
46	10.1	Sites of Special Scientific Interest (SSSI)	0	0	0	0	0
47	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
47	10.3	Special Areas of Conservation (SAC)	0	0	0	0	0
47	10.4	Special Protection Areas (SPA)	0	0	0	0	0
47	10.5	National Nature Reserves (NNR)	0	0	0	0	0
48 >	10.6 >	Local Nature Reserves (LNR) >	0	0	0	0	1
48 >	10.7 >	Designated Ancient Woodland >	0	0	0	0	9
49	10.8	Biosphere Reserves	0	0	0	0	0
49	10.9	Forest Parks	0	0	0	0	0
49	10.10	Marine Conservation Zones	0	0	0	0	0
49 >	10.11 >	Green Belt >	1	0	0	0	2
50	10.12	Proposed Ramsar sites	0	0	0	0	0



50	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
50	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
50	10.15	Nitrate Sensitive Areas	0	0	0	0	0
51 >	10.16 >	<u>Nitrate Vulnerable Zones ></u>	1	0	0	0	2
52	10.17	SSSI Impact Risk Zones	0	-	-	-	-
52	10.18	SSSI Units	0	0	0	0	0
Page	Section	Visual and cultural designations	On site	0-50m	50-250m	250-500m	500-2000m
53	11.1	World Heritage Sites	0	0	0	-	-
53	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
53	11.3	National Parks	0	0	0	-	-
53	11.4	Listed Buildings	0	0	0	-	-
54	11.5	Conservation Areas	0	0	0	-	-
54	11.6	Scheduled Ancient Monuments	0	0	0	-	-
54	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	<u>Agricultural designations ></u>	On site	0-50m	50-250m	250-500m	500-2000m
55 >	12.1 >	<u>Agricultural Land Classification ></u>	Grade 3 (within 250m)				
56	12.2	Open Access Land	0	0	0	-	-
56	12.3	Tree Felling Licences	0	0	0	-	-
56	12.4	Environmental Stewardship Schemes	0	0	0	-	-
56 >	12.5 >	<u>Countryside Stewardship Schemes ></u>	0	0	3	-	-
Page	Section	<u>Habitat designations ></u>	On site	0-50m	50-250m	250-500m	500-2000m
58 >	13.1 >	<u>Priority Habitat Inventory ></u>	0	0	4	-	-
59	13.2	Habitat Networks	0	0	0	-	-
59	13.3	Open Mosaic Habitat	0	0	0	-	-
59	13.4	Limestone Pavement Orders	0	0	0	-	-
Page	Section	<u>Geology 1:10,000 scale ></u>	On site	0-50m	50-250m	250-500m	500-2000m
60 >	14.1 >	<u>10k Availability ></u>	Identified (within 500m)				
61	14.2	Artificial and made ground (10k)	0	0	0	0	-
62	14.3	Superficial geology (10k)	0	0	0	0	-

62	14.4	Landslip (10k)	0	0	0	0	-
63	14.5	Bedrock geology (10k)	0	0	0	0	-
63	14.6	Bedrock faults and other linear features (10k)	0	0	0	0	-
Page	Section	Geology 1:50,000 scale >	On site	0-50m	50-250m	250-500m	500-2000m
64 >	15.1 >	50k Availability >	Identified (within 500m)				
65	15.2	Artificial and made ground (50k)	0	0	0	0	-
65	15.3	Artificial ground permeability (50k)	0	0	-	-	-
66 >	15.4 >	Superficial geology (50k) >	1	0	0	0	-
67 >	15.5 >	Superficial permeability (50k) >	Identified (within 50m)				
67	15.6	Landslip (50k)	0	0	0	0	-
67	15.7	Landslip permeability (50k)	None (within 50m)				
68 >	15.8 >	Bedrock geology (50k) >	1	0	0	0	-
69 >	15.9 >	Bedrock permeability (50k) >	Identified (within 50m)				
69	15.10	Bedrock faults and other linear features (50k)	0	0	0	0	-
Page	Section	Boreholes	On site	0-50m	50-250m	250-500m	500-2000m
70	16.1	BGS Boreholes	0	0	0	-	-
Page	Section	Natural ground subsidence >					
71 >	17.1 >	Shrink swell clays >	Low (within 50m)				
72 >	17.2 >	Running sands >	Negligible (within 50m)				
73 >	17.3 >	Compressible deposits >	Negligible (within 50m)				
74 >	17.4 >	Collapsible deposits >	Very low (within 50m)				
75 >	17.5 >	Landslides >	Very low (within 50m)				
77 >	17.6 >	Ground dissolution of soluble rocks >	Moderate (within 50m)				
Page	Section	Mining and ground workings >	On site	0-50m	50-250m	250-500m	500-2000m
79 >	18.1 >	BritPits >	0	0	1	0	-
80 >	18.2 >	Surface ground workings >	0	0	1	-	-
80	18.3	Underground workings	0	0	0	0	0
80	18.4	Underground mining extents	0	0	0	0	-
81	18.5	Historical Mineral Planning Areas	0	0	0	0	-



81 >	18.6 >	Non-coal mining >	1	0	0	0	0
81	18.7	JPB mining areas	None (within 0m)				
81	18.8	The Coal Authority non-coal mining	0	0	0	0	-
82	18.9	Researched mining	0	0	0	0	-
82	18.10	Mining record office plans	0	0	0	0	-
82	18.11	BGS mine plans	0	0	0	0	-
82	18.12	Coal mining	None (within 0m)				
83	18.13	Brine areas	None (within 0m)				
83	18.14	Gypsum areas	None (within 0m)				
83	18.15	Tin mining	None (within 0m)				
83	18.16	Clay mining	None (within 0m)				
Page	Section	Ground cavities and sinkholes	On site	0-50m	50-250m	250-500m	500-2000m
84	19.1	Natural cavities	0	0	0	0	-
84	19.2	Mining cavities	0	0	0	0	0
84	19.3	Reported recent incidents	0	0	0	0	-
84	19.4	Historical incidents	0	0	0	0	-
85	19.5	National karst database	0	0	0	0	-
Page	Section	Radon >					
86 >	20.1 >	Radon >	Less than 1% (within 0m)				
Page	Section	Soil chemistry >	On site	0-50m	50-250m	250-500m	500-2000m
88 >	21.1 >	BGS Estimated Background Soil Chemistry >	1	1	-	-	-
88	21.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
88	21.3	BGS Measured Urban Soil Chemistry	0	0	-	-	-
Page	Section	Railway infrastructure and projects	On site	0-50m	50-250m	250-500m	500-2000m
89	22.1	Underground railways (London)	0	0	0	-	-
89	22.2	Underground railways (Non-London)	0	0	0	-	-
89	22.3	Railway tunnels	0	0	0	-	-
89	22.4	Historical railway and tunnel features	0	0	0	-	-
89	22.5	Royal Mail tunnels	0	0	0	-	-



90	22.6	Historical railways	0	0	0	-	-
90	22.7	Railways	0	0	0	-	-
90	22.8	Crossrail 1	0	0	0	0	-
90	22.9	Crossrail 2	0	0	0	0	-
90	22.10	HS2	0	0	0	0	-

Recent aerial photograph



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Capture Date: 09/04/2020

Site Area: 0.29ha



Recent site history - 2016 aerial photograph



Capture Date: 23/07/2016

Site Area: 0.29ha



Recent site history - 2010 aerial photograph



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Capture Date: 27/04/2010

Site Area: 0.29ha



Recent site history - 2006 aerial photograph



Aerial photography supplied by Getmapping PLC. © Copyright Getmapping PLC 2024. All Rights Reserved.

Capture Date: 21/09/2006

Site Area: 0.29ha



Recent site history - 1999 aerial photograph

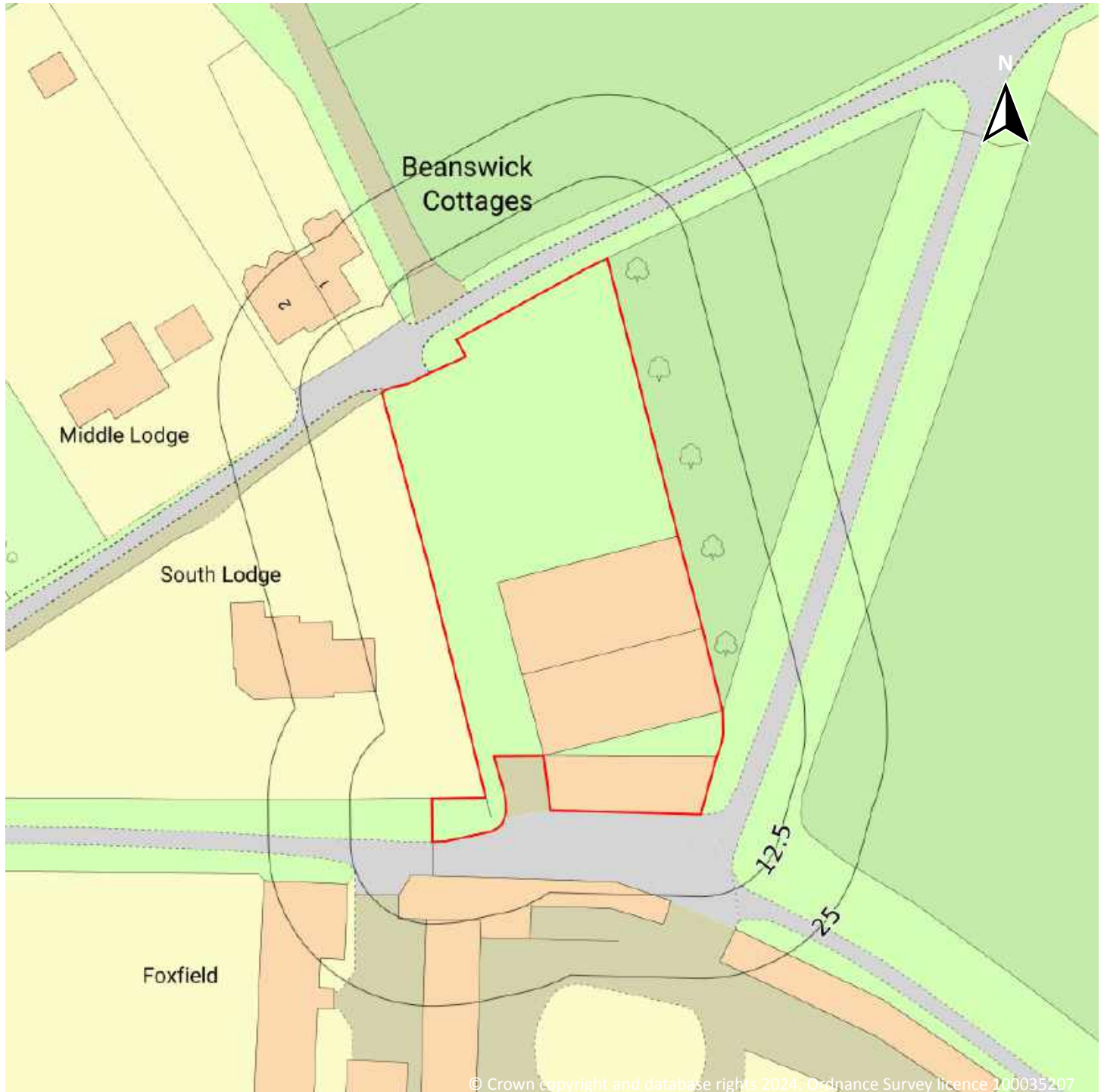


Capture Date: 27/05/1999

Site Area: 0.29ha



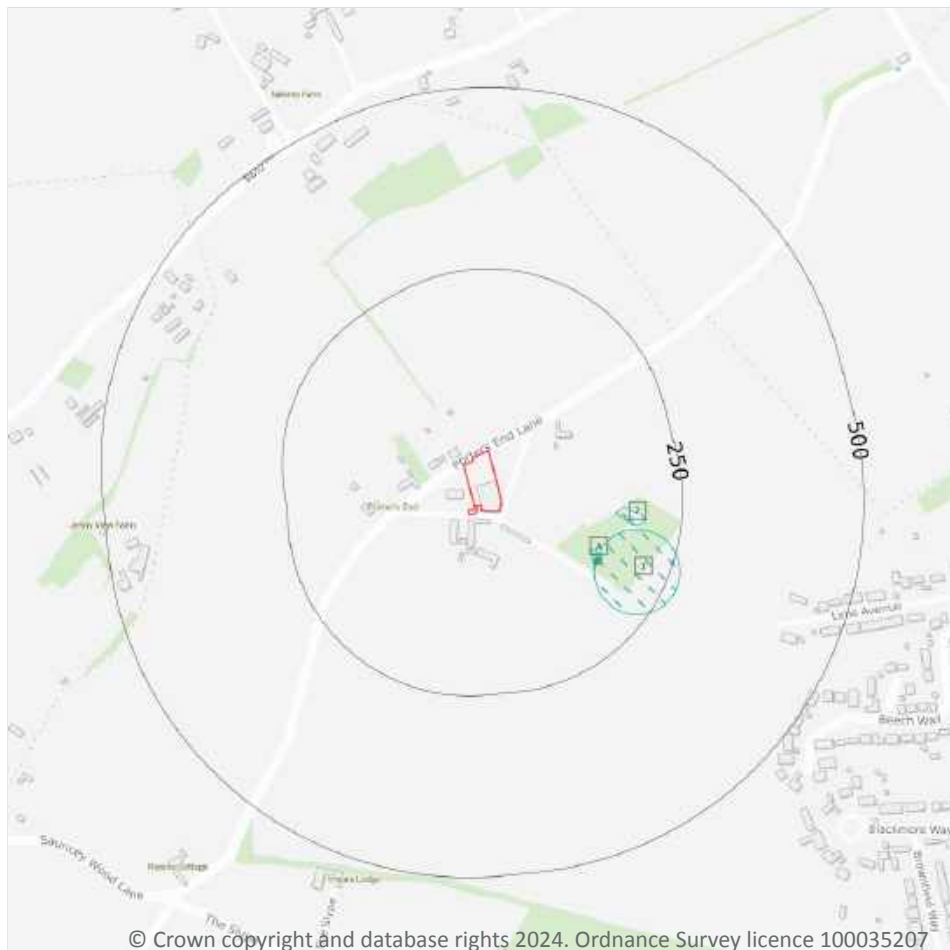
OS MasterMap site plan



Site Area: 0.29ha



1 Past land use



- Site Outline
- Search buffers in metres (m)
- Historical industrial land uses
- Historical tanks
- Historical energy features

1.1 Historical industrial land uses

Records within 500m

10

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

Features are displayed on the Past land use map on [page 15 >](#)

ID	Location	Land use	Dates present	Group ID
A	137m SE	Gasometer	1938	2046947



ID	Location	Land use	Dates present	Group ID
A	145m SE	Gasometer	1946	2093911
A	147m SE	Gasometer	1878	2090590
A	148m SE	Gasometer	1922	2121102
A	148m SE	Gasometer	1899	2119355
1	149m SE	Gasometer	1938	2120192
A	149m SE	Gasometer	1899	2063901
A	149m SE	Gasometer	1938	2078449
A	149m SE	Gasometer	1922	2121611
2	158m E	Unspecified Pit	1881	2040806

This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m

1

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

Features are displayed on the Past land use map on [page 15 >](#)

ID	Location	Land use	Dates present	Group ID
A	150m SE	Gasometer	1881 - 1924	350253

This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m

1

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

Features are displayed on the Past land use map on [page 15 >](#)



ID	Location	Land use	Dates present	Group ID
A	150m SE	Gasometer	1881 - 1924	233835

This data is sourced from Ordnance Survey / Groundsure.

1.4 Historical petrol stations

Records within 500m	0
----------------------------	----------

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

This data is sourced from Ordnance Survey / Groundsure.

1.5 Historical garages

Records within 500m	0
----------------------------	----------

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

This data is sourced from Ordnance Survey / Groundsure.

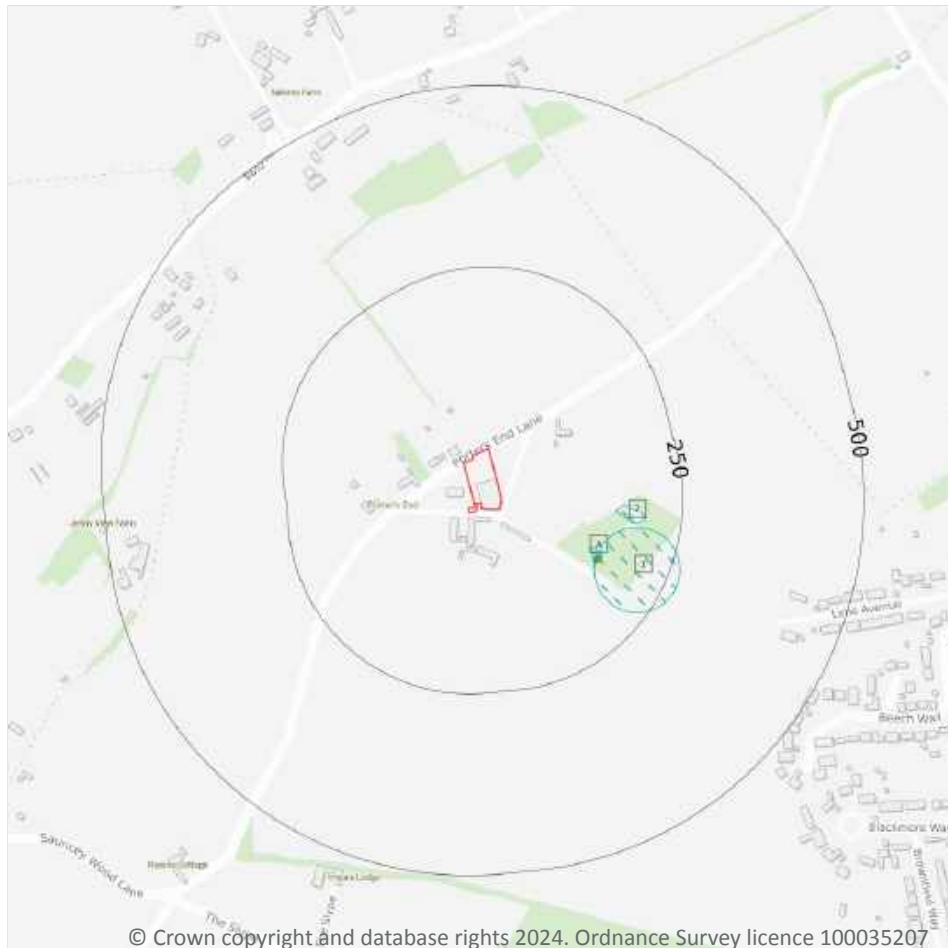
1.6 Historical military land

Records within 500m	0
----------------------------	----------

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

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

2 Past land use - un-grouped



- Site Outline
- Search buffers in metres (m)
- Historical industrial land uses
- Historical tanks
- Historical energy features

2.1 Historical industrial land uses

Records within 500m

10

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

Features are displayed on the Past land use - un-grouped map on [page 18](#) >

ID	Location	Land Use	Date	Group ID
A	137m SE	Gasometer	1938	2046947
A	145m SE	Gasometer	1946	2093911
A	147m SE	Gasometer	1878	2090590



ID	Location	Land Use	Date	Group ID
A	148m SE	Gasometer	1922	2121102
A	148m SE	Gasometer	1899	2119355
1	149m SE	Gasometer	1938	2120192
A	149m SE	Gasometer	1938	2078449
A	149m SE	Gasometer	1922	2121611
A	149m SE	Gasometer	1899	2063901
2	158m E	Unspecified Pit	1881	2040806

This data is sourced from Ordnance Survey / Groundsure.

2.2 Historical tanks

Records within 500m

3

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

Features are displayed on the Past land use - un-grouped map on [page 18 >](#)

ID	Location	Land Use	Date	Group ID
A	150m SE	Gasometer	1881	350253
A	150m SE	Gasometer	1898	350253
A	150m SE	Gasometer	1924	350253

This data is sourced from Ordnance Survey / Groundsure.

2.3 Historical energy features

Records within 500m

3

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

Features are displayed on the Past land use - un-grouped map on [page 18 >](#)

ID	Location	Land Use	Date	Group ID
A	150m SE	Gasometer	1881	233835



ID	Location	Land Use	Date	Group ID
A	150m SE	Gasometer	1898	233835
A	150m SE	Gasometer	1924	233835

This data is sourced from Ordnance Survey / Groundsure.

2.4 Historical petrol stations

Records within 500m

0

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

This data is sourced from Ordnance Survey / Groundsure.

2.5 Historical garages

Records within 500m

0

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

This data is sourced from Ordnance Survey / Groundsure.



3 Waste and landfill



- Site Outline
- Search buffers in metres (m)
- Waste exemptions

3.1 Active or recent landfill

Records within 500m

0

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

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

3.2 Historical landfill (BGS records)

Records within 500m

0

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

This data is sourced from the British Geological Survey.



3.3 Historical landfill (LA/mapping records)

Records within 500m**0**

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

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

3.4 Historical landfill (EA/NRW records)

Records within 500m**0**

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

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

3.5 Historical waste sites

Records within 500m**0**

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

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

3.6 Licensed waste sites

Records within 500m**0**

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

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

3.7 Waste exemptions

Records within 500m**3**

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

Features are displayed on the Waste and landfill map on [page 21](#) >

ID	Location	Site	Reference	Category	Sub-Category	Description
1	344m NE	Rambridge Farm Kimpton	EPR/PE5454ZJ /A001	Storing waste exemption	Non-agricultural waste only	Storage of sludge



ID	Location	Site	Reference	Category	Sub-Category	Description
2	410m NE	Rambridge Farm Kimpton	EPR/PE5254ZA/A001	Storing waste exemption	Non-agricultural waste only	Storage of sludge
3	421m SW	Rambridge Farm Kimpton	EPR/PE5854ZX/A001	Storing waste exemption	Non-agricultural waste only	Storage of sludge

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



4 Current industrial land use



- Site Outline
- Search buffers in metres (m)
- Licensed Discharges to controlled waters

4.1 Recent industrial land uses

Records within 250m

0

Current potentially contaminative industrial sites.

This data is sourced from Ordnance Survey.

4.2 Current or recent petrol stations

Records within 500m

0

Open, closed, under development and obsolete petrol stations.

This data is sourced from Experian.



4.3 Electricity cables

Records within 500m**0**

High voltage underground electricity transmission cables.

This data is sourced from National Grid.

4.4 Gas pipelines

Records within 500m**0**

High pressure underground gas transmission pipelines.

This data is sourced from National Grid.

4.5 Sites determined as Contaminated Land

Records within 500m**0**

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

This data is sourced from Local Authority records.

4.6 Control of Major Accident Hazards (COMAH)

Records within 500m**0**

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

This data is sourced from the Health and Safety Executive.

4.7 Regulated explosive sites

Records within 500m**0**

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

This data is sourced from the Health and Safety Executive.



4.8 Hazardous substance storage/usage

Records within 500m**0**

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

This data is sourced from Local Authority records.

4.9 Historical licensed industrial activities (IPC)

Records within 500m**0**

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

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

4.10 Licensed industrial activities (Part A(1))

Records within 500m**0**

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

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

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

Records within 500m**0**

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

This data is sourced from Local Authority records.

4.12 Radioactive Substance Authorisations

Records within 500m**0**

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

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



4.13 Licensed Discharges to controlled waters

Records within 500m

1

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

Features are displayed on the Current industrial land use map on [page 24 >](#)

ID	Location	Address	Details	
1	477m NW	BLUE CROSS CENTRE STP, KIMPTON BOTTOM, KIMPTON, HITCHIN, HERTFORDSHIRE, SG4 8EU	Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: EPRMB3093VB Permit Version: 1 Receiving Water: GROUNDWATER	Status: NEW ISSUED UNDER EPR 2010 Issue date: 31/07/2019 Effective Date: 31/07/2019 Revocation Date: -

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

4.14 Pollutant release to surface waters (Red List)

Records within 500m

0

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

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

4.15 Pollutant release to public sewer

Records within 500m

0

Discharges of Special Category Effluents to the public sewer.

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

4.16 List 1 Dangerous Substances

Records within 500m

0

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

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



4.17 List 2 Dangerous Substances

Records within 500m**0**

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

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

4.18 Pollution Incidents (EA/NRW)

Records within 500m**0**

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

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

4.19 Pollution inventory substances

Records within 500m**0**

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

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

4.20 Pollution inventory waste transfers

Records within 500m**0**

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

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

4.21 Pollution inventory radioactive waste

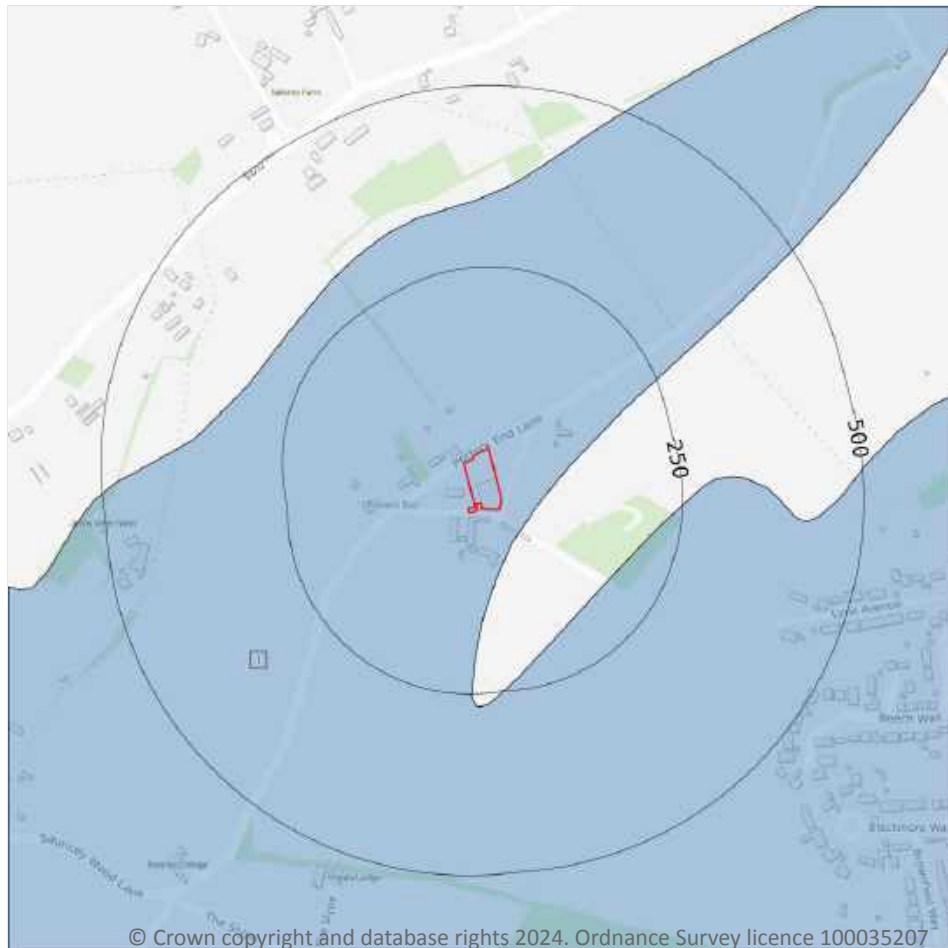
Records within 500m**0**

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

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



5 Hydrogeology - Superficial aquifer



- Site Outline
- Search buffers in metres (m)
- Principal
 - Secondary A
 - Secondary B
 - Secondary Undifferentiated
 - Unproductive
 - Unknown

5.1 Superficial aquifer

Records within 500m

1

Aquifer status of groundwater held within superficial geology.

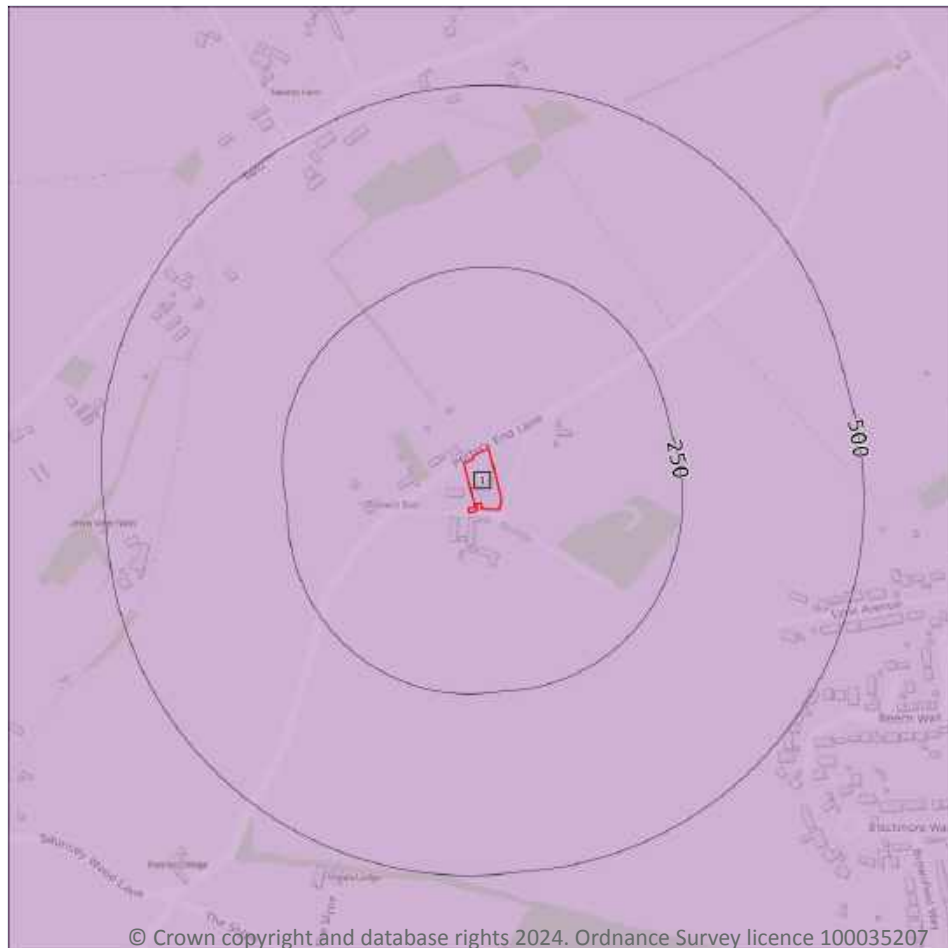
Features are displayed on the Hydrogeology map on [page 29 >](#)

ID	Location	Designation	Description
1	On site	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow

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



Bedrock aquifer



- Site Outline
- Search buffers in metres (m)
- Principal
 - Secondary A
 - Secondary B
 - Secondary Undifferentiated
 - Unproductive

5.2 Bedrock aquifer

Records within 500m

1

Aquifer status of groundwater held within bedrock geology.

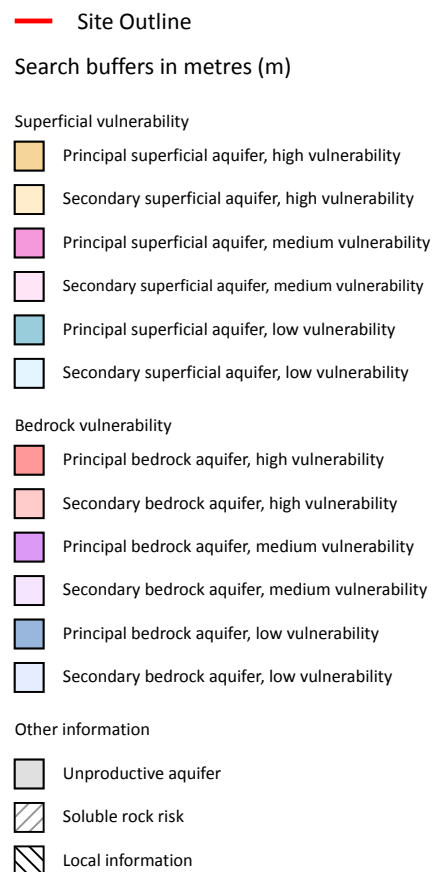
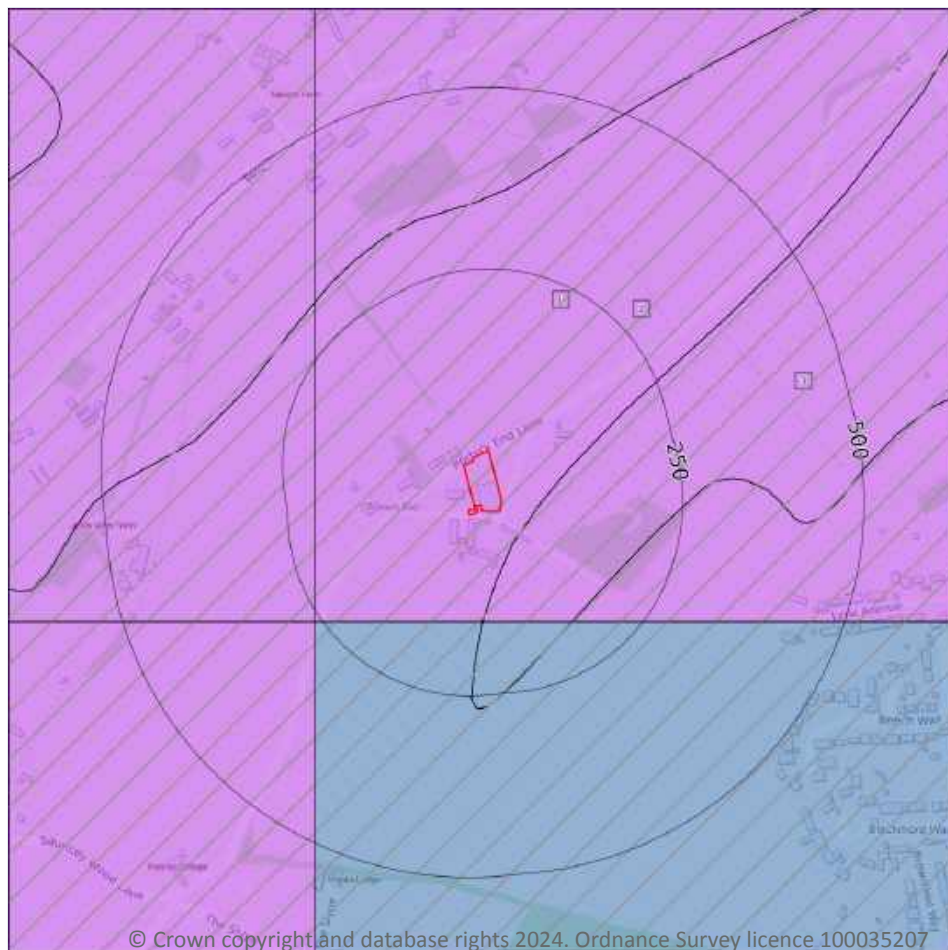
Features are displayed on the Bedrock aquifer map on [page 30](#) >

ID	Location	Designation	Description
1	On site	Principal	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers

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



Groundwater vulnerability



5.3 Groundwater vulnerability

Records within 50m

2

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

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

Features are displayed on the Groundwater vulnerability map on [page 31](#) >



ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	On site	Summary Classification: Principal bedrock aquifer - Medium Vulnerability Combined classification: Productive Bedrock Aquifer, Unproductive Superficial Aquifer	Leaching class: Intermediate Infiltration value: 40- 70% Dilution value: <300mm/year	Vulnerability: Unproductive Aquifer type: Unproductive Thickness: 3-10m Patchiness value: <90% Recharge potential: Low	Vulnerability: Medium Aquifer type: Principal Flow mechanism: Well connected fractures
3	40m SE	Summary Classification: Principal bedrock aquifer - Medium Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: Intermediate Infiltration value: 40- 70% Dilution value: <300mm/year	Vulnerability: - Aquifer type: - Thickness: 3-10m Patchiness value: <90% Recharge potential: Low	Vulnerability: Medium Aquifer type: Principal Flow mechanism: Well connected fractures

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

5.4 Groundwater vulnerability- soluble rock risk

Records on site	1
------------------------	----------

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

ID	Maximum soluble risk category	Percentage of grid square covered by maximum risk
2	Very significant soluble rocks are likely to be present with a moderate possibility of localised natural subsidence or dissolution-related degradation of bedrock, especially in adverse conditions such as concentrated surface or subsurface water flow.	37.0%

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

5.5 Groundwater vulnerability- local information

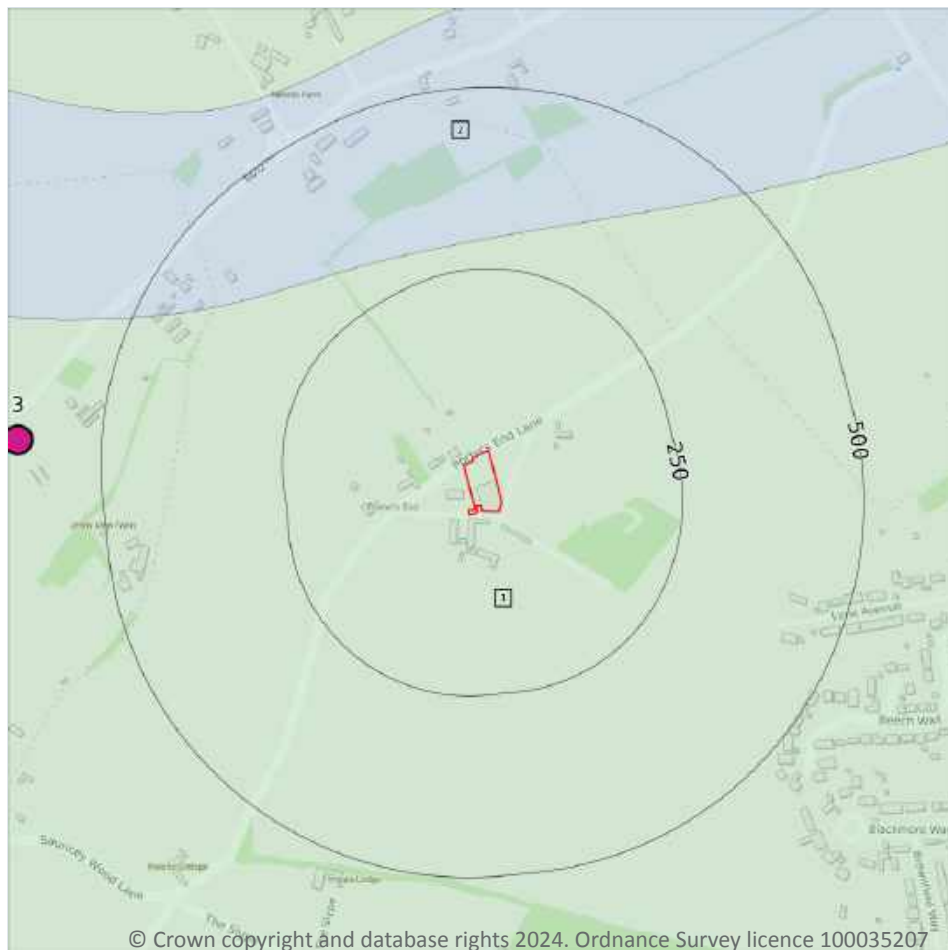
Records on site	0
------------------------	----------

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

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



Abstractions and Source Protection Zones



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

5.6 Groundwater abstractions

Records within 2000m

5

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

Features are displayed on the Abstractions and Source Protection Zones map on [page 33](#) >



ID	Location	Details	
3	615m W	Status: Active Licence No: 29/38/02/0022 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: THAMES GROUNDWATER Point: THE POOL HOUSE, KIMPTON BOTTOM - BOREHOLE Data Type: Point Name: Baldwin Easting: 515590 Northing: 217250	Annual Volume (m ³): 591 Max Daily Volume (m ³): 55 Original Application No: NPS/WR/016215 Original Start Date: 20/03/1966 Expiry Date: - Issue No: 102 Version Start Date: 15/07/2014 Version End Date: -
-	704m W	Status: Historical Licence No: 29/38/02/0022 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: THAMES GROUNDWATER Point: POOL HOUSE, KIMPTON BOTTOM - BOREHOLE Data Type: Point Name: DR M FOLEY & MRS M HUCK Easting: 515500 Northing: 217200	Annual Volume (m ³): 590.98 Max Daily Volume (m ³): 54.552 Original Application No: - Original Start Date: 20/03/1966 Expiry Date: - Issue No: 100 Version Start Date: 21/02/1985 Version End Date: -
-	1261m W	Status: Historical Licence No: 29/38/02/0021 Details: General Farming & Domestic Direct Source: THAMES GROUNDWATER Point: BOWER HEATH FARM, HARPENDEN - BOREHOLE Data Type: Point Name: DULIEU Easting: 515000 Northing: 216800	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 20/03/1966 Expiry Date: - Issue No: 100 Version Start Date: 30/04/1976 Version End Date: -
-	1542m SE	Status: Active Licence No: 29/38/01/0027 Details: Horticultural Watering Direct Source: THAMES GROUNDWATER Point: COMBINED WELL AND BOREHOLE AT GUSTARD WOOD NURSERY Data Type: Point Name: Lombardo Easting: 517600 Northing: 216400	Annual Volume (m ³): 4546 Max Daily Volume (m ³): 45.46 Original Application No: NPS/WR/038276 Original Start Date: 02/03/1966 Expiry Date: - Issue No: 102 Version Start Date: 30/01/2023 Version End Date: -



ID	Location	Details	
-	1693m NW	Status: Historical Licence No: 29/38/02/0077 Details: General Farming & Domestic Direct Source: THAMES GROUNDWATER Point: GREENVELDT KENNELS, KIMPTON - BOREHOLE Data Type: Point Name: GREEN Easting: 515100 Northing: 218500	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 08/11/1994 Expiry Date: - Issue No: 100 Version Start Date: 08/11/1994 Version End Date: -

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

5.7 Surface water abstractions

Records within 2000m	1
-----------------------------	----------

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

Features are displayed on the Abstractions and Source Protection Zones map on [page 33 >](#)

ID	Location	Details	
-	1573m NW	Status: Active Licence No: AN/031/0014/032 Details: Spray Irrigation - Direct Direct Source: SURFACE WATER SOURCE OF SUPPLY Point: RIVER GLEN AT BOURNE Data Type: Line Name: J E G FARMS LTD Easting: 513977 Northing: 217512	Annual Volume (m ³): 16000 Max Daily Volume (m ³): 2637 Original Application No: NPS/WR/025311 Original Start Date: 17/07/2017 Expiry Date: 31/03/2026 Issue No: 1 Version Start Date: 01/04/2018 Version End Date: -

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

5.8 Potable abstractions

Records within 2000m	0
-----------------------------	----------

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

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



5.9 Source Protection Zones

Records within 500m**2**

Source Protection Zones define the sensitivity of an area around a potable abstraction site to contamination. Features are displayed on the Abstractions and Source Protection Zones map on [page 33 >](#)

ID	Location	Type	Description
1	On site	3	Total catchment
2	287m N	2	Outer catchment

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

5.10 Source Protection Zones (confined aquifer)

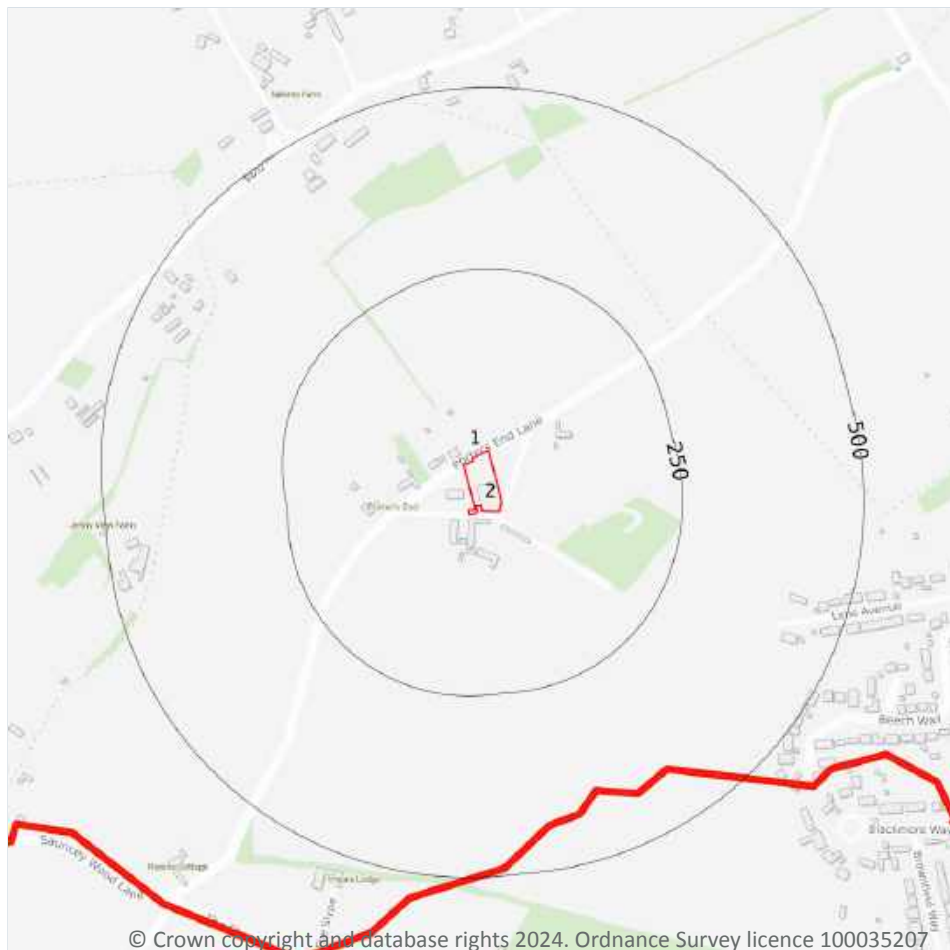
Records within 500m**0**

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

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



6 Hydrology



- Site Outline
- Search buffers in metres (m)
- Water Network (OS MasterMap)
- Surface water features (wider than 5m)
- Surface water features (narrower than 5m)
- ⋯ WFD River, canal and surface water transfer water bodies
- WFD Lake water bodies
- WFD Transitional and coastal water bodies
- WFD Surface water body catchments boundaries
- WFD Groundwater body boundaries

6.1 Water Network (OS MasterMap)

Records within 250m

0

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

This data is sourced from the Ordnance Survey.

6.2 Surface water features

Records within 250m

0

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



This data is sourced from the Ordnance Survey.

6.3 WFD Surface water body catchments

Records on site	1
------------------------	----------

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

Features are displayed on the Hydrology map on [page 37](#) >

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
1	On site	River	Mimram (Codicote Bottom to Lee)	GB106038033270	Lee Upper	Lee Upper

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

6.4 WFD Surface water bodies

Records identified	1
---------------------------	----------

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

Features are displayed on the Hydrology map on [page 37](#) >

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
-	3724m E	River	Mimram (Codicote Bottom to Lee)	GB106038033270 ↗	Moderate	Fail	Moderate	2019

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



6.5 WFD Groundwater bodies

Records on site

1

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

Features are displayed on the Hydrology map on [page 37](#) >

ID	Location	Name	Water body ID	Overall rating	Chemical rating	Quantitative	Year
2	On site	Upper Lee Chalk	GB40601G602900 ↗	Poor	Poor	Poor	2019

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



7 River and coastal flooding

7.1 Risk of flooding from rivers and the sea

Records within 50m**0**

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

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

7.2 Historical Flood Events

Records within 250m**0**

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

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

7.3 Flood Defences

Records within 250m**0**

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

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



7.4 Areas Benefiting from Flood Defences

Records within 250m

0

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

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

7.5 Flood Storage Areas

Records within 250m

0

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

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



River and coastal flooding - Flood Zones

7.6 Flood Zone 2

Records within 50m

0

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

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

7.7 Flood Zone 3

Records within 50m

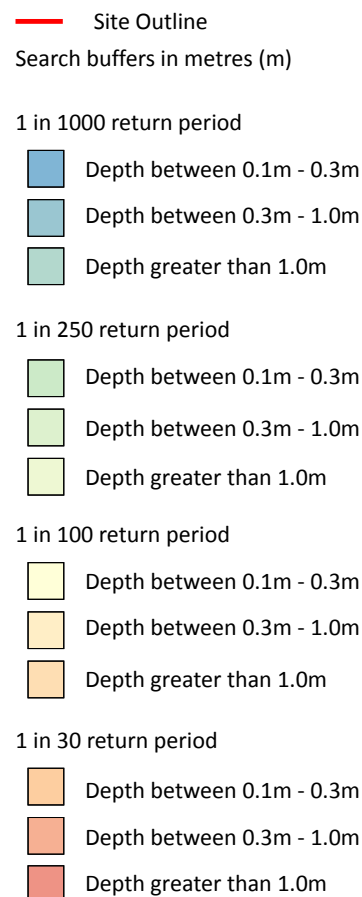
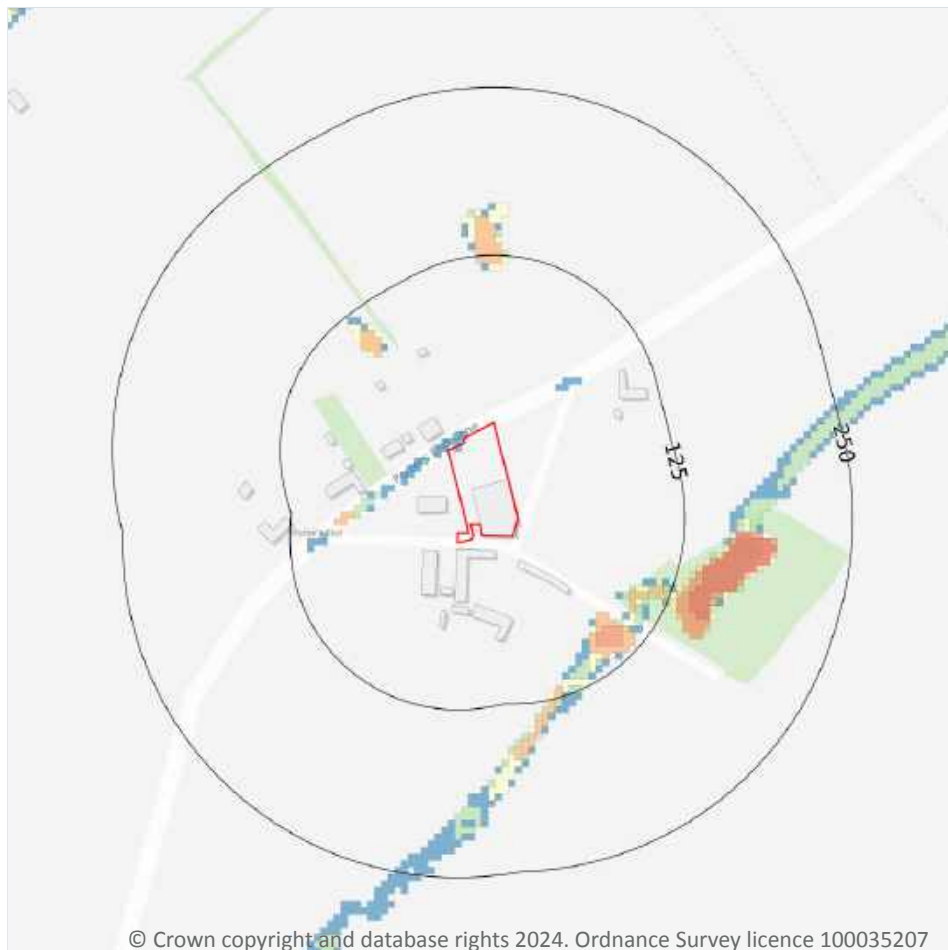
0

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

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



8 Surface water flooding



8.1 Surface water flooding

Highest risk on site

1 in 1000 year, 0.3m - 1.0m

Highest risk within 50m

1 in 1000 year, 0.3m - 1.0m

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

Features are displayed on the Surface water flooding map on [page 43 >](#)

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

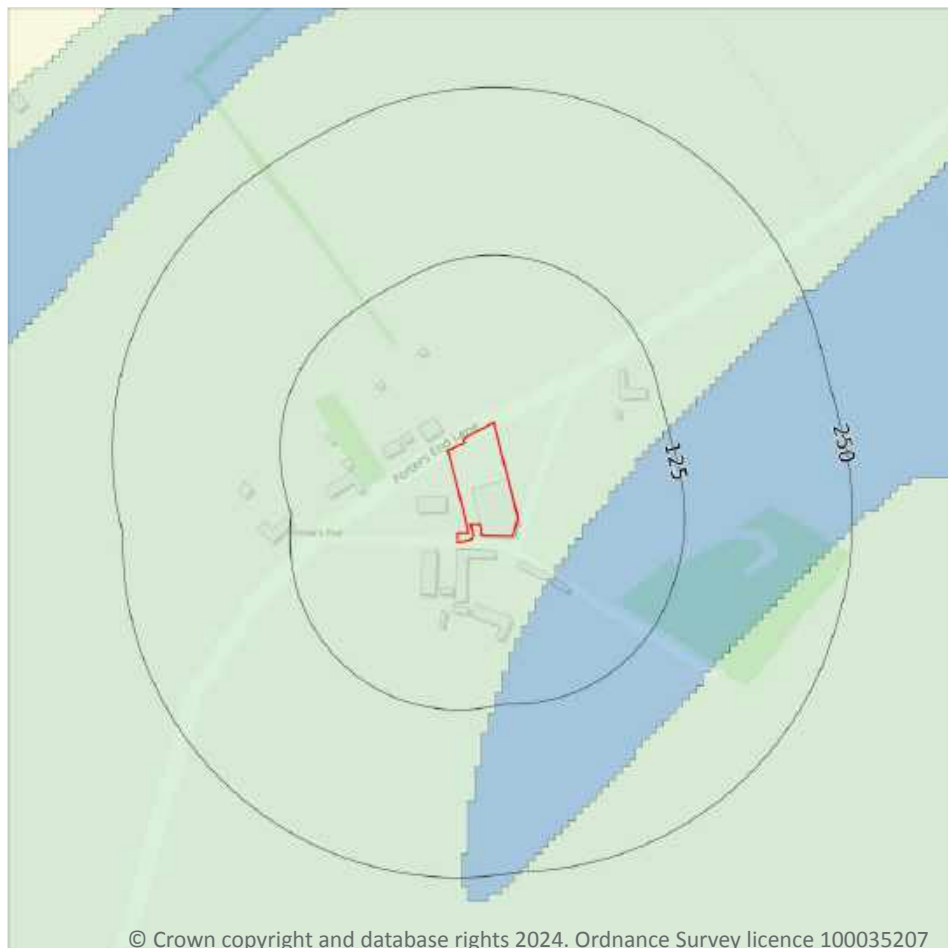
The table below shows the maximum flood depths for a range of return periods for the site.

Return period	Maximum modelled depth
1 in 1000 year	Between 0.3m and 1.0m
1 in 250 year	Negligible
1 in 100 year	Negligible
1 in 30 year	Negligible

This data is sourced from Ambiantal Risk Analytics.



9 Groundwater flooding



- Site Outline
- Search buffers in metres (m)
- High
 - Moderate - High
 - Moderate
 - Low
 - Negligible

9.1 Groundwater flooding

Highest risk on site

Low

Highest risk within 50m

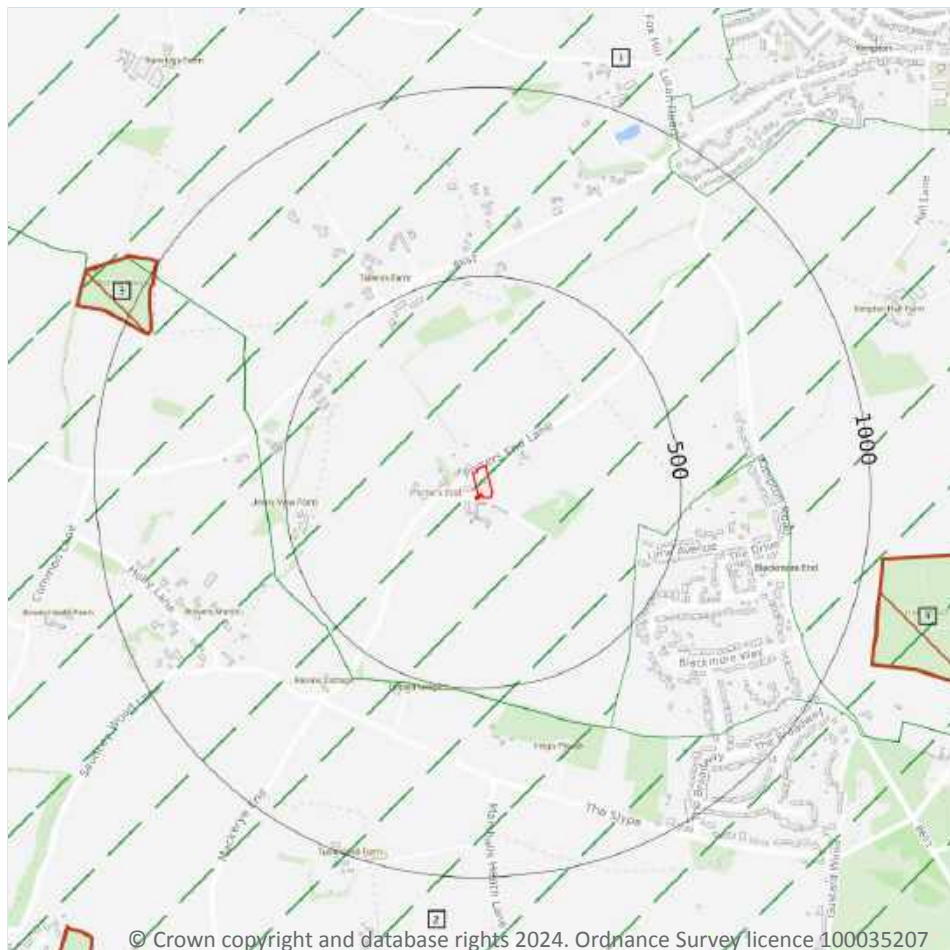
Low

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

Features are displayed on the Groundwater flooding map on [page 45 >](#)

This data is sourced from Ambiantal Risk Analytics.

10 Environmental designations



- Site Outline
- Search buffers in metres (m)
- + Local Nature Reserves (LNR)
- / Designated Ancient Woodland
- / Green Belt

10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m

0

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

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

10.2 Conserved wetland sites (Ramsar sites)

Records within 2000m**0**

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

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

10.3 Special Areas of Conservation (SAC)

Records within 2000m**0**

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

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

10.4 Special Protection Areas (SPA)

Records within 2000m**0**

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

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

10.5 National Nature Reserves (NNR)

Records within 2000m**0**

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

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

10.6 Local Nature Reserves (LNR)

Records within 2000m

1

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

Features are displayed on the Environmental designations map on [page 46 >](#)

ID	Location	Name	Data source
-	1643m S	Marshalls Heath	Natural England

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

10.7 Designated Ancient Woodland

Records within 2000m

9

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

Features are displayed on the Environmental designations map on [page 46 >](#)

ID	Location	Name	Woodland Type
3	931m NW	Bishey Wood	Ancient & Semi-Natural Woodland
4	1047m E	Hall Wood	Ancient Replanted Woodland
-	1519m S	Marshalls Heath Wood	Ancient & Semi-Natural Woodland
6	1540m SW	Sauncy Wood	Ancient & Semi-Natural Woodland
-	1627m E	Lamer Wood	Ancient & Semi-Natural Woodland
-	1647m S	Marshalls Heath Wood	Ancient Replanted Woodland
-	1740m SE	Lamer Wood	Ancient Replanted Woodland
-	1752m NW	Unknown	Ancient & Semi-Natural Woodland
-	1784m NE	Park/dovehouse Woods.	Ancient Replanted Woodland

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



10.8 Biosphere Reserves

Records within 2000m**0**

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

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

10.9 Forest Parks

Records within 2000m**0**

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

This data is sourced from the Forestry Commission.

10.10 Marine Conservation Zones

Records within 2000m**0**

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

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

10.11 Green Belt

Records within 2000m**3**

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

Features are displayed on the Environmental designations map on [page 46 >](#)

ID	Location	Name	Local Authority name
1	On site	London	North Hertfordshire
2	504m S	London	St Albans
-	1941m NW	London	Central Bedfordshire

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



10.12 Proposed Ramsar sites

Records within 2000m**0**

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

This data is sourced from Natural England.

10.13 Possible Special Areas of Conservation (pSAC)

Records within 2000m**0**

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

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

10.14 Potential Special Protection Areas (pSPA)

Records within 2000m**0**

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

This data is sourced from Natural England.

10.15 Nitrate Sensitive Areas

Records within 2000m**0**

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

This data is sourced from Natural England.



10.16 Nitrate Vulnerable Zones

Records within 2000m**3**

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

Location	Name	Type	NVZ ID	Status
On site	LEE NVZ	Surface Water	443	Existing
1165m S	LEE NVZ	Surface Water	443	Existing
1989m N	Luton Chalk	Groundwater	146	Existing

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



SSSI Impact Zones and Units

10.17 SSSI Impact Risk Zones

Records on site	0
-----------------	---

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

This data is sourced from Natural England.

10.18 SSSI Units

Records within 2000m	0
----------------------	---

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

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



11 Visual and cultural designations

11.1 World Heritage Sites

Records within 250m

0

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

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

11.2 Area of Outstanding Natural Beauty

Records within 250m

0

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

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

11.3 National Parks

Records within 250m

0

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

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

11.4 Listed Buildings

Records within 250m

0

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



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

11.5 Conservation Areas

Records within 250m

0

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

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

11.6 Scheduled Ancient Monuments

Records within 250m

0

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

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

11.7 Registered Parks and Gardens

Records within 250m

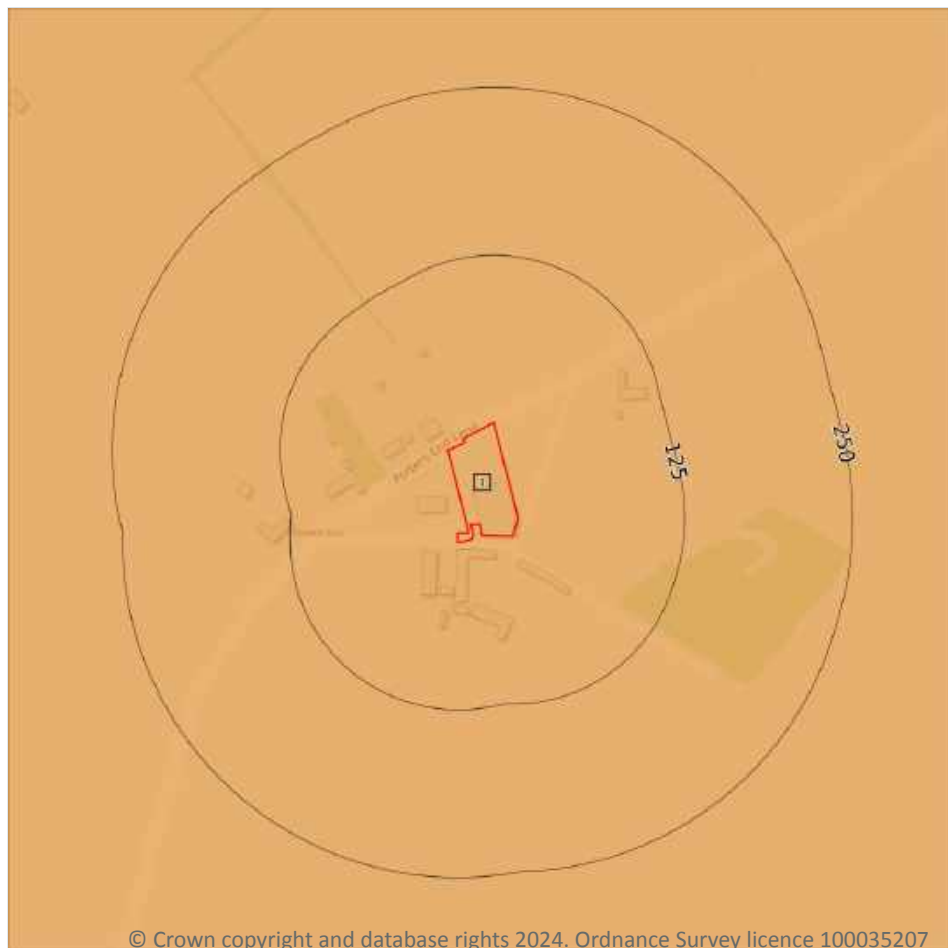
0

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

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



12 Agricultural designations



- Site Outline
- Search buffers in metres (m)
- Grade 1 - excellent quality
- Grade 2 - very good quality
- Grade 3 - good to moderate quality
- Grade 3a - good quality
- Grade 3b - moderate quality
- Grade 4 - poor quality
- Grade 5 - very poor quality
- Non-agricultural land
- Urban land
- Exclusion land
- Tree felling licences
- Open Access land

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12.1 Agricultural Land Classification

Records within 250m

1

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

Features are displayed on the Agricultural designations map on [page 55](#) >

ID	Location	Classification	Description
1	On site	Grade 3	Good to moderate quality agricultural land. Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where more demanding crops are grown yields are generally lower or more variable than on land in Grades 1 and 2.

This data is sourced from Natural England.



12.2 Open Access Land

Records within 250m

0

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

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

12.3 Tree Felling Licences

Records within 250m

0

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

This data is sourced from the Forestry Commission.

12.4 Environmental Stewardship Schemes

Records within 250m

0

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

This data is sourced from Natural England.

12.5 Countryside Stewardship Schemes

Records within 250m

3

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

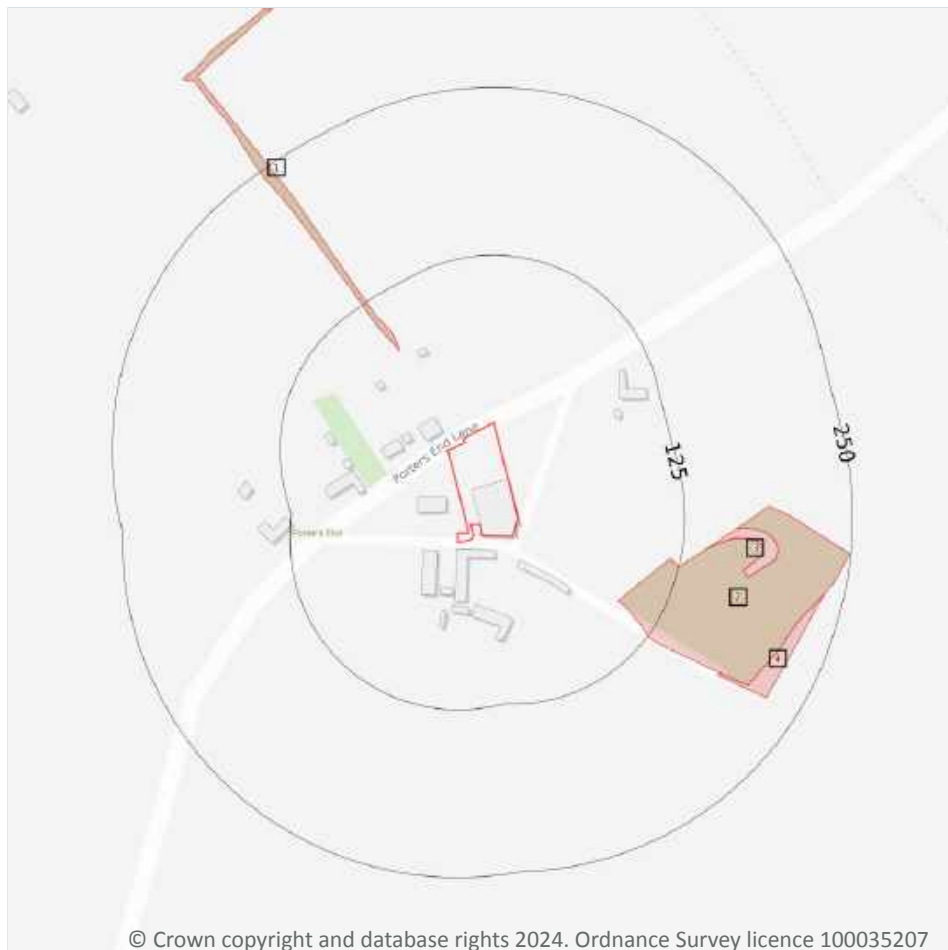
Location	Reference	Scheme	Start Date	End Date
76m NW	1270229	Countryside Stewardship (Middle Tier)	01/01/2022	31/12/2026
178m NE	1270229	Countryside Stewardship (Middle Tier)	01/01/2022	31/12/2026
182m SW	1270229	Countryside Stewardship (Middle Tier)	01/01/2022	31/12/2026



This data is sourced from Natural England.



13 Habitat designations



- Site Outline
- Search buffers in metres (m)
- Priority Habitat Inventory
- Open Mosaic Habitat
- Limestone Pavement Orders
- Habitat Networks
- Primary Habitat
- Restorable Habitat
- Associated Habitats
- Habitat Restoration-Creation
- Network Enhancement Zone 1
- Network Enhancement Zone 2

13.1 Priority Habitat Inventory

Records within 250m

4

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

Features are displayed on the Habitat designations map on [page 58](#) >

ID	Location	Main Habitat	Other habitats
1	81m NW	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
2	92m SE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
3	143m E	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
4	185m SE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)



This data is sourced from Natural England.

13.2 Habitat Networks

Records within 250m

0

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

This data is sourced from Natural England.

13.3 Open Mosaic Habitat

Records within 250m

0

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

This data is sourced from Natural England.

13.4 Limestone Pavement Orders

Records within 250m

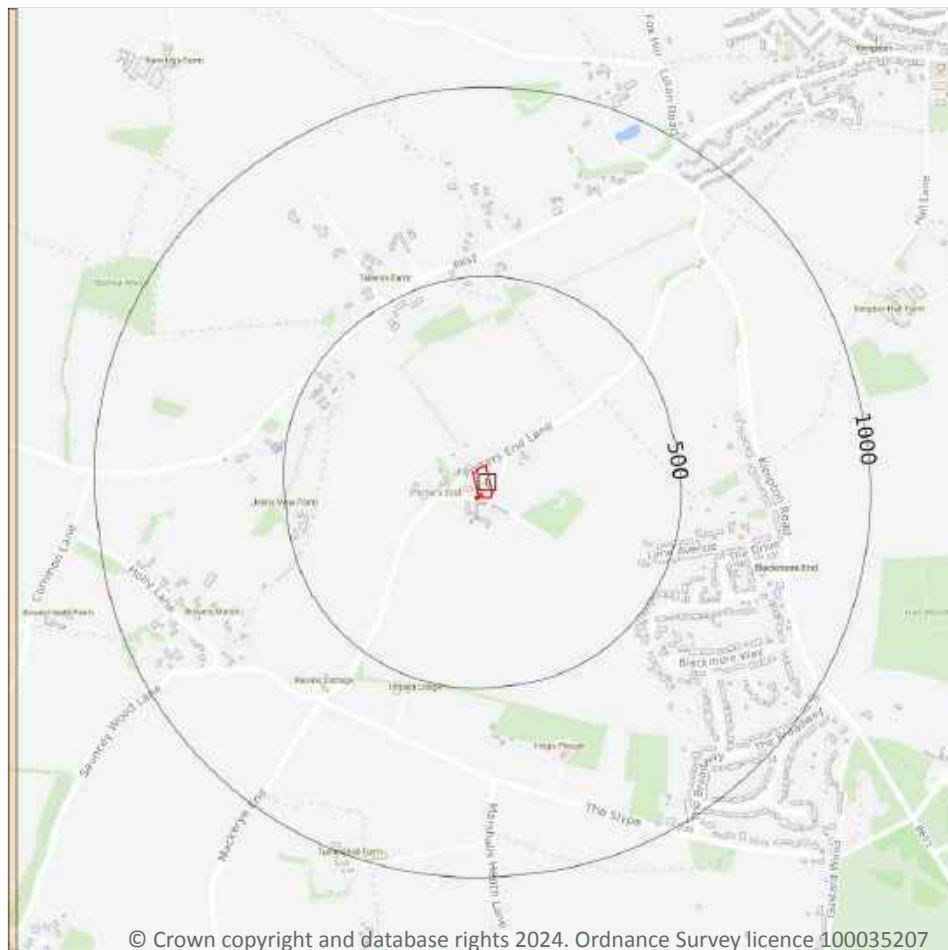
0

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

This data is sourced from Natural England.



14 Geology 1:10,000 scale - Availability



- Site Outline**
- Search buffers in metres (m)
- Full coverage
 - Partial coverage
 - No coverage

14.1 10k Availability

Records within 500m

1

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

Features are displayed on the Geology 1:10,000 scale - Availability map on [page 60](#) >

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	No coverage	No coverage	No coverage	NoCov

This data is sourced from the British Geological Survey.



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

14.2 Artificial and made ground (10k)

Records within 500m

0

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

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Superficial

14.3 Superficial geology (10k)

Records within 500m

0

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

This data is sourced from the British Geological Survey.

14.4 Landslip (10k)

Records within 500m

0

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

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Bedrock

14.5 Bedrock geology (10k)

Records within 500m

0

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

This data is sourced from the British Geological Survey.

14.6 Bedrock faults and other linear features (10k)

Records within 500m

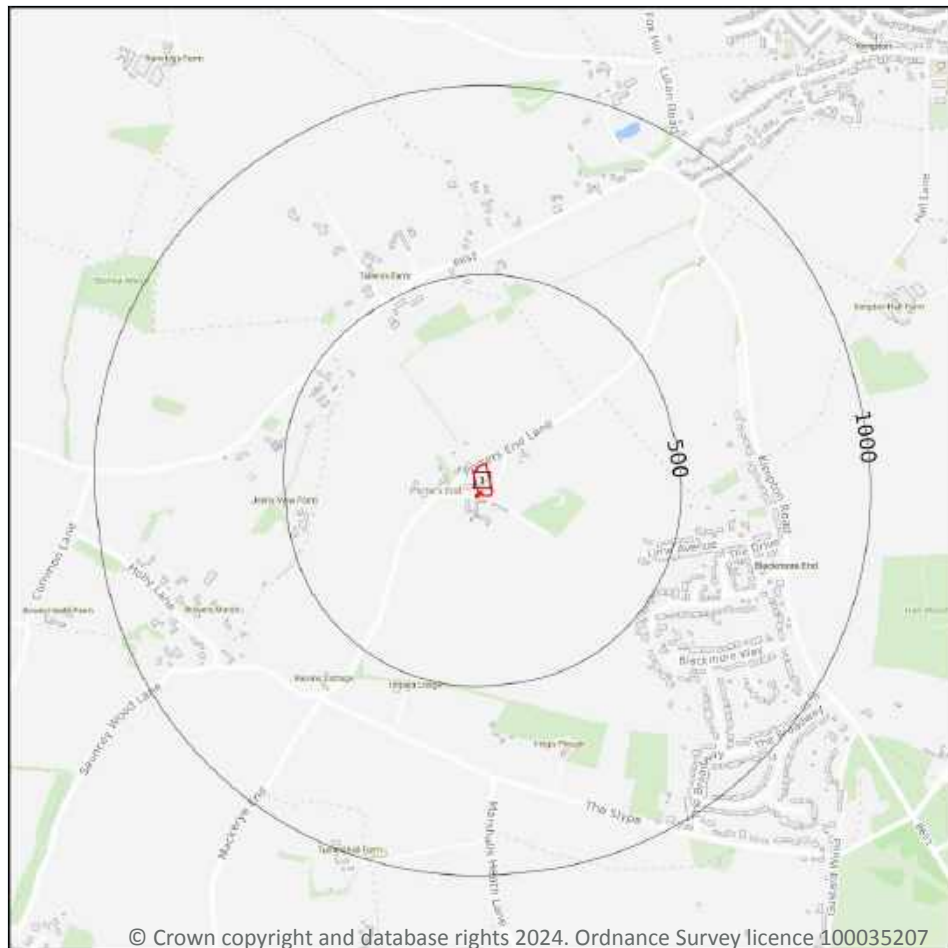
0

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

This data is sourced from the British Geological Survey.



15 Geology 1:50,000 scale - Availability



— Site Outline

Search buffers in metres (m)

□ Geological map tile

15.1 50k Availability

Records within 500m

1

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

Features are displayed on the Geology 1:50,000 scale - Availability map on [page 64](#) >

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	Full	Full	No coverage	EW239_hertford_v4

This data is sourced from the British Geological Survey.



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

15.2 Artificial and made ground (50k)

Records within 500m

0

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

This data is sourced from the British Geological Survey.

15.3 Artificial ground permeability (50k)

Records within 50m

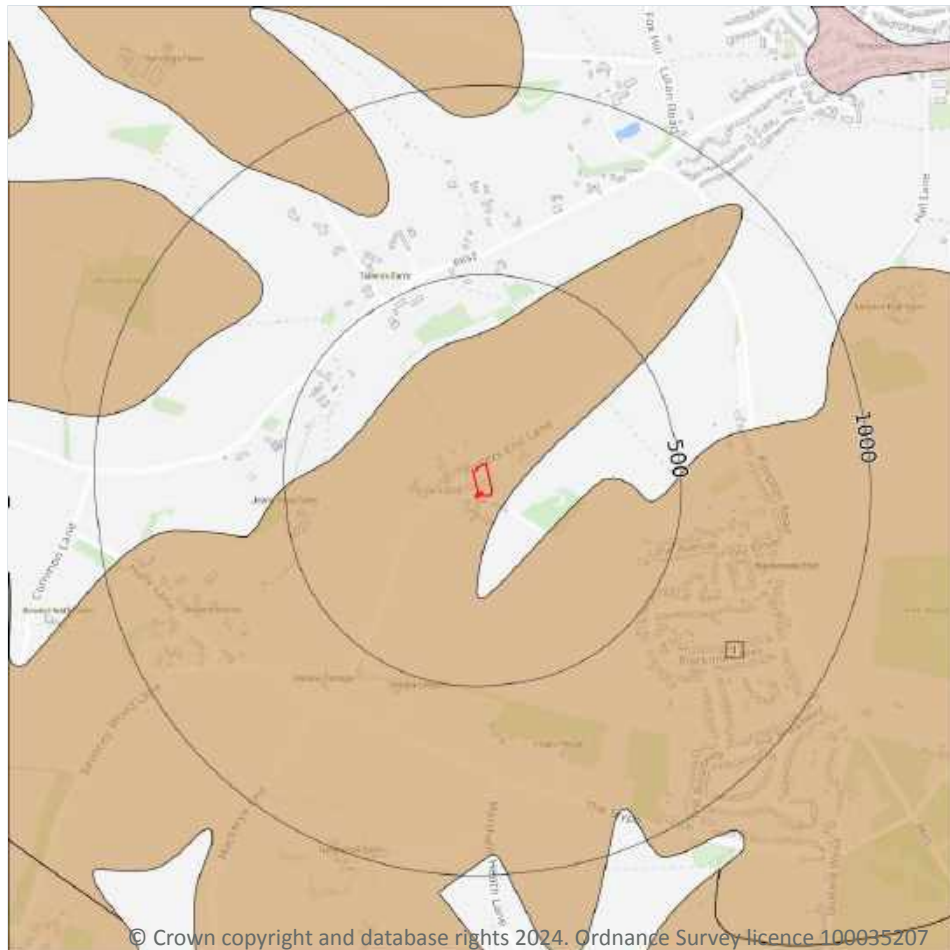
0

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

This data is sourced from the British Geological Survey.



Geology 1:50,000 scale - Superficial



— Site Outline

Search buffers in metres (m)

 Landslip (50k)

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

15.4 Superficial geology (50k)

Records within 500m

1

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

Features are displayed on the Geology 1:50,000 scale - Superficial map on [page 66](#) >

ID	Location	LEX Code	Description	Rock description
1	On site	CWF-XCZSV	CLAY-WITH-FLINTS FORMATION	CLAY, SILT, SAND AND GRAVEL

This data is sourced from the British Geological Survey.



15.5 Superficial permeability (50k)

Records within 50m**1**

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

Location	Flow type	Maximum permeability	Minimum permeability
On site	Mixed	High	Very Low

This data is sourced from the British Geological Survey.

15.6 Landslip (50k)

Records within 500m**0**

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

This data is sourced from the British Geological Survey.

15.7 Landslip permeability (50k)

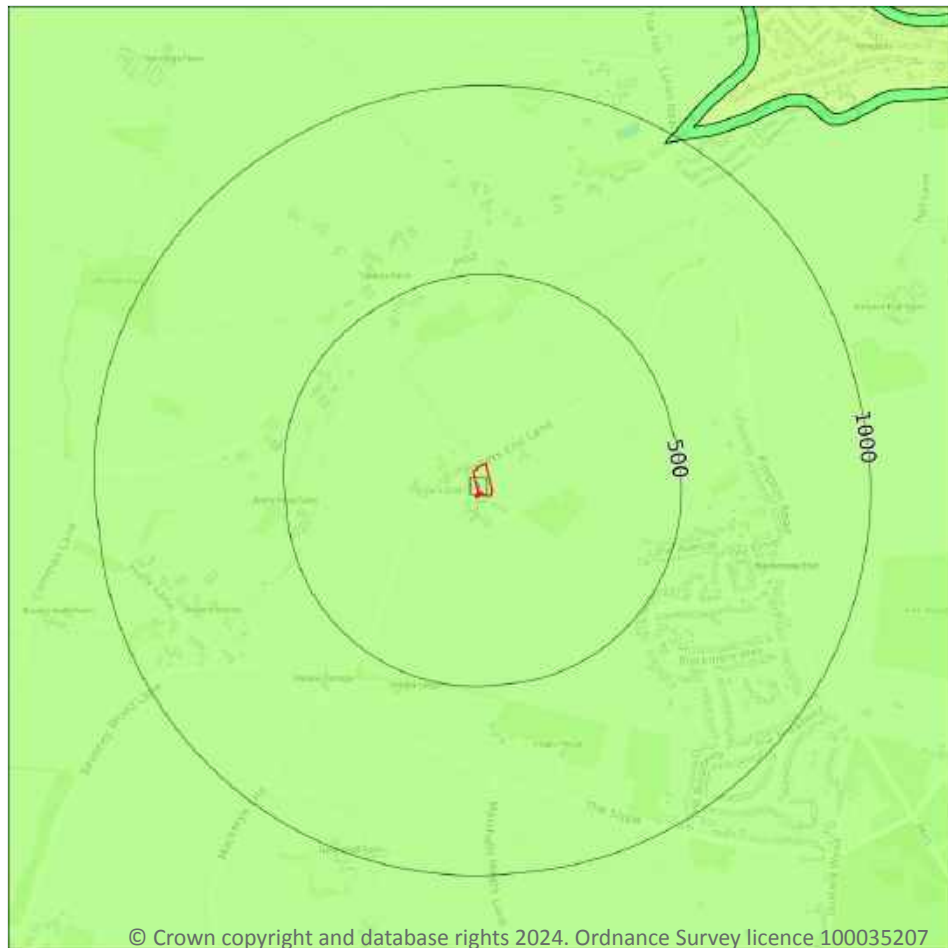
Records within 50m**0**

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

This data is sourced from the British Geological Survey.



Geology 1:50,000 scale - Bedrock



- Site Outline
- Search buffers in metres (m)
- Bedrock faults and other linear features (50k)
- Bedrock geology (50k)
Please see table for more details.

15.8 Bedrock geology (50k)

Records within 500m

1

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

Features are displayed on the Geology 1:50,000 scale - Bedrock map on [page 68 >](#)

ID	Location	LEX Code	Description	Rock age
1	On site	LESE-CHLK	LEWES NODULAR CHALK FORMATION AND SEAFORD CHALK FORMATION (UNDIFFERENTIATED) - CHALK	TURONIAN

This data is sourced from the British Geological Survey.



15.9 Bedrock permeability (50k)

Records within 50m

1

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

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

This data is sourced from the British Geological Survey.

15.10 Bedrock faults and other linear features (50k)

Records within 500m

0

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

This data is sourced from the British Geological Survey.



16 Boreholes

16.1 BGS Boreholes

Records within 250m

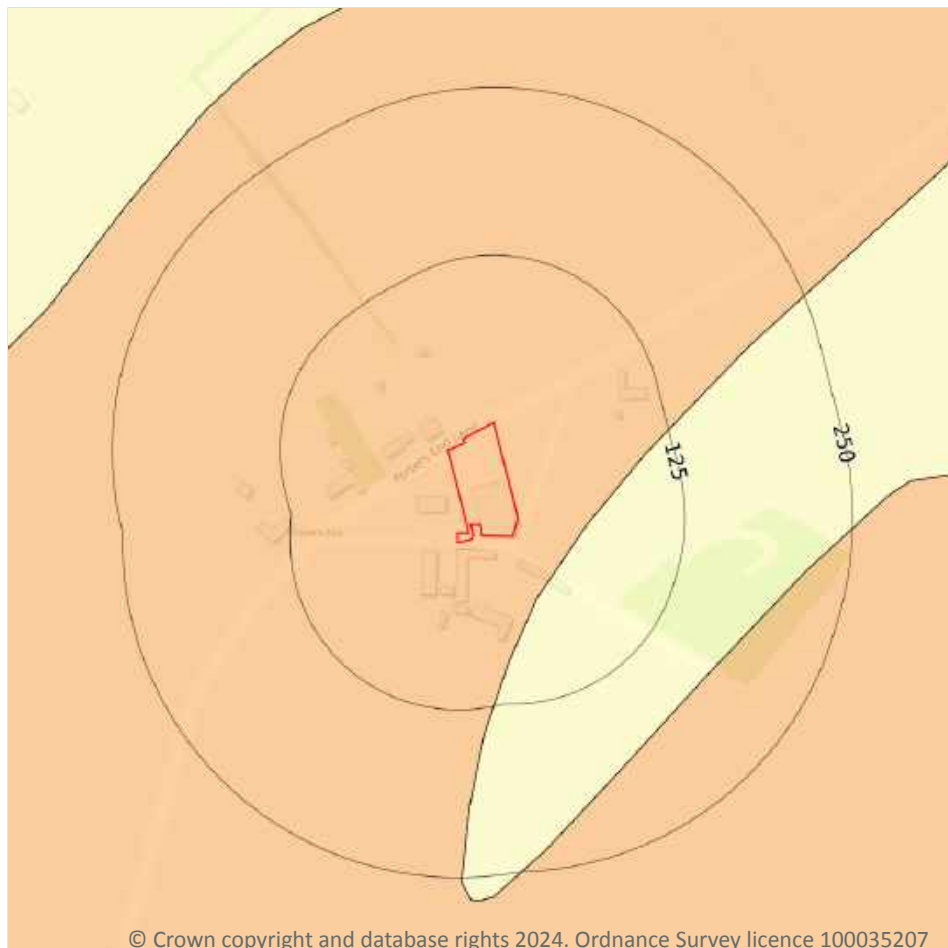
0

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

This data is sourced from the British Geological Survey.



17 Natural ground subsidence - Shrink swell clays



- Site Outline
- Search buffers in metres (m)
- ☐ No data
 - ☐ Negligible
 - ☐ Very low
 - ☐ Low
 - ☐ Moderate
 - ☐ High

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17.1 Shrink swell clays

Records within 50m

2

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

Features are displayed on the Natural ground subsidence - Shrink swell clays map on [page 71](#) >

Location	Hazard rating	Details
On site	Low	Ground conditions predominantly medium plasticity.
41m SE	Negligible	Ground conditions predominantly non-plastic.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Running sands



- Site Outline
- Search buffers in metres (m)
- ☐ No data
 - ☐ Negligible
 - ☐ Very low
 - ☐ Low
 - ☐ Moderate
 - ☐ High

17.2 Running sands

Records within 50m

1

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

Features are displayed on the Natural ground subsidence - Running sands map on [page 72 >](#)

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

This data is sourced from the British Geological Survey.



Natural ground subsidence - Compressible deposits



- Site Outline
- Search buffers in metres (m)
- ☐ No data
 - ☐ Negligible
 - ☐ Very low
 - ☐ Low
 - ☐ Moderate
 - ☐ High

17.3 Compressible deposits

Records within 50m

1

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

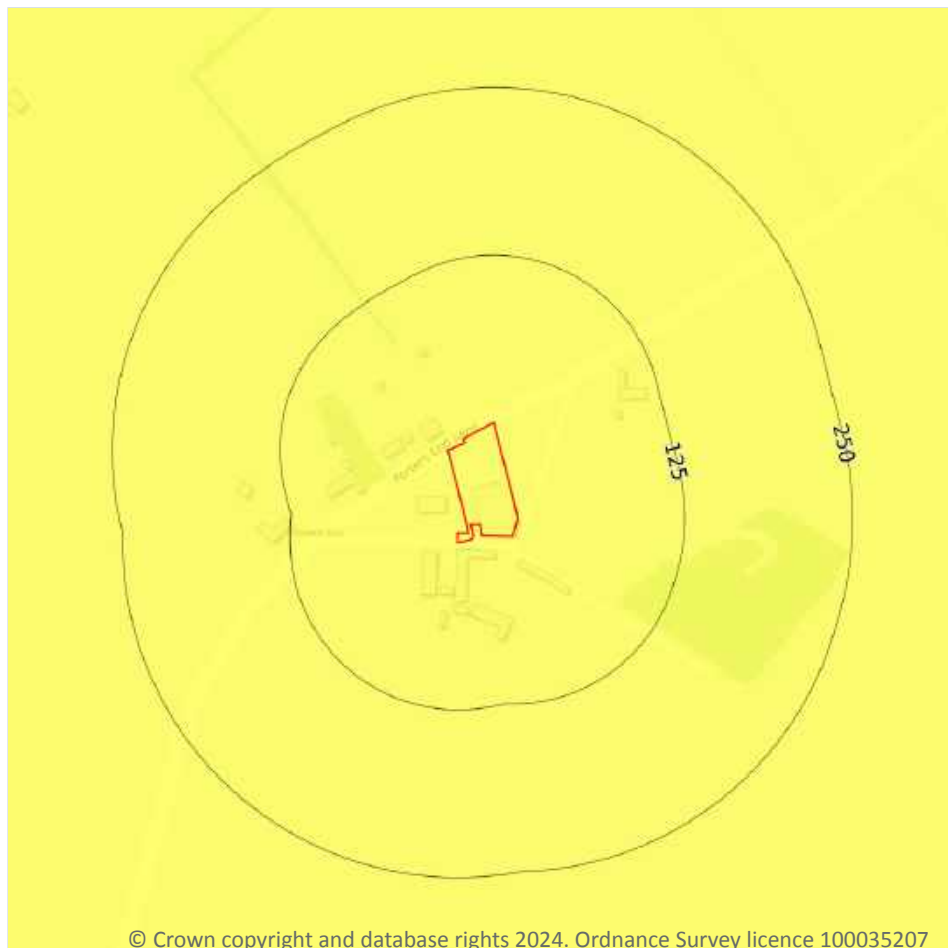
Features are displayed on the Natural ground subsidence - Compressible deposits map on [page 73 >](#)

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

This data is sourced from the British Geological Survey.



Natural ground subsidence - Collapsible deposits



- Site Outline
- Search buffers in metres (m)
- ☐ No data
 - ☐ Negligible
 - ☒ Very low
 - ☐ Low
 - ☐ Moderate
 - ☐ High

17.4 Collapsible deposits

Records within 50m

1

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

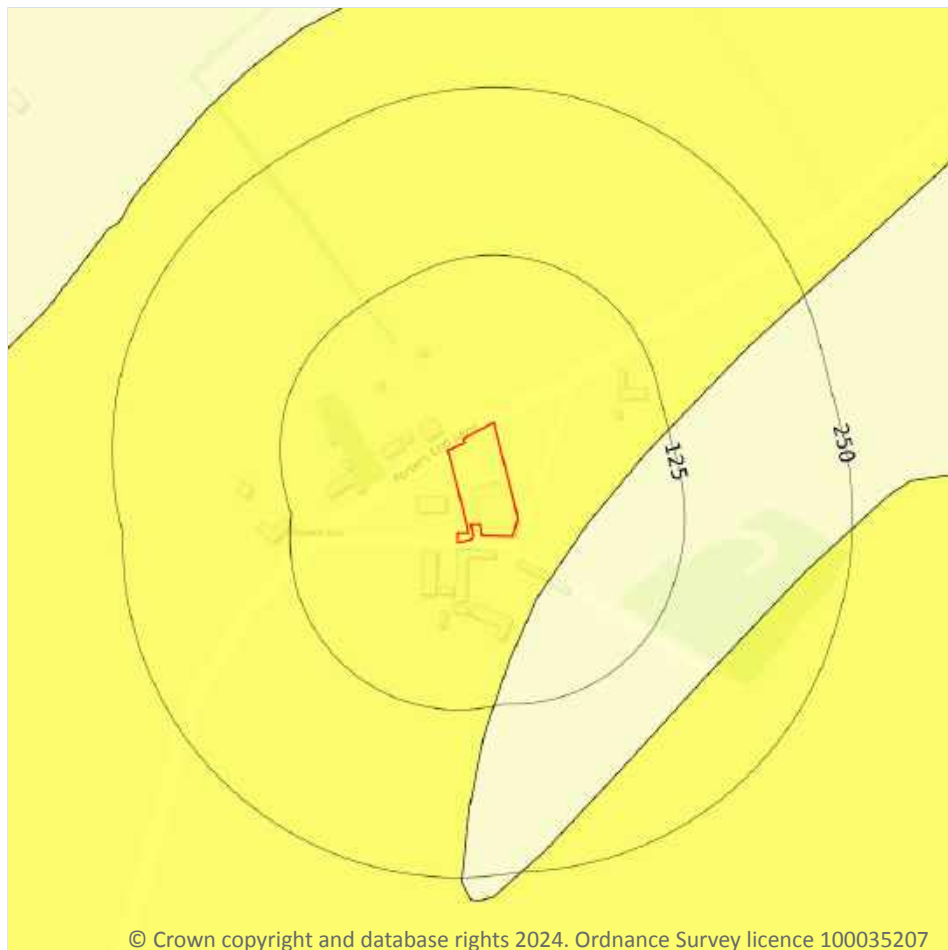
Features are displayed on the Natural ground subsidence - Collapsible deposits map on [page 74 >](#)

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

This data is sourced from the British Geological Survey.



Natural ground subsidence - Landslides



- Site Outline
- Search buffers in metres (m)
- ☐ No data
 - ☐ Negligible
 - ☒ Very low
 - ☐ Low
 - ☐ Moderate
 - ☐ High

17.5 Landslides

Records within 50m

2

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

Features are displayed on the Natural ground subsidence - Landslides map on [page 75 >](#)

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

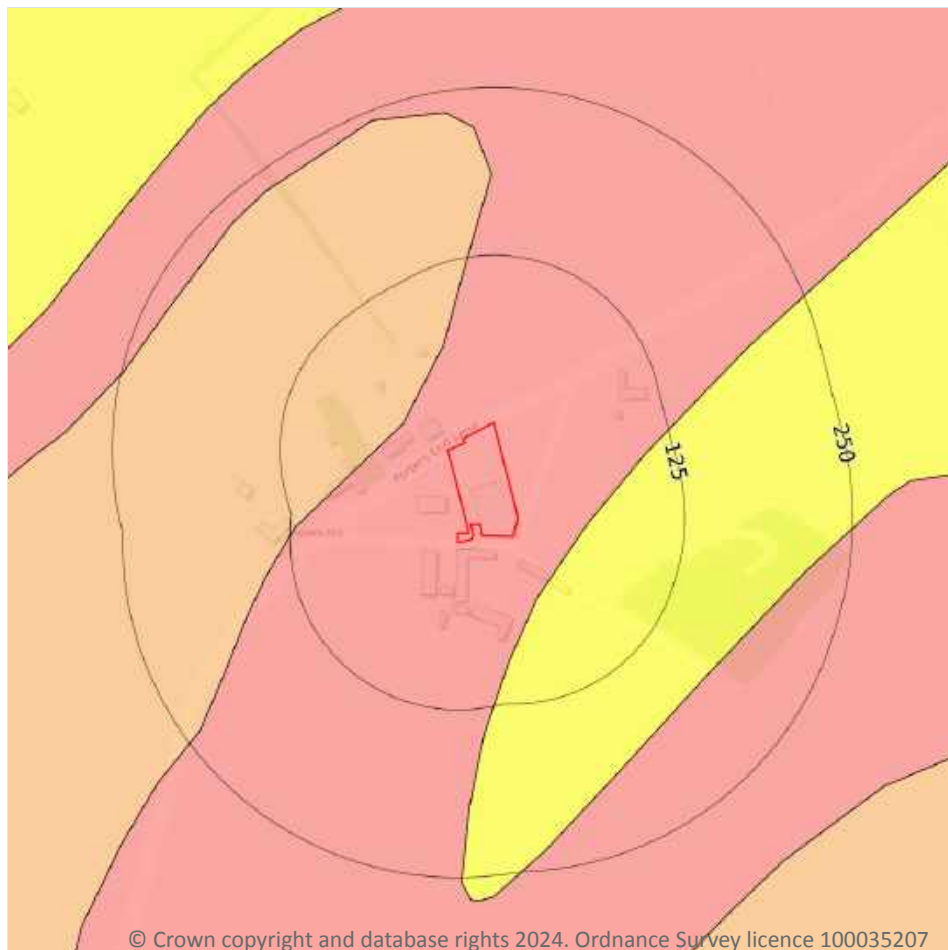


Location	Hazard rating	Details
41m SE	Negligible	Slope instability problems are not thought to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Ground dissolution of soluble rocks



- Site Outline
- Search buffers in metres (m)
- ☐ No data
 - ☐ Negligible
 - ☐ Very low
 - ☐ Low
 - ☐ Moderate
 - ☐ High

17.6 Ground dissolution of soluble rocks

Records within 50m

3

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

Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on [page 77](#)

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

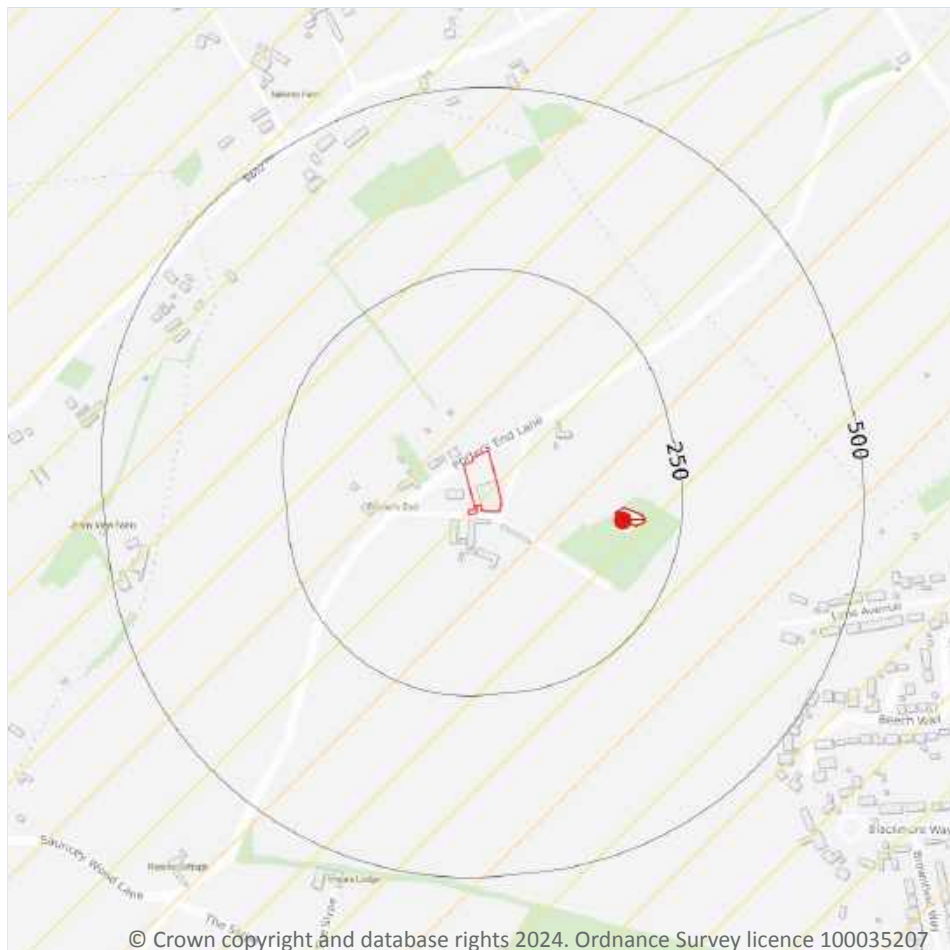


Location	Hazard rating	Details
39m NW	Low	Soluble rocks are present within the ground. Some dissolution features may be present. Potential for difficult ground conditions are at a level where they may be considered, localised subsidence need not be considered except in exceptional circumstances.
41m SE	Very low	Soluble rocks are present within the ground. Few dissolution features are likely to be present. Potential for difficult ground conditions or localised subsidence are at a level where they need not be considered.

This data is sourced from the British Geological Survey.



18 Mining and ground workings



- Site Outline
- Search buffers in metres (m)
- BritPits
- Surface ground workings
- Underground workings
- Underground mining extents
- Historical mineral planning areas
- TCA non-coal mining
- Non Coal Mining
- Sporadic underground mining of restricted extent possible
- Localised small scale underground mining possible
- Small scale mining possible
- Underground mining known or likely within or in close proximity
- Underground mining known within or in very close proximity

18.1 BritPits

Records within 500m

1

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

Features are displayed on the Mining and ground workings map on [page 79 >](#)

ID	Location	Details	Description
A	169m E	Name: The Dell Address: Porter's End, HARPENDEN, Hertfordshire Commodity: Chalk Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority

This data is sourced from the British Geological Survey.

18.2 Surface ground workings

Records within 250m	1
----------------------------	----------

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

Features are displayed on the Mining and ground workings map on [page 79 >](#)

ID	Location	Land Use	Year of mapping	Mapping scale
A	158m E	Unspecified Pit	1881	1:10560

This is data is sourced from Ordnance Survey/Groundsure.

18.3 Underground workings

Records within 1000m	0
-----------------------------	----------

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

This is data is sourced from Ordnance Survey/Groundsure.

18.4 Underground mining extents

Records within 500m	0
----------------------------	----------

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

This data is sourced from Groundsure.



18.5 Historical Mineral Planning Areas

Records within 500m

0

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

This data is sourced from the British Geological Survey.

18.6 Non-coal mining

Records within 1000m

1

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

Features are displayed on the Mining and ground workings map on [page 79 >](#)

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

This data is sourced from the British Geological Survey.

18.7 JPB mining areas

Records on site

0

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

This data is sourced from Johnson Poole and Bloomer.

18.8 The Coal Authority non-coal mining

Records within 500m

0

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



This data is sourced from The Coal Authority.

18.9 Researched mining

Records within 500m

0

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

This data is sourced from Groundsure.

18.10 Mining record office plans

Records within 500m

0

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

This data is sourced from Groundsure.

18.11 BGS mine plans

Records within 500m

0

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

This data is sourced from Groundsure.

18.12 Coal mining

Records on site

0

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

This data is sourced from the Coal Authority.



18.13 Brine areas

Records on site	0
-----------------	---

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

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

18.14 Gypsum areas

Records on site	0
-----------------	---

Generalised areas that may be affected by gypsum extraction.

This data is sourced from British Gypsum.

18.15 Tin mining

Records on site	0
-----------------	---

Generalised areas that may be affected by historical tin mining.

This data is sourced from Groundsure.

18.16 Clay mining

Records on site	0
-----------------	---

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

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

19 Ground cavities and sinkholes

19.1 Natural cavities

Records within 500m

0

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

This data is sourced from Stantec UK Ltd.

19.2 Mining cavities

Records within 1000m

0

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

This data is sourced from Stantec UK Ltd.

19.3 Reported recent incidents

Records within 500m

0

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

This data is sourced from Groundsure.

19.4 Historical incidents

Records within 500m

0

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

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



This data is sourced from Groundsure.

19.5 National karst database

Records within 500m

0

This is a comprehensive database of national karst information gathered from a wide range of sources. BGS have collected data on five main types of karst feature: Sinkholes, stream links, caves, springs, and incidences of associated damage to buildings, roads, bridges and other engineered works.

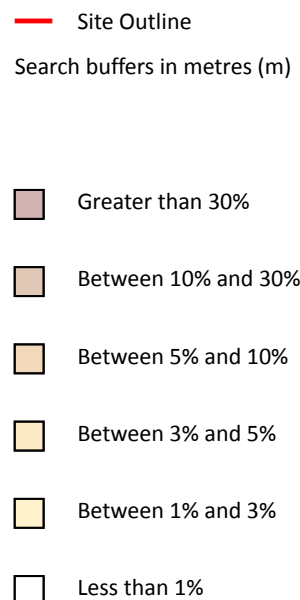
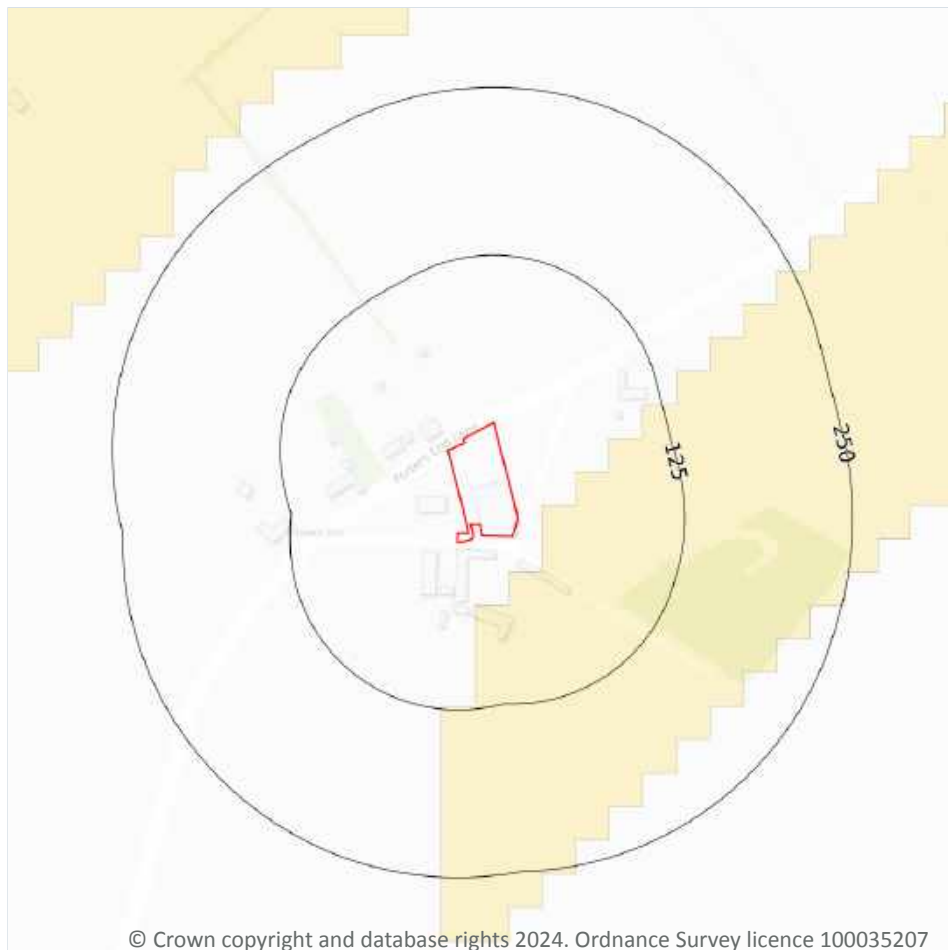
Since the database was set up in 2002 data covering most of the evaporite karst areas of the UK have now been added, along with data covering about 60% of the Chalk, and 35% of the Carboniferous Limestone outcrops. Many of the classic upland karst areas have yet to be included. Recorded so far are: Over 800 caves, 1300 stream sinks, 5600 springs, 10,000 sinkholes.

The database is not yet complete, and not all records have been verified. The absence of data does not mean that karst features are not present at a site. A reliability rating is included with each record.

This data is sourced from the British Geological Survey.



20 Radon



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20.1 Radon

Records on site

1

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

Features are displayed on the Radon map on [page 86](#) >

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



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



21 Soil chemistry

21.1 BGS Estimated Background Soil Chemistry

Records within 50m

2

The estimated values provide the likely background concentration of the potentially harmful elements Arsenic, Cadmium, Chromium, Lead and Nickel in topsoil. The values are estimated primarily from rural topsoil data collected at a sample density of approximately 1 per 2 km². In areas where rural soil samples are not available, estimation is based on stream sediment data collected from small streams at a sampling density of 1 per 2.5 km²; this is the case for most of Scotland, Wales and southern England. The stream sediment data are converted to soil-equivalent concentrations prior to the estimation.

Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
41m SE	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	45 - 60 mg/kg

This data is sourced from the British Geological Survey.

21.2 BGS Estimated Urban Soil Chemistry

Records within 50m

0

Estimated topsoil chemistry of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc and bioaccessible Arsenic and Lead in 23 urban centres across Great Britain. These estimates are derived from interpolation of the measured urban topsoil data referred to above and provide information across each city between the measured sample locations (4 per km²).

This data is sourced from the British Geological Survey.

21.3 BGS Measured Urban Soil Chemistry

Records within 50m

0

The locations and measured total concentrations (mg/kg) of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc in urban topsoil samples from 23 urban centres across Great Britain. These are collected at a sample density of 4 per km².

This data is sourced from the British Geological Survey.



22 Railway infrastructure and projects

22.1 Underground railways (London)

Records within 250m**0**

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

This data is sourced from publicly available information by Groundsure.

22.2 Underground railways (Non-London)

Records within 250m**0**

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

This data is sourced from publicly available information by Groundsure.

22.3 Railway tunnels

Records within 250m**0**

Railway tunnels taken from contemporary Ordnance Survey mapping.

This data is sourced from the Ordnance Survey.

22.4 Historical railway and tunnel features

Records within 250m**0**

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

This data is sourced from Ordnance Survey/Groundsure.

22.5 Royal Mail tunnels

Records within 250m**0**

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



This data is sourced from Groundsure/the Postal Museum.

22.6 Historical railways

Records within 250m

0

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

This data is sourced from OpenStreetMap.

22.7 Railways

Records within 250m

0

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

This data is sourced from Ordnance Survey and OpenStreetMap.

22.8 Crossrail 1

Records within 500m

0

The Crossrail railway project links 41 stations over 100 kilometres from Reading and Heathrow in the west, through underground sections in central London, to Shenfield and Abbey Wood in the east.

This data is sourced from publicly available information by Groundsure.

22.9 Crossrail 2

Records within 500m

0

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

This data is sourced from publicly available information by Groundsure.

22.10 HS2

Records within 500m

0

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

This data is sourced from HS2 Ltd.



Data providers

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

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Map Name: County Series

Map date: 1881

Scale: 1:2,500

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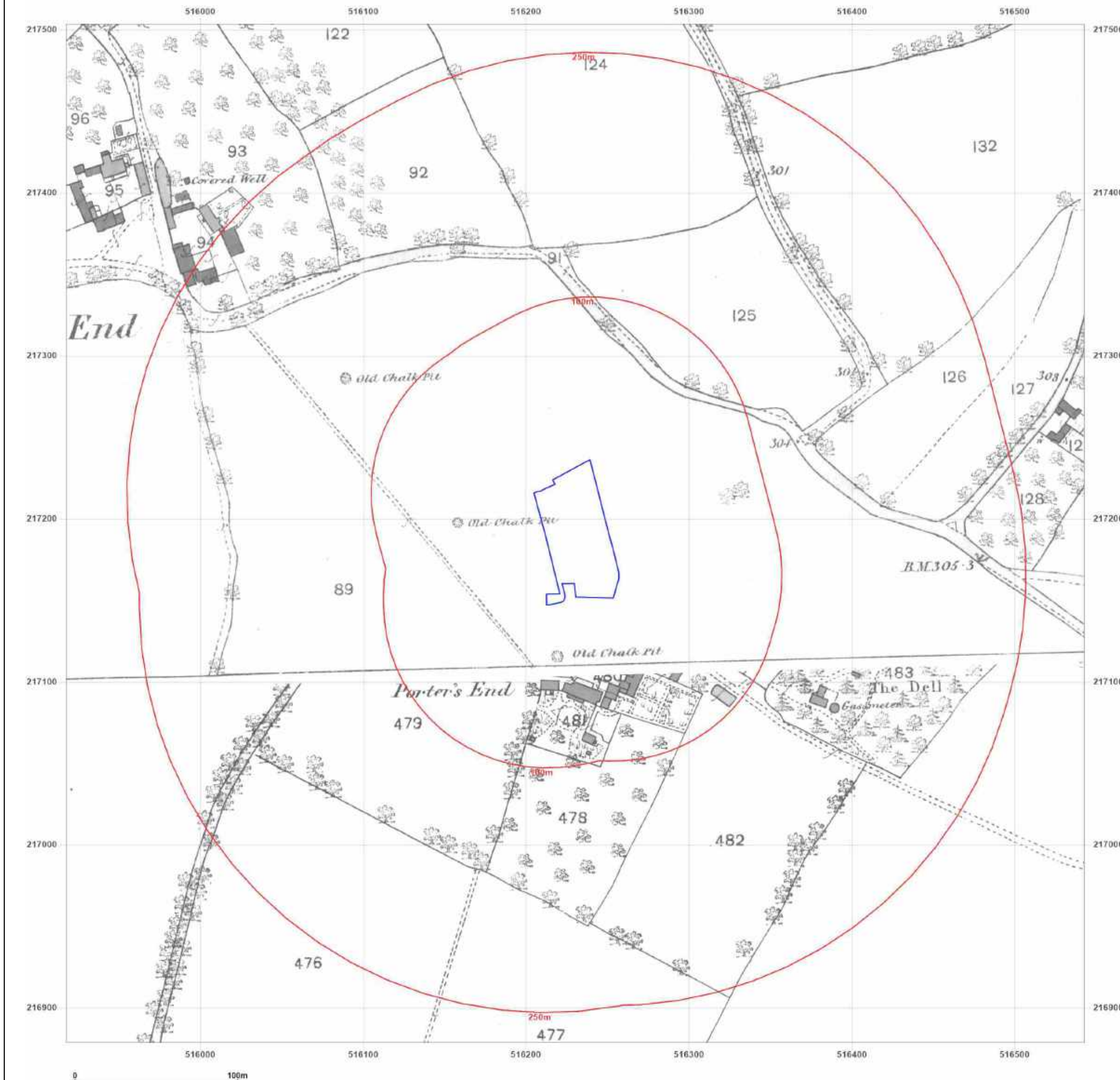


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Map Name: County Series

Map date: 1898

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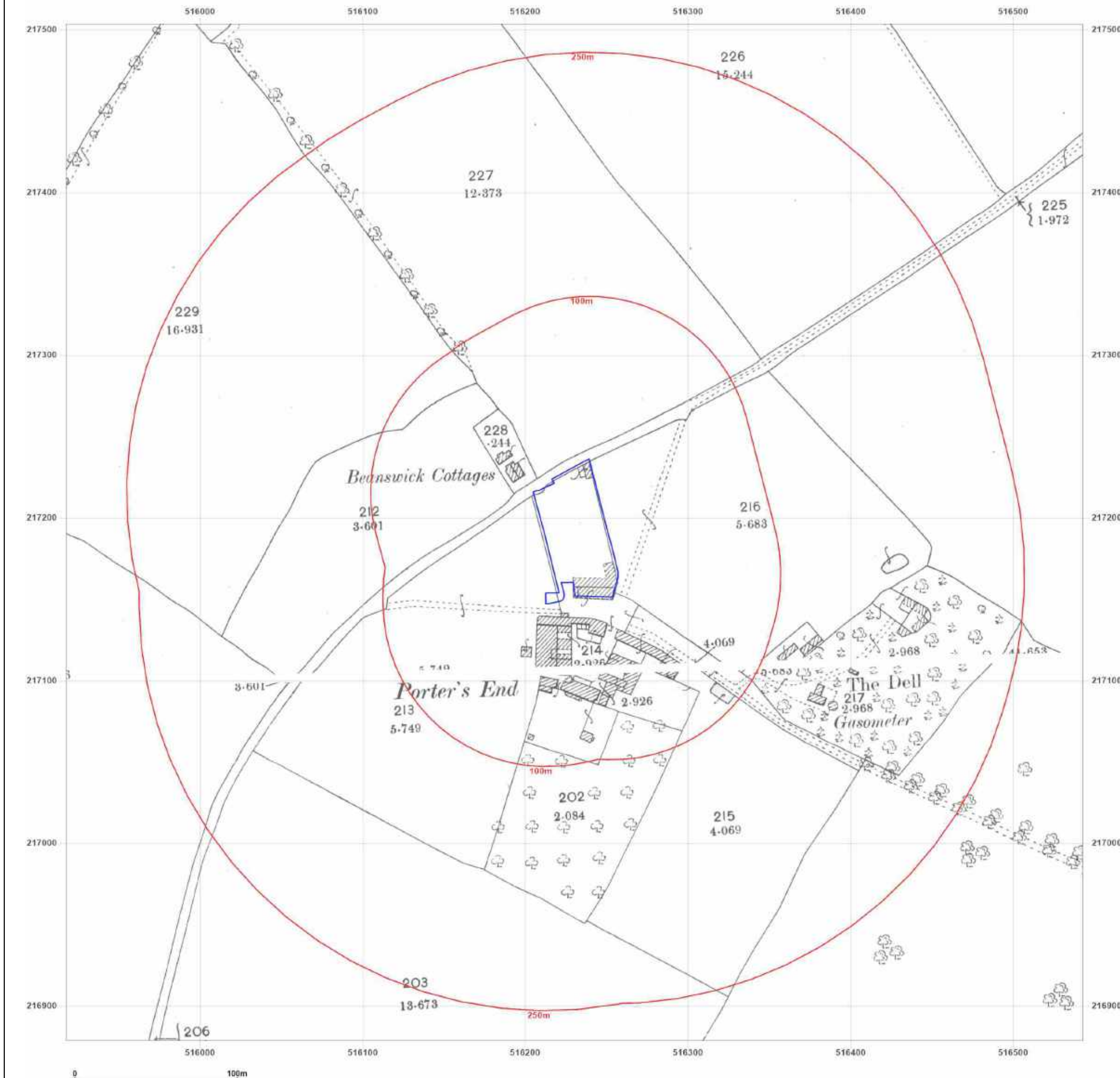


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Map Name: County Series

Map date: 1924

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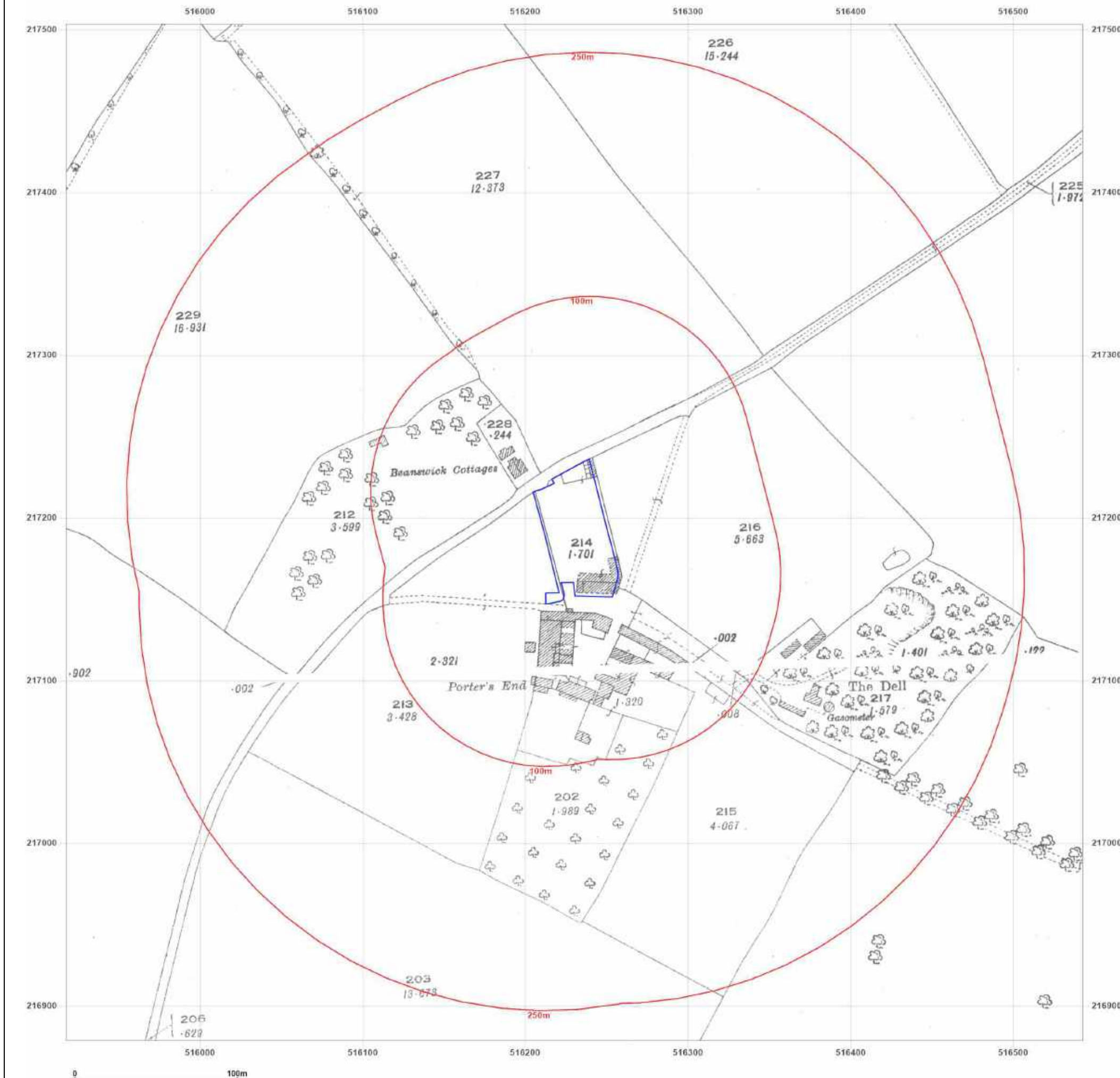


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Map Name: National Grid

Map date: 1971

Scale: 1:2,500

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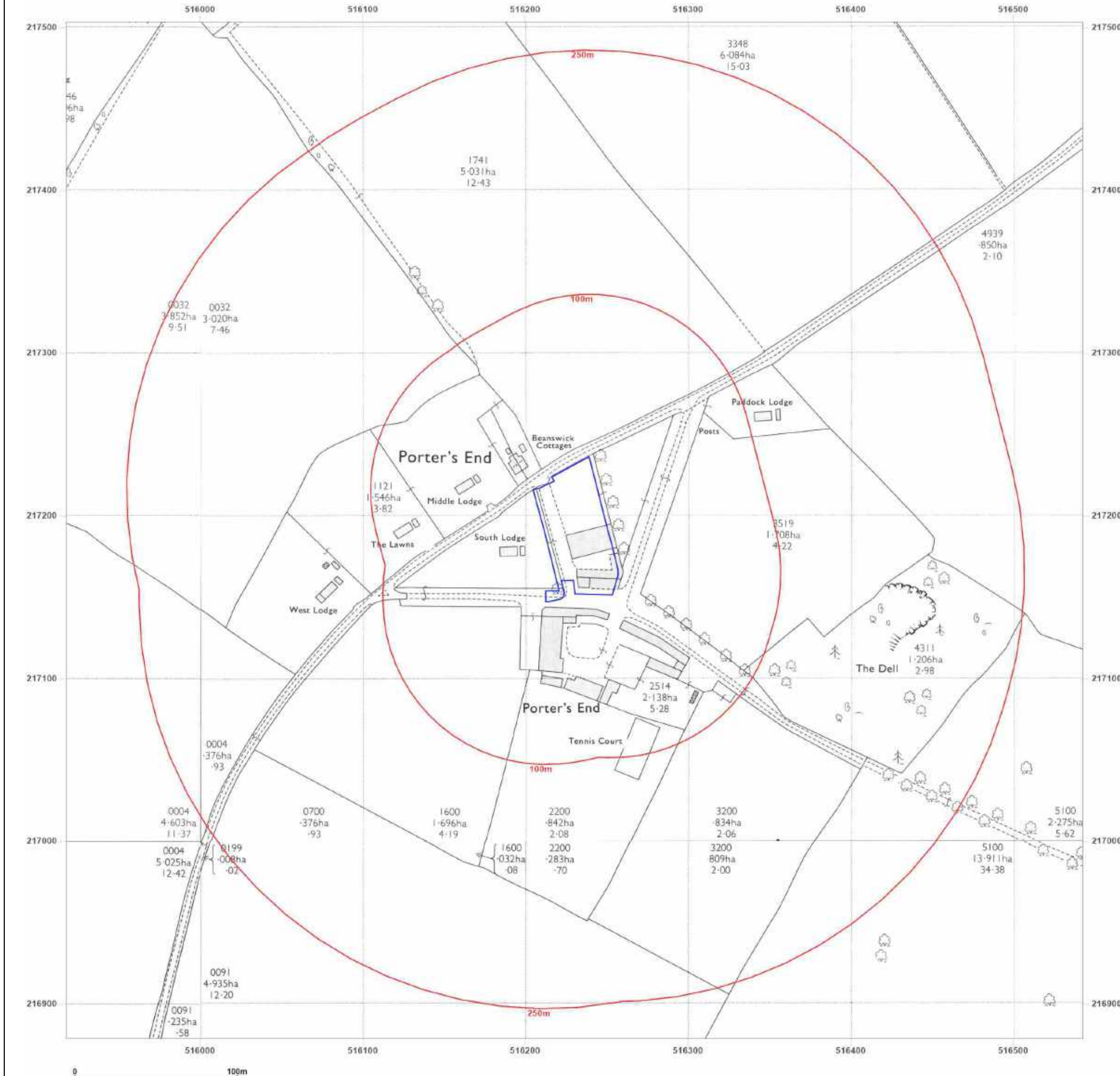


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Map Name: National Grid

Map date: 1993

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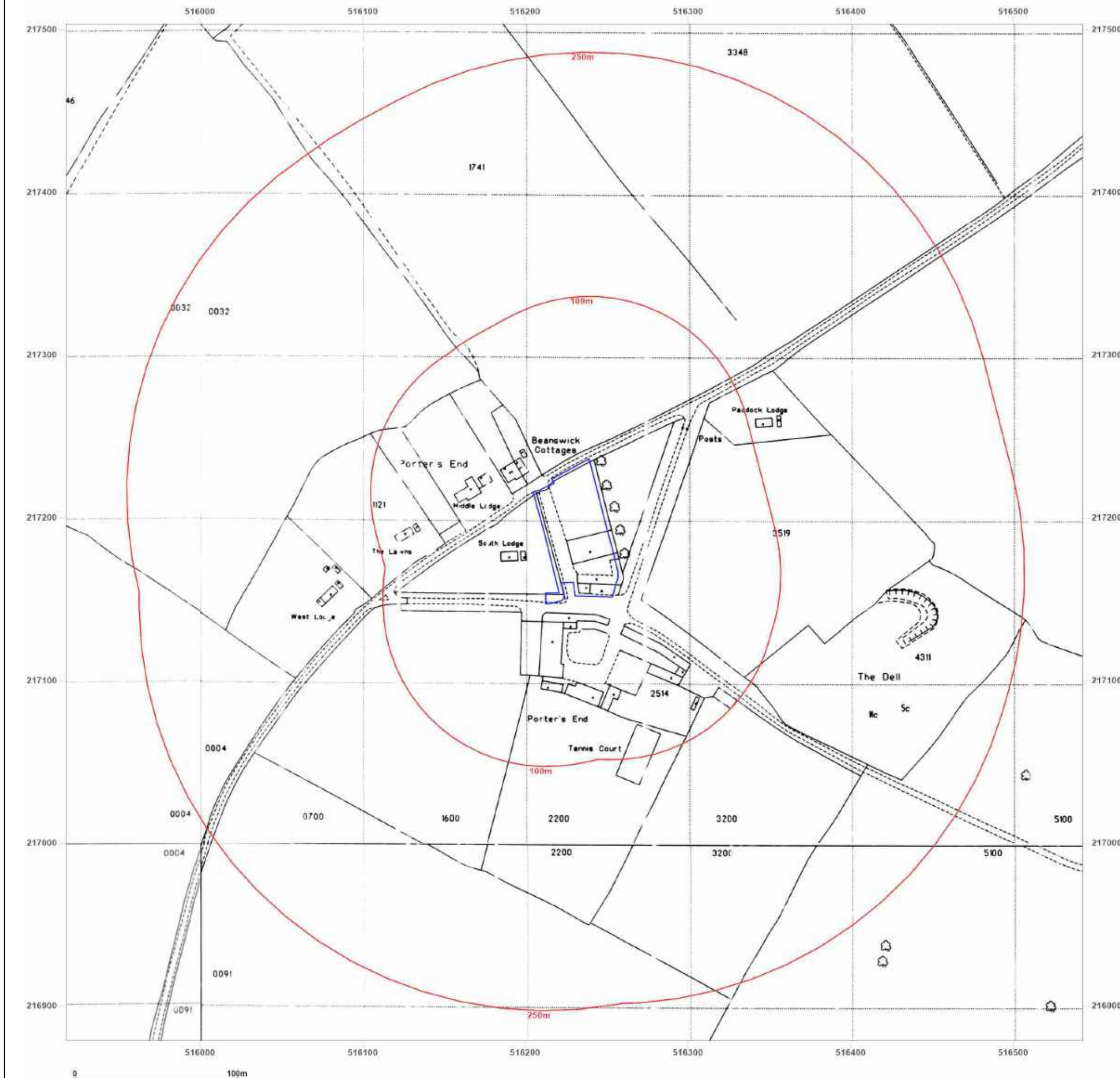


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Grid Ref: 516230, 217191

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Map date: 1995

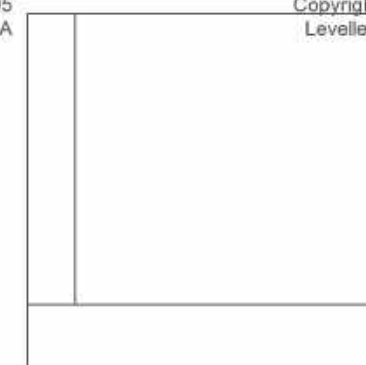
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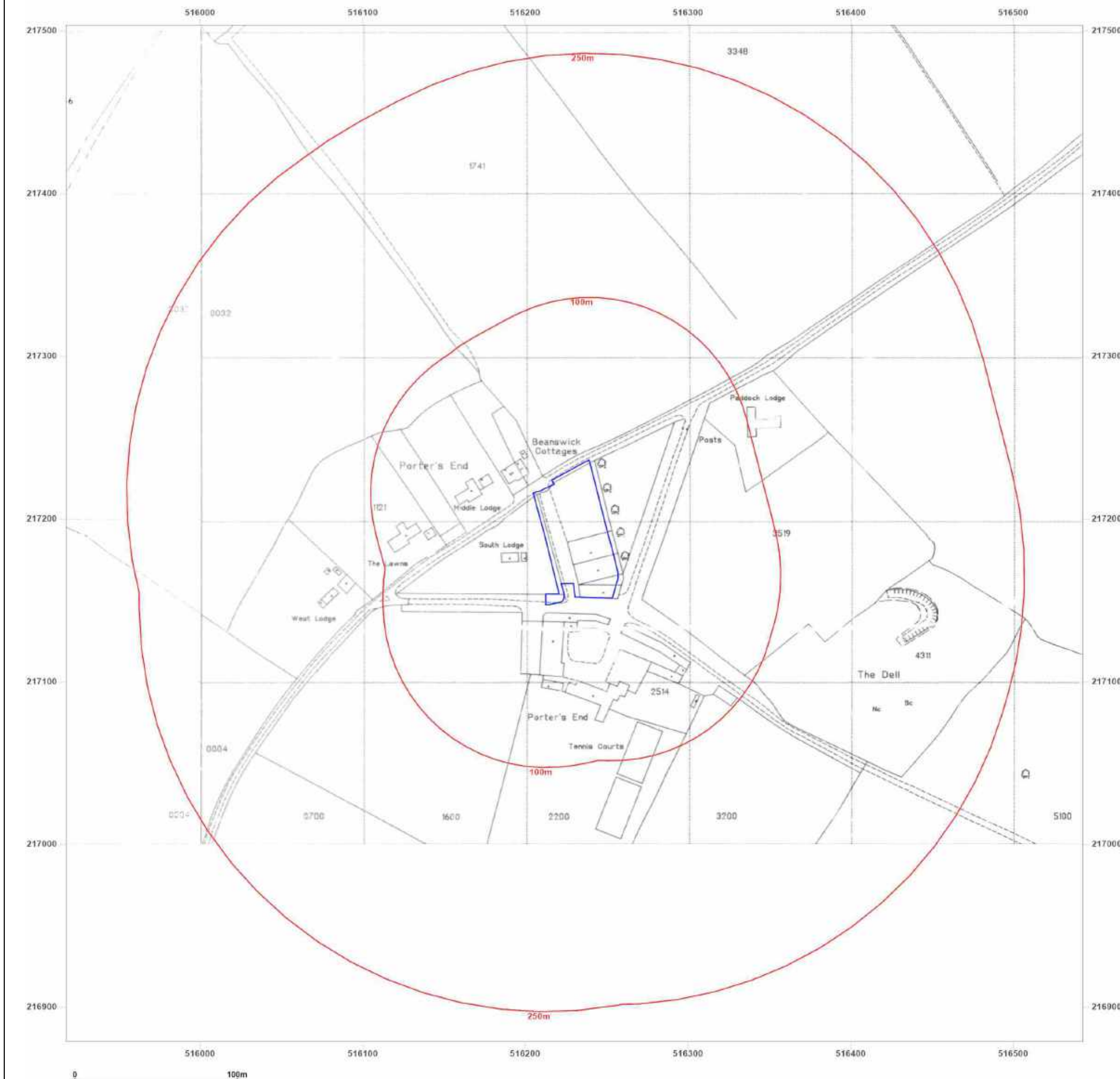


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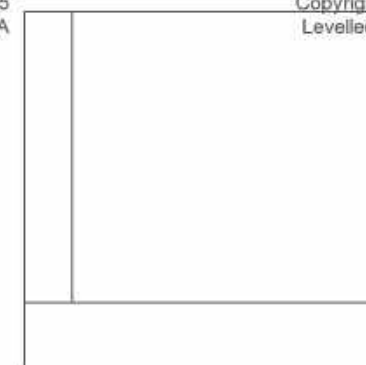
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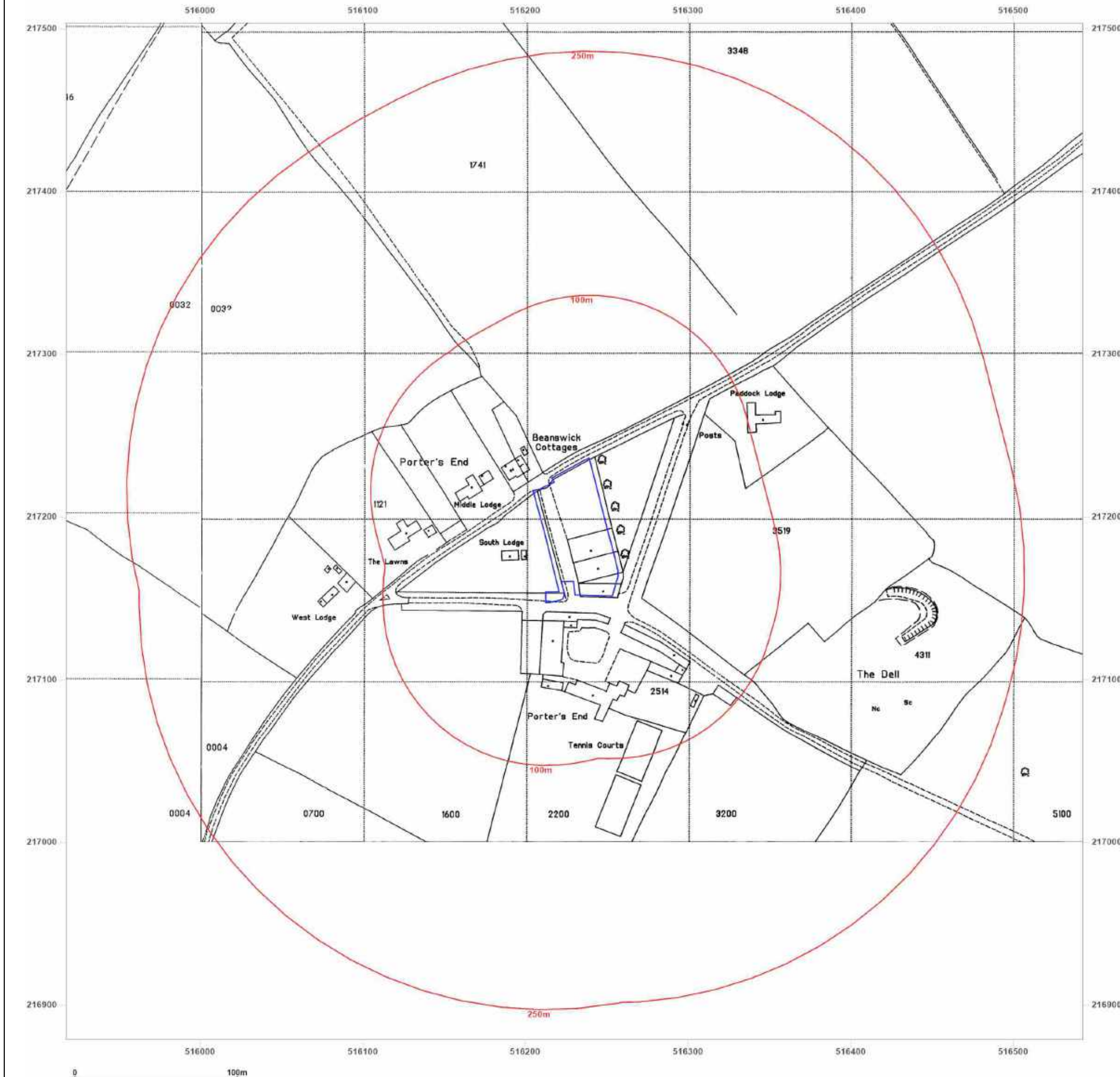


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Map date: 2003

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2003

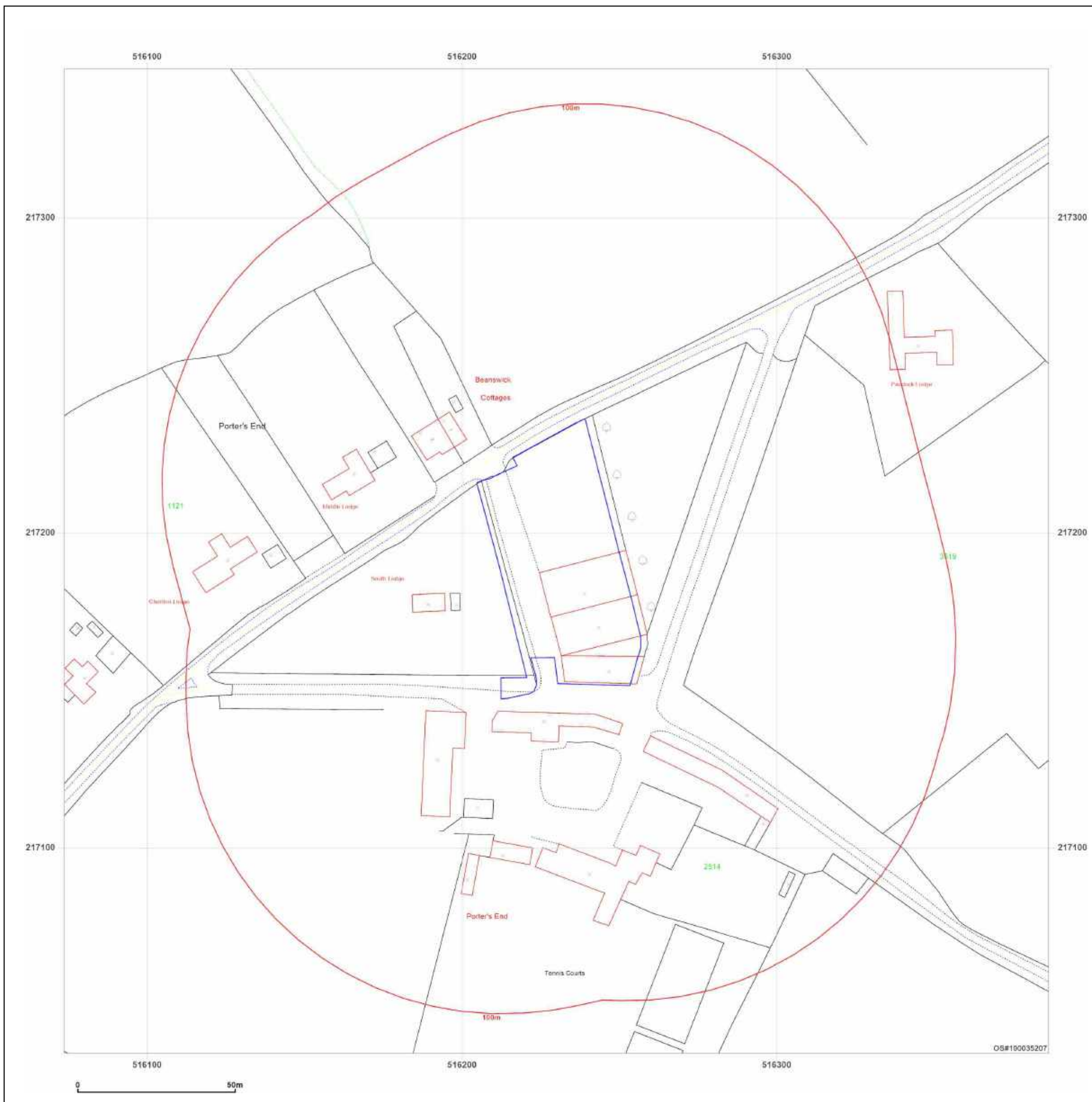


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Map Name: County Series

Map date: 1884

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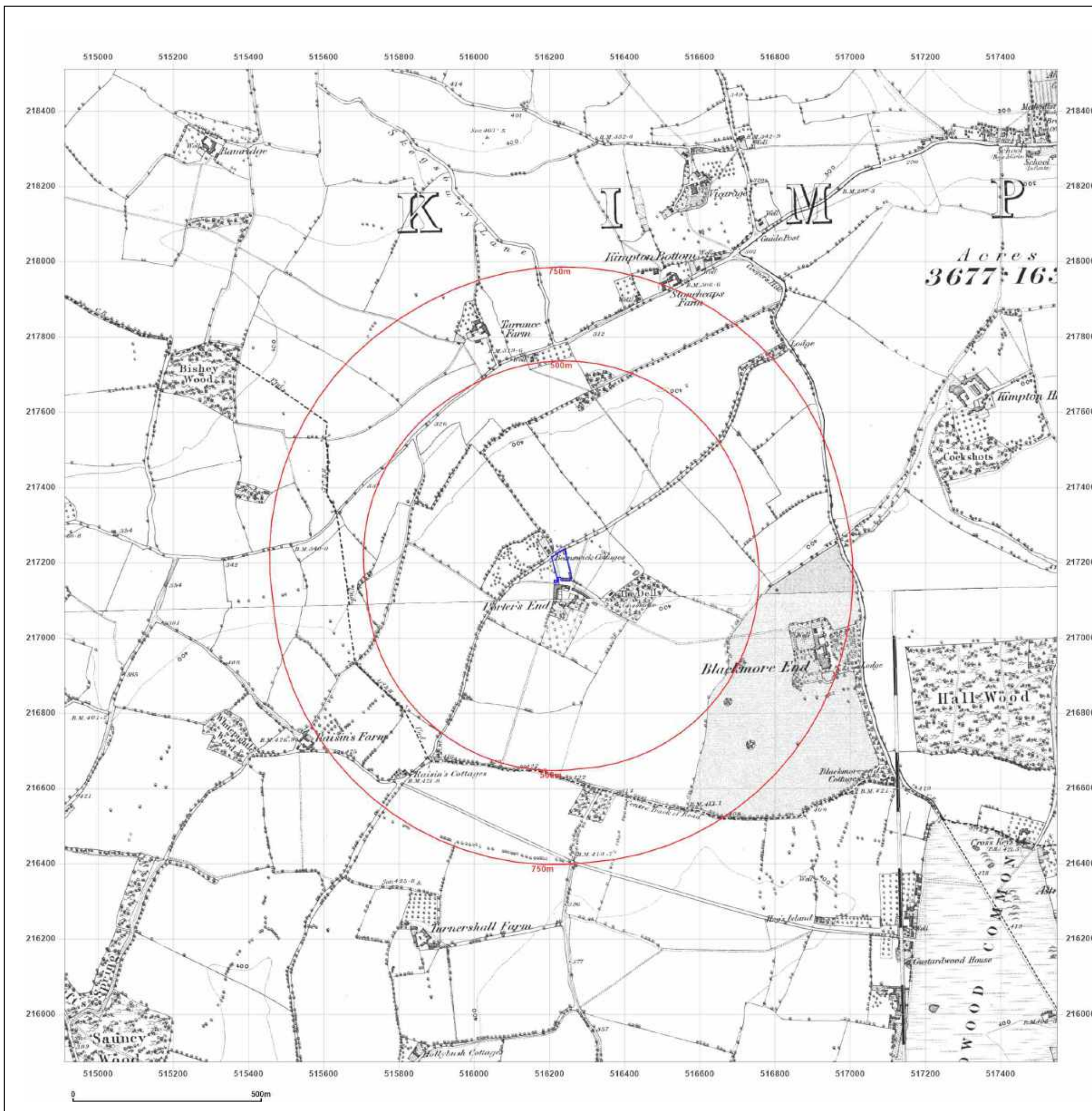


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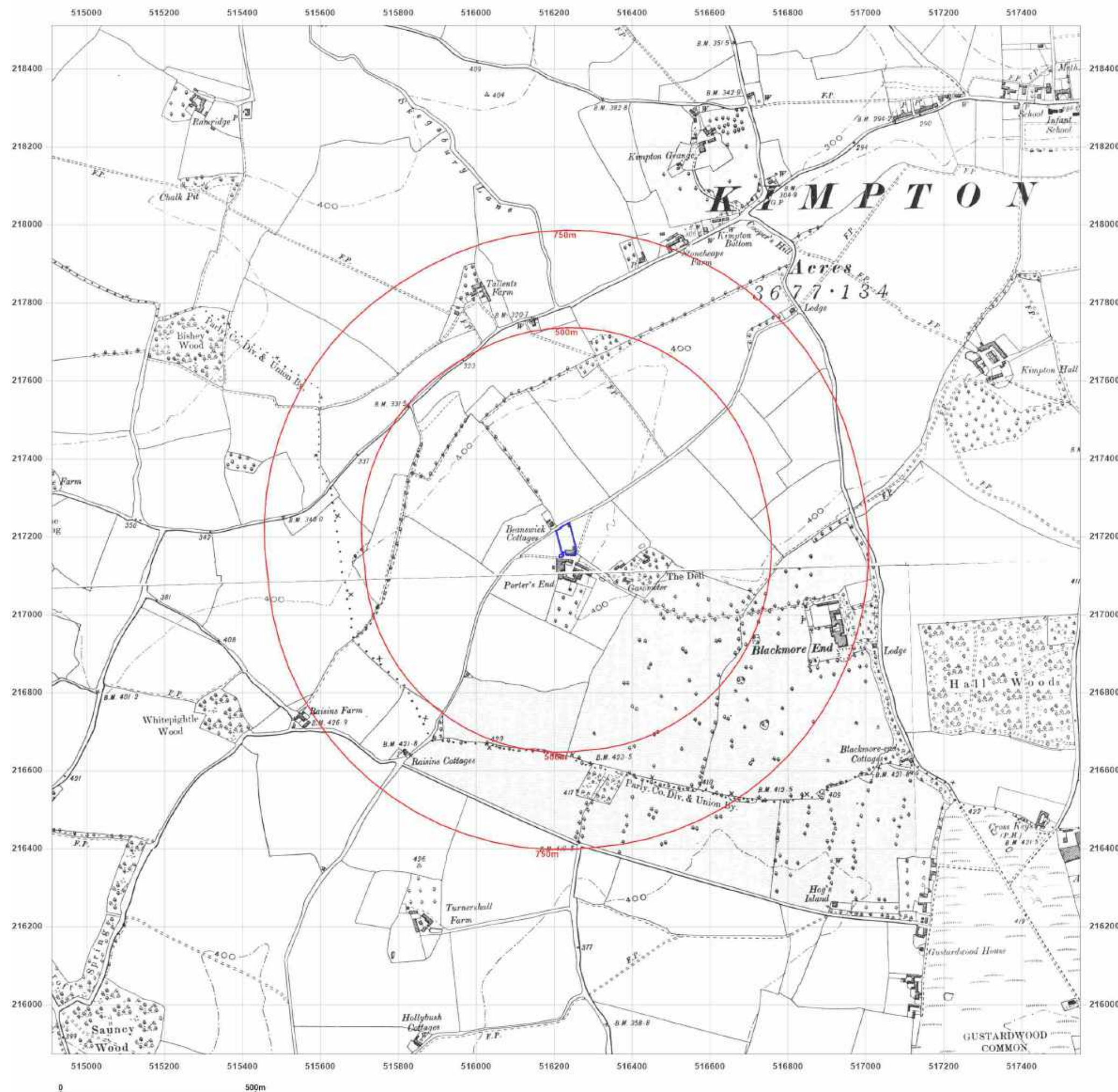


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Map date: 1922

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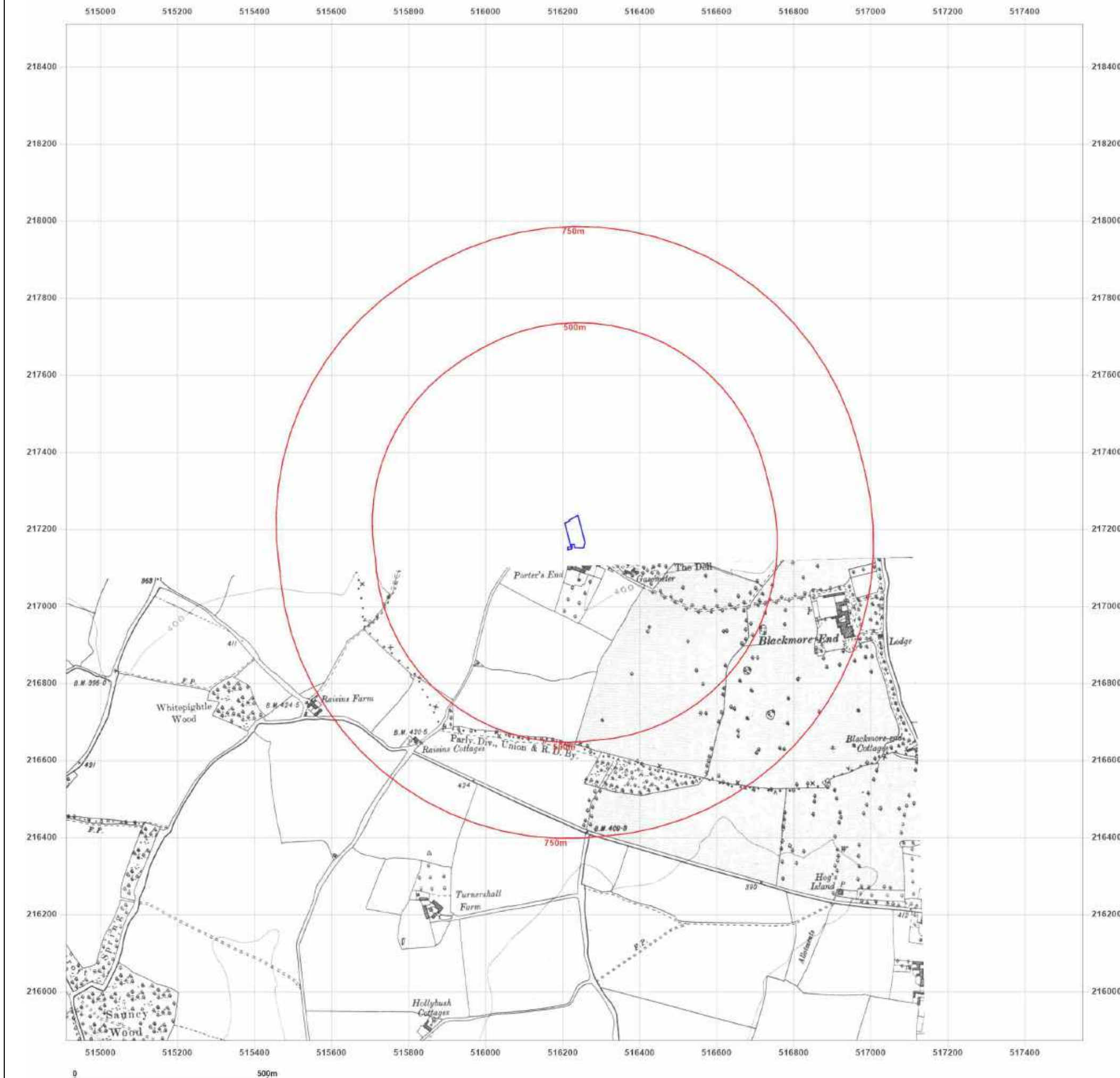


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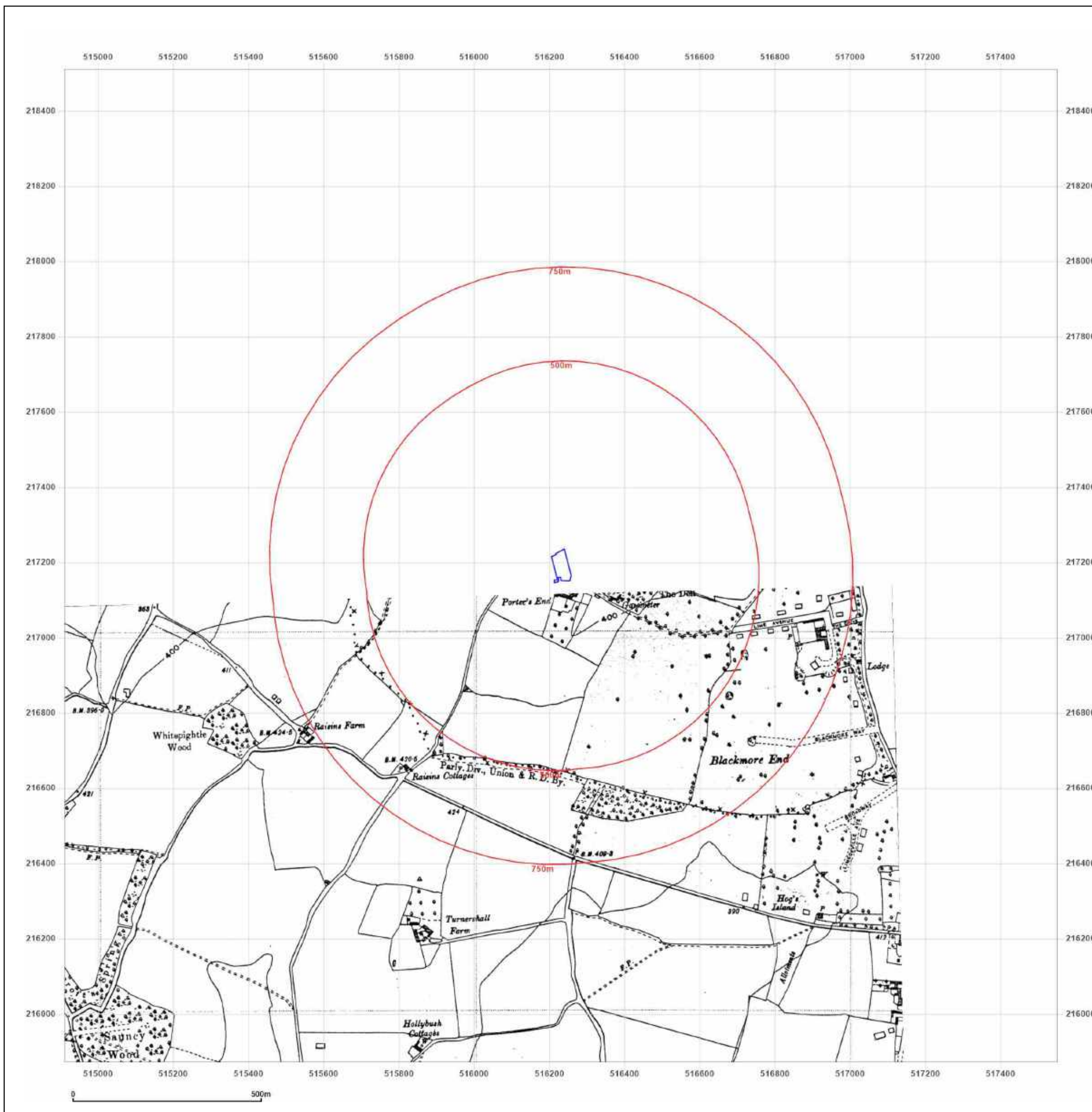


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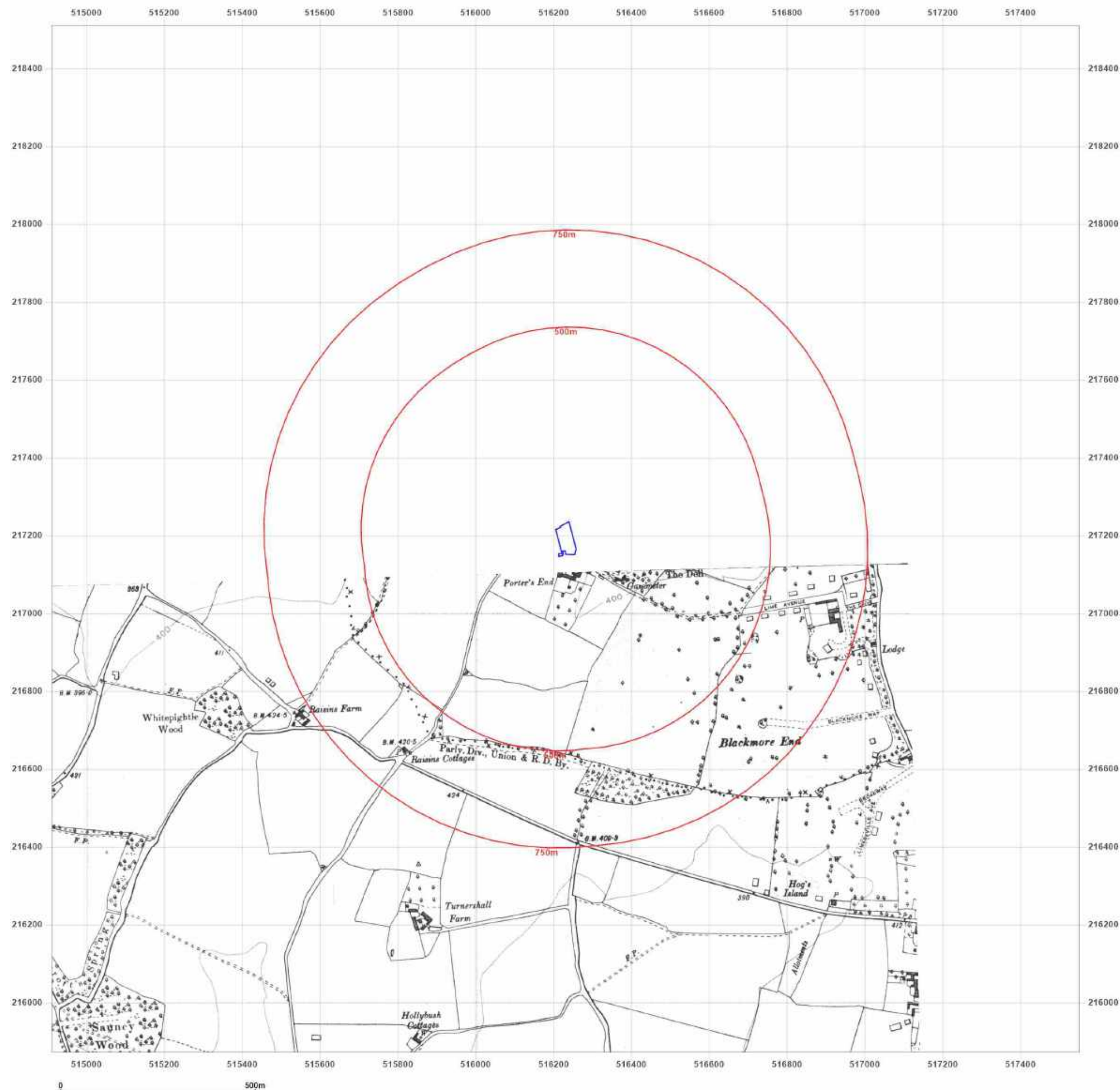


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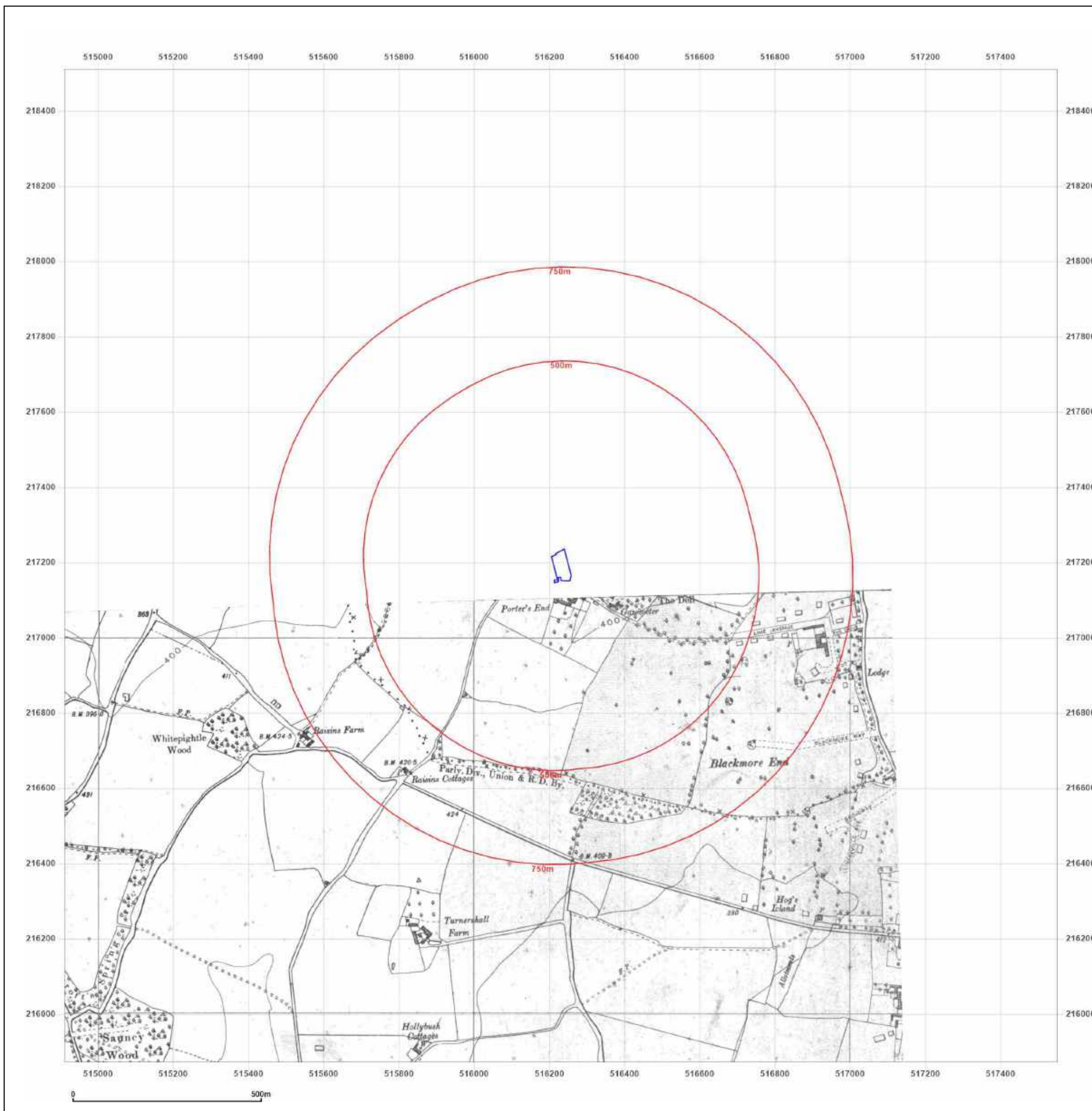


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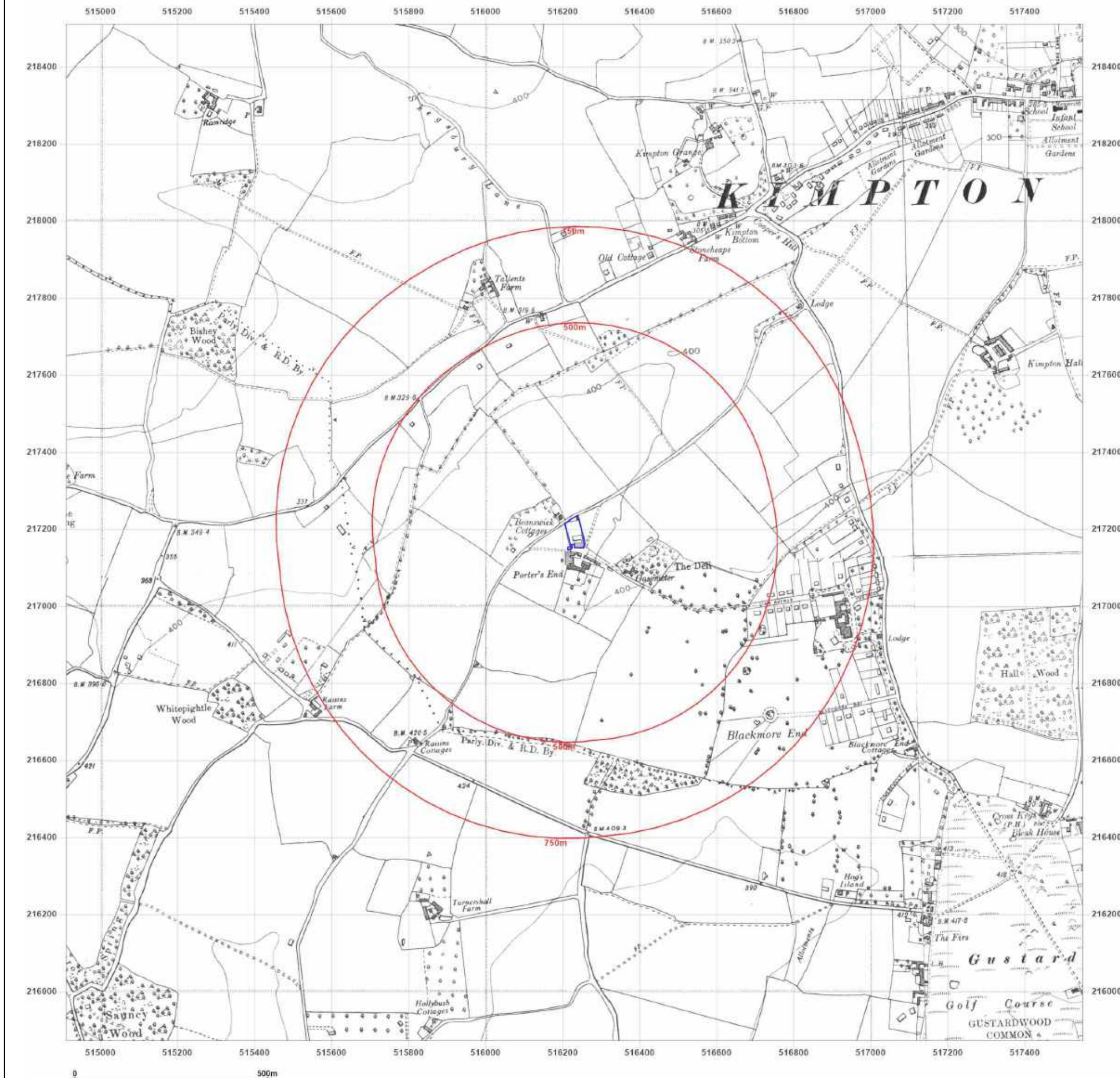


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Site Details:

PORTERS END LANE, KIMPTON,
HERTFORDSHIRE, SG4 8ER

Client Ref: 24-231
Report Ref: GS-XPY-XNU-XFI-573
Grid Ref: 516230, 217191

Map Name: Provisional

Map date: 1960

Scale: 1:10,560

Printed at: 1:10,560



Surveyed N/A
Revised 1959
Edition N/A
Copyright 1960
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Surveyed 1951
Revised 1959
Edition N/A
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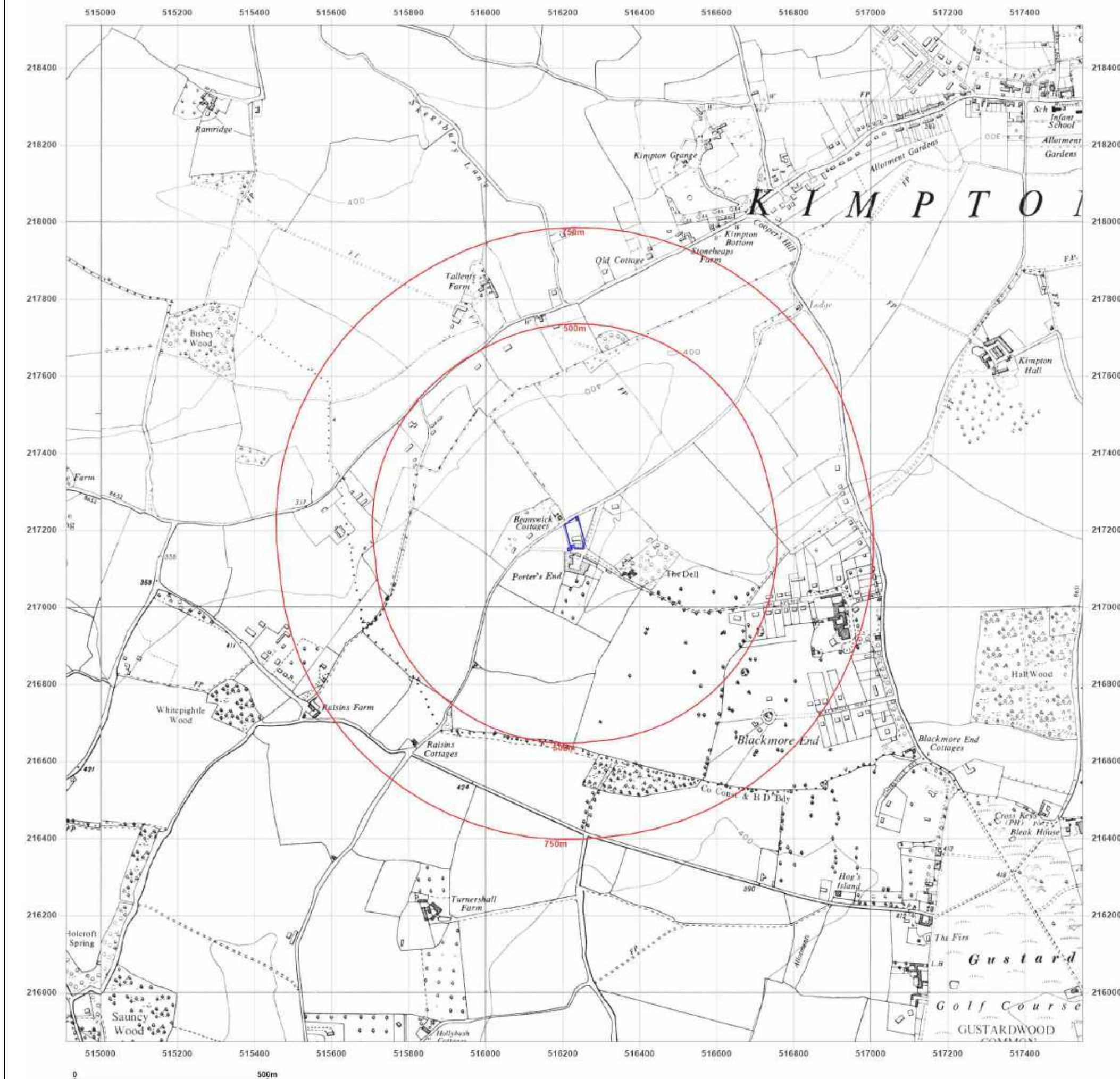


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Site Details:

PORTERS END LANE, KIMPTON,
HERTFORDSHIRE, SG4 8ER

Client Ref: 24-231
Report Ref: GS-XPY-XNU-XFI-573
Grid Ref: 516230, 217191

Map Name: National Grid

Map date: 1974-1975

Scale: 1:10,000

Printed at: 1:10,000



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Revised 1974
Edition N/A
Copyright 1974
Levelled 1973

Surveyed 1972
Revised 1974
Edition N/A
Copyright 1975
Levelled 1973

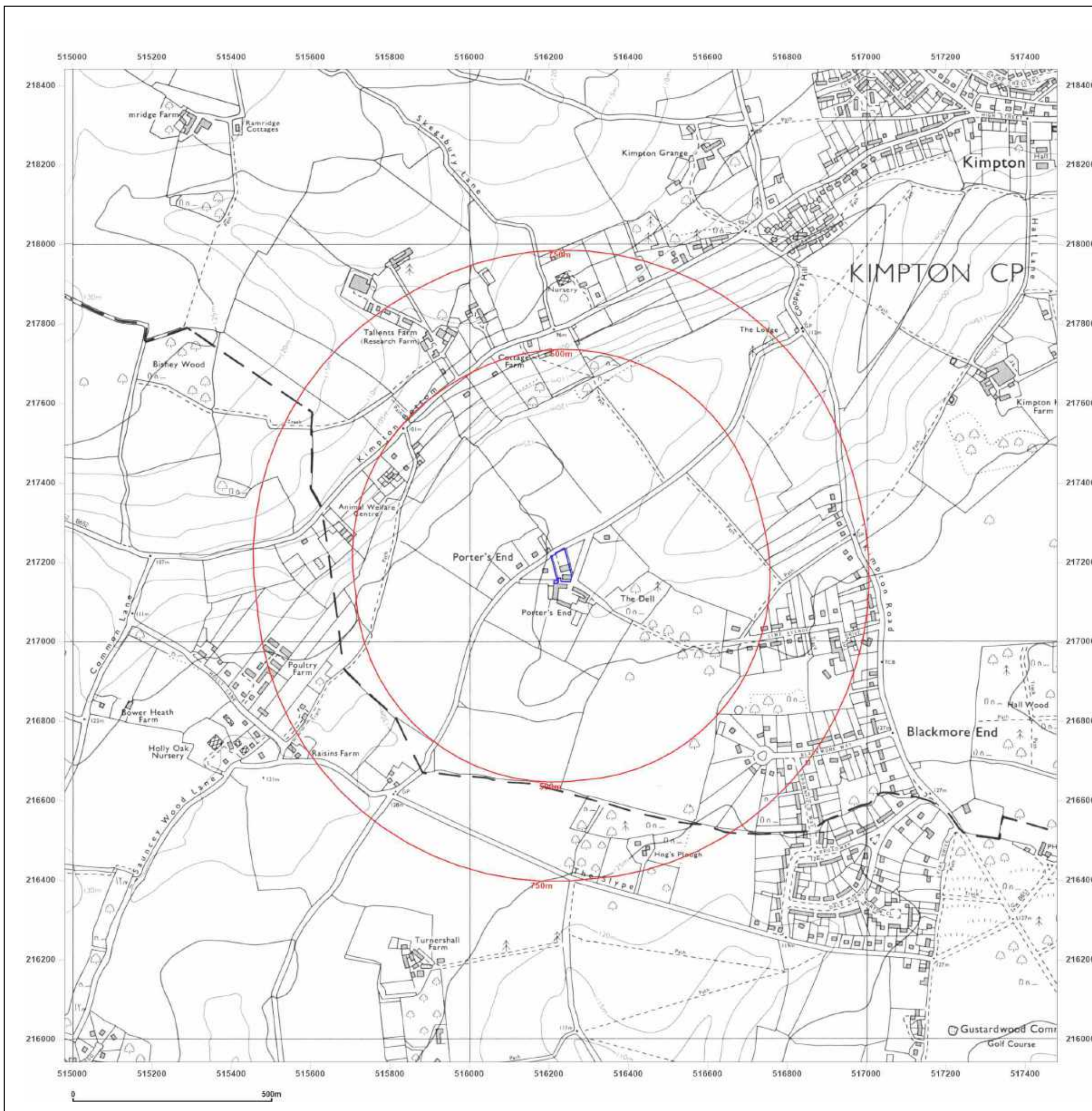


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Site Details:

PORTERS END LANE, KIMPTON,
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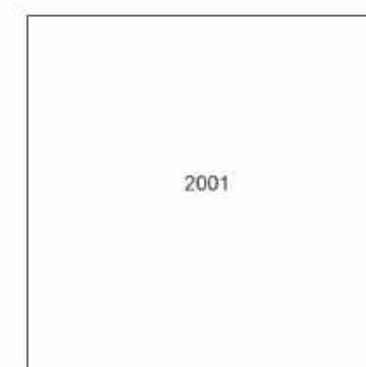
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Grid Ref: 516230, 217191

Map Name: National Grid

Map date: 2001

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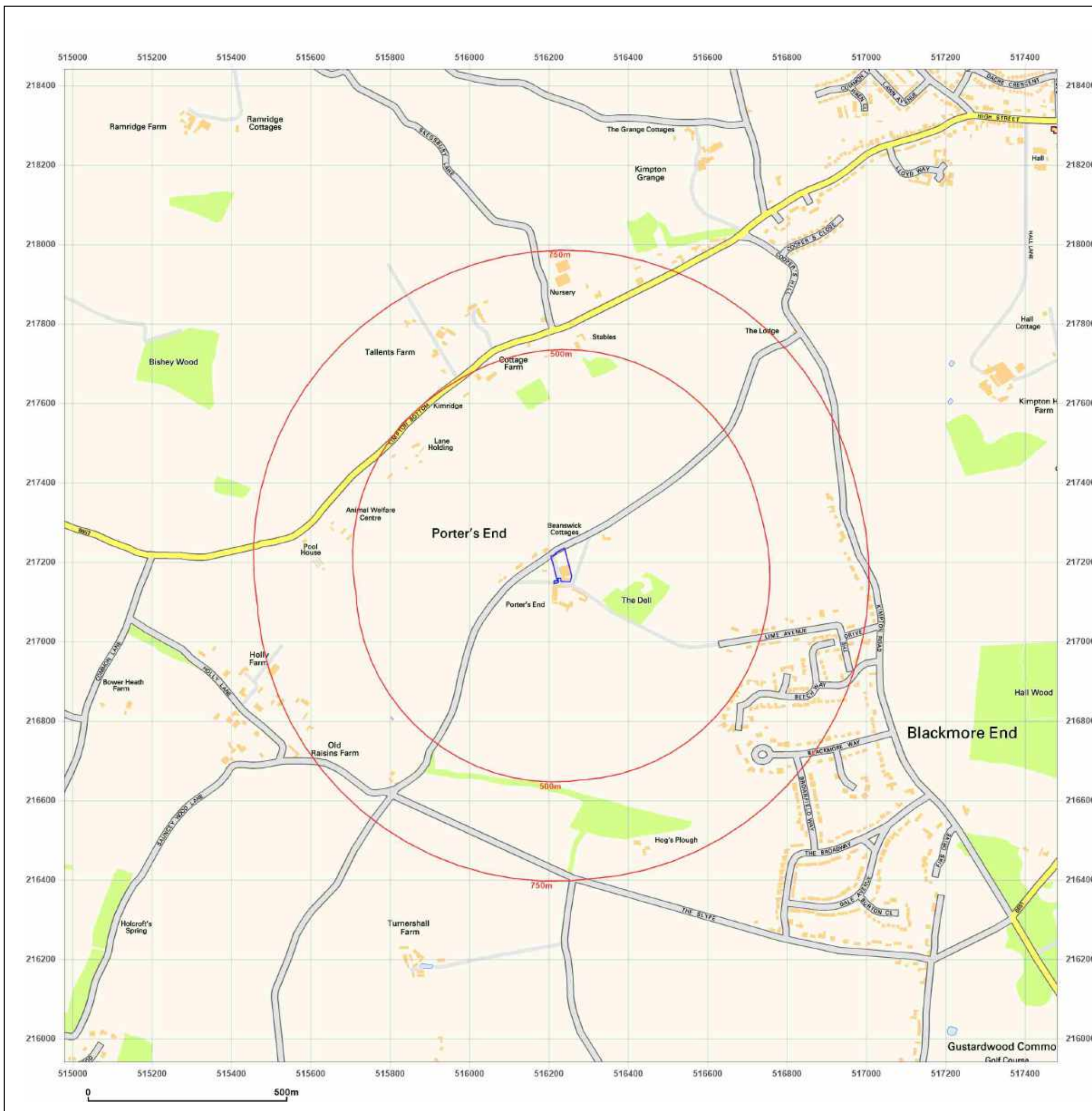


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Site Details:

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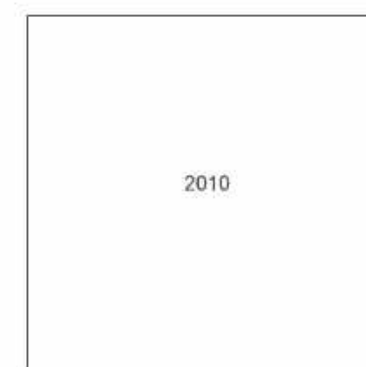
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Map Name: National Grid

Map date: 2010

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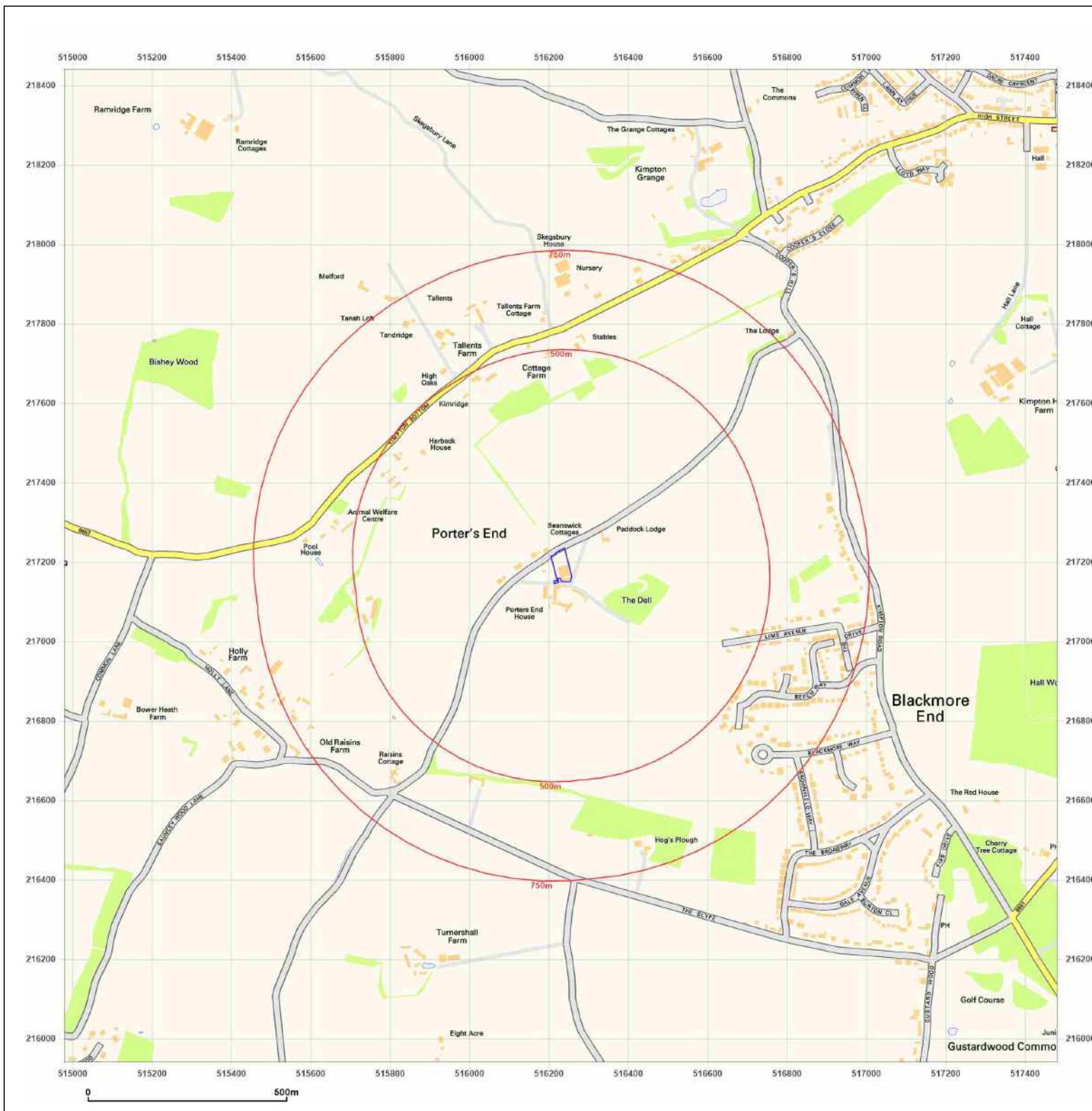


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Site Details:

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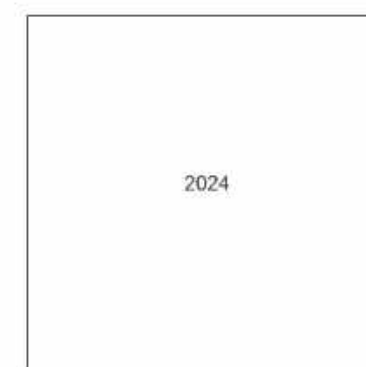
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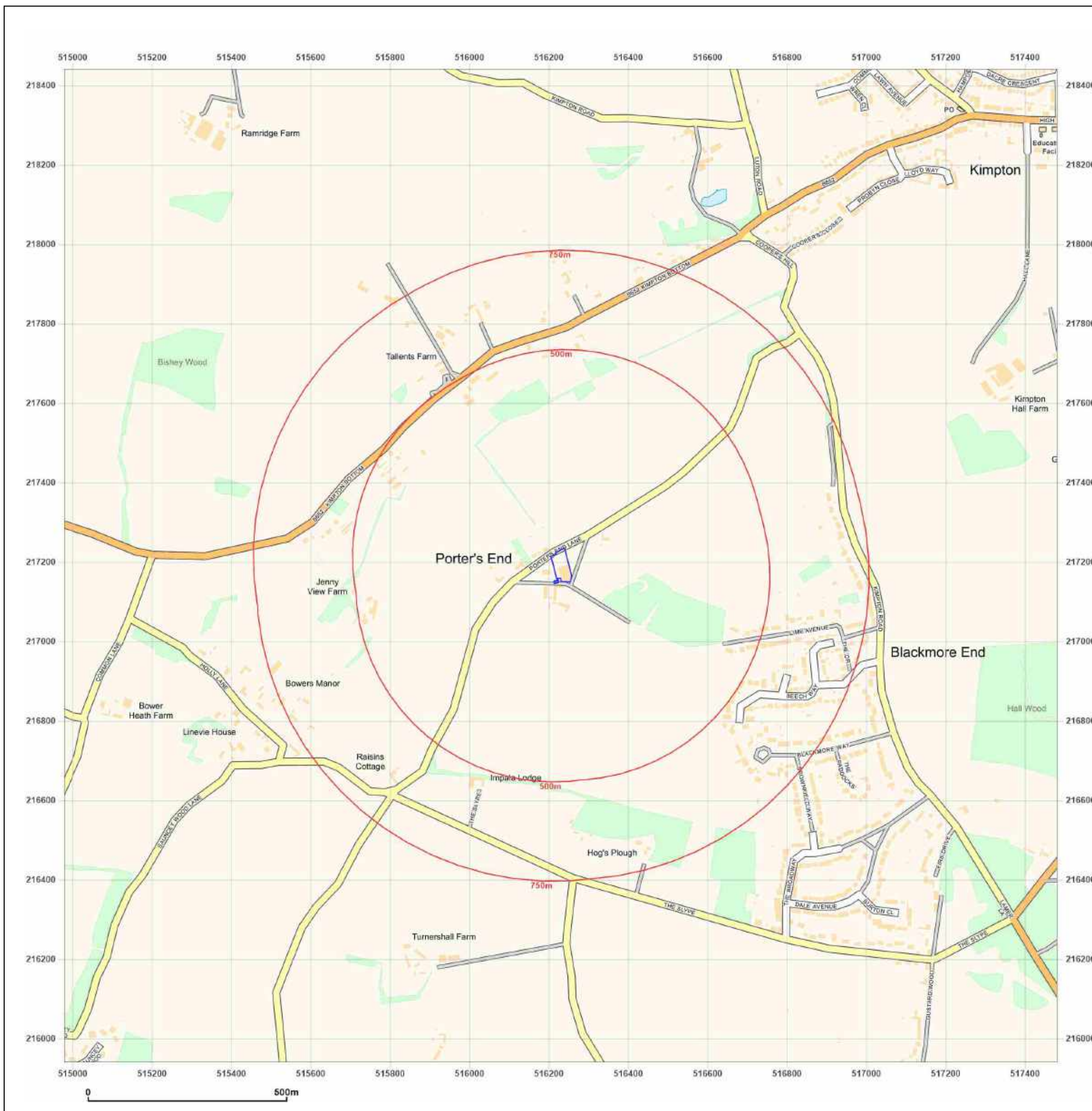


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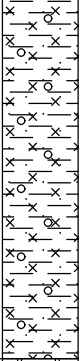
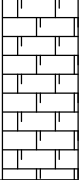
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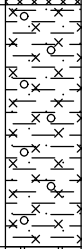
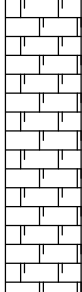
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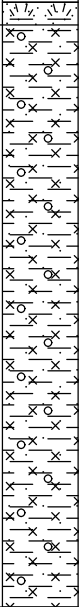
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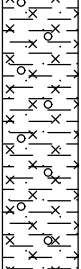
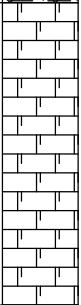


APPENDIX D: FIELD LOGS

			62a Western Road Tring, Hertfordshire HP23 4BB Tel. 01442 825570 Fax. 01442 891410			Site Porters End House Barns, Kimpton		Borehole Number BH1	
Excavation Method Window Sampler		Dimensions		Ground Level (mOD)		Client Ms Carly Procter		Job Number 21301	
		Location		Dates 15/05/2024 - 15/05/2024		Engineer Ryan Saint		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	DESCRIPTION	Legend	Water	Instr
0.30	J				0.18	MADE GROUND: Concrete slab.			
0.60	J					MADE GROUND: Gravelly silty CLAY with occasional brick fragments.			
1.00	PP1.1 = 480kPa SPT N=11		1,1/3,3,3,2		(2.55)	Very stiff brown slightly sandy silty gravelly CLAY. Gravels are fine to coarse sub angular to sub rounded flints.			
2.00	SPT N=12		2,2/3,3,3,3						
3.00	SPT N=6		1,2/2,2,1,1		2.80 (1.20)	White CHALK (grade Dm).			
4.00	SPT N=12		2,3/3,2,3,4		4.00	Complete at 4.00m			
Remarks PP = Pocket Penetrometer Groundwater Not Encountered							Scale (approx) 1:50	Logged By RS	Figure Number 21301.BH1

WDE consulting				62a Western Road Tring, Hertfordshire HP23 4BB Tel. 01442 825570 Fax. 01442 891410		Site Porters End House Barns, Kimpton		Borehole Number BH2	
Excavation Method Window Sampler		Dimensions		Ground Level (mOD)		Client Ms Carly Procter		Job Number 21301	
		Location				Engineer Ryan Saint		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	DESCRIPTION	Legend	Water	Instr
0.80	J C/D PP2.1 = 300kPa SPT N=8		1,2/2,2,2,2		(0.40)	MADE GROUND: Slightly gravelly clay with red brick fragments.			
1.00-2.00					0.40	Stiff to very stiff brown/orange slightly silty sandy gravelly CLAY. Gravels are fine to coarse sub rounded to sub angular.			
2.00-3.00	C/D PP2.2 = 400kPa SPT N=4		1,1/1,1,1,1		(1.60)	White CHALK (grade Dm).			
3.00	D SPT N=5		1,0/0,1,2,2		2.00				
4.00	D SPT N=6		1,1/2,2,1,1		4.00	Complete at 4.00m			
Remarks PP = Pocket Penetrometer Groundwater Not Encountered							Scale (approx)	Logged By	
							1:50	RS	
							Figure Number		
						21301.BH2			

			62a Western Road Tring, Hertfordshire HP23 4BB Tel. 01442 825570 Fax. 01442 891410			Site Porters End House Barns, Kimpton		Borehole Number BH3	
Excavation Method Window Sampler		Dimensions		Ground Level (mOD)		Client Ms Carly Procter		Job Number 21301	
		Location		Dates 15/05/2024 - 15/05/2024		Engineer Ryan Saint		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	DESCRIPTION	Legend	Water	Instr
0.80	J				0.15	TOPSOIL with rootlets.			
1.00-2.00	C/D PP3.1 = 275kPa SPT N=26		2,2/4,7,7,8			Stiff to very stiff brown/orange slightly silty sandy gravelly CLAY. Gravels are fine to coarse sub angular to sub rounded flints.			
						1.00 - 2.00 Chalk fragments present			
2.00-3.00	C/D PP3.2 = 300kPa SPT N=11		2,2/2,3,3,3		(3.85)				
3.00	D PP3.3 = 450kPa SPT N=8		4,3/3,2,2,1						
4.00	D PP3.5 = 300kPa SPT N=9	4.00	Water Strike at 4.00m 2,2/2,3,2,2		4.00	Complete at 4.00m			
Remarks							Scale (approx) 1:50	Logged By RS	
							Figure Number 21301.BH3		

			62a Western Road Tring, Hertfordshire HP23 4BB Tel. 01442 825570 Fax. 01442 891410			Site Porters End House Barns, Kimpton		Borehole Number BH4	
Excavation Method Window Sampler		Dimensions		Ground Level (mOD)		Client Ms Carly Procter		Job Number 21301	
		Location		Dates 15/05/2024 - 15/05/2024		Engineer Ryan Saint		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	DESCRIPTION	Legend	Water	Instr
0.80	J				0.15	TOPSOIL with occasional rootlets.			
1.00-2.00	C/D PP4.1 = 250kPa SPT N=11		1,1/3,3,3,2		(1.85)	Very stiff orange/brown slightly sandy silty gravelly CLAY. Gravels are fine to coarse angular to sub angular flints.			
2.00-3.00	C/D SPT N=12		2,2/3,3,3,3		2.00	White CHALK (grade Dm).			
3.00	D SPT N=6		1,2/2,2,1,1		(2.00)				
3.50	D								
4.00	D SPT N=12		2,3/3,2,3,4		4.00	Complete at 4.00m			
Remarks PP = Pocket Penetrometer Groundwater Not Encountered							Scale (approx) 1:50	Logged By RS	Figure Number 21301.BH4

APPENDIX E: ANALYTICAL TEST RESULTS

Chemtest WDE Standard QRA Suite

	No. of Samples	Unit	Target Concentration	Source	Min	Max	No. That Exceed	ACH Lab	Deviating	Deviating	Deviating	Deviating																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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WDE Consulting Ltd
62a Western Road
Tring
Hertfordshire
HP23 4BB

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01442 825570

e: rsaint@wdeconsulting.co.uk
Results@wdeconsulting.co.uk

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 24-020136

Project / Site name:	Porters End Barns, Hitchin	Samples received on:	17/05/2024
Your job number:	21301	Samples instructed on/ Analysis started on:	17/05/2024
Your order number:	24-210	Analysis completed by:	27/05/2024
Report Issue Number:	1	Report issued on:	27/05/2024
Samples Analysed:	4 soil samples		

Signed: _____

Anna Goc
PL Head of Reporting Team
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 24-020136
Project / Site name: Porters End Barns, Hitchin
Your Order No: 24-210

Lab Sample Number				201886	201887	201888	201889
Sample Reference				BH1	BH2	BH3	BH4
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.60	0.30	0.40	0.50
Date Sampled				Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status	

Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	11	8.8	13	8.6
Total mass of sample received	kg	0.1	NONE	0.8	0.8	0.8	0.8

Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	MBI	MBI	MBI	MBI

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	8.6	8.1	8.1	7.5
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO ₄	%	0.005	MCERTS	0.058	0.083	0.029	0.147
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	280	380	100	530
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	139	191	50.4	263
Sulphide	mg/kg	1	MCERTS	4.3	6.3	10	< 1.0
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	0.4	0.9	0.5	1.2

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	0.16	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	0.47	< 0.05	0.14
Anthracene	mg/kg	0.05	MCERTS	< 0.05	0.35	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	3.2	< 0.05	0.67
Pyrene	mg/kg	0.05	MCERTS	< 0.05	3.8	< 0.05	0.73
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	2.8	< 0.05	0.5
Chrysene	mg/kg	0.05	MCERTS	< 0.05	2.6	< 0.05	0.48
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	4.4	< 0.05	0.77
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	1.6	< 0.05	0.26
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	4	< 0.05	0.62
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	2.3	< 0.05	0.38
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.77	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	2.6	< 0.05	0.44

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	< 0.80	28.9	< 0.80	5
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Analytical Report Number: 24-020136
 Project / Site name: Porters End Barns, Hitchin
 Your Order No: 24-210

Lab Sample Number				201886	201887	201888	201889
Sample Reference				BH1	BH2	BH3	BH4
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.60	0.30	0.40	0.50
Date Sampled				Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	23	29	22	28
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.8	0.91	1.8	0.93
Boron (water soluble)	mg/kg	0.2	MCERTS	0.8	0.4	1.1	0.5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	51	25	47	24
Copper (aqua regia extractable)	mg/kg	1	MCERTS	22	18	30	20
Lead (aqua regia extractable)	mg/kg	1	MCERTS	25	51	27	53
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	37	30	36	33
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	77	49	71	46
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	74	120	69	96

Petroleum Hydrocarbons

TPHCWG - Aliphatic >C5 - C6 HS_1D_AL	mg/kg	0.02	NONE	< 0.020	< 0.020	< 0.020	< 0.020
TPHCWG - Aliphatic >C6 - C8 HS_1D_AL	mg/kg	0.02	NONE	< 0.020	< 0.020	< 0.020	< 0.020
TPHCWG - Aliphatic >C8 - C10 HS_1D_AL	mg/kg	0.05	NONE	< 0.050	< 0.050	< 0.050	< 0.050
TPHCWG - Aliphatic >C10 - C12 EH_CU_1D_AL	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
TPHCWG - Aliphatic >C12 - C16 EH_CU_1D_AL	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0
TPHCWG - Aliphatic >C16 - C21 EH_CU_1D_AL	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0
TPHCWG - Aliphatic >C21 - C35 EH_CU_1D_AL	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0
TPHCWG - Aliphatic >C35 - C44 EH_CU_1D_AL	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4
TPHCWG - Aliphatic >C5 - C35 EH_CU+HS_1D_AL	mg/kg	10	NONE	< 10	< 10	< 10	< 10
TPHCWG - Aliphatic >C5 - C44 EH_CU+HS_1D_AL	mg/kg	10	NONE	< 10	< 10	< 10	< 10

TPHCWG - Aromatic >EC5 - EC7 HS_1D_AR	mg/kg	0.01	NONE	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aromatic >EC7 - EC8 HS_1D_AR	mg/kg	0.01	NONE	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aromatic >EC8 - EC10 HS_1D_AR	mg/kg	0.05	NONE	< 0.050	< 0.050	< 0.050	< 0.050
TPHCWG - Aromatic >EC10 - EC12 EH_CU_1D_AR	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
TPHCWG - Aromatic >EC12 - EC16 EH_CU_1D_AR	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0
TPHCWG - Aromatic >EC16 - EC21 EH_CU_1D_AR	mg/kg	10	MCERTS	< 10	20	< 10	< 10
TPHCWG - Aromatic >EC21 - EC35 EH_CU_1D_AR	mg/kg	10	MCERTS	< 10	93	< 10	< 10
TPHCWG - Aromatic >EC35 - EC44 EH_CU_1D_AR	mg/kg	8.4	NONE	< 8.4	17	< 8.4	< 8.4
TPHCWG - Aromatic >EC5 - EC35 EH_CU+HS_1D_AR	mg/kg	10	NONE	< 10	110	< 10	< 10
TPHCWG - Aromatic >EC5 - EC44 EH_CU+HS_1D_AR	mg/kg	10	NONE	< 10	130	< 10	< 10

VOCs

MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0
Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
p & m-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
o-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number : 24-020136

Project / Site name: Porters End Barns, Hitchin

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
201886	BH1	None Supplied	0.6	Brown clay and sand with gravel
201887	BH2	None Supplied	0.3	Brown loam and clay with gravel and vegetation
201888	BH3	None Supplied	0.4	Brown clay and loam
201889	BH4	None Supplied	0.5	Brown clay and loam with gravel and vegetation

Analytical Report Number : 24-020136

Project / Site name: Porters End Barns, Hitchin

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode	In-house method	L010	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES	In-house method based on Second Site Properties version 3	L038B	D	MCERTS
Total sulphate (as SO ₄ in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES	In-house method	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
BTEX and/or Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	MCERTS
Total petroleum hydrocarbons with carbon banding by GC-FID/GC-MS HS in soil	Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS with carbon banding aliphatic and aromatic	In-house method	L076B/L088	D/W	MCERTS
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS

Analytical Report Number : 24-020136

Project / Site name: Porters End Barns, Hitchin

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099	D	MCERTS

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
-	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Sample Deviation Report



Analytical Report Number : 24-020136

Project / Site name: Porters End Barns, Hitchin

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis. Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
BH1	N/A	S	201886	a	Asbestos identification in Soil	A001B	a
BH1	N/A	S	201886	a	BTEX and/or Volatile organic compounds in soil	L073B	a
BH1	N/A	S	201886	a	Boron, water soluble, in soil	L038B	a
BH1	N/A	S	201886	a	Metals in soil by ICP-OES	L038B	a
BH1	N/A	S	201886	a	Monohydric phenols in soil	L080	a
BH1	N/A	S	201886	a	Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in soil	L064B	a
BH1	N/A	S	201886	a	Sulphate, water soluble, in soil (16hr extraction)	L038B	a
BH1	N/A	S	201886	a	Sulphide in soil	L010	a
BH1	N/A	S	201886	a	Total cyanide in soil	L080	a
BH1	N/A	S	201886	a	Total organic carbon (Automated) in soil	L009B	a
BH1	N/A	S	201886	a	Total petroleum hydrocarbons with carbon banding by GC-FID/GC-MS HS in soil	L076B/L088	a
BH1	N/A	S	201886	a	Total sulphate (as SO4 in soil)	L038B	a
BH1	N/A	S	201886	a	pH in soil (automated)	L099	a
BH2	N/A	S	201887	a	Asbestos identification in Soil	A001B	a
BH2	N/A	S	201887	a	BTEX and/or Volatile organic compounds in soil	L073B	a
BH2	N/A	S	201887	a	Boron, water soluble, in soil	L038B	a
BH2	N/A	S	201887	a	Metals in soil by ICP-OES	L038B	a
BH2	N/A	S	201887	a	Monohydric phenols in soil	L080	a
BH2	N/A	S	201887	a	Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in soil	L064B	a
BH2	N/A	S	201887	a	Sulphate, water soluble, in soil (16hr extraction)	L038B	a
BH2	N/A	S	201887	a	Sulphide in soil	L010	a
BH2	N/A	S	201887	a	Total cyanide in soil	L080	a
BH2	N/A	S	201887	a	Total organic carbon (Automated) in soil	L009B	a
BH2	N/A	S	201887	a	Total petroleum hydrocarbons with carbon banding by GC-FID/GC-MS HS in soil	L076B/L088	a
BH2	N/A	S	201887	a	Total sulphate (as SO4 in soil)	L038B	a
BH2	N/A	S	201887	a	pH in soil (automated)	L099	a
BH3	N/A	S	201888	a	Asbestos identification in Soil	A001B	a
BH3	N/A	S	201888	a	BTEX and/or Volatile organic compounds in soil	L073B	a
BH3	N/A	S	201888	a	Boron, water soluble, in soil	L038B	a
BH3	N/A	S	201888	a	Metals in soil by ICP-OES	L038B	a
BH3	N/A	S	201888	a	Monohydric phenols in soil	L080	a
BH3	N/A	S	201888	a	Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in soil	L064B	a
BH3	N/A	S	201888	a	Sulphate, water soluble, in soil (16hr extraction)	L038B	a
BH3	N/A	S	201888	a	Sulphide in soil	L010	a
BH3	N/A	S	201888	a	Total cyanide in soil	L080	a
BH3	N/A	S	201888	a	Total organic carbon (Automated) in soil	L009B	a
BH3	N/A	S	201888	a	Total petroleum hydrocarbons with carbon banding by GC-FID/GC-MS HS in soil	L076B/L088	a
BH3	N/A	S	201888	a	Total sulphate (as SO4 in soil)	L038B	a
BH3	N/A	S	201888	a	pH in soil (automated)	L099	a
BH4	N/A	S	201889	a	Asbestos identification in Soil	A001B	a
BH4	N/A	S	201889	a	BTEX and/or Volatile organic compounds in soil	L073B	a
BH4	N/A	S	201889	a	Boron, water soluble, in soil	L038B	a
BH4	N/A	S	201889	a	Metals in soil by ICP-OES	L038B	a
BH4	N/A	S	201889	a	Monohydric phenols in soil	L080	a
BH4	N/A	S	201889	a	Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in soil	L064B	a
BH4	N/A	S	201889	a	Sulphate, water soluble, in soil (16hr extraction)	L038B	a
BH4	N/A	S	201889	a	Sulphide in soil	L010	a
BH4	N/A	S	201889	a	Total cyanide in soil	L080	a
BH4	N/A	S	201889	a	Total organic carbon (Automated) in soil	L009B	a
BH4	N/A	S	201889	a	Total petroleum hydrocarbons with carbon banding by GC-FID/GC-MS HS in soil	L076B/L088	a
BH4	N/A	S	201889	a	Total sulphate (as SO4 in soil)	L038B	a
BH4	N/A	S	201889	a	pH in soil (automated)	L099	a



WDE Consulting Ltd
62a Western Road
Tring
Hertfordshire
HP23 4BB

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01442 825570

e: rsaint@wdeconsulting.co.uk
Results@wdeconsulting.co.uk

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 24-020138

Project / Site name:	Porters End Barns, Hitchin	Samples received on:	17/05/2024
Your job number:	21301	Samples instructed on/ Analysis started on:	17/05/2024
Your order number:	24-210	Analysis completed by:	27/05/2024
Report Issue Number:	1	Report issued on:	27/05/2024
Samples Analysed:	10:1 WAC sample		

Signed: _____

Anna Goc
PL Head of Reporting Team
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

i2 Analytical

7 Woodshots Meadow
Croxley Green Business Park
Watford, WD18 8YS

Telephone: 01923 225404
Fax: 01923 237404
email:reception@i2analytical.com

Waste Acceptance Criteria Analytical Results

Report No:	24-020138						
				Client: WDENV			
Location	Porters End Barns, Hitchin						
Lab Reference (Sample Number)	201894			Landfill Waste Acceptance Criteria			
Sampling Date	/ /			Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID	BH1						
Depth (m)	0.30						
Solid Waste Analysis							
TOC (%)**	0.5			3%	5%	6%	
Loss on Ignition (%) **	3.1			--	--	10%	
BTEX (µg/kg) **	< 5.0			6000	--	--	
Sum of PCBs (mg/kg) **	< 0.007			1	--	--	
Mineral Oil (mg/kg) EH, ID, CU, AL	< 10			500	--	--	
Total PAH (WAC-17) (mg/kg)	11.4			100	--	--	
pH (units)**	9.5			--	>6	--	
Acid Neutralisation Capacity (mmol / kg)	16			--	To be evaluated	To be evaluated	
Eluate Analysis (BS EN 12457 - 2 preparation utilising end over end leaching procedure)		10:1		10:1	Limit values for compliance leaching test		
		mg/l		mg/kg		using BS EN 12457-2 at L/S 10 l/kg (mg/kg)	
Arsenic *	0.00350			0.0350	0.5	2	25
Barium *	0.00564			0.0564	20	100	300
Cadmium *	< 0.000100			< 0.00100	0.04	1	5
Chromium *	0.0031			0.031	0.5	10	70
Copper *	0.011			0.11	2	50	100
Mercury *	< 0.000500			< 0.00500	0.01	0.2	2
Molybdenum *	0.00249			0.0249	0.5	10	30
Nickel *	0.0022			0.022	0.4	10	40
Lead *	< 0.0010			< 0.010	0.5	10	50
Antimony *	< 0.0017			< 0.017	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.0015			0.015	4	50	200
Chloride *	3.2			32	800	15000	25000
Fluoride*	0.56			5.6	10	150	500
Sulphate *	26			260	1000	20000	50000
TDS*	110			1100	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	13.7			137	500	800	1000
Leach Test Information							
Stone Content (%)	50.9						
Sample Mass (kg)	0.9						
Dry Matter (%)	92						
Moisture (%)	7.8						
Results are expressed on a dry weight basis, after correction for moisture content where applicable.							
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation							

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.
This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.



Analytical Report Number : 24-020138

Project / Site name: Porters End Barns, Hitchin

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
201894	BH1	None Supplied	0.3	Brown sandy loam with brick and stones

Analytical Report Number : 24-020138

Project / Site name: Porters End Barns, Hitchin

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
pH at 20°C in soil	Determination of pH in soil by addition of water followed by electrometric measurement	In-house method	L005B	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
PCB's By GC-MS in soil	Determination of PCB by extraction with hexane followed by GC-MS	In-house method based on USEPA 8082	L027B	D	MCERTS
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by electrometric measurement	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L031B	W	ISO 17025
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1 ratio with a buffer solution followed by Ion Selective Electrode	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination	L033B	W	ISO 17025
Dissolved organic carbon 10:1 WAC	Determination of dissolved organic carbon in leachate by TOC/DOC NDIR Analyser	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037B	W	NONE
Metals in leachate by ICP-OES	Determination of metals in leachate by acidification followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
Sample Preparation		In-house method	L043B	W	NONE
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe	In-house method based on Guidance on Sampling and Testing of Wastes to Meet Landfill Waste Acceptance	L046B	W	NONE
Loss on ignition of soil @ 450°C	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	In-house method	L047	D	MCERTS
Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
BTEX and/or Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	MCERTS
Total petroleum hydrocarbons by GC-FID/GC-MS HS in soil	Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS	In-house method	L076B/L088	D/W	NONE

Analytical Report Number : 24-020138

Project / Site name: Porters End Barns, Hitchin

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Monohydric phenols 10:1 WAC	Determination of phenols in leachate by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	ISO 17025
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser	In-house based on MEWAM Method ISBN 0117516260	L082B	W	ISO 17025
WAC Leachate 10:1		In-house method	L043B	W	NONE

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
-	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Sample Deviation Report



Analytical Report Number : 24-020138

Project / Site name: Porters End Barns, Hitchin

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis. Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
BH1	N/A	L	201894	a	Chloride 10:1 WAC	L082B	a
BH1	N/A	L	201894	a	Dissolved organic carbon 10:1 WAC	L037B	a
BH1	N/A	L	201894	a	Fluoride 10:1 WAC	L033B	a
BH1	N/A	L	201894	a	Metals in leachate by ICP-OES	L039B	a
BH1	N/A	L	201894	a	Monohydric phenols 10:1 WAC	L080	a
BH1	N/A	L	201894	a	Sample Preparation	L043B	a
BH1	N/A	L	201894	a	Total dissolved solids 10:1 WAC	L031B	a
BH1	N/A	L	201894	a	WAC Leachate 10:1	L043B	a
BH1	N/A	S	201894	a	Acid neutralisation capacity of soil	L046B	a
BH1	N/A	S	201894	a	BTEX and/or Volatile organic compounds in soil	L073B	a
BH1	N/A	S	201894	a	Loss on ignition of soil @ 450°C	L047	a
BH1	N/A	S	201894	a	PCB's By GC-MS in soil	L027B	a
BH1	N/A	S	201894	a	Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in soil	L064B	a
BH1	N/A	S	201894	a	Total organic carbon (Automated) in soil	L009B	a
BH1	N/A	S	201894	a	Total petroleum hydrocarbons by GC-FID/GC-MS HS in soil	L076B/L088	a
BH1	N/A	S	201894	a	pH at 20°C in soil	L005B	a

Category or Danger	Xi	T+	T	Xn	T	T+	Car. Cat 1 / 2		Carc. Cat 3	C	Repr. Cat 1 / 2		Muta. Cat 1 / 2	N	
Substance	Irritant	Harmful			Toxic		Carcinogenic			Corrosive	Teratogenic		Mutagenic	Ecotoxic	
Risk Phase	R36-38	R26-28, R39	R23-25, R39, R48	R20-22, 48,65,68	R23-25, R39, R48	R26-28, R39	R45	R49	R40	R35	R60 / R61	R62 / R63	R46	R50	R53
Hazard	H4	H5	H5	H5	H6	H6	H7			H8	H10		H11	H14	H14
Naphthalene				0.0000001					0.0000001					0.0000001	0.0000001
Acenaphthylene	0.000016			0.000016											
Acenaphthene	0.0000001														
Fluorene															
Phenanthrene	0.000047			0.000047					0.000047						
Anthracene	0.000035													0.000035	0.000035
Fluoranthene	0.00032			0.00032					0.00032						
Pyrene	0.00038			0.00038											
Benzo(a)anthracene															
Chrysene				0.00026			0.00026						0.00026		
Benzo(b)fluoranthene							0.00044							0.00044	0.00044
Benzo(k)fluoranthene				0.00016			0.00016								
Benzo(a)pyrene							0.0004				0.0004		0.0004	0.0004	0.0004
Indeno(1,2,3-cd)pyrene															
Dibenz(a,h)anthracene							0.000077							0.000077	0.000077
Benzo(ghi)perylene														0.00026	0.00026
Arsenic			0.0029		0.0029									0.0029	0.0029
Boron	0.00004			0.00004											
Cadmium	0.0000001	0.0000001	0.0000001		0.0000001	0.0000001	0.0000001								
Chromium										0.0025			0.0025		
Copper				0.0018										0.0018	0.0018
Lead				0.0051					0.0051		0.0051	0.0051		0.0051	0.0051
Mercury		0.0000001				0.0000001								0.0000001	0.0000001
Nickel							0.003	0.003	0.003						
Selenium			0.0000001		0.0000001										0.0000001
Zinc	0.012			0.012											
Benzene	0.0000001		0.0000001	0.0000001			0.0000001								
Toluene				0.0000001											
Ethylbenzene				0.0000001	0.0000001						0.0000001	0.0000001			
p & m-xylene	0.0000001			0.0000001											
o-xylene	0.0000001			0.0000001											
MTBE (Methyl Tertiary Butyl Ethel	0.0000001														
PRO C6-C10				0.0000006			0.0000006							0.0000006	0.0000006
DRO C10-C25				0.0113006					0.0113006					0.0113006	0.0113006
Total (or greatest)	0.0128	0.0000002	0.0029	0.0314	0.0029	0.0000002	0.0030	0.0030	0.0113	0.0025	0.0051	0.0051	0.0025	0.0223	0.0223
Threshold (%)	20.0	0.1	3	25.0	3.0	0.1	0.1	0.1	1.0	1.0	0.5	5.0	0.1	25.00	25.00
Exceeded? (y/n)	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

Category or Danger	Xi	T+	T	Xn	T	T+	Car. Cat 1 / 2		Carc. Cat 3	C	Repr. Cat 1 / 2		Muta. Cat 1 / 2	N	
Substance	Irritant	Harmful			Toxic		Carcinogenic			Corrosive	Teratogenic		Mutagenic	Ecotoxic	
Risk Phase	R36-38	R26-28, R39	R23-25, R39, R48	R20-22, 48,65,68	R23-25, R39, R48	R26-28, R39	R45	R49	R40	R35	R60 / R61	R62 / R63	R46	R50	R53
Hazard	H4	H5	H5	H5	H6	H6	H7			H8	H10		H11	H14	H14
Benzo[a]pyrene							4						0.0004		
BaP Concentration in TPH													5.20004E-08		
BaP Exceeded (y/n)													N		
TPH (EC5 - EC35)				0.0130001			130.001				0.0130001		0.0130001	0.0130001	0.0130001
Threshold (%)				25.0			Y				5.0		0.1	2.50	2.50
Hazardous Properties				N			N				N		N	N	N

TPH has to be >1000mg otherwise non-haz

Category or Danger	Xi	T+	T	Xn	T	T+	Car. Cat 1 / 2		Carc. Cat 3	Car. Cat 1a	Repr. Cat 1 / 2		Muta. Cat 1 / 2	N	
Substance	Irritant	Harmful			Toxic		Carcinogenic				Teratogenic	Mutagenic		Ecotoxic	
Risk Phase		R26-28, R39	R23-25, R39, R48	R20-22, 48,65,68	R23-25, R39, R48	R26-28, R39	R45	R49	R40	RE1	R60 / R61	R62 / R63	R46	R50	R53
Hazard	H4	H5	H5	H5	H6	H6	H7			H350	H10		H11	H14	H14
Asbestos										0					
Threshold (%)										0.1					
Hazardous Properties										N					

APPENDIX F: GEOTECHNICAL TEST RESULTS

					Summary of Natural Moisture Content, Liquid Limit and Plastic Limit Results						
Job No.		Project Name				Programme					
35364		Porters End Barns, Hitchin				Samples received		17/05/2024			
Project No.		Client				Schedule received		17/05/2024			
21301		WDE Consulting				Project started		20/05/2024			
						Testing Started		29/05/2024			
Hole No.	Sample				Soil Description	NMC %	Passing 425µm %	LL %	PL %	PI %	Remarks
	Ref	Top m	Base m	Type							
BH2	-	1.00	2.00	C	High strength orangish brown slightly gravelly slightly sandy silty CLAY with occasional black flecks (gravel is fmc and angular to sub-angular)	41					
BH2	-	1.00	-	D	Orangish brown silty CLAY with sandy patches, black carbonaceous specks and rare fm sub-angular gravel	41	98	110	42	68	
BH3	-	1.00	2.00	C	High strength orangish brown mottled brown slightly gravelly silty CLAY (gravel is fmc and angular)	26					
BH3	-	1.00	-	D	Reddish brown and orangish brown mottled silty CLAY with rare fm sub-angular gravel	30	98	79	29	50	
BH3	-	2.00	-	D	Orangish brown and reddish brown mottled slightly gravelly silty CLAY with soft white chalk patches (gravel is fm and sub-angular)	21	97	63	22	41	
BH3	-	3.00	-	D	Orangish brown slightly gravelly silty CLAY with occasional sandy patches (gravel is fmc and sub-angular flint)	24	70	59	23	36	
BH4	-	1.00	2.00	C	Extremely high strength orangish brown slightly gravelly slightly sandy silty CLAY with numerous black flecks (gravel is fmc and angular)	48					
BH4	-	1.00	-	D	Brown slightly gravelly silty CLAY with sandy patches (gravel is fmc and sub-angular flint)	39	95	98	40	58	
BH4	-	3.00	4.00	C	Off white slightly mottled brown slightly clayey putty CHALK with occasional fm intact chalk fragments	34					

	Test Methods: BS1377: Part 2: 1990: Natural Moisture Content : clause 3.2 Atterberg Limits: clause 4.3 and 5.0 <i>These results only apply to the items tested</i>	Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU Tel: 01923 711 288 Email: James@k4soils.com	Checked and Approved Initials J.P Date: 30/05/2024
	NOTE: The report shall not be reproduced except in full without authority of the laboratory		
	2519		Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

MSF-5-R1(b)



LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

Job No. 35364

Borehole/Pit No. BH2

Site Name Porters End Barns, Hitchin

Sample No. -

Project No. 21301 Client WDE Consulting

Depth Top m 1.00

Soil Description Orangish brown silty CLAY with sandy patches, black carbonaceous specks and rare fm sub-angular gravel

Depth Base m -

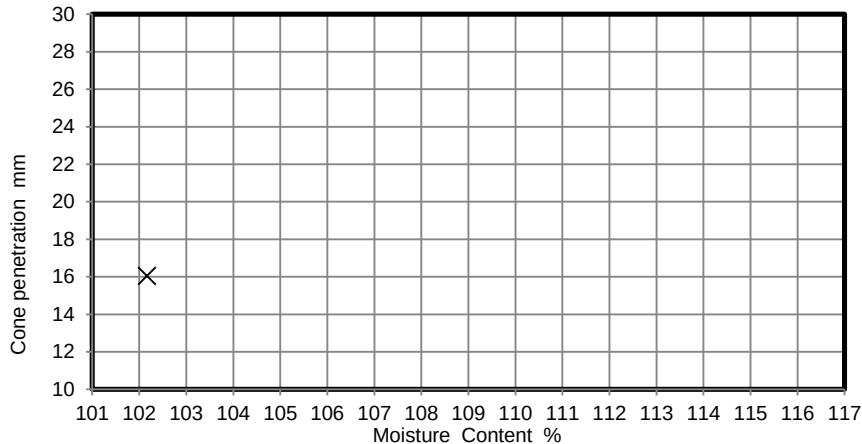
Sample Type D

Samples received 17/05/2024

Schedules received 17/05/2024

Project Started 20/05/2024

Date Tested 29/05/2024



NATURAL MOISTURE CONTENT

41

%

% PASSING 425µm SIEVE

98

%

LIQUID LIMIT

110

%

PLASTIC LIMIT

42

%

PLASTICITY INDEX

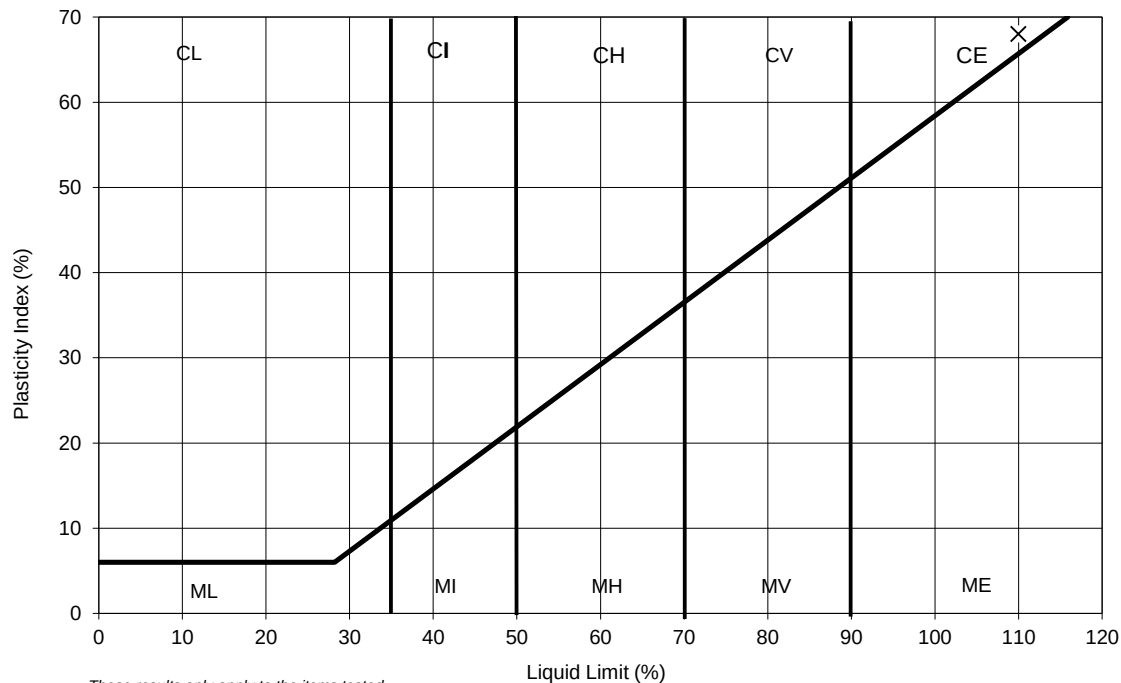
68

%

Remarks

Factors corresponding to the cone penetration and moisture content range in Table 1 (BS1377:1990 ; Part 2)

PLASTICITY INDEX



These results only apply to the items tested

NOTE: The report shall not be reproduced except in full without authority of the laboratory

TEST METHOD

BS1377: Part 2 :Clause 4.4 : 1990 Determination of the liquid limit by the cone penetrometer method

BS1377: Part 2 :Clause 5.0 : 1990: Determination of the plastic limit and plasticity index

BS1377: Part 2 :Clause 3.2 : 1990:Determination of the moisture content by the oven drying

Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU

Tel: 01923 711 288 Email: James@k4soils.com

Checked and Approved

Initials: J.P

Date: 30/05/2024

2519

Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

MSF-5 R2



LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

Job No. 35364

Borehole/Pit No. BH3

Site Name Porters End Barns, Hitchin

Sample No. -

Project No. 21301 Client WDE Consulting

Depth Top m 1.00

Soil Description

Reddish brown and orangish brown mottled silty CLAY with rare fm sub-angular gravel

Depth Base m -

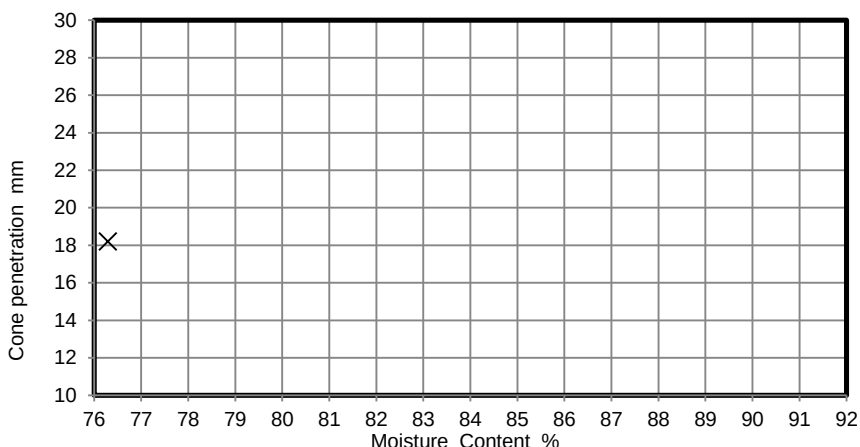
Sample Type D

Samples received 17/05/2024

Schedules received 17/05/2024

Project Started 20/05/2024

Date Tested 29/05/2024



NATURAL MOISTURE CONTENT

30

%

% PASSING 425µm SIEVE

98

%

LIQUID LIMIT

79

%

PLASTIC LIMIT

29

%

PLASTICITY INDEX

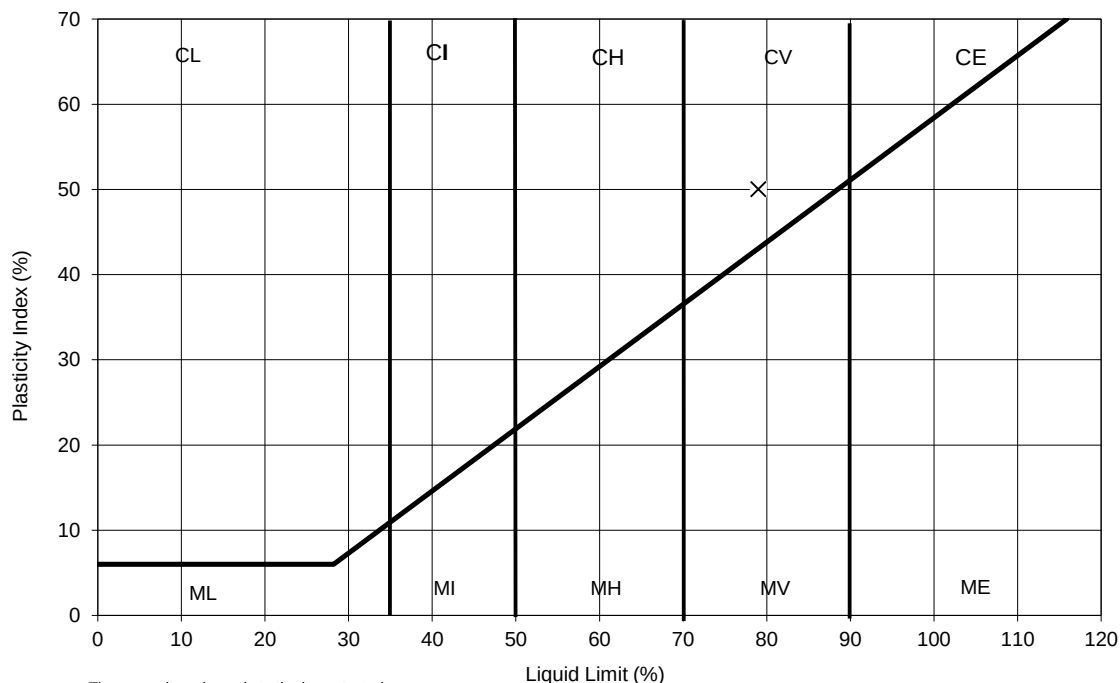
50

%

Remarks

Factors corresponding to the cone penetration and moisture content range in Table 1 (BS1377:1990 ; Part 2)

PLASTICITY INDEX



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TEST METHOD

BS1377: Part 2 :Clause 4.4 : 1990 Determination of the liquid limit by the cone penetrometer method

BS1377: Part 2 :Clause 5.0 : 1990: Determination of the plastic limit and plasticity index

BS1377: Part 2 :Clause 3.2 : 1990:Determination of the moisture content by the oven drying

Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU

Tel: 01923 711 288 Email: James@k4soils.com

Checked and Approved

Initials: J.P

Date: 30/05/2024



LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

Job No. 35364

Borehole/Pit No. BH3

Site Name Porters End Barns, Hitchin

Sample No. -

Project No. 21301 Client WDE Consulting

Depth Top m 2.00

Soil Description Orangish brown and reddish brown mottled slightly gravelly silty CLAY with soft white chalk patches (gravel is fm and sub-angular)

Depth Base m -

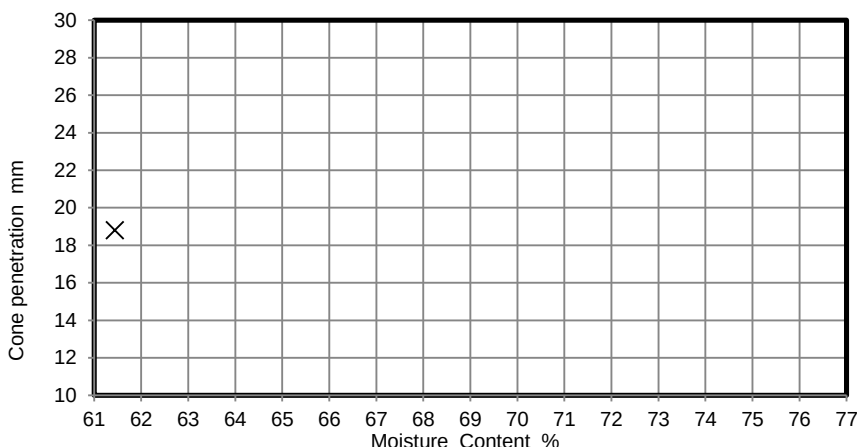
Sample Type D

Samples received 17/05/2024

Schedules received 17/05/2024

Project Started 20/05/2024

Date Tested 29/05/2024



NATURAL MOISTURE CONTENT

21

%

% PASSING 425µm SIEVE

97

%

LIQUID LIMIT

63

%

PLASTIC LIMIT

22

%

PLASTICITY INDEX

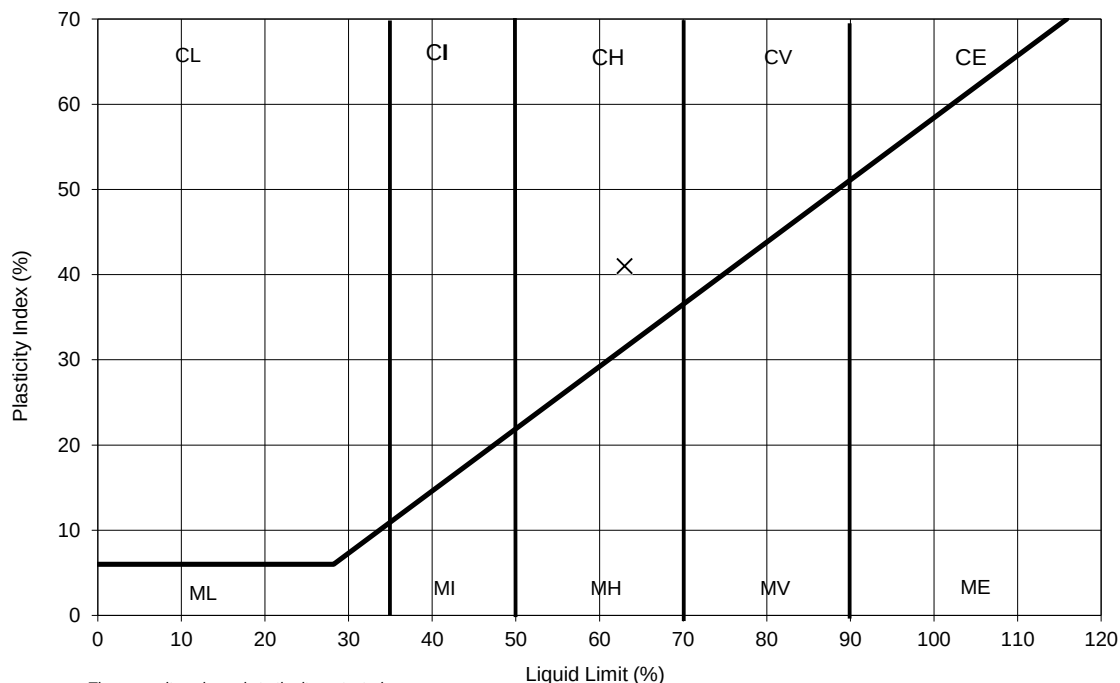
41

%

Remarks

Factors corresponding to the cone penetration and moisture content range in Table 1 (BS1377:1990 ; Part 2)

PLASTICITY INDEX



These results only apply to the items tested

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TEST METHOD

BS1377: Part 2 :Clause 4.4 : 1990 Determination of the liquid limit by the cone penetrometer method

BS1377: Part 2 :Clause 5.0 : 1990: Determination of the plastic limit and plasticity index

BS1377: Part 2 :Clause 3.2 : 1990:Determination of the moisture content by the oven drying

Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU

Tel: 01923 711 288 Email: James@k4soils.com

Checked and Approved

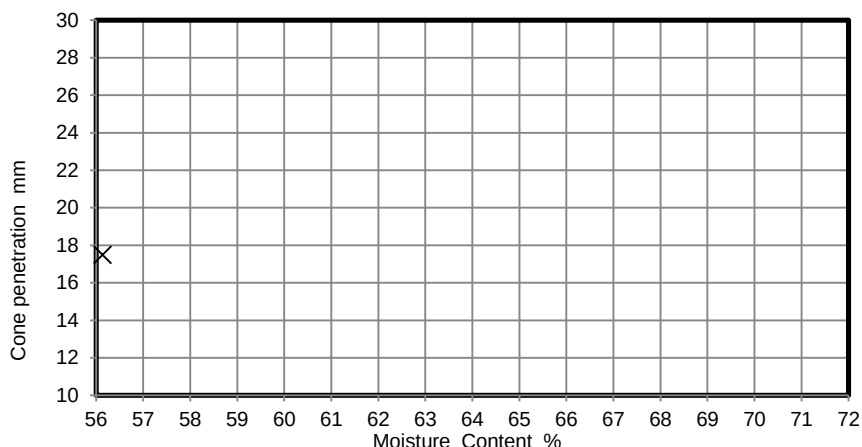
Initials: J.P

Date: 30/05/2024



LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

Job No.	35364		
	Borehole/Pit No.		
Site Name		Porters End Barns, Hitchin	Sample No.
Project No.		21301	Client
		WDE Consulting	Depth Top m
Soil Description	Orangish brown slightly gravelly silty CLAY with occasional sandy patches (gravel is fmc and sub-angular flint)		Depth Base m
			Sample Type
			Samples received
			Schedules received
			Project Started
			Date Tested

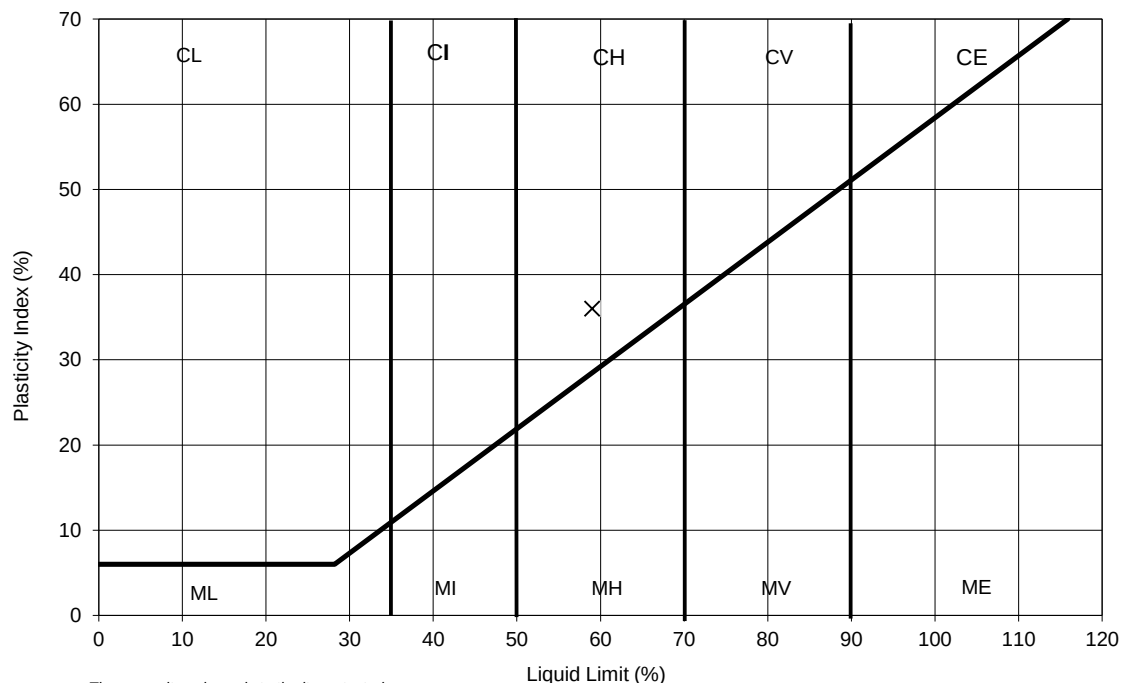


NATURAL MOISTURE CONTENT	24	%
% PASSING 425µm SIEVE	70	%
LIQUID LIMIT	59	%
PLASTIC LIMIT	23	%
PLASTICITY INDEX	36	%

Remarks

Factors corresponding to the cone penetration and moisture content range in Table 1 (BS1377:1990 ; Part 2)

PLASTICITY INDEX



These results only apply to the items tested

NOTE: The report shall not be reproduced except in full without authority of the laboratory



TEST METHOD

BS1377: Part 2 :Clause 4.4 : 1990 Determination of the liquid limit by the cone penetrometer method

BS1377: Part 2 :Clause 5.0 : 1990: Determination of the plastic limit and plasticity index

BS1377: Part 2 :Clause 3.2 : 1990:Determination of the moisture content by the oven drying

Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU

Tel: 01923 711 288 Email: James@k4soils.com

Checked and Approved

Initials: J.P

Date: 30/05/2024



LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

Job No. 35364

Borehole/Pit No. BH4

Site Name Porters End Barns, Hitchin

Sample No. -

Project No. 21301 Client WDE Consulting

Depth Top m 1.00

Soil Description Brown slightly gravelly silty CLAY with sandy patches (gravel is fmc and sub-angular flint)

Depth Base m -

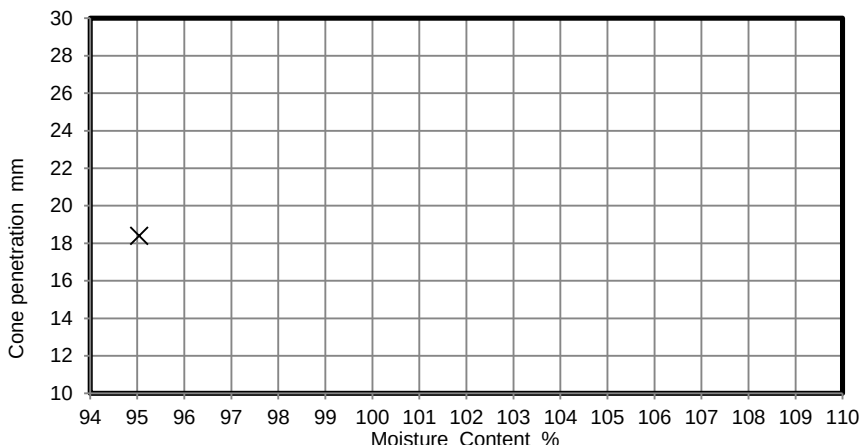
Sample Type D

Samples received 17/05/2024

Schedules received 17/05/2024

Project Started 20/05/2024

Date Tested 29/05/2024



NATURAL MOISTURE CONTENT

39 %

% PASSING 425µm SIEVE

95 %

LIQUID LIMIT

98 %

PLASTIC LIMIT

40 %

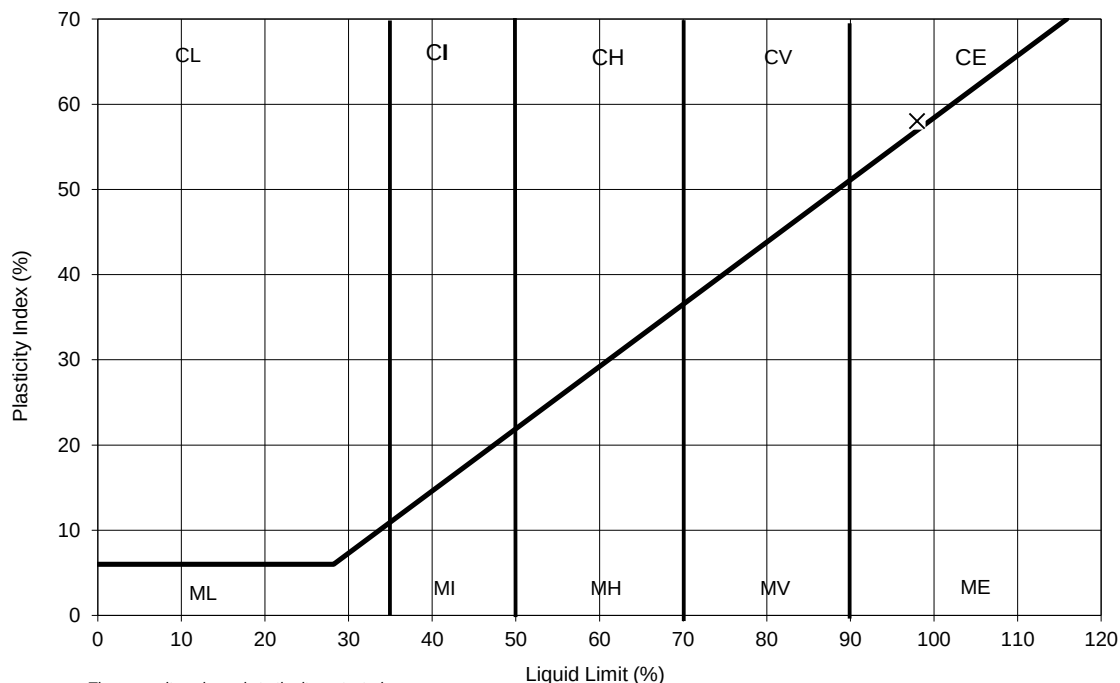
PLASTICITY INDEX

58 %

Remarks

Factors corresponding to the cone penetration and moisture content range in Table 1 (BS1377:1990 ; Part 2)

PLASTICITY INDEX



These results only apply to the items tested

NOTE: The report shall not be reproduced except in full without authority of the laboratory

TEST METHOD

BS1377: Part 2 :Clause 4.4 : 1990 Determination of the liquid limit by the cone penetrometer method

BS1377: Part 2 :Clause 5.0 : 1990: Determination of the plastic limit and plasticity index

BS1377: Part 2 :Clause 3.2 : 1990:Determination of the moisture content by the oven drying

Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU

Tel: 01923 711 288 Email: James@k4soils.com

Checked and Approved

Initials: J.P

Date: 30/05/2024

2519

Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

MSF-5 R2



Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen

Job Ref	35364
Borehole/Pit No.	BH2
Sample No.	-
Depth Top	1.00 m
Depth Base	2.00 m
Sample Type	C
Samples received	17/05/2024
Schedules received	17/05/2024
Date of test	24/05/2024

Site Name	Porters End Barns, Hitchin		
Project No.	21301	Client	WDE Consulting
Soil Description	High strength orangish brown slightly gravelly slightly sandy silty CLAY with occasional black flecks (gravel is fmc and angular to sub-angular)		
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen		

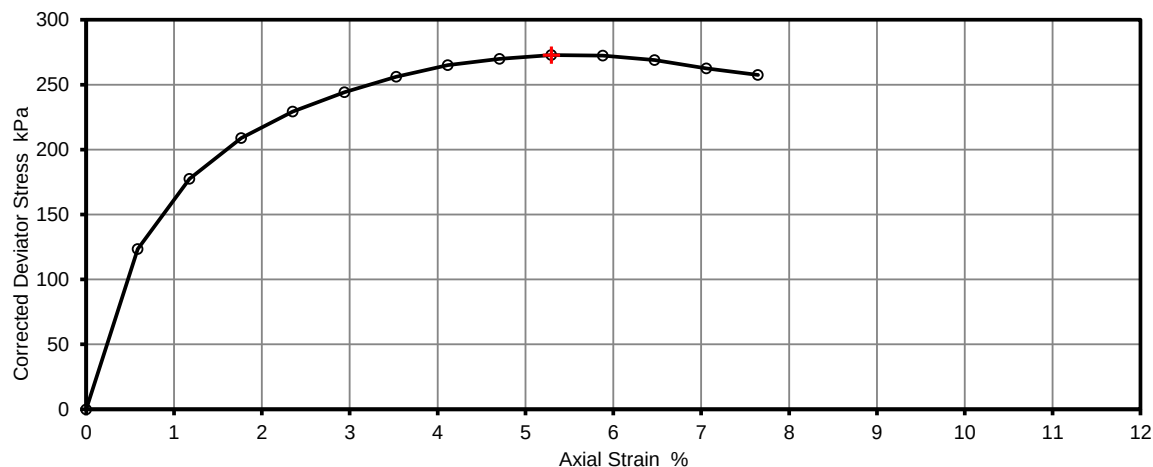
Remarks

Coarse gravel not present in sample tested

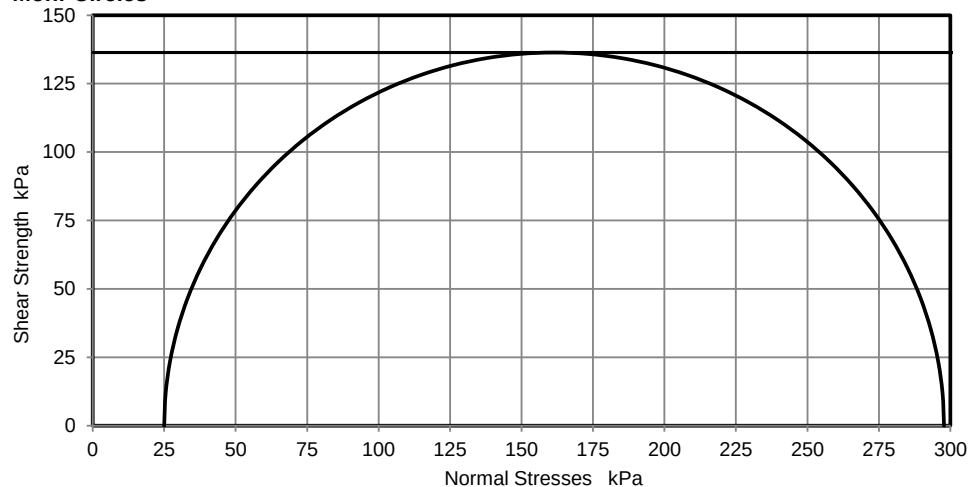


Test Number	1
Length	170.0 mm
Diameter	85.0 mm
Bulk Density	1.71 Mg/m3
Moisture Content	41 %
Dry Density	1.21 Mg/m3
Rate of Strain	2.0 %/min
Cell Pressure	25 kPa
Axial Strain	5.3 %
Deviator Stress, $(\sigma_1 - \sigma_3) f$	273 kPa
Undrained Shear Strength, c_u	136 kPa $\frac{1}{2}(\sigma_1 - \sigma_3) f$
Mode of Failure	Brittle

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.



Test Report by **K4 SOILS LABORATORY**
Unit 8 Olds Close Olds Approach
Watford Herts WD18 9RU
Tel: 01923 711 288 Email: James@k4soils.com

Checked and Approved

Initials: J.P

Date 30/05/2024

These results only apply to the items tested. The report shall not be reproduced except in full without authority of the laboratory

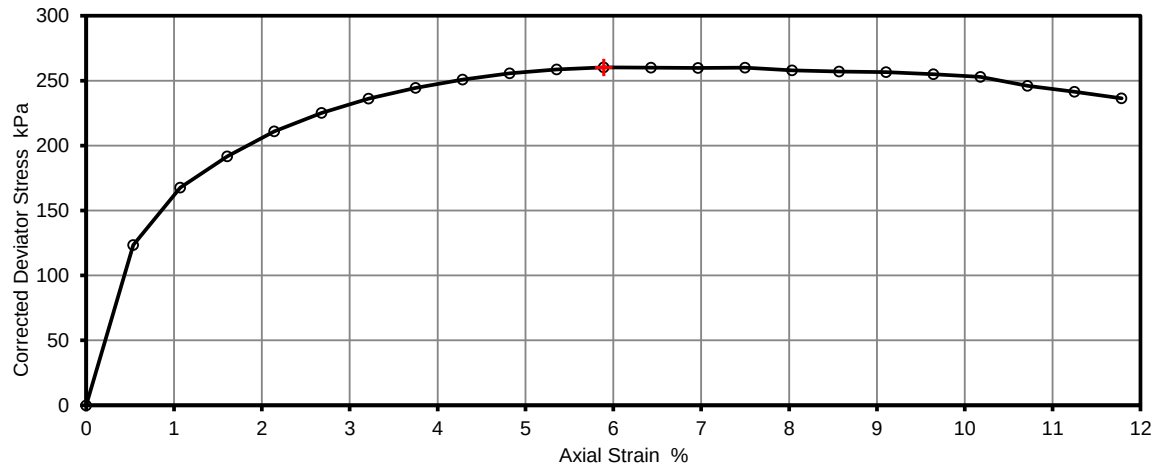
	Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen			Job Ref	35364
				Borehole/Pit No.	BH3
Site Name	Porters End Barns, Hitchin			Sample No.	-
Project No.	21301	Client	WDE Consulting	Depth Top	1.00 m
Soil Description	High strength orangish brown mottled brown slightly gravelly silty CLAY (gravel is fmc and angular)			Depth Base	2.00 m
				Sample Type	C
				Samples received	17/05/2024
				Schedules received	17/05/2024
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen			Date of test	24/05/2024

Remarks

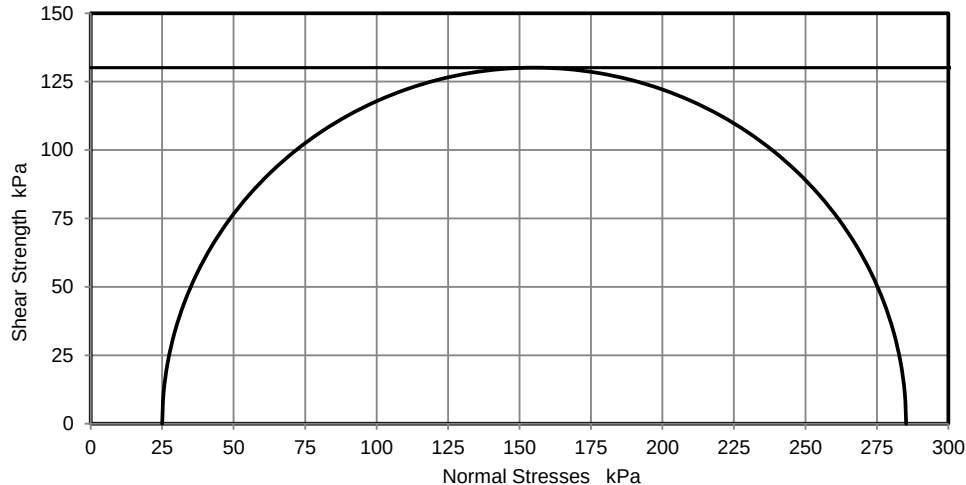
Position within sample

Test Number	1	
Length	140.0	mm
Diameter	70.0	mm
Bulk Density	1.97	Mg/m3
Moisture Content	26	%
Dry Density	1.56	Mg/m3
Rate of Strain	1.5	%/min
Cell Pressure	25	kPa
Axial Strain	5.9	%
Deviator Stress, $(\sigma_1 - \sigma_3) f$	260	kPa
Undrained Shear Strength, c_u	130	kPa $\frac{1}{2}(\sigma_1 - \sigma_3) f$
Mode of Failure	Brittle	

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

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	Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen			Job Ref	35364
				Borehole/Pit No.	BH4
Site Name	Porters End Barns, Hitchin			Sample No.	-
Project No.	21301	Client	WDE Consulting	Depth Top	1.00 m
Soil Description	Extremely high strength orangish brown slightly gravelly slightly sandy silty CLAY with numerous black flecks (gravel is fmc and angular)			Depth Base	2.00 m
				Sample Type	C
				Samples received	17/05/2024
				Schedules received	17/05/2024
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen			Date of test	24/05/2024

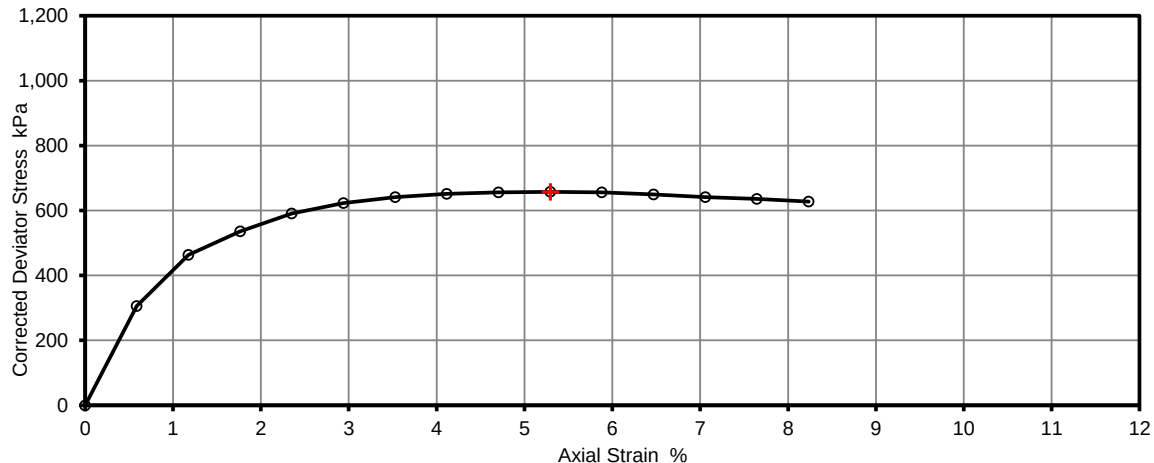
Remarks

Sample taken @ 1.50 m, Coarse gravel not present in part tested

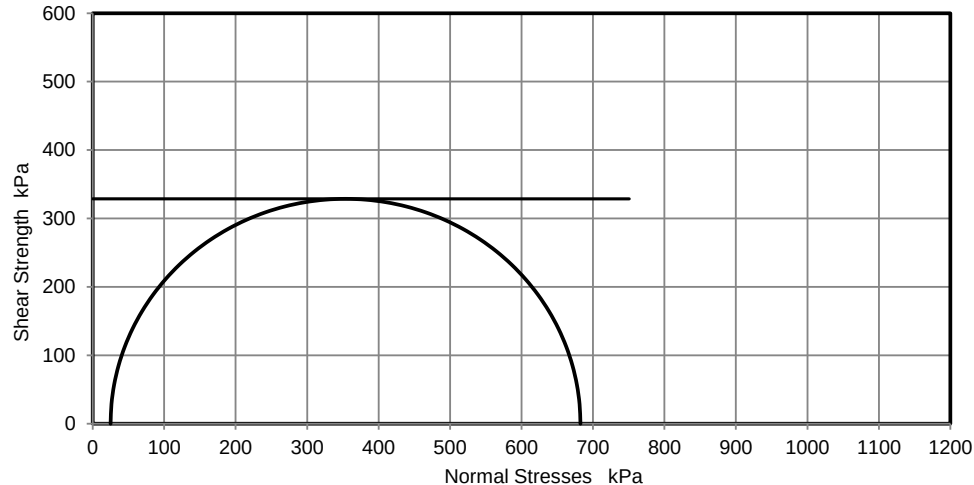


Test Number	1	
Length	170.0	mm
Diameter	85.0	mm
Bulk Density	1.74	Mg/m ³
Moisture Content	48	%
Dry Density	1.18	Mg/m ³
Rate of Strain	1.5	%/min
Cell Pressure	25	kPa
Axial Strain	5.3	%
Deviator Stress, ($\sigma_1 - \sigma_3$)f	657	kPa
Undrained Shear Strength, cu	329	kPa $\frac{1}{2}(\sigma_1 - \sigma_3)$ f
Mode of Failure	Brittle	

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

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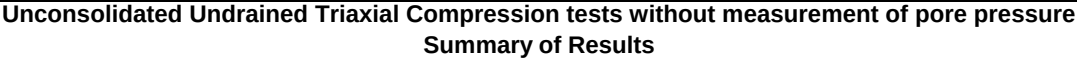


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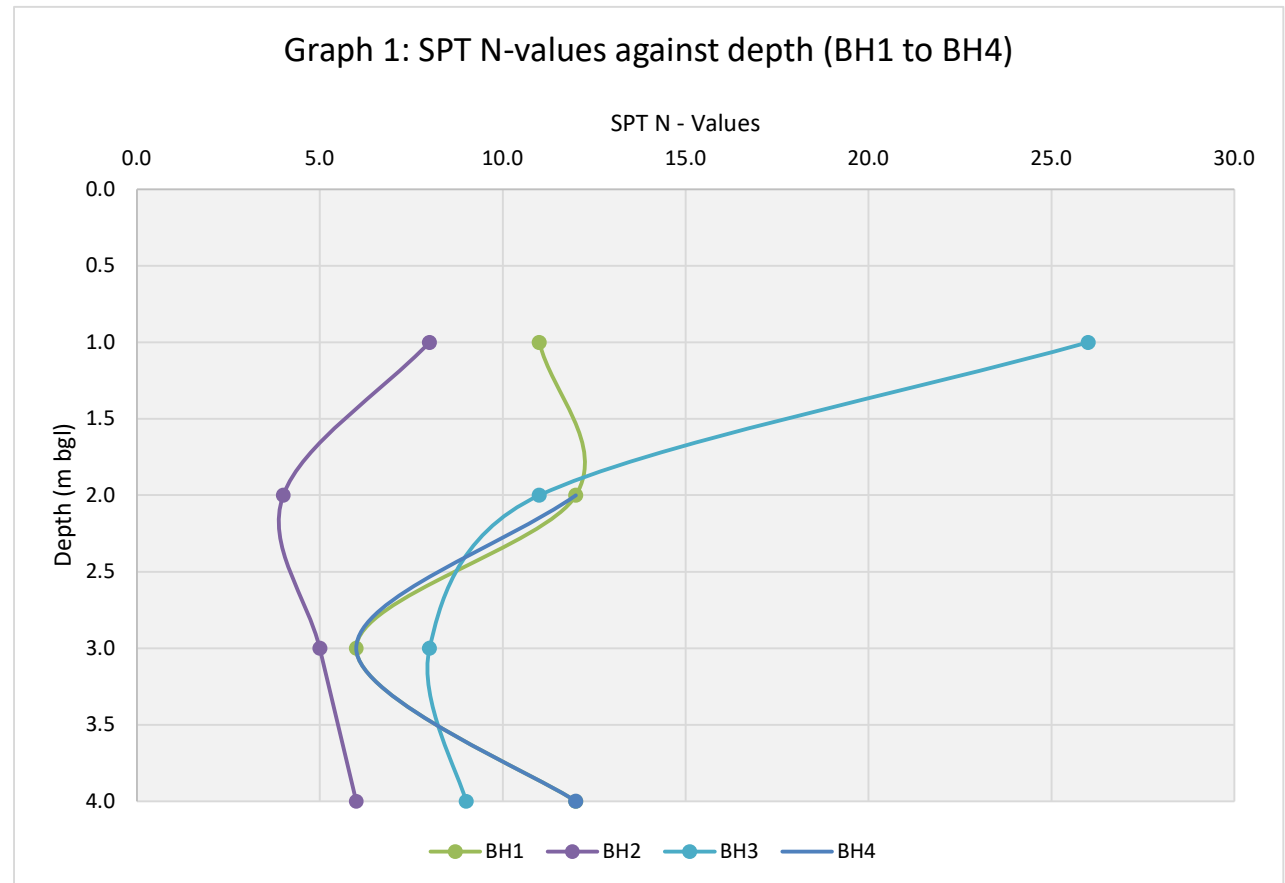


Job No.	Project Name	Programme	
35364	Porters End Barns, Hitchin	Samples received	17/05/2024
		Schedule received	17/05/2024
Project No.	Client	Project started	20/05/2024
21301	WDE Consulting	Testing Started	24/05/2024

Legend	UU - single stage test (single and multiple specimens)	σ_3	Cell pressure	Mode of failure ;	B - Brittle
	UUM - Multistage test on a single specimen	$\sigma_1 - \sigma_3$	Maximum corrected deviator stress		P - Plastic
	suffix R - remoulded or recompacted	cu	Undrained shear strength, $\frac{1}{2}(\sigma_1 - \sigma_3)$		C - Compound

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	<i>These results only apply to the items tested. The report shall not be reproduced except in full without authority of the laboratory</i>	Initials: J.P Date: 30/05/2024
2519	Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)	MSF-5-R7b

	Depth (m)	SPT N Value
BH1	1.0	11.0
	2.0	12.0
	3.0	6.0
	4.0	12.0
BH2	1.0	8.0
	2.0	4.0
	3.0	5.0
	4.0	6.0
BH3	1.0	26.0
	2.0	11.0
	3.0	8.0
	4.0	9.0
BH4	1.0	11.0
	2.0	12.0
	3.0	6.0
	4.0	12.0



WDE RANGE OF SERVICES



Liquidity Index from BRE412

BH	Depth (m)	Moisture Content	Liquid Limit	Plastic Limit	Plastic Index	Liquidity Index
2	1	41	110	42	68	-0.015
3	1	30	79	29	50	0.020
3	2	21	59	22	41	-0.027
3	3	24	59	23	36	0.028
4	1	39	98	40	58	-0.017

 Potentially desiccated