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CONTAMINATION INVESTIGATION

REPORT

No.2 PLEDGERS PLACE

BARKWAY

ROYSTON

Report Reference No. 122403A

On behalf of:-

Mr J. Swain & Mrs C. Swain
c/o Gateley Smithers Purslow
The Officers Mess
Royston Road
Duxford
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January 2025

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MR J. SWAIN & MRS C. SWAIN

GATELEY SMITHERS PURSLOW

CONTAMINATION INVESTIGATION REPORT

FOR A

RESIDENTIAL DEVELOPMENT

AT

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BARKWAY

ROYSTON

HERTFORDSHIRE

Report Reference No. 122403A

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INTRODUCTION

The client, Mr J. Swain & Mrs C. Swain, propose to build a new house, replacing a burnt down house, at No.2 Pledgers Place, Barkway, Royston, Hertfordshire. Gardens will remain to the east and west of the property, however they will now be completely covered by hardstanding underlain by a ‘no-dig’ layer, with the existing double garage to the front unchanged. The layout of the previous development has been used as a base plan for the exploratory hole plan, and the proposed development layout is shown on the site plan at the rear of this text.

Lucion Ground Engineering Limited was commissioned by the client to carry out a ground investigation to determine the nature and chemical properties of the underlying soils, and provide a contamination assessment including recommendations for remediation of the site, if required.

LOCATION, TOPOGRAPHY AND GEOLOGY OF THE SITE

The site of No.2 is located at the northern end of Pledgers Place, off the western side of High Street, in the village of Barkway, Hertfordshire. The site is approximately 6km south-east of Royston town centre. The site is centred at National Grid Reference TL 38370 354450 and its location is shown on plans following this report text.

The irregular shaped 0.08-hectare site is approximately 16m wide fronting Pledgers Place, from which it extends for approximately 21m to the north. The site is bounded by Pledgers Place to the south; landscaped ground to the west; the site of burnt down garages to the north; and gardens of properties fronting High Street to the east.

The southern part of the site contains a double garage associated with No.2, which survived the fire. The floor slab of the former house is located centrally on the site, with gardens to the east and west. A former heating oil tank was understood to have been located in the north-eastern corner of the site. The western garden area is mostly paved, contains a shed in its northern part, with a central gravelled area and ornamental planting along the boundary

Trees are present in neighbouring gardens around the site.

The site stands at an elevation of approximately 125mOD on ground which slopes down to the east towards the River Quin some 300m distant.

The geological map for the area, sheet 221 at 1:50,000 scale, shows superficial Till, now named Lowestoft Formation, covering the site. Immediately south of the site an east-west aligned strip of Head Deposits is shown. The solid geology of the Upper Chalk, now named Lewes Nodular Chalk Formation and Seaford Chalk Formation (undifferentiated), are shown beneath the superficial deposits.

HISTORY OF THE SITE

Research into the site history involved reference to historical Ordnance Survey (OS) maps, photographs and information obtained from the internet. The map extracts studied are presented in the desk study map section, Appendix 1, and are described below. Distances are approximate.

<i>OS extract studied</i>	<i>Description</i>
1877 Hertfordshire Sheets 9.1, 9.2, 9.5 & 9.6 Scale 1:2500 Figure A	The site is undeveloped except for part of a building extending into the north-eastern corner. A track aligned east-west crosses the centre of the site. A west-east aligned drain is shown 10m south of the site. An irregular shaped pond is shown 15m distant, and a 'moat' 45m away on the southern side of Parsonage Farm, both to the north-west of the site. Another pond is also shown 70m north of the site. A brewery is denoted 45m east of the site. Smithies are denoted 140m north-east and 165m north of the site.
1878 Hertfordshire Sheet 9NW Scale 1:10,560 Figure B	The site and its immediate surrounding area appear unchanged.
1898 Hertfordshire Sheets 9.1, 9.2, 9.5 & 9.6 Scale 1:2500 Figure C	The site and its immediate surrounding area appear generally unchanged. The moat to the north-west is not indicated as a body of water.
1921 Hertfordshire Sheets 9.1, 9.2, 9.5 & 9.6 Scale 1:2500 Figure D	The site and its immediate surrounding area appear unchanged.
1948 Cambridgeshire Sheets 62A SE & NE Scale 1:10,560 Figure E	The site and its immediate surrounding area appear unchanged.
1960 Sheet TL33NE Scale 1:10,560 Figure F	The site and its immediate surrounding area appear unchanged.

<i>OS extract studied</i>	<i>Description</i>
1977 Sheet TL3835 Scale 1:2500 Figure G	The site is an undeveloped parcel of land. A new irregular shaped pond is shown 45m west of the site to the south of the former moat, which is no longer depicted.
1989 Sheet TL3835 Scale 1:2500 Figure H	The western part of the site contains two buildings, one of which appears to have been extended from a building to the south. New houses are shown to the north-east, with new garages immediately north of the site.
1994 Sheet TL3835 Scale: 1:2500 Figure I	The site and its immediate surrounding area appear unchanged.
1999-2009 Aerial Photographs Pages 11-13 Appendix 2	The buildings are visible in the western part of the site, with hardstanding evident in the eastern part. Buildings fronting High Street are present to the east of the site, with a grassed area to the west and north-west. Clumps of trees are evident to the south and north-west of the site, with trees in gardens to the east.
2001 Sheet TL33NE Scale 1:10,000 Figure J	The site and surroundings remain unchanged.
2003 Sheets TL3835NW, NE, SE & SW Originally at scale: 1:1250 Figure K	The site and surroundings remain unchanged.
2010 Sheet TL33NE Scale 1:10,000 Figure L	The site and surroundings remained unaltered.
2018-2021 Aerial Photographs Pages 9 & 10 Appendix 2	A new building is shown on the site (No.2), and a new building to the south (No.1), replacing the former buildings.
2024 Sheet TL33NE Scale 1:10,000 Figure M	The site and surroundings appear unchanged.

Summary of Historical Information

In summary, the site was undeveloped except for part of a building extending into the north-eastern corner, which had been cleared by 1977. New buildings had been constructed in the western part of the site between 1977 and 1989, which were understood to have been used as a workshop. The current houses (Nos.1 & 2) were built between 2010 and 2018, replacing the

buildings in the western part of the site. The site has remained in this configuration to the present day; however, No.2 was cleared following the fire in 2024.

The surrounding area comprised houses and gardens in the southern part of Barkway in 1877, with the grounds of Parsonage Farm to the west. Apart from some new houses and garages to the north and north-east, the area is little changed.

SUMMARY OF ENVIRONMENTAL DATA

Appendix 2 contains information derived from Environmental Databases for a radius of up to 2,000m from the site. The information covers datasets held by Groundsure with contributors including the local authority, the Environment Agency (EA), British Geological Survey, Ordnance Survey and the Coal Authority and the results, within a radius of 250m, are summarised below:

1-2. Historical Industrial Sites	On-Site	0 - 250m
Potentially Contaminative Uses (1:10,000 mapping)	1	12
Historical Tank Database	0	0
Historical Energy Features Database	0	4
Historical Petrol & Fuel Site Database	0	0
Historical Garage & Motor Vehicle Repair Database	0	0
3. Landfill and Other Waste Sites	On-Site	0 - 250m
Landfill Sites	0	0
Historical Landfill and Other Waste Sites	0	0
Waste Exemptions	0	0
4. Current Land Use	On-Site	0 - 250m
Current Industrial Sites Data	0	3
Records of Petrol and Fuel Sites	0	0
Underground Electricity, High Pressure Oil and Gas Pipelines	0	0
Sites Determined as Contaminated Land under Part IIA EPA 1990	0	0
Records of COMAH and NIHHS Sites	0	0
Environmental permits/pollution incidents/registers	0	0
5-6. Hydrogeology and Hydrology	On-Site	0 - 250m
Productive strata within superficial geology beneath the site	Identified (within 500m)	
Productive strata within solid geology	Identified (within 500m)	
Groundwater Abstraction Licences	0	0
Surface Water Abstraction Licences	0	0
Potable Water Abstraction Licences	0	0
Source Protection Zones	1	0
Water Network Entries	1	18
Surface Water Features	0	10

7-9. Flooding				On-Site	0-250m
Risk of flooding from rivers & the sea (RoFRaS) rating				None (within 50m)	
Historical flood events				0	0
Flood defences within 250m of site				No	
Any areas benefitting from flood defences within 250m of site				No	
Flood storage areas within 250m of site				No	
Environment Agency indicative Zone 2 floodplains within 50m of site				No	
Environment Agency indicative Zone 3 floodplains within 50m of site				No	
Surface water flooding on site or within 50m of site				1 in 30 year (0.3m to 1m)	
Groundwater flooding on site or within 50m of site				Low	
10-13. Designated Environmentally Sensitive Sites				On Site	0 - 250m
Environmentally sensitive sites				3	0
14-16. Geology					
Artificial Ground or Made Ground records				0	0
Superficial Ground and Drift Geology records beneath the site				Yes	
17. Natural Hazards (on site)					
Hazard	Negligible	Very Low	Low	Moderate	High
Shrinking or Swelling Clay	-	-	Within 50m	-	-
Running Sand	-	Within 50m	-	-	-
Compressible Ground	Within 50m	-	-	-	-
Collapsible Rocks	-	Within 50m	-	-	-
Landslides	-	Within 50m	-	-	-
Soluble rocks	-	-	Within 50m	-	-
18. Mining					
Surface ground workings/BritPits				0	35
Underground workings				0	0
Non coal-mining areas within 50m of site				1	0
Mining cavities				0	0
Brine affected areas on study site				None (within 0m)	
19. Radon					
The property is not within a Radon Affected Area, as less than 1% of properties are above the action level. No Radon Protective Measures will be required for new properties or extensions.					

Database Summary

A brewery, which is to the east of the High Street, is incorrectly recorded on the site. A graveyard, smithies and unspecified pit are recorded around the site. Electricity sub-stations are recorded 127m north and 151m south of the site. No petrol stations or garages are recorded within 250m of the site. No landfills or waste sites are recorded with 250m of the site.

Current industrial land uses around the site include an office and shop equipment business and the electricity sub-stations.

No made ground deposits are recorded beneath the site. The underlying superficial Lowestoft Formation Till is classified by the Environment Agency (EA) as a 'Secondary Undifferentiated Aquifer'. The underlying solid geology White Chalk Subgroup is classified by the EA as a 'Principal Aquifer'. No groundwater or surface water abstractions are recorded within 250m of the site. The site is within a Zone 3 total catchment source protection zone.

A water network record, for an underground inland river, is shown beneath the site aligned north-south. An eastward flowing drain, a tributary of the River Quin, is shown 10m south of the site. The site is not within a Zone 2 or Zone 3 floodplain and has a low risk of groundwater flooding. The site has a 1 in 30 year risk of surface water flooding. The site is within an SSSI impact zone, and a nitrate vulnerable zone, both environmentally sensitive areas.

There is a low hazard from shrinking and swelling clays and soluble rocks; a very low hazard from running sand, collapsible rocks and landslides; and a negligible hazard from compressible deposits.

The site is in an area where no radon protection measures are required for new dwellings.

PRELIMINARY RISK ASSESSMENT

Potential sources of contamination present on or beneath the site would relate primarily to; the historical use of the site; the presence of contaminated soil; and the potential presence of hazardous or ground gas beneath the site.

In order to assess the risks associated with the presence of ground contamination the linkages between the sources and potential receptors to contamination need to be established and evaluated. This is in accordance with the Environmental Protection Act 1990, which provides a statutory definition of Contaminated Land. To fall within this definition it is necessary that, as a result of the condition of the land, substances may be present on or under the land such that;

- *Significant harm is being caused or there is a significant possibility of such harm being caused; or*
- *Pollution of controlled waters is being, or is likely to be, caused.*

There are three principal factors that are assessed whilst undertaking a qualitative risk assessment for any site. These are the presence of a contamination source, the existence of migration pathways and the presence of a sensitive target(s). It should be noted that it is necessary for each element of source, pathway and target to be present in order for exposure of a human or environmental receptor to occur.

UK Government guidance on the assessment of contaminated land, requires risk to human health and the environment to be reviewed using source – pathway – target relationships. If each of these elements is present, the linkage provides a potential risk to the identified targets.

Contaminants or ***potential pollutants*** identified as ***sources*** in relation to the identified previous uses are listed overleaf in Table 1.

Table 1: Identified Potential Contaminant Sources

<i>Contaminant Source</i>	<i>Comments</i>
Drainage/Buildings	Drains could provide a contaminant source. Buildings might have asbestos containing material (ACM).
Soil Beneath Site	Contamination may be present within any made ground on the site.
Soil Gas	Potential soil gas generated from made ground or natural soils.
Ground Contamination Outside Site Boundary	Ground contamination migrating from adjoining sites.

A ***Pathway*** is defined as one or more routes through which a receptor is being, or could be, exposed to, or affected by, a given contaminant.

Potential ***Target or Receptors*** fall within the categories of Human Health, Water Environment, Flora and Fauna, and Building Materials.

There are a number of possible pathways for the contaminants identified on the site to impact human and/or environmental receptors and these are summarised in Tables 2 and 3.

Table 2: Human Receptors and Pathways

<i>Human Receptor-Mechanism</i>	<i>Typical Exposure Pathway</i>
Human Inhalation	Breathing Dust and Fumes Breathing Gas emissions
Human Ingestion	Eating -contaminated soil, for example by small children -produce grown on contaminated soil Ingesting dust or soil on vegetables Drinking contaminated water
Human Contact	Direct skin contact with contamination Direct skin contact with contaminated liquids

Table 3: Water Receptors and Pathways

<i>Receptor-Water Environment</i>	<i>Typical Exposure Pathway</i>
Groundwater The underlying superficial Lowestoft Formation Till is indicated to be a 'Secondary Undifferentiated' Aquifer; the solid geology White Chalk is indicated to be a 'Principal Aquifer'. The site is within a total catchment Source Protection Zone. There are no groundwater abstractions within 250m of the site.	Surface infiltration of atmospheric waters into the soils beneath the site could wash or dissolve potential contaminants and migrate to underlying groundwater. Contamination leads to restriction/prevention of use as a resource, for example, drinking water, and can have secondary impacts on other resources, which depend on it.
Surface Water/Watercourses A north-south aligned underground inland river is denoted beneath the site, which is now believed to be culverted to the east of the site. The nearest water feature is a drain 10m south of the site.	Surface infiltration of atmospheric waters into the soils beneath the site could wash or dissolve potential contaminants and laterally migrate. Contamination leads to a restriction/prevention of use: -as drinking water resource -for amenity use Effects on aquatic life.

Preliminary Conceptual Model

Assessment of the potential linkage between ground contamination sources, human and environmental receptors have been assessed based on the desk study research documented in the preceding sections of this report.

A generalised preliminary conceptual model is presented below in Table 4.

Table 4: Preliminary Conceptual Model Relative to Residential Development

Receptors	Pathway	Estimated Potential for Linkage with Contaminant Sources			
		Drainage/ Buildings	Soil Beneath Site	Soil Gas	Ground Contamination Outside Site Boundary
Human Health – ground workers	Ingestion and Inhalation of contaminated Soil, Dust and Vapour	Low likelihood	Low likelihood	Low likelihood	Low likelihood
Human Health – end users	Ingestion and Inhalation of contaminated Soil, Dust and Vapour	Unlikely	Low likelihood	Low likelihood	Low likelihood
Water Environment	Migration through ground into surface water or surrounding groundwater	Low likelihood	Low likelihood	Unlikely	Low likelihood
Flora	Vegetation on site growing on contaminated soil	Unlikely	Low likelihood	Low likelihood	Unlikely
Building Materials	Contact with contaminated soil	Low likelihood	Low likelihood	Low likelihood	Low likelihood
<u>Key to Table 4</u> Estimated Potential for Linkage with Contaminant Source		Definition			
High likelihood		There is a pollution linkage and an event that either appears very likely in the short term and almost inevitable over the long term, or there is evidence at the receptor of harm or pollution.			
Likely		There is a pollution linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.			
Low likelihood		There is a pollution linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such an event would take place, and is less likely in the shorter term.			
Unlikely		There is a pollution linkage but circumstances are such that it is improbable that an event would occur even in the very long term.			
N/A		Not Applicable.			

SITE WORK

The site work undertaken on 20th November 2024, comprised three hand augered boreholes (HA1, HA2 and HA3). The positions are shown on the exploratory hole location plan following this report text. A trial pit (TP1) previously excavated by the client is also recorded on this plan.

Public utility service drawings were sourced and consulted prior to determining the exploratory hole positions. Prior to excavation a service scan was made at each position using a CAT (Cable Avoidance Tool) to check for the absence of detectable buried services that may otherwise have been damaged by the investigation.

The exploratory hole records, presented following the plans, give the descriptions and depths of the various strata encountered, details of all samples taken, and the groundwater conditions observed during and on completion of excavation.

Hand Augered Boreholes

Hand augered boreholes (HA1, HA2 and HA3) were undertaken using hand tools to depths of between 0.95m or 1.05m.

Small disturbed (D) samples of soil were taken at regular intervals throughout the boreholes and placed into polycarbonate pots. Environmental samples (ES) were also recovered and placed into amber glass jars.

On completion of the boreholes, they were backfilled with arisings.

LABORATORY WORK

The samples were inspected in the laboratory and assessments of the soil characteristics have been taken into account during preparation of the exploratory hole records. The soil descriptions have been made in accordance with BS5930:2015+A1:2020. The chemical test results follow the exploratory hole records.

Chemical analysis of three soil samples recovered from the exploratory holes was undertaken, by an independent laboratory, primarily for characterisation purposes. The samples were tested for a suite encompassing a wide range of potential contaminants outlined by the Environment Agency (EA) and National House Building Council (NHBC) document R&D 66; 2008 'Guidance for the Safe Development of Housing on Land Affected by Contamination'. In addition, all of the selected samples were screened for the presence of asbestos, and tested for Total Petroleum Hydrocarbons (TPH). Two samples of soil from the client's TP1 had been previously tested for Speciated Total Petroleum Hydrocarbons.

GROUND CONDITIONS

The ground conditions comprised a surface layer of made ground/possible made ground, to between 0.95m and at least 1.05m depth, possibly reflecting infilled ground along a former stream course. The naturally deposited Lowestoft Formation and chalk were not encountered in these shallow holes. Groundwater was recorded as shallow as 0.60m depth in the boreholes during the investigation.

Made Ground

Surface layers of made ground/possible made ground were encountered to at least the base of the boreholes at between 0.95m and 1.05m below ground level. In the western patio garden, a surface layer of pea gravel underlain by a geotextile membrane was encountered to 0.05m depth in HA3. In HA1 and HA2, in the eastern garden, the made ground initially comprised dark brown, brown and black, silty sand and gravel fill, with occasional cobbles of concrete, to 0.60m/0.70m depth. The gravel fraction comprised angular to rounded flint, quartz, brick, concrete, ash, chalk and glass.

Beneath the granular fill in HA1 & HA2, and beneath the pea gravel in HA3, firm or soft, light brown, brown and dark brown, slightly sandy, slightly gravelly, silty clay fill was encountered to at least the base of the boreholes at between 0.95m and 1.05m depth. The gravel fraction comprised angular to rounded flint, chalk, quartzite, sandstone, concrete, brick, shell fragments, coal and ash.

Groundwater

Groundwater was recorded at 0.80m depth in HA1 & HA2, rising to depths of 0.60m in HA2 and 0.70m in HA1, at the base of the granular fill. No groundwater was recorded within 0.95m depth during excavation or on completion of HA3, within clay fill soils.

Evidence of Contamination

The made ground encountered during this investigation was not noted to have olfactory or visual evidence of fuel contamination, however a hydrocarbon odour was noted in the client's previously excavated TP1. The made ground contained concrete, brick, coal, ash and glass fragments. No asbestos containing materials were noted during excavation and boring, however fibres/clumps of chrysotile asbestos were identified in HA1 at 0.30m depth during optical microscopy in the laboratory.

COMMENTS ON THE SOIL CHEMICAL TEST RESULTS

The results of the laboratory chemical testing on near surface soil samples have primarily been compared to soil screening values (SSVs) produced by Land Quality Management Limited (LQM) and the Chartered Institute for Environmental Health (CIEH) presented in their document ‘The LQM/CIEH S4ULs for Human Health Risk Assessment: 2015 (Publication Number S4UL3608)’. The LQM/CIEH S4ULs are intended for use in assessing the potential risks posed to human health by contaminants in soil and are transparently-derived and cautious ‘trigger values’ above which further assessment of the risks or remedial action may be needed. The S4ULs (Suitable for Use Levels) have been derived, in accordance with UK legislation and Environment Agency policy, using a modified version of the Environment Agency CLEA 1.06 software.

Reference has also been given to AGAC soil screening values produced by Society of Brownfield Risk Assessment (SoBRA) as documented in their July 2020 publication ‘Development of Acute Generic Assessment Criteria for Assessing Risks to Human Health from Contaminants in Soil’. With the absence of a S4UL for cyanide, the SoBRA AGAC has been used as the soil screening criteria within this report because the acute dose toxicity thresholds for free cyanide are very close to the chronic dose toxicity thresholds.

In 2014 the Department for Environment Food and Rural Affairs (DEFRA) published, in their document SP1010, Category 4 Screening Levels (C4SL) for several contaminants including lead. The C4SL represent screening levels below which the land could be considered suitable for a specified use and definitely not contaminated land in respect of those determinands. With the absence of S4UL for lead the C4SL has been used as the soil screening criteria within this report.

For each contaminant the adopted soil screening criteria have been calculated for the following land uses:

- Residential use with home grown produce
- Residential use without home grown produce
- Commercial and industrial usage

The intended purpose of the SSVs are as “intervention values” in the regulatory framework for assessment of human health risks in relation to land use. These values are not binding standards, but are intended to inform judgements about the need for action to ensure that a new use of land does not pose any unacceptable risks to the health of the intended users.

Tables 5 and 6 compare the test results for the made ground with the SSVs in relation to the specified uses. The number of test results, which exceed these values, are also provided.

Residential usage values are considered appropriate screening values for the proposed residential development.

Table 5: Comparison of Chemical Test Results with SSVs for Near Surface Soils

Determinand	Number of Samples	Min Value mg/kg	Max Value mg/kg	Number of Samples Exceeding SSV for			Assessment Method	Soil Screening Criteria 6.0% SOM		
				Residential with home grown produce	Residential without home grown produce	Commercial/Industrial		Residential with home grown produce mg/kg	Residential without home grown produce mg/kg	Commercial/Industrial mg/kg
Organic matter	3	6.9%	19%	-	-	-	-	-	-	-
Arsenic	3	17	25	0	0	0	S4UL	37	40	640
Cadmium	3	0.60	1.3	0	0	0	S4UL	11	85	190
Total Chromium	3	17	23	0	0	0	S4UL	910	910	8600
Hexavalent Chromium	3	<0.50	<0.50	0	0	0	S4UL	6	6	33
Lead	3	460	860	3	3	0	C4SL	200	310	2330
Mercury	3	0.60	1.7	0	0	0	S4UL	11	15	320
Selenium	3	0.93	1.1	0	0	0	S4UL	250	430	12,000
Nickel	3	24	31	0	0	0	S4UL	130	180	980
Phenols	3	<0.10	<0.10	0	0	0	S4UL	380	1200	1300
Copper	3	49	72	0	0	0	S4UL	2400	7100	68,000
Zinc	3	220	640	0	0	0	S4UL	3700	40,000	730,000
Free Cyanide	3	<0.50	<0.50	0	0	0	AGAC	24	24	24

Notes

S4UL and C4SL for metals were derived using 6% SOM. These values are not sensitive to SOM and would also be applicable for 1% SOM and 2.5% SOM

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AGAC soil screening values produced by Society of Brownfield Risk Assessment (SoBRA) as documented in their July 2020 publication 'Development of Acute Generic Assessment Criteria for Assessing Risks to Human Health from Contaminants in Soil'.

Table 6: Comparison of PAH Chemical Test Results for Near Surface Soil with Soil Screening Values (SSV)

Determinand	Number of Samples	Min Value (mg/kg)	Max Value (mg/kg)	Number of Samples Exceeding SSV for:			Soil Screening Values (SSV) (1% SOM)			
				Residential with home grown produce	Residential without home grown produce	Commercial/ Industrial	Assessment Method	Residential with home grown produce (mg/kg)	Residential without home grown produce (mg/kg)	Commercial/ Industrial (mg/kg)
Acenaphthene	3	0.17	1.8	0	0	0	S4UL	210	3000	84,000
Acenaphthylene	3	0.36	0.62	0	0	0	S4UL	170	2900	83,000
Anthracene	3	0.47	1.1	0	0	0	S4UL	2400	3100	520,000
Benzo[a]anthracene	3	3.4	3.6	0	0	0	S4UL	7.2	11	170
Benzo[a]pyrene	3	3.7	4.0	3	3	0	S4UL	2.2	3.2	35
Benzo[b]fluoranthene	3	4.8	5.3	3	3	0	S4UL	2.6	3.9	44
Benzo[g,h,i]perylene	3	2.8	3.2	0	0	0	S4UL	320	360	390
Benzo[k]fluoranthene	3	2.0	2.1	0	0	0	S4UL	77	110	1200
Chrysene	3	4.3	4.9	0	0	0	S4UL	15	30	350
Dibenz[a,h]anthracene	3	0.66	0.88	3	3	0	S4UL	0.24	0.31	3.5
Fluoranthene	3	5.7	8.0	0	0	0	S4UL	280	1500	23,000
Fluorene	3	0.21	0.66	0	0	0	S4UL	170	2800	63,000
Indeno[1,2,3-cd]pyrene	3	2.6	2.7	0	0	0	S4UL	27	45	500
Naphthalene	3	0.54	0.56	0	0	0	S4UL	2.3	2.3	190
Phenanthrene	3	1.7	5.3	0	0	0	S4UL	95	1300	22,000
Pyrene	3	5.9	7.9	0	0	0	S4UL	620	3700	54,000

Notes

S4UL and C4SL for metals were derived using 6% SOM. These values are not sensitive to SOM and would also be applicable for 1% SOM and 2.5% SOM
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Discussion of Soil Results

Concentrations of lead, benzo[a]pyrene, benzo[b]fluoranthene and dibenz[a,h]anthracene in HA1, HA2 and HA3, at between 0.30m and 0.50m depth, exceeded the associated soil screening values for residential end uses with home grown produce and without home grown produce, but did not exceed the soil screening values for the proposed hardstanding end use. The speciated PAH concentrations indicate that they are combustion derived and are related to the coal and ash in the soils.

The made ground across the site was not generally noted to have olfactory or visual evidence of fuel contamination, however samples from a trial pit (TP1) previously excavated by the client, close to the location of a former above ground oil tank in the north-eastern corner of the site, did have an obvious hydrocarbon odour. In the samples tested, total petroleum hydrocarbon (TPH) concentrations were between 72mg/kg and 750mg/kg, which is not considered significant. Previous samples supplied by the client from TP1 had total TPH concentrations of 1500mg/kg and 1600mg/kg, and the TPH fractions indication diesel range organics (heating oil).

No asbestos containing materials (ACM) were observed within the made ground soils during site work, however fibres/clumps of chrysotile asbestos were observed in the sample from HA1 at 0.30m depth during optical microscopy in the laboratory.

In conclusion, the near surface soil would be considered suitable for retention in the proposed hardstanding areas, but would not be considered suitable for retention at the surface in soft landscaped areas of the residential development. If geotechnically suitable, near surface soil could be used beneath buildings and areas of permanent hardstanding.

Sulphate Conditions

Sulphate analysis of selected samples of soil yielded soluble sulphate concentrations within Design Sulphate Class DS-1 of the BRE Special Digest 1, Table C2 (2001), presented in Appendix 3. The pH results of the samples were between 7.3 and 8.4 indicating alkaline conditions.

These results indicate an Aggressive Chemical Environment for Concrete (ACEC) Class of AC-1 for buried concrete. This ACEC Class should be considered when specifying a Design Chemical Class (DC Class) for buried concrete on this site, as detailed in the above cited BRE document.

UPDATED CONCEPTUAL MODEL

Assessment of the potential linkage between ground contamination sources, human and environmental receptors have been assessed based on the desk study research and the intrusive ground investigation documented in the preceding sections of this report.

A generalised conceptual model relative to the existing site and proposed residential use of the site is presented in Table 7 below.

Table 7: General Conceptual Model Relative to Future Residential Development

Receptors	Pathway	Estimated Potential for Linkage with Contaminant Sources			
		Drainage/ Buildings	Soil Beneath Site	Soil Gas	Ground Contamination Outside Site Boundary
Human Health – ground workers	Ingestion and Inhalation of contaminated Soil, Dust and Vapour	Very Low/ High (asbestos)	Moderate	Low	Very Low
Human Health – users of completed development	Ingestion and Inhalation of contaminated Soil, Dust and Vapour	N/A	Low	Low	Very Low
Water Environment	Migration through ground into surface water or groundwater	Low	Very Low	Very Low	Low
Flora	Vegetation on site growing on contaminated soil	Very Low	Very Low	Very Low	Very Low
Building Materials	Contact with contaminated soil	Very Low	Very Low	Very Low	Very Low

<u>Key to Table 7 Risk</u>	Definition
Very High	There is a high probability that severe harm could arise to a designated receptor from an identified hazard, or, there is evidence that severe harm to a designated receptor is currently happening. The risk, if realised, is likely to result in a substantial liability. Urgent investigation (if not undertaken already) and remediation are likely to be required.
High	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) and remedial works may be necessary in the short term and likely over the long term.
Moderate	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild.
Low	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.
Very Low	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.
N/A	Not Applicable because the proposed development will remove the source.

COMMENTS ON GROUND CONTAMINATION IN RELATION TO PROPOSED DEVELOPMENT

Anticipated exposure scenarios relating to the existing site, the site history and proposed residential end use of the site, in the context of the conceptual model, are discussed as follows.

This investigation may not have revealed the full extent of contamination on the site and appropriate professional advice should be sought if subsequent site work reveals materials that may appear to be contaminated.

Contaminated Soil

On the basis of the ground investigation, the site is underlain by between at least 0.95m and at least 1.05m of made ground/possible made ground. The chemical testing has not identified elevated concentrations of contaminants in the soils tested, with respect to the proposed hardstanding in the garden areas. Fibres/clumps of chrysotile asbestos were identified in HA1. The level of contaminants in the made ground indicates that there is a moderate risk of contaminants affecting groundworkers during any construction works, however this rises to high risk where asbestos fibres are present. There will be a low risk of affecting future end users of the site where the gardens are covered by hardstanding underlain by a 'no-dig' layer.

The made ground could be considered for re-use beneath proposed buildings and permanent hardstanding, if suitable for engineering purposes, where it is unlikely to affect future users of the site.

Existing Drainage

Redundant drain runs, if present, should be removed where encountered from beneath the site and precautions should ensure that any remaining sediment is directly disposed off-site. The integrity of the existing drains should be checked, and where they are to be retained, any damaged sections should be replaced prior to development.

Existing/Former Buildings

The former house, constructed after 2010, has been cleared to ground floor slab level and is presumed clear of asbestos. Asbestos may remain in the soil following the demolition of the 1970s workshop, as evidenced by the fibres/clumps of chrysotile found in HA1. Suitable precautions, in line with current best practice, should be put in place to protect workers from the effects of asbestos material, during the site clearance and redevelopment phases.

There is a very low risk of contamination affecting the proposed structures and their foundations.

Soil Gas

According to the environmental database there are no landfills recorded within 250m of the site. The site is underlain by a layer of made ground, covering superficial Lowestoft Formation Till deposits, comprising predominantly silty clay. No significant quantities of organic/biodegradable materials were found in the soils encountered by this investigation.

Consequently, there is a low risk that hazardous gases would affect groundworkers during the construction phase and a low risk of hazardous gases affecting future users of the site.

The site is not in a radon affected area, and no radon protection measures are required for new properties on the site.

Human Health - Construction Workers

Based on the chemical test results, no special precautions would be required during the development of the site by workers who may come into contact with the soil during groundworks, providing standard precautions are adopted which should generally include the procedures given by the Health and Safety Executive (The Blue Book) HS(G)66.

For the protection of workers during groundworks the following is recommended:

a) Limit repeated or prolonged skin contact with soils by wearing gloves with sleeves rolled down.

b) Washing facilities should be made available to groundworkers, so as to minimise the potential for inadvertent ingestion of soil.

c) If any soils are revealed which are different to those encountered by this ground investigation, the advice of a specialist should be sought in view of classifying the material and ascertaining its risk to groundworkers.

d) Suitable precautions such as damping down, in line with current best practice, should be put in place to protect workers, general public and neighbours from the effects of asbestos material, during earth or building works. All ACM should be disposed of at a suitably licenced disposal site.

Human Health - Users of Completed Development

The results of the chemical analysis indicate that the made ground is considered suitable for retention beneath the proposed hardstanding garden areas, but would not be considered suitable for retention exposed at the surface within any soft garden or landscaped areas.

No remediation is considered necessary for garden areas covered by hardstanding. If soft garden/landscaping was proposed, a minimum depth of removal and replacement of 0.60m in front garden areas, and 1.00m in rear gardens, or the full thickness of made ground where the thickness of made ground is less than this, would be considered appropriate in gardens and landscaping areas, where soil will be exposed at the surface, and will involve the removal of the made ground and replacement with a suitably thick cover or barrier layer in order to break the pathway between the underlying made ground and the site users.

The made ground could be considered for re-use beneath proposed buildings and permanent hardstanding, if suitable for engineering purposes, where there is a very low risk to affect future users of the site.

Any soil imported to site must be certified as "suitable for use".

Water Environment

Superficial Lowestoft Formation Deposits beneath the site, are classified by the EA as a 'Secondary Undifferentiated Aquifer'. The underlying solid geology White Chalk Subgroup at depth is classified by the EA as a 'Principal Aquifer'. No groundwater or surface water abstractions are recorded within 250m of the site. The site is within a total catchment source protection zone.

The route of a north-south aligned underground river is indicated beneath the site, which now appears to be culverted to the east of the site. The closest water feature is a drain 10m south of the site. The site is not within a Zone 2 or Zone 3 floodplain, and has a low risk of groundwater flooding. The lowest south-eastern part of the site has a 1 in 30 year risk of surface water flooding. The site is within an SSSI impact zone, and a nitrate vulnerable zone, both environmentally sensitive areas.

Groundwater was recorded as shallow as 0.60m depth, at the base of granular fill.

There is a very low risk that the proposed development and low level of contaminants within the made ground soils would impact the quality of the water environment.

Effects on Building Materials and Buried Services

The sulphate requirements for buried concrete have been discussed in the previous section of this report.

Off-Site Disposal of Soil Arisings

The results of chemical analysis are provided to the rear of this report and can be used within the information necessary for basic characterisation of the soil destined for landfill. The Environment Agency publication Hazardous Waste, Technical Guidance WM3 outlines the methodology for classifying wastes and should be referenced for guidance. The test results (total metals, hydrocarbons and cyanide) should be compared to the relevant thresholds to determine whether they fall into the primary categories of non-hazardous or hazardous waste and will help

indicate the likely European Waste Catalogue (EWC) code which is determined by the waste type.

Excavated material and excess spoil should always be classified prior to removal from site as required by 'Duty of Care' (Environmental Protection Act, 1990) legislation. This means that material has to be given a proper description and waste classification prior to removal. Basic characterisation is the responsibility of the waste producer, whilst compliance checking and on-site verification are generally the responsibility of the landfill operator. The landfill operator will need to liaise with the waste producer, as the approach relies on the information from basic characterisation.

It is expected that arisings of natural soils from the excavations across this site would fall into the inert category under the European Waste Catalogue description 'Soil and Stones', EWC code 17 05 04 with restrictions excluding topsoil and peat.

All ACM should be disposed of at a suitably licenced disposal site.

REMEDIATION PLAN

The proposed redevelopment is to comprise the construction of a replacement house, on the site of a previously burnt down house, together with hardstanding garden areas.

A plan showing the layout of the proposed development has been provided by the client and is included to the rear of this report.

General Comments

1. In the event that subsequent site works reveal materials that may appear to be contaminated, the works will stop and appropriate professional advice will be sought.
2. Suitable precautions, in line with current best practice, should be put in place to protect workers from the effects of asbestos material, during earth or building works. All ACM should be disposed of at a suitably licenced disposal site.
3. Standard Health and Safety precautions should be observed by groundworkers when dealing with soils across the site.
4. Redundant foul or surface water drain runs will be removed from beneath the site and precautions implemented ensuring that any remaining effluent is directly disposed off-site. The integrity of existing drainage will be checked, and where they are to be retained, any damaged sections replaced prior to redevelopment. The latter measures should remove any future risk to human health and to the water environment.
5. All soils removed from site will be disposed of using licensed carriers and taken to appropriately licensed disposal facilities.
6. The local authority will be informed regarding each stage of the works and photographic evidence together with copied waste transfer receipts for all soil and material disposal should be gathered, as they are essential to demonstrate the works.

Buildings and Hardstanding Areas

7. Providing that it is geotechnically suitable, selected made ground could be retained or re-used beneath buildings and permanent hardstanding areas.
8. The likelihood of soils affecting future users when present beneath buildings and permanent areas of hardstanding would be considered to be low. This is because it would be very unlikely that the general site users would normally be able to penetrate the building floors and hardstanding, which would be necessary for them to uncover any contaminated soils beneath the site.

Remediation Garden Areas

9. The made ground is considered suitable for use retained beneath hardstanding and a 'no-dig' layer, and consequently no remediation is considered necessary. The made ground is considered unsuitable for use exposed at the surface within garden and landscaped areas of the residential development.
10. If soft garden/landscaping was proposed, a minimum depth of removal and replacement of 0.60m in front garden areas, and 1.00m in rear gardens, or the full thickness of made ground where the thickness of made ground is less than this, would be considered appropriate in gardens and landscaping areas, where soil will be exposed at the surface, and will involve the removal of the made ground and replacement with a suitably thick cover or barrier layer in order to break the pathway between the underlying made ground and the site users.
11. All imported soils will be certified 'clean' fill and will be suitable for use in accordance with UK legislation and Environment Agency policy.
12. In the event that subsequent site works reveal materials that may appear to be contaminated, the works will stop and appropriate professional advice will be sought.

Verification

13. The garden areas will be inspected during the works to check that the soils are suitable for use.

14. The analysis of all imported soil samples will meet current UK soil levels (DEFRA C4SLs, LQM/CIEH S4ULs for Residential with plant uptake and residential without plant update end uses).
15. Following validation testing any unsuitable soils will be removed and replaced with clean soil in accordance with the remediation plan.

Validation

16. The work will be fully documented and on completion a validation report prepared providing a full descriptive record of the process, quantities of material excavated, stored and removed, and the materials imported and placed, together with chemical test results and photographs.

LUCION GROUND ENGINEERING LIMITED

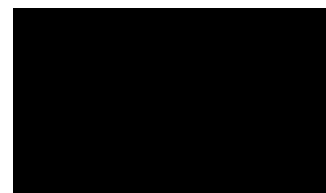


S. WEATHERLEY

B.Eng.(Hons.),

C.Geol., F.G.S.

Associate



S. J. FLEMING

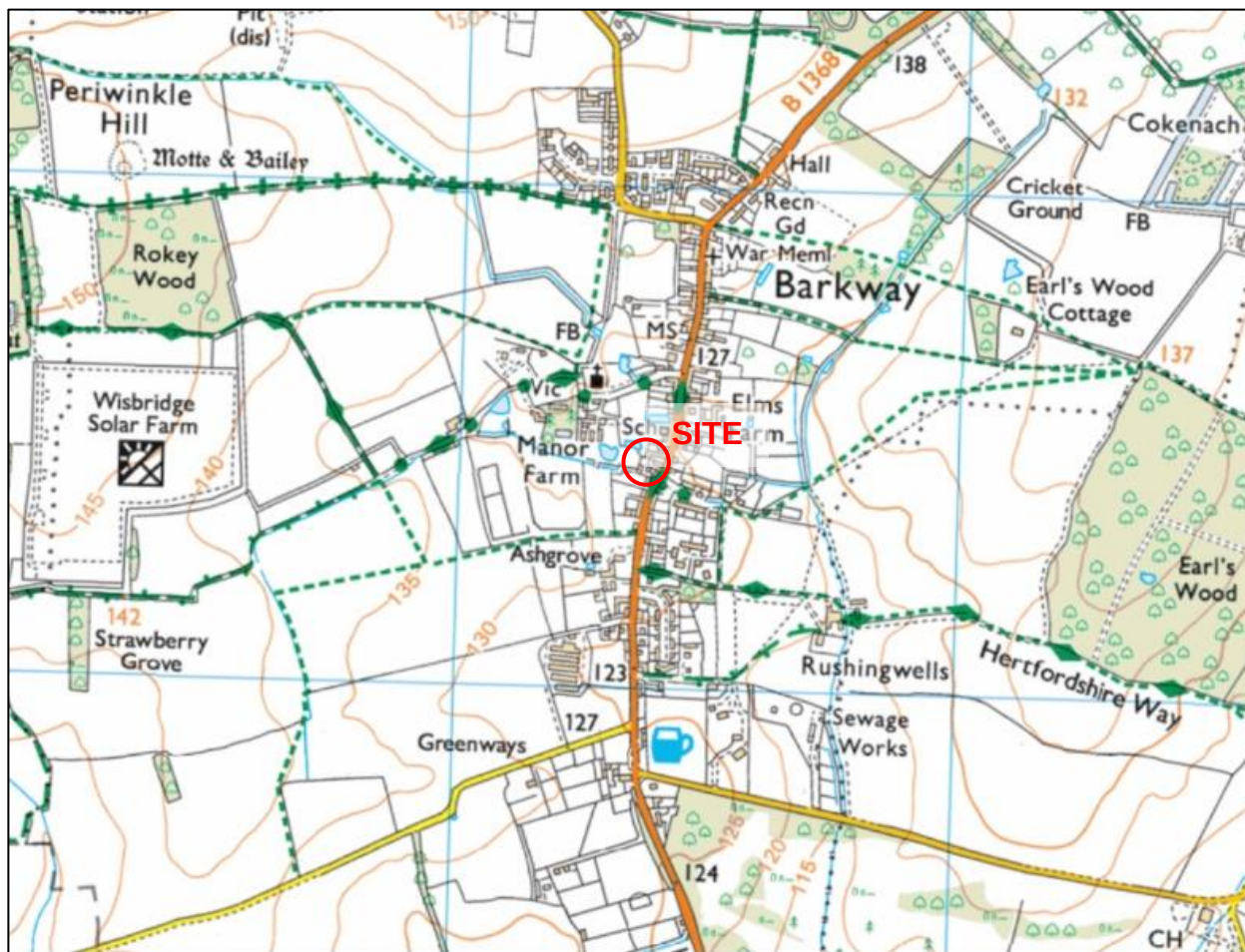
M.Sc., M.C.S.M.,

C.Geol., F.G.S.

Ground Engineering Director

Site Location Plan

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0m 500m 1000m

Project : 2 Pledgers Place, Barkway, Royston

Client : Mr J. Swain & Mrs C. Swain

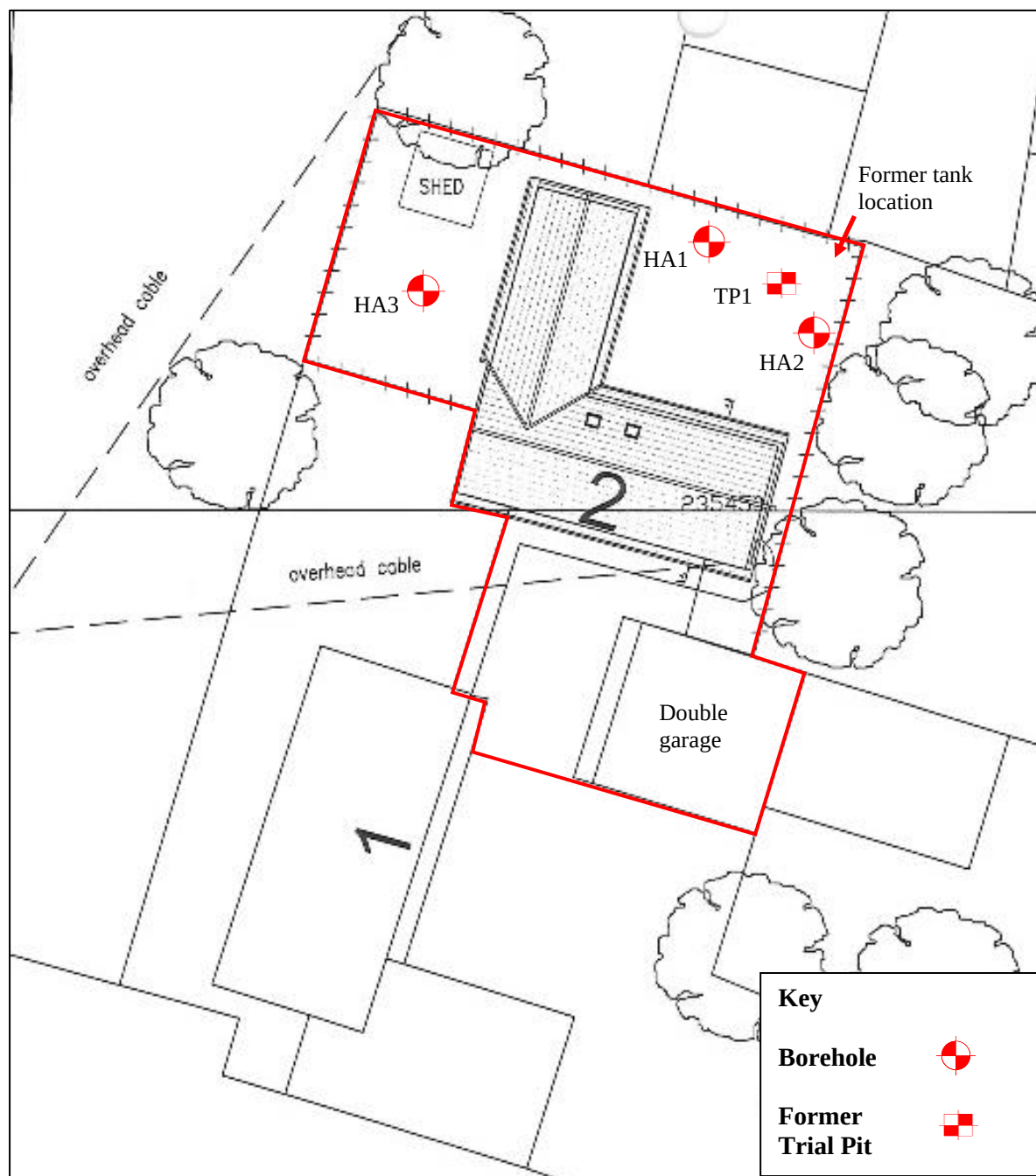


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Project No.
122403

Exploratory Hole Location Plan

Reproduced from a plan provided by the client (former house location).



0m

25m

Project : 2 Pledgers Place, Barkway, Royston

Client : Mr J. Swain & Mrs C. Swain



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Peterborough Tel : 01733 566566

Project No.
122403

Proposed Site Plan

Reproduced from a plan provided by the client.



Project : 2 Pledgers Place, Barkway, Royston

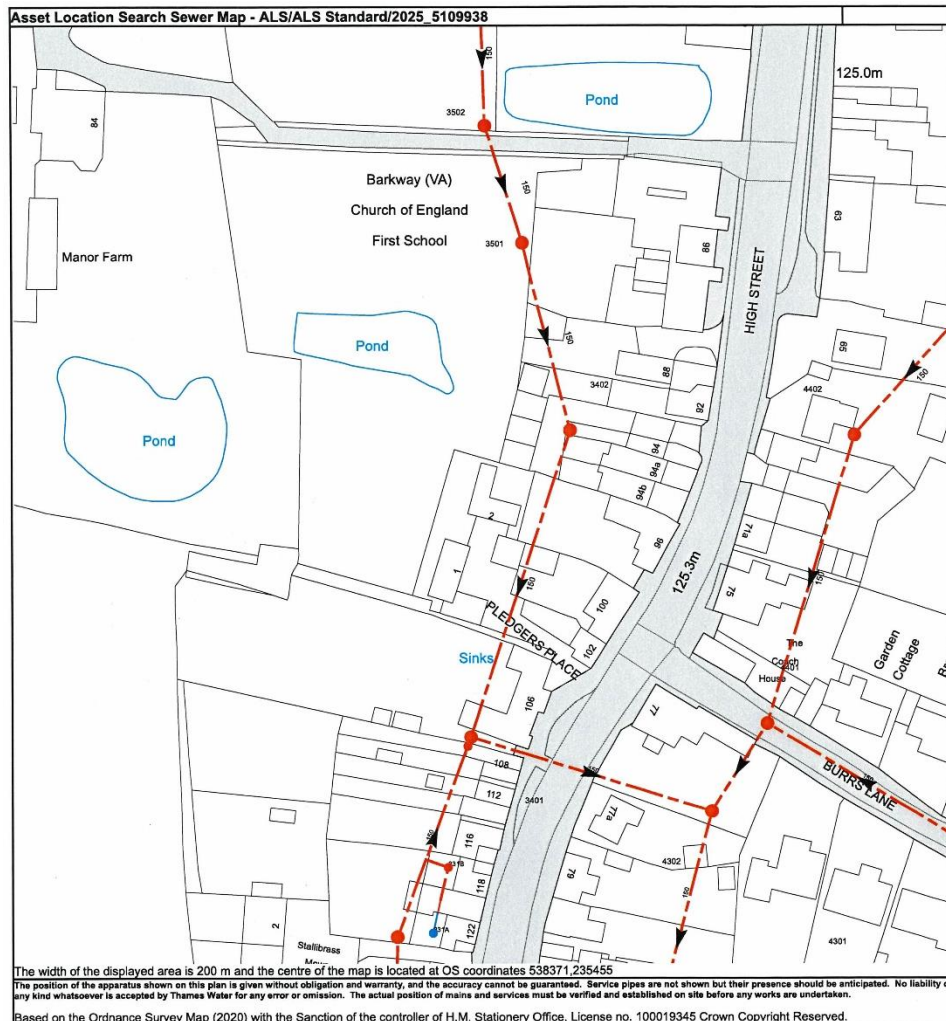
Client : Mr J. Swain & Mrs C. Swain



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Project No.
122403

Reproduced from Thames Water sewer plan. Licence number AL100005523



Client : Mr J. Swain & Mrs C. Swain



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Peterborough Tel : 01733 566566

Project No.	122403
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L I M I T E D
Tel: 01733-566566
www.groundengineering.co.uk

Date: 20/11/24

Ground
Level:

REMARKS	1. Roots observed to at least 1.05m depth 2. Hole sides stable	Project No 122403	
		Scale 1:10	Page 1/1

KEY		Groundwater Strikes						Groundwater Observations			
		Depth m							Depth m		
		No	Struck	Rose to	Rate	Cased	Sealed		Date	Hole	Casing
D - Disturbed Sample	MP - Mackintosh Probe	1	0.80	0.70				20/11/24	1.05		0.70
B - Bulk Sample	V - Vane Shear Test										
U - Undisturbed Sample	Cohesion () kPa										
W - Water Sample	ES - Environmental										
R - Root Sample	Sample										
☒ Water Strike	☒ Water Rise										
☒c Level on completion	☒s Standpipe Level										

GROUND ENGINEERING L I M I T E D Tel: 01733-566566 www.groundengineering.co.uk			Site: 2 PLEDGERS PLACE, BARKWAY, ROYSTON				HAND AUGER HA2					
			Date: 20/11/24		Hole Size: 400mm dia to 1.00m		Ground Level:					
Samples and in-situ Tests			(Date) Water	Description of Strata	Legend	Depth m	O.D. Level m					
Depth m	Type	Result										
0.05 0.05	D1 ES1			MADE GROUND - Brown and dark brown, slightly gravelly, silty SAND. Gravel is angular flint, brick and ash.		0.15						
0.20 0.20	D2 ES2			MADE GROUND - Light brown and brown, slightly silty SAND AND GRAVEL. Gravel is angular to rounded flint, quartz, brick and concrete.		0.25						
0.50 0.50	D3 ES3		1 ▼	MADE GROUND - Dark brown and black, slightly gravelly, silty SAND. Gravel is angular flint, brick and ash.		0.70						
0.75 0.75	D4 ES4		1 ▽	MADE GROUND - Soft, dark brown and dark grey, slightly sandy, slightly gravelly, silty CLAY. Gravel is angular to rounded flint, quartzite, chalk, brick, ash and shell fragments.		1.00						
0.90	D5			Hole completed at 1.00m depth								
REMARKS 1. Roots observed to 0.90m depth 2. Hole sides stable						Project No 122403						
						Scale 1:10	Page 1/1					
KEY D - Disturbed Sample MP - Mackintosh Probe B - Bulk Sample V - Vane Shear Test U - Undisturbed Sample Cohesion () kPa W - Water Sample ES - Environmental Sample R - Root Sample ▼ Water Strike ▼ Water Rise ▼c Level on completion ▼s Standpipe Level			Groundwater Strikes				Groundwater Observations					
			Depth m						Depth m			
			No	Struck	Rose to	Rate	Cased	Sealed	Date	Hole	Casing	Water
1	0.80	0.60				20/11/24	1.00		0.60			

GROUND ENGINEERING L I M I T E D Tel: 01733-566566 www.groundengineering.co.uk			Site: 2 PLEDGERS PLACE, BARKWAY, ROYSTON				HAND AUGER HA3																																									
			Date: 20/11/24		Hole Size: 300mm dia to 0.95m		Ground Level:																																									
Samples and in-situ Tests			(Date) Water	Description of Strata	Legend	Depth m	O.D. Level m																																									
Depth m	Type	Result																																														
0.10 0.10	D1 ES1			MADE GROUND - PEA GRAVEL underlain by geotextile membrane.		0.03																																										
				MADE GROUND - Firm, dark brown and brown, slightly gravelly, sandy, silty CLAY. Gravel is angular to sub-rounded flint, quartz, brick and ash.		0.20																																										
0.30 0.30	D2 ES2			MADE GROUND - Soft, dark brown, slightly sandy, slightly gravelly, silty CLAY. Gravel is angular to sub-rounded flint, brick and concrete.		0.40																																										
0.50 0.50	D3 ES3			MADE GROUND - Soft, brown and light brown, slightly gravelly, sandy, silty CLAY. Gravel is angular to rounded flint and brick.		0.60																																										
0.90 0.90	D4 ES4			POSSIBLE MADE GROUND - Soft, brown, slightly sandy, slightly gravelly, silty CLAY. Gravel is angular to rounded flint, sandstone and chalk.		0.95																																										
				Hole completed at 0.95m depth																																												
REMARKS 1. Roots observed to at least 0.95m depth 2. Hole sides stable							Project No 122403																																									
							Scale 1:10	Page 1/1																																								
KEY D - Disturbed Sample B - Bulk Sample U - Undisturbed Sample W - Water Sample R - Root Sample ▽ Water Strike ▽c Level on completion			MP - Mackintosh Probe V - Vane Shear Test Cohesion () kPa ES - Environmental Sample ▽ Water Rise ▽s Standpipe Level			<table border="1"> <tr> <th colspan="6">Groundwater Strikes</th> <th colspan="4">Groundwater Observations</th> </tr> <tr> <th colspan="6">Depth m</th> <th colspan="4">Depth m</th> </tr> <tr> <th>No</th> <th>Struck</th> <th>Rose to</th> <th>Rate</th> <th>Cased</th> <th>Sealed</th> <th>Date</th> <th>Hole</th> <th>Casing</th> <th>Water</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>20/11/24</td> <td>0.95</td> <td></td> <td>dry</td> </tr> </table>			Groundwater Strikes						Groundwater Observations				Depth m						Depth m				No	Struck	Rose to	Rate	Cased	Sealed	Date	Hole	Casing	Water							20/11/24	0.95		dry
Groundwater Strikes						Groundwater Observations																																										
Depth m						Depth m																																										
No	Struck	Rose to	Rate	Cased	Sealed	Date	Hole	Casing	Water																																							
						20/11/24	0.95		dry																																							

GROUND ENGINEERING L I M I T E D Tel: 01733-566566 www.groundengineering.co.uk			Site: 2 PLEDGERS PLACE, BARKWAY, ROYSTON				HAND AUGER HA4					
			Date: 26/03/25		Hole Size: 250mm dia to 0.30m		Ground Level:					
Samples and in-situ Tests			(Date)	Description of Strata	Legend	Depth m	O.D. Level m					
Depth m	Type	Result	Water									
0.15	D1			TOPSOIL - Dark brown and black, slightly gravelly, silty SAND. Gravel of angular to sub-angular flint.		0.20						
0.25	D2			MADE GROUND - Dark brown and light brown, slightly gravelly, silty, clayey SAND. Gravel of angular to sub-angular flint, brick, ash, glass and plastic.			0.30					
				Hole completed at 0.30m depth								
REMARKS 1. Roots observed to at least 0.30m depth 2. Hole sides stable						Project No 122403						
						Scale 1:10	Page 1/1					
KEY D - Disturbed Sample MP - Mackintosh Probe B - Bulk Sample V - Vane Shear Test U - Undisturbed Sample Cohesion () kPa W - Water Sample ES - Environmental Sample R - Root Sample Sample ☒ Water Strike ▼ Water Rise ▼c Level on completion ▼s Standpipe Level			Groundwater Strikes				Groundwater Observations					
			Depth m						Date			
			No	Struck	Rose to	Rate	Cased	Sealed	Hole	Casing	Water	
							26/03/25	0.30		dry		

GROUND ENGINEERING L I M I T E D Tel: 01733-566566 www.groundengineering.co.uk			Site: 2 PLEDGERS PLACE, BARKWAY, ROYSTON				HAND AUGER HA5	
Date: 26/03/25			Hole Size: 250mm dia to 0.35m				Ground Level:	
Samples and in-situ Tests			(Date) Water	Description of Strata	Legend	Depth m	O.D. Level m	
Depth m	Type	Result						
0.10	D1			TOPSOIL - Dark brown and brown, slightly gravelly, silty SAND. Gravel of angular flint and brick.		0.20		
0.30	D2			MADE GROUND - Brown and light brown, slightly gravelly, silty, clayey SAND. Gravel of angular to sub-angular flint, brick and ash.		0.35		
				Hole completed at 0.35m depth				
REMARKS 1. Roots observed to 0.35m depth 2. Hole sides stable							Project No 122403	
							Scale 1:10	
							Page 1/1	
KEY D - Disturbed Sample B - Bulk Sample U - Undisturbed Sample W - Water Sample R - Root Sample ▽ Water Strike ▽c Level on completion			MP - Mackintosh Probe V - Vane Shear Test Cohesion () kPa ES - Environmental Sample ▽ Water Rise ▽s Standpipe Level			Groundwater Strikes		
Depth m						Groundwater Observations		
No	Struck	Rose to	Rate	Cased	Sealed	Date	Depth m	
						26/03/25	0.35	
							dry	

LABORATORY TEST RESULTS

CONTRACT 2 PLEDGERS PLACE, ROYSTON

[illegible]

U - UNDISTURBED SAMPLE
D - DISTURBED SAMPLE
B - BULK SAMPLE
W - WATER SAMPLE

C.U. - CONSOLIDATED UNDRAINED
C.D. - CONSOLIDATED DRAINED
Q. - IMMEDIATE UNDRAINED
Q.M. - IMMEDIATE UNDRAINED MULTISTAGE

Aqueous Extract 2:1 Water:Soil

122403

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Final Report

Report No.: 24-38333-1

Initial Date of Issue: 02-Dec-2024

Re-Issue Details:

Client Lucion Ground Engineering Limited

Client Address: Newark Road
Peterborough
Cambridgeshire
PE1 5UA

Contact(s): Simon Weatherley

Project 122403 2 Pledgers Place

Quotation No.: **Date Received:** 22-Nov-2024

Order No.: 18407 **Date Instructed:** 22-Nov-2024

No. of Samples: 3

Turnaround (Wkdays): 5 **Results Due:** 28-Nov-2024

Date Approved: 02-Dec-2024

Approved By:



Details: David Smith, Technical Director

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Soil

Project: 122403 2 Pledgers Place

Client: Lucion Ground Engineering Limited		Chemtest Job No.:				24-38333	24-38333	24-38333
Quotation No.:		Chemtest Sample ID.:				1899265	1899266	1899267
Order No.: 18407		Client Sample Ref.:				D2 ES2	D3 ES3	D2 ES2
		Sample Location:				HA1	HA2	HA3
		Sample Type:				SOIL	SOIL	SOIL
		Top Depth (m):				0.30	0.50	0.30
		Date Sampled:				20-Nov-2024	20-Nov-2024	20-Nov-2024
		Asbestos Lab:				DURHAM	DURHAM	DURHAM
Determinand	HWOL Code	Accred.	SOP	Units	LOD			
pH at 20C		M	2010		4.0	8.4	8.2	7.6
Moisture		N	2030	%	0.020	13	15	14
Stones and Removed Materials		N	2030	%	0.020	< 0.020	< 0.020	< 0.020
Boron (Hot Water Soluble)		M	2120	mg/kg	0.40	2.1	2.0	1.9
Sulphate (2:1 Water Soluble) as SO4		M	2120	g/l	0.010	0.051	0.061	0.020
Cyanide (Free)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Sulphide (Easily Liberatable)		N	2325	mg/kg	0.50	13	3.5	2.8
Arsenic		M	2455	mg/kg	0.5	18	25	17
Cadmium		M	2455	mg/kg	0.10	1.3	1.3	0.60
Chromium		M	2455	mg/kg	0.5	17	23	19
Copper		M	2455	mg/kg	0.50	49	72	54
Mercury		M	2455	mg/kg	0.05	1.1	1.7	0.60
Nickel		M	2455	mg/kg	0.50	24	31	24
Lead		M	2455	mg/kg	0.50	610	860	460
Selenium		M	2455	mg/kg	0.25	0.94	1.1	0.93
Zinc		M	2455	mg/kg	0.50	330	640	220
Chromium (Hexavalent)		N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Organic Matter		M	2625	%	0.40	19	6.9	6.9
Acenaphthene		M	2700	mg/kg	0.10	0.17	0.31	1.8
Acenaphthylene		M	2700	mg/kg	0.10	0.36	0.54	0.62
Anthracene		M	2700	mg/kg	0.10	0.65	0.47	1.1
Benzo[a]anthracene		M	2700	mg/kg	0.10	3.4	3.4	3.6
Benzo[a]pyrene		M	2700	mg/kg	0.10	3.7	4.0	4.0
Benzo[b]fluoranthene		M	2700	mg/kg	0.10	4.8	5.2	5.3
Benzo[g,h,i]perylene		M	2700	mg/kg	0.10	2.8	3.2	3.1
Benzo[k]fluoranthene		M	2700	mg/kg	0.10	2.1	2.0	2.0
Chrysene		M	2700	mg/kg	0.10	4.3	4.9	4.7
Dibenz(a,h)Anthracene		M	2700	mg/kg	0.10	0.88	0.66	0.78
Fluoranthene		M	2700	mg/kg	0.10	5.7	5.9	8.0
Fluorene		M	2700	mg/kg	0.10	0.21	0.23	0.66
Indeno(1,2,3-c,d)Pyrene		M	2700	mg/kg	0.10	2.6	2.6	2.7
Naphthalene		M	2700	mg/kg	0.10	0.54	0.56	0.55
Phenanthrene		M	2700	mg/kg	0.10	1.7	2.1	5.3
Pyrene		M	2700	mg/kg	0.10	5.9	6.4	7.9
Total Of 16 PAH's		M	2700	mg/kg	2.0	40	43	52
Total Phenols		M	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10

Results - Soil

Project: 122403 2 Pledgers Place

Client: Lucion Ground Engineering Limited		Chemtest Job No.:				24-38333	24-38333	24-38333
Quotation No.:		Chemtest Sample ID.:				1899265	1899266	1899267
Order No.: 18407		Client Sample Ref.:				D2 ES2	D3 ES3	D2 ES2
		Sample Location:				HA1	HA2	HA3
		Sample Type:				SOIL	SOIL	SOIL
		Top Depth (m):				0.30	0.50	0.30
		Date Sampled:				20-Nov-2024	20-Nov-2024	20-Nov-2024
		Asbestos Lab:				DURHAM	DURHAM	DURHAM
Determinand	HWOL Code	Accred.	SOP	Units	LOD			
ACM Type		U	2192		N/A	Fibres/Clumps	-	-
Asbestos Identification		U	2192		N/A	Chrysotile	No Asbestos Detected	No Asbestos Detected
Asbestos by Gravimetry		U	2192	%	0.001	<0.001		
Total Asbestos		U	2192	%	0.001	<0.001		
Soil Colour		N	2040		N/A	Brown	Brown	Brown
Other Material		N	2040		N/A	Stones	Stones and Roots	Stones, Roots and
Soil Texture		N	2040		N/A	Clay	Clay	Clay
Total TPH >C6-C40	EH_1D_Total	U	2670	mg/kg	10	750	360	72

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
2010	pH Value of Soils	pH at 20°C	pH Meter	
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <30°C.	
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930	
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES	
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry	
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.	
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N-dimethyl-p-phenylenediamine.	
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.	
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazine.	
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.	
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID	
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)	
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.	

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- A - Date of sampling not supplied
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- D - Broken Container
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Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt.

All water samples will be retained for 14 days from the date of receipt.

Charges may apply to extended sample storage.

Water Sample Category Key for Accreditation

- DW - Drinking Water
- GW - Ground Water
- LE - Land Leachate
- NA - Not Applicable

Report Information

PL - Prepared Leachate
PW - Processed Water
RE - Recreational Water
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Clean Up Codes

NC - No Clean Up
MC - Mathematical Clean Up
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HWOL Acronym System

HS - Headspace analysis
EH - Extractable hydrocarbons – i.e. everything extracted by the solvent
CU - Clean-up – e.g. by Florisil, silica gel
1D - GC – Single coil gas chromatography
Total - Aliphatics & Aromatics
AL - Aliphatics only
AR - Aromatic only
2D - GC-GC – Double coil gas chromatography
#1 - EH_2D_Total but with humics mathematically subtracted
#2 - EH_2D_Total but with fatty acids mathematically subtracted
+ - Operator to indicate cumulative e.g. EH+EH_Total or EH_CU+HS_Total

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com



Final Report

Report No.: 24-33097-1

Initial Date of Issue: 20-Oct-2024

Re-Issue Details:

Client Lucion Ground Engineering Limited

Client Address: Newark Road
Peterborough
Cambridgeshire
PE1 5UA

Contact(s): Simon Weatherley

Project 122403 2 PLEDGERS PLACE

Quotation No.: **Date Received:** 14-Oct-2024

Order No.: 17647 **Date Instructed:** 14-Oct-2024

No. of Samples: 2

Turnaround (Wkdays): 5 **Results Due:** 18-Oct-2024

Date Approved: 20-Oct-2024

Approved By:



Details: David Smith, Technical Director

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Soil

Project: 122403 2 PLEDGERS PLACE

Client: Lucion Ground Engineering Limited		Chemtest Job No.:				24-33097	24-33097
Quotation No.:		Chemtest Sample ID.:				1879809	1879810
Order No.: 17647		Client Sample Ref.:				A	B
		Sample Location:				TH1	TH1
		Sample Type:				SOIL	SOIL
		Top Depth (m):				0.50	1.00
		Date Sampled:				10-Oct-2024	10-Oct-2024
Determinand	HWOL Code	Accred.	SOP	Units	LOD		
Moisture		N	2030	%	0.020	14	17
Soil Colour		N	2040		N/A	Brown	Brown
Other Material		N	2040		N/A	Stones	Stones
Soil Texture		N	2040		N/A	Clay	Clay
Aliphatic VPH >C5-C6	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C7	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aliphatic VPH >C7-C8	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C8 (Sum)	HS_2D_AL	N	2780	mg/kg	0.10	< 0.10	< 0.10
Aliphatic VPH >C8-C10	HS_2D_AL	U	2780	mg/kg	0.05	2.9	1.2
Total Aliphatic VPH >C5-C10	HS_2D_AL	U	2780	mg/kg	0.25	2.9	1.2
Aliphatic EPH >C10-C12 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	420	470
Aliphatic EPH >C12-C16 MC	EH_2D_AL_#1	M	2690	mg/kg	1.00	640	640
Aliphatic EPH >C16-C21 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	28	9.4
Aliphatic EPH >C21-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	3.00	13	7.5
Aliphatic EPH >C35-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	< 10	< 10
Total Aliphatic EPH >C10-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	5.00	1100	1100
Total Aliphatic EPH >C10-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	1100	1100
Aromatic VPH >C5-C7	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aromatic VPH >C7-C8	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aromatic VPH >C8-C10	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05
Total Aromatic VPH >C5-C10	HS_2D_AR	U	2780	mg/kg	0.25	< 0.25	< 0.25
Aromatic EPH >C10-C12 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	110	160
Aromatic EPH >C12-C16 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	210	310
Aromatic EPH >C16-C21 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	5.2	2.6
Aromatic EPH >C21-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	4.8	3.0
Aromatic EPH >C35-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	1.00	30	1.1
Total Aromatic EPH >C10-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	5.00	330	480
Total Aromatic EPH >C10-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	10.00	360	480
Total VPH >C5-C10	HS_2D_Total	U	2780	mg/kg	0.50	2.9	1.2
Total EPH >C10-C35 MC	EH_2D_Total_#1	U	2690	mg/kg	10.00	1400	1600
Total EPH >C10-C40 MC	EH_2D_Total_#1	N	2690	mg/kg	10.00	1500	1600

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <30°C.	
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930	
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID	
2690	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40	Acetone/Heptane extraction / GCxGC FID detection	
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8–C10 Aromatics: >C5–C7,>C7–C8,>C8–C10	Water extraction / Headspace GCxGC FID detection	

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MC - Mathematical Clean Up
FC - Florisil Clean Up

HWOL Acronym System

HS - Headspace analysis
EH - Extractable hydrocarbons – i.e. everything extracted by the solvent
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AL - Aliphatics only
AR - Aromatic only
2D - GC-GC – Double coil gas chromatography
#1 - EH_2D_Total but with humics mathematically subtracted
#2 - EH_2D_Total but with fatty acids mathematically subtracted
+ - Operator to indicate cumulative e.g. EH+EH_Total or EH_CU+HS_Total

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com



Final Report

Report No.: 25-10376-1

Initial Date of Issue: 01-Apr-2025

Re-Issue Details:

Client Lucion Ground Engineering Limited

Client Address: Newark Road
Peterborough
Cambridgeshire
PE1 5UA

Contact(s): Simon Weatherley

Project 122403 2 Pledgers Place

Quotation No.:	Date Received:	26-Mar-2025
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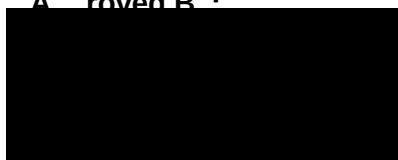
Order No.:	Date Instructed:	26-Mar-2025
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No. of Samples: 2

Turnaround (Wkdays):	Results Due:	01-Apr-2025
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Date Approved: 01-Apr-2025

Approved By:



Details: David Smith, Technical Director

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Soil

Project: 122403 2 Pledgers Place

Client: Lucion Ground Engineering Limited		Chemtest Job No.:				25-10376	25-10376
Quotation No.:		Chemtest Sample ID.:				1952599	1952600
Order No.: 20594		Client Sample Ref.:				D1	D2
		Sample Location:				HA4	HA5
		Sample Type:				SOIL	SOIL
		Top Depth (m):				0.15	0.30
		Date Sampled:				26-Mar-2025	26-Mar-2025
Determinand	HWOL Code	Accred.	SOP	Units	LOD		
pH at 20C		M	2010		4.0	8.0	8.2
Moisture		N	2030	%	0.020	37	20
Stones and Removed Materials		N	2030	%	0.020	< 0.020	< 0.020
Boron (Hot Water Soluble)		M	2120	mg/kg	0.40	2.1	2.6
Sulphate (2:1 Water Soluble) as SO4		M	2120	g/l	0.010	0.015	< 0.010
Cyanide (Free)		M	2300	mg/kg	0.50	0.50	< 0.50
Cyanide (Total)		M	2300	mg/kg	0.50	0.70	< 0.50
Sulphide (Easily Liberatable)		N	2325	mg/kg	0.50	5.8	2.8
Arsenic		M	2455	mg/kg	0.5	2.7	16
Cadmium		M	2455	mg/kg	0.10	0.16	0.33
Chromium		M	2455	mg/kg	0.5	5.4	18
Copper		M	2455	mg/kg	0.50	18	51
Mercury		M	2455	mg/kg	0.05	0.08	0.99
Nickel		M	2455	mg/kg	0.50	6.4	22
Lead		M	2455	mg/kg	0.50	29	300
Selenium		M	2455	mg/kg	0.25	< 0.25	0.66
Zinc		M	2455	mg/kg	0.50	52	180
Chromium (Hexavalent)		N	2490	mg/kg	0.50	< 0.50	< 0.50
Organic Matter		M	2625	%	0.40	22	6.6
Acenaphthene		M	2700	mg/kg	0.10	< 0.10	0.63
Acenaphthylene		M	2700	mg/kg	0.10	< 0.10	0.33
Anthracene		M	2700	mg/kg	0.10	0.12	0.18
Benzo[a]anthracene		M	2700	mg/kg	0.10	0.57	1.2
Benzo[a]pyrene		M	2700	mg/kg	0.10	0.64	1.1
Benzo[b]fluoranthene		M	2700	mg/kg	0.10	0.60	1.4
Benzo[g,h,i]perylene		M	2700	mg/kg	0.10	5.0	1.3
Benzo[k]fluoranthene		M	2700	mg/kg	0.10	1.2	1.1
Chrysene		M	2700	mg/kg	0.10	1.6	1.6
Dibenz(a,h)Anthracene		M	2700	mg/kg	0.10	2.0	0.56
Fluoranthene		M	2700	mg/kg	0.10	0.86	1.6
Fluorene		M	2700	mg/kg	0.10	< 0.10	0.16
Indeno(1,2,3-c,d)Pyrene		M	2700	mg/kg	0.10	0.43	0.76
Naphthalene		M	2700	mg/kg	0.10	< 0.10	0.34
Phenanthrene		M	2700	mg/kg	0.10	0.79	0.76
Pyrene		M	2700	mg/kg	0.10	0.99	1.7
Total Of 16 PAH's		M	2700	mg/kg	2.0	15	15
Total Phenols		M	2920	mg/kg	0.10	< 0.10	< 0.10
Soil Colour		N	2040		N/A	Brown	Brown
Other Material		N	2040		N/A	Stones and Roots	Stones and Roots
Soil Texture		N	2040		N/A	Loam	Loam

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
2010	pH Value of Soils	pH at 20°C	pH Meter	
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <30°C.	
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930	
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES	
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.	
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N-dimethyl-p-phenylenediamine.	
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.	
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazine.	
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.	
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)	
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.	

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LOD	Limit of detection

This report shall not be reproduced except in full, and only with the prior approval of the laboratory.

Any comments or interpretations are outside the scope of UKAS accreditation.

The Laboratory is not accredited for any sampling activities and reported results relate to the samples 'as received' at the laboratory.

Uncertainty of measurement for the determinands tested are available upon request .

None of the results in this report have been recovery corrected.

All results are expressed on a dry weight basis.

The following tests were analysed on samples 'as received' and the results subsequently corrected to a dry weight basis EPH, VPH, TPH, BTEX, VOCs, SVOCs, PCBs, Phenols.

For all other tests the samples were dried at $\leq 30^{\circ}\text{C}$ prior to analysis.

All Asbestos testing is performed at the indicated laboratory .

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1.

NEW_ASB Eurofins Chemtest Limited, 11 Depot Road, Newmarket, CB8 0AL

DURHAM Eurofins Chemtest Limited, Unit A North Wing, Prospect Business Park, Crookhall Lane, Consett, Co Durham, DH8 7PW

Sample Deviation Codes

As a result of any of the below deviations applying, the test results may be unreliable

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - The required amount of sample for analysis was not received

H - Appropriate cooling measures were not taken for sample transportation

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt.

All water samples will be retained for 14 days from the date of receipt.

Charges may apply to extended sample storage.

Report Information

Water Sample Category Key for Accreditation

DW - Drinking Water
GW - Ground Water
LE - Land Leachate
NA - Not Applicable
PL - Prepared Leachate
PW - Processed Water
RE - Recreational Water
SA - Saline Water
SW - Surface Water
TE - Treated Effluent
TS - Treated Sewage
UL - Unspecified Liquid

Clean Up Codes

NC - No Clean Up
MC - Mathematical Clean Up
FC - Florisil Clean Up

HWOL Acronym System

HS - Headspace analysis
EH - Extractable hydrocarbons – i.e. everything extracted by the solvent
CU - Clean-up – e.g. by Florisil, silica gel
1D - GC – Single coil gas chromatography
Total - Aliphatics & Aromatics
AL - Aliphatics only
AR - Aromatic only
2D - GC-GC – Double coil gas chromatography
#1 - EH_2D_Total but with humics mathematically subtracted
#2 - EH_2D_Total but with fatty acids mathematically subtracted
+ - Operator to indicate cumulative e.g. EH+EH_Total or EH_CU+HS_Total

Asbestos Tests LOD = LOQ

Limit of Detection = Limit of Quantification for asbestos results only

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

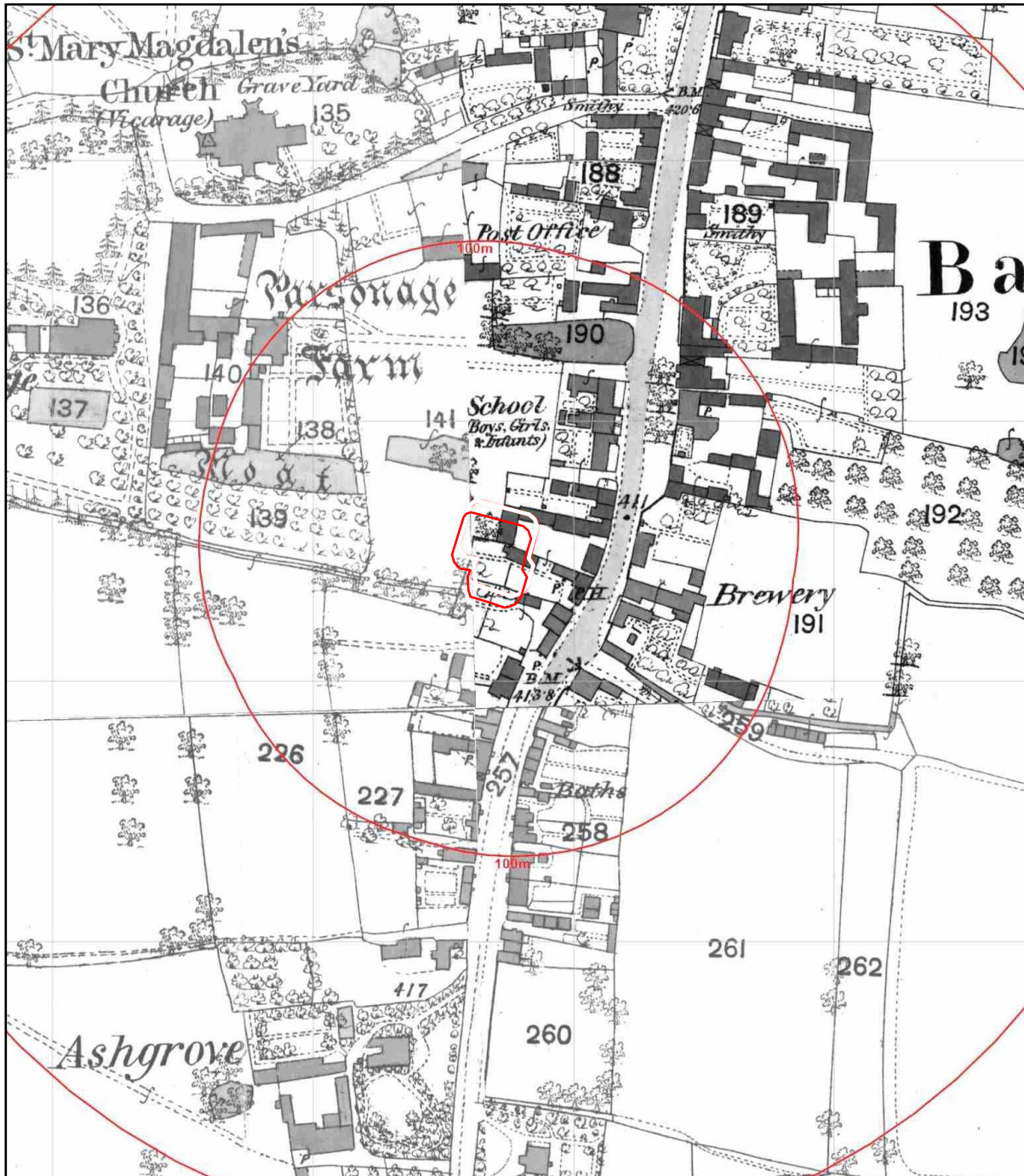
APPENDIX 1

HISTORICAL MAP EXTRACTS

Site History

Figure A

Reproduced from the 1877 edition Ordnance Survey sheets Hertfordshire 9.1, 9.2, 9.5 & 9.6 at 1:2500 scale



Project : 2 Pledgers Place, Barkway, Royston

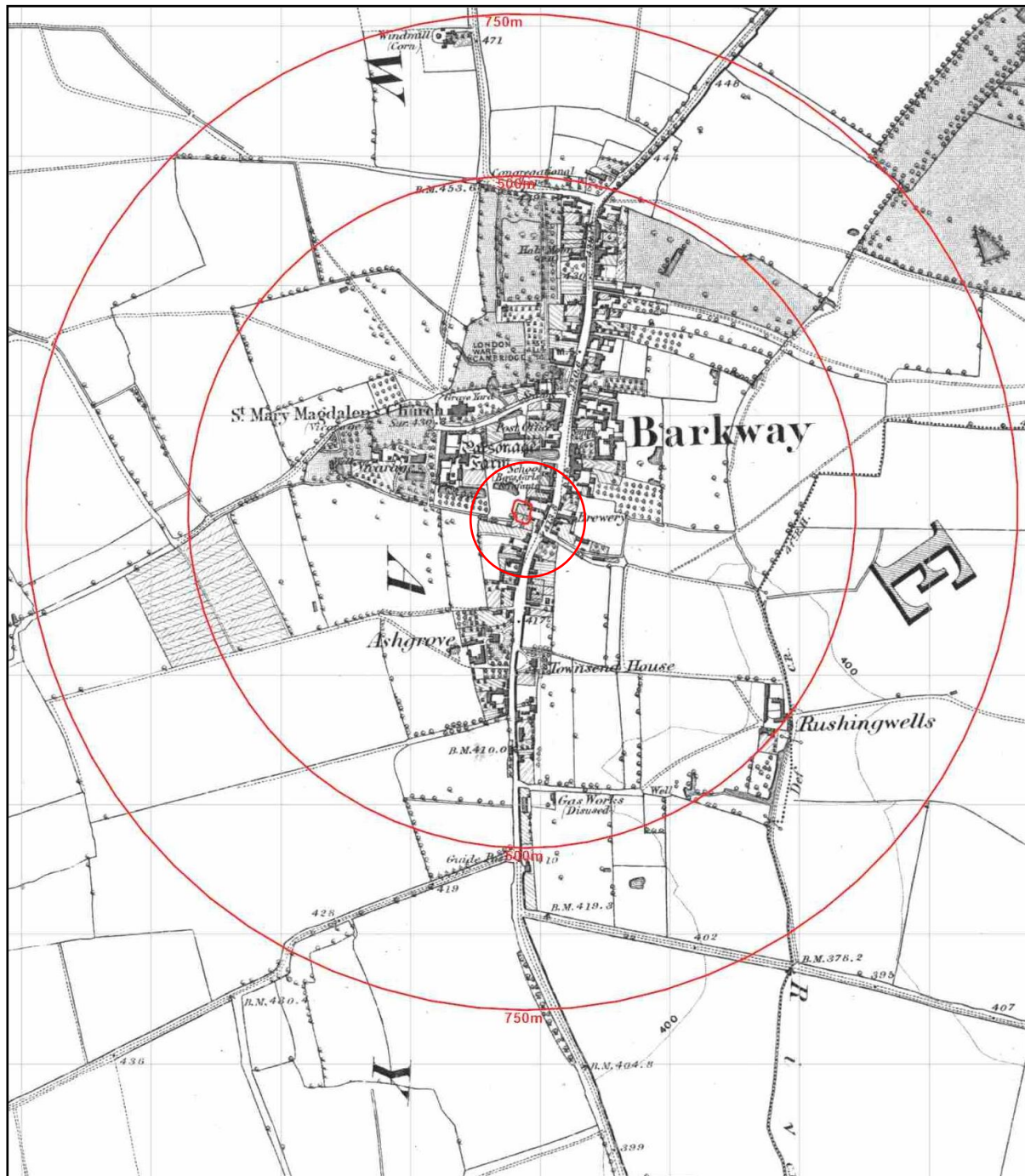
Client : Mr J. Swain & Mrs C. Swain



LUCION GROUND ENGINEERING LIMITED
Peterborough Tel : 01733 566566

Project No.
122403

Figure B



Client : Mr J. Swain & Mrs C. Swain



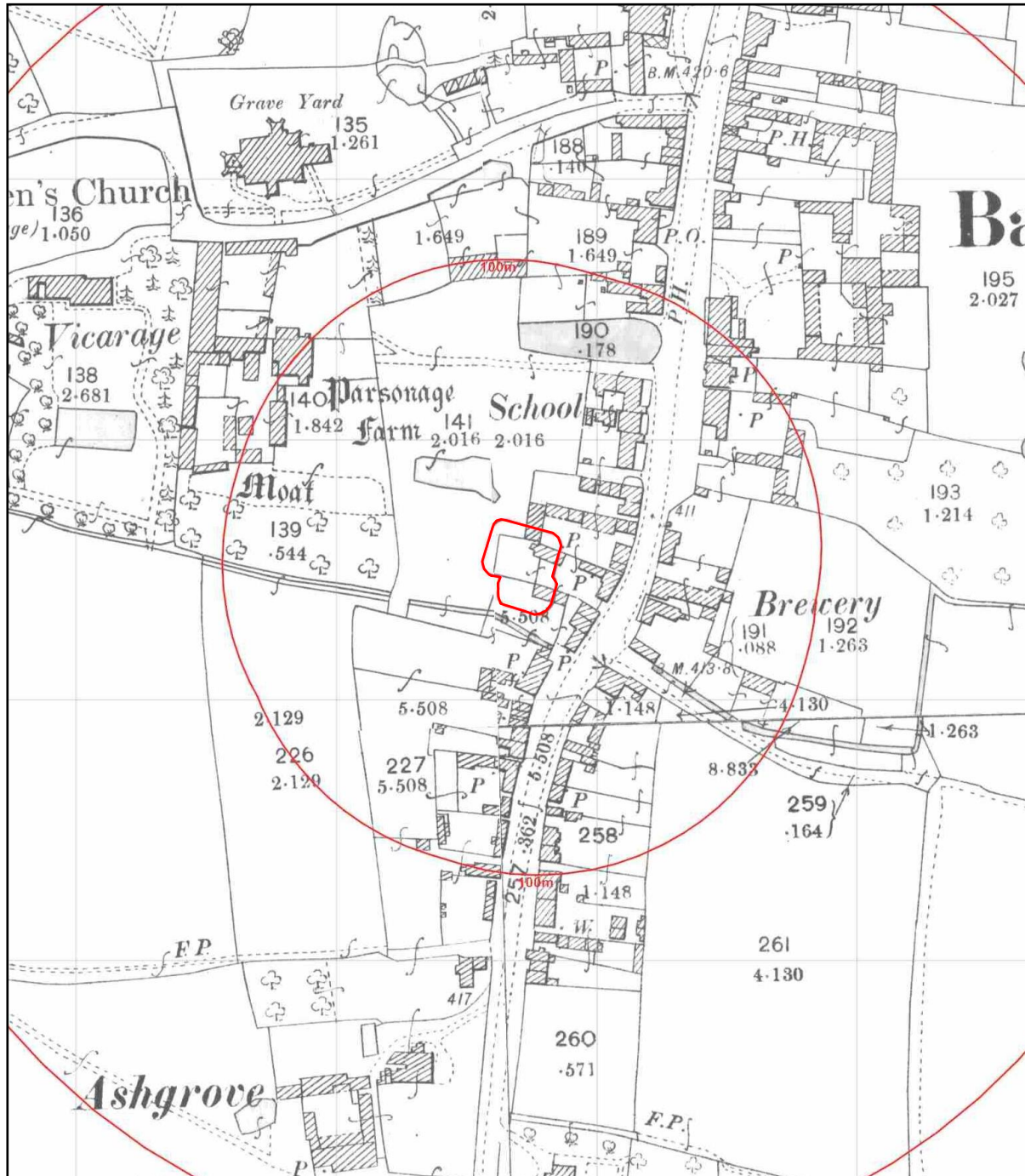
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Peterborough Tel : 01733 566566

Project No.	122403
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Site History

Figure C

Reproduced from the 1898 edition Ordnance Survey sheets Hertfordshire 9.1, 9.2, 9.5 & 9.6 at 1:2500 scale



Project : 2 Pledgers Place, Barkway, Royston

Client : Mr J. Swain & Mrs C. Swain



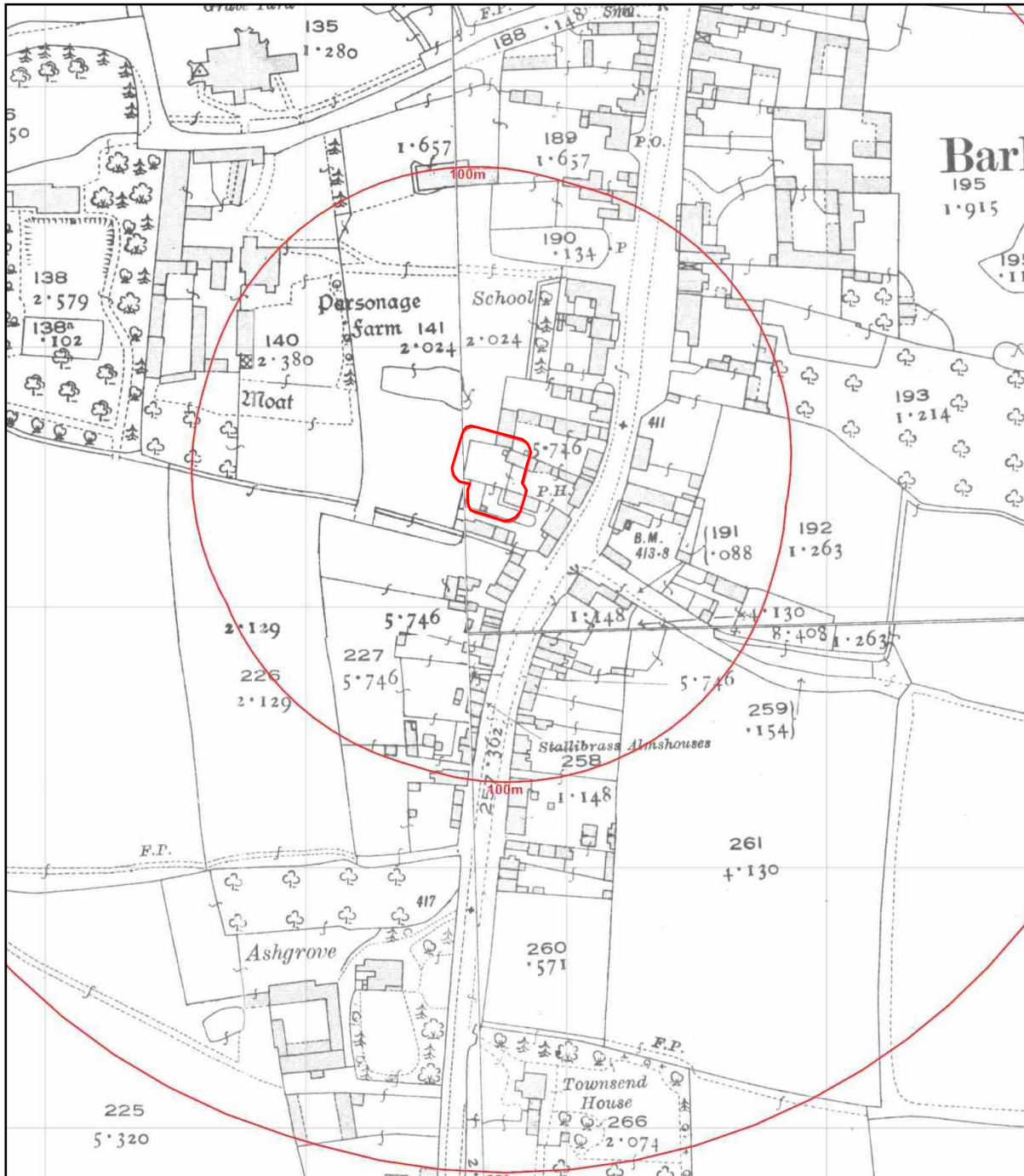
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Site History

Figure D

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Project : 2 Pledgers Place, Barkway, Royston

Client : Mr J. Swain & Mrs C. Swain



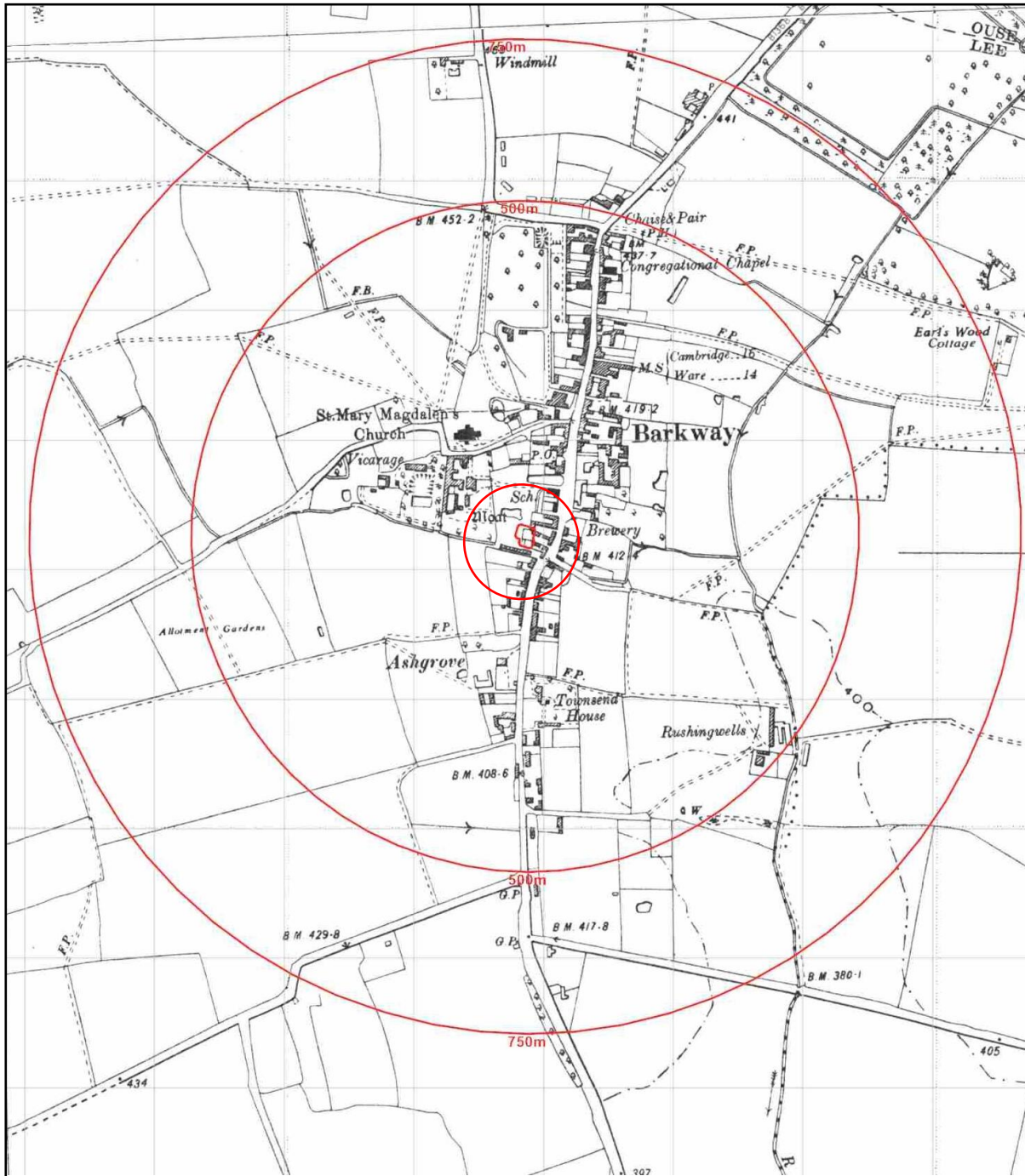
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122403

Site History

Figure E

Reproduced from the 1948 edition Ordnance Survey sheets Cambridgeshire 62A SE & NE at 1:10,560 scale



Project : 2 Pledgers Place, Barkway, Royston

Client : Mr J. Swain & Mrs C. Swain



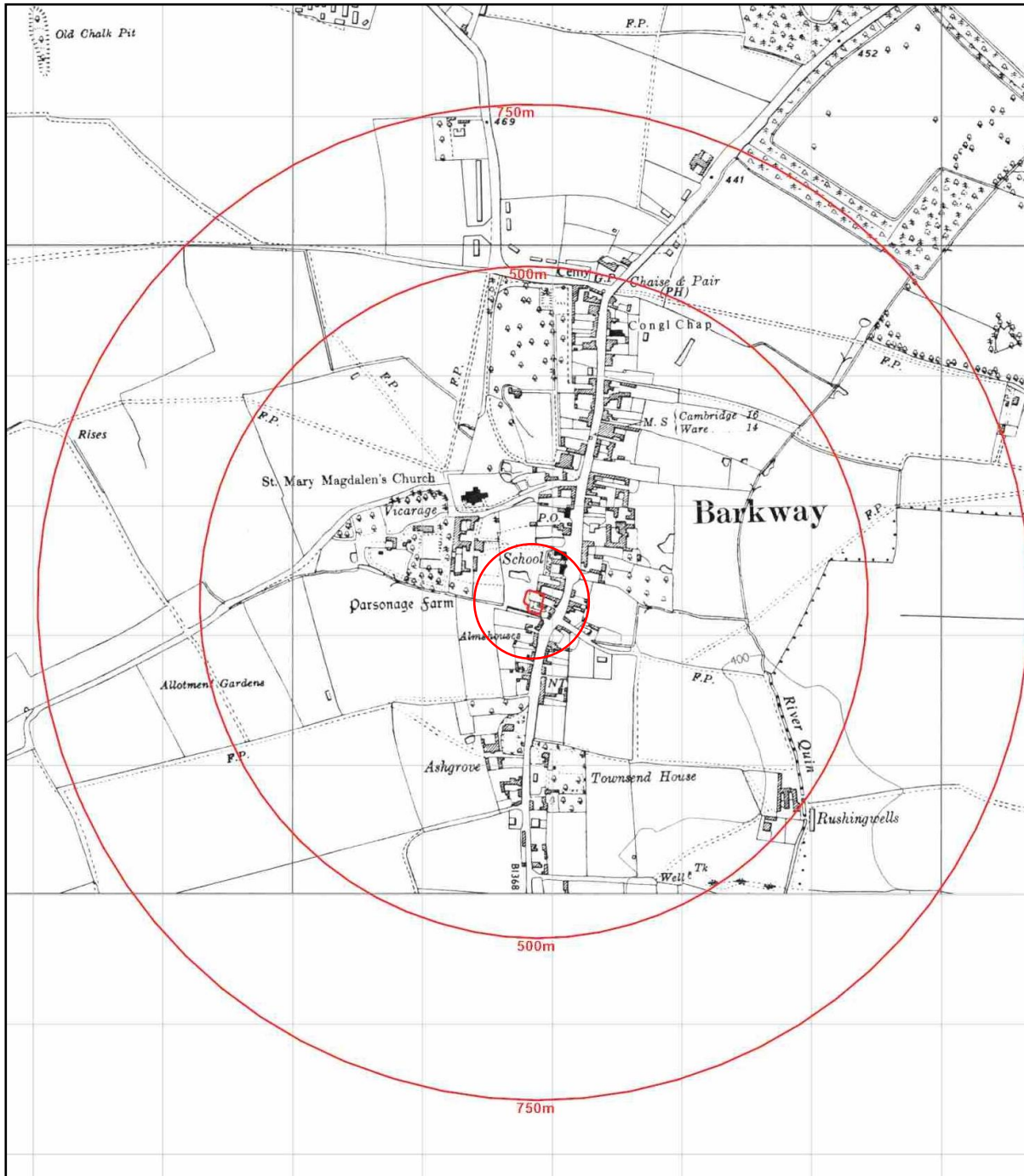
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122403

Site History

Figure F

Reproduced from the 1960 edition Ordnance Survey sheet TL33NE at 1:10,560 scale



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Client : Mr J. Swain & Mrs C. Swain



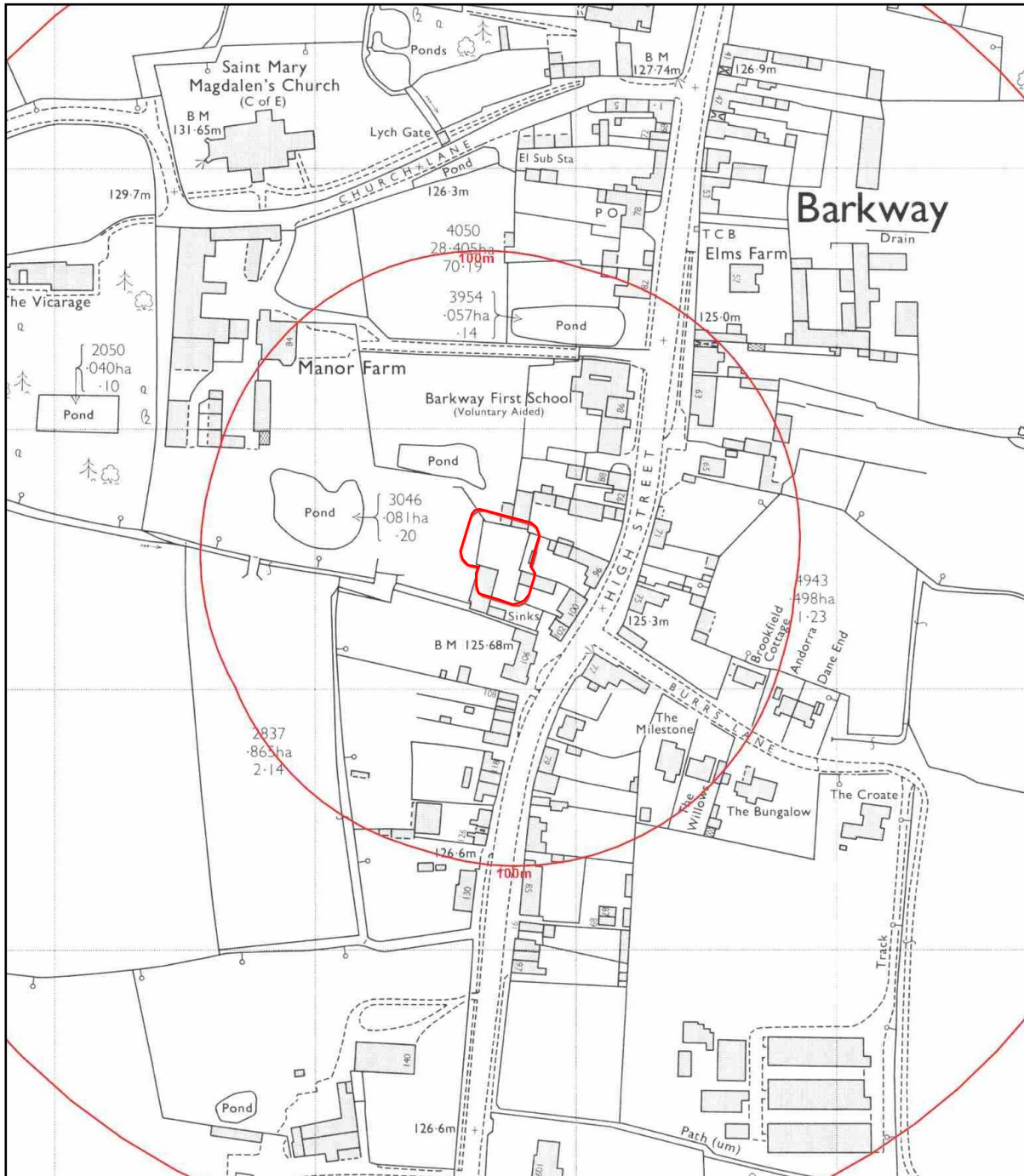
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Site History

Figure G

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Client : Mr J. Swain & Mrs C. Swain



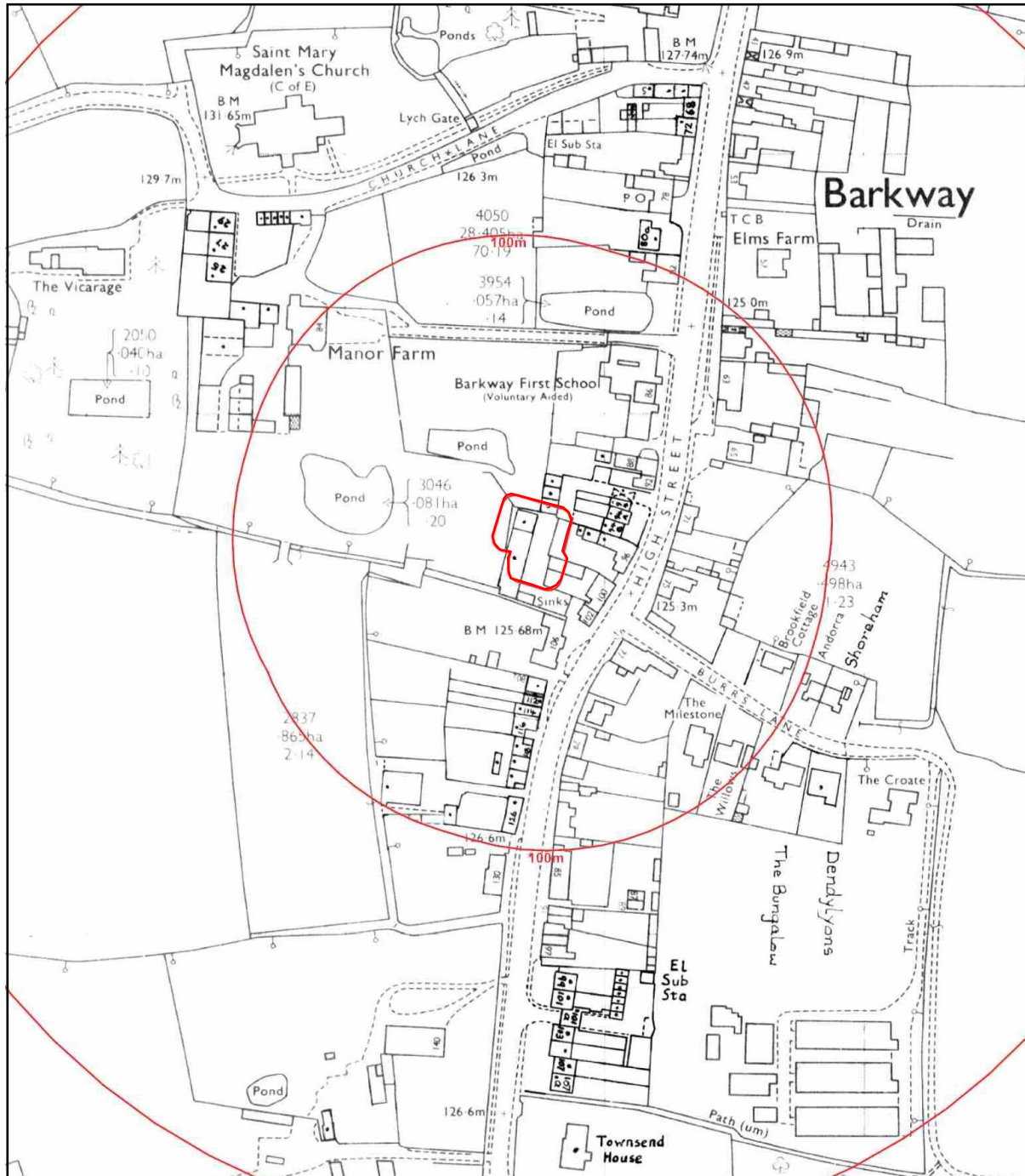
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Site History

Figure H

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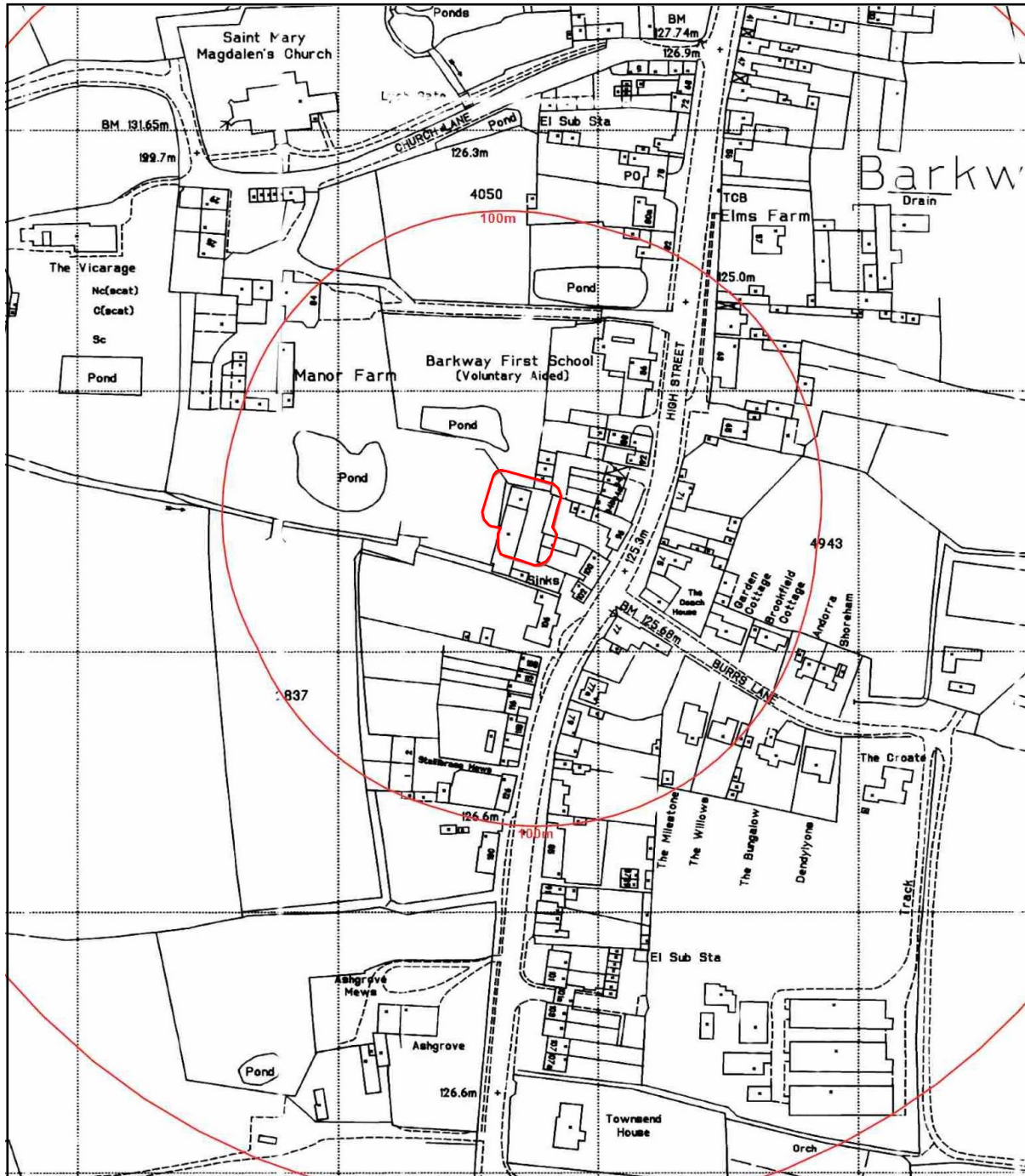
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Site History

Figure I

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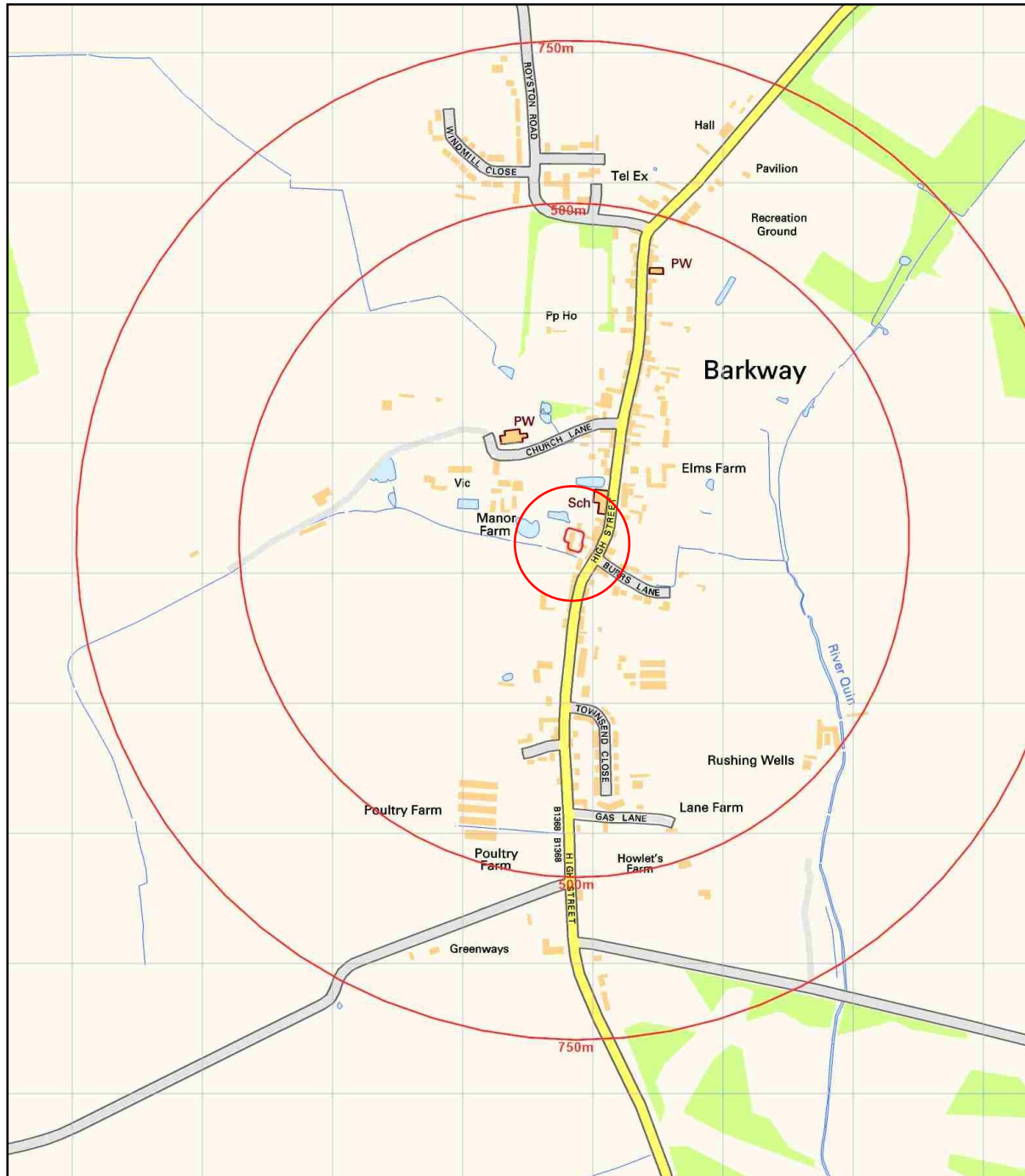
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Site History

Figure J

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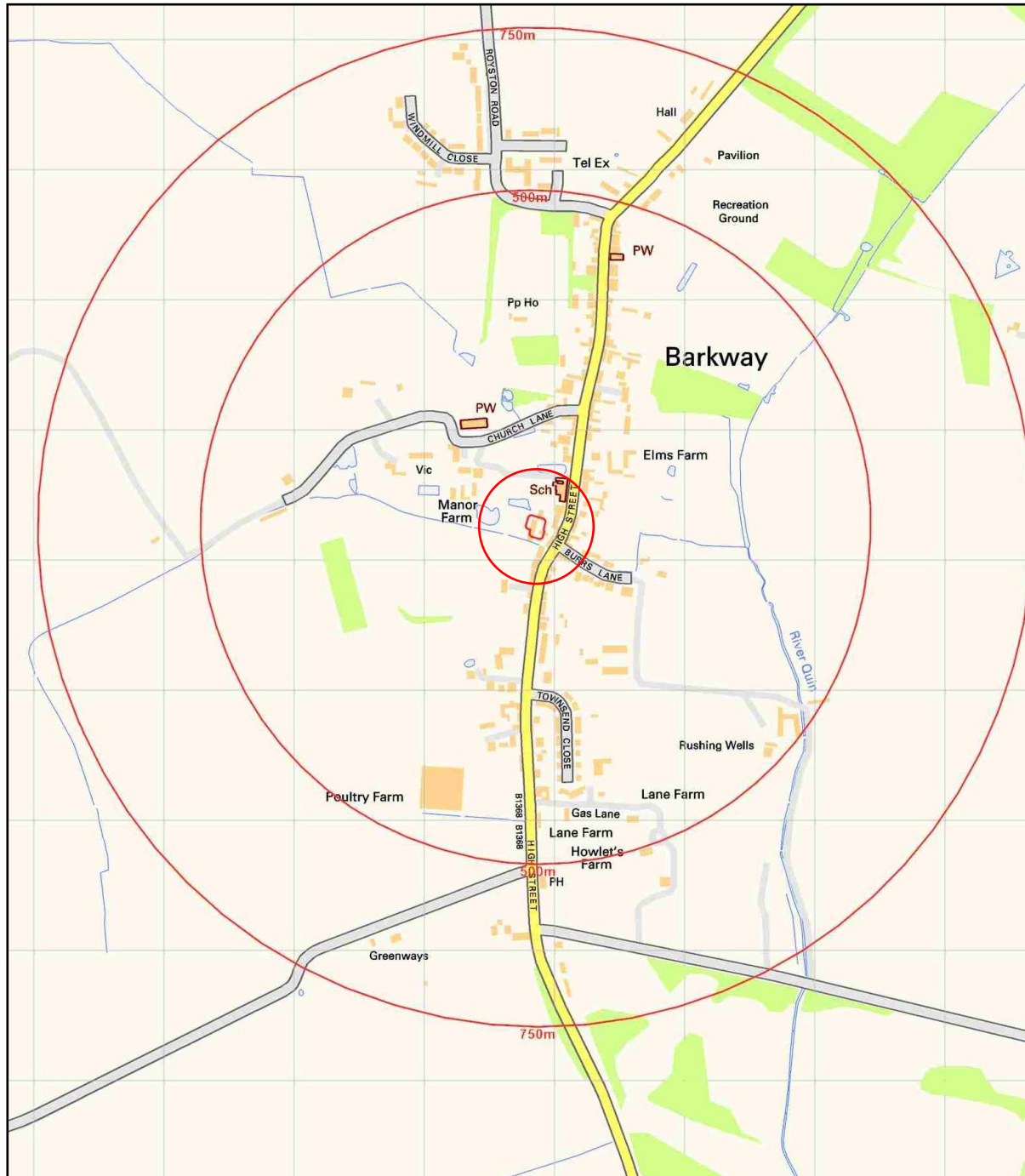
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Peterborough Tel : 01733 566566

Project No.
122403

Site History

Figure L

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Client : Mr J. Swain & Mrs C. Swain



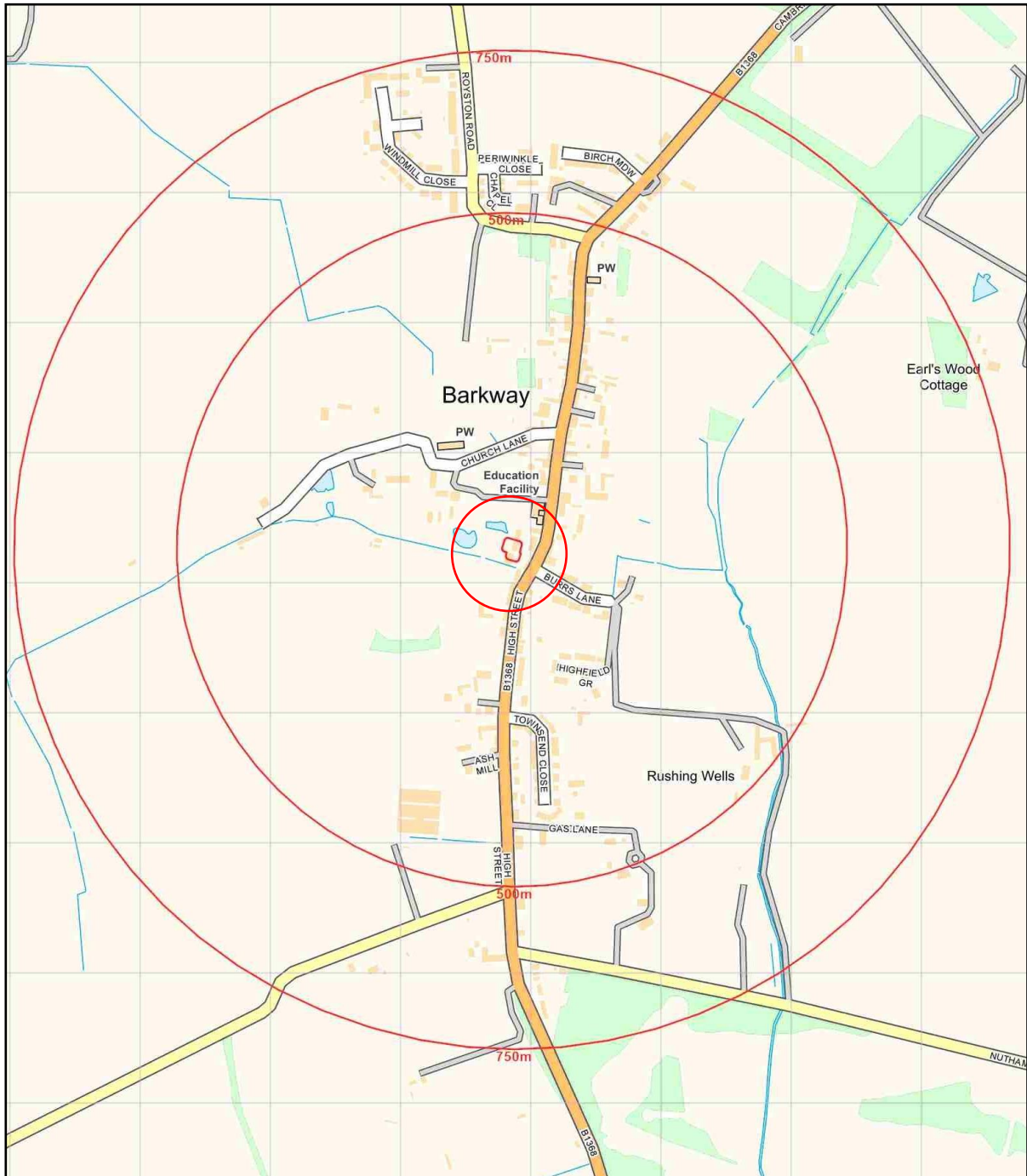
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Project No.
122403

Site History

Figure M

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Client : Mr J. Swain & Mrs C. Swain



LUCION GROUND ENGINEERING LIMITED
Peterborough Tel : 01733 566566

Project No.
122403

APPENDIX 2

ENVIRONMENTAL DATABASE SEARCH



2, PLEDGERS PLACE, BARKWAY, HERTFORDSHIRE, SG8 8DQ

Order Details

Date: 18/11/2024
Your ref: SW 18331
Our Ref: HMD-1JW-E2Z-SSG-MCM

Site Details

Location: 538371 235451
Area: 0.08 ha
Authority: [North Hertfordshire District Council](#) ↗



Summary of findings

[p. 2 >](#)

Aerial image

[p. 9 >](#)

OS MasterMap site plan

[p.14 >](#)

[Insight User Guide](#) ↗

Contact us with any questions at:

info@groundsure.com ↗

01273 257 755

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 >	1	5	7	17	-
17 >	1.2 >	Historical tanks >	0	0	0	2	-
17 >	1.3 >	Historical energy features >	0	0	4	3	-
18	1.4	Historical petrol stations	0	0	0	0	-
18 >	1.5 >	Historical garages >	0	0	0	3	-
19	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
20 >	2.1 >	Historical industrial land uses >	1	7	8	17	-
22 >	2.2 >	Historical tanks >	0	0	0	3	-
22 >	2.3 >	Historical energy features >	0	0	5	6	-
23	2.4	Historical petrol stations	0	0	0	0	-
23 >	2.5 >	Historical garages >	0	0	0	3	-
Page	Section	Waste and landfill	On site	0-50m	50-250m	250-500m	500-2000m
24	3.1	Active or recent landfill	0	0	0	0	-
24	3.2	Historical landfill (BGS records)	0	0	0	0	-
24	3.3	Historical landfill (LA/mapping records)	0	0	0	0	-
24	3.4	Historical landfill (EA/NRW records)	0	0	0	0	-
24	3.5	Historical waste sites	0	0	0	0	-
25	3.6	Licensed waste sites	0	0	0	0	-
25	3.7	Waste exemptions	0	0	0	0	-
Page	Section	Current industrial land use >	On site	0-50m	50-250m	250-500m	500-2000m
26 >	4.1 >	Recent industrial land uses >	0	0	3	-	-
27	4.2	Current or recent petrol stations	0	0	0	0	-
27	4.3	Electricity cables	0	0	0	0	-
27	4.4	Gas pipelines	0	0	0	0	-
27	4.5	Sites determined as Contaminated Land	0	0	0	0	-



27	4.6	Control of Major Accident Hazards (COMAH)	0	0	0	0	-
28	4.7	Regulated explosive sites	0	0	0	0	-
28	4.8	Hazardous substance storage/usage	0	0	0	0	-
28	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
28 >	4.10 >	<u>Licensed industrial activities (Part A(1)) ></u>	0	0	0	3	-
29	4.11	Licensed pollutant release (Part A(2)/B)	0	0	0	0	-
29	4.12	Radioactive Substance Authorisations	0	0	0	0	-
29	4.13	Licensed Discharges to controlled waters	0	0	0	0	-
30	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
30	4.15	Pollutant release to public sewer	0	0	0	0	-
30	4.16	List 1 Dangerous Substances	0	0	0	0	-
30	4.17	List 2 Dangerous Substances	0	0	0	0	-
30 >	4.18 >	<u>Pollution Incidents (EA/NRW) ></u>	0	0	0	2	-
31	4.19	Pollution inventory substances	0	0	0	0	-
31	4.20	Pollution inventory waste transfers	0	0	0	0	-
31	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
32 >	5.1 >	<u>Superficial aquifer ></u>	Identified (within 500m)				
34 >	5.2 >	<u>Bedrock aquifer ></u>	Identified (within 500m)				
36 >	5.3 >	<u>Groundwater vulnerability ></u>	Identified (within 50m)				
37 >	5.4 >	<u>Groundwater vulnerability- soluble rock risk ></u>	Identified (within 0m)				
37	5.5	Groundwater vulnerability- local information	None (within 0m)				
38 >	5.6 >	<u>Groundwater abstractions ></u>	0	0	0	0	1
39	5.7	Surface water abstractions	0	0	0	0	0
39	5.8	Potable abstractions	0	0	0	0	0
39 >	5.9 >	<u>Source Protection Zones ></u>	1	0	0	0	-
40	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
41 >	6.1 >	<u>Water Network (OS MasterMap) ></u>	1	4	14	-	-



43 >	6.2 >	Surface water features >	0	4	6	-	-
43 >	6.3 >	WFD Surface water body catchments >	1	-	-	-	-
44 >	6.4 >	WFD Surface water bodies >	0	0	0	-	-
44 >	6.5 >	WFD Groundwater bodies >	1	-	-	-	-
Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
45	7.1	Risk of flooding from rivers and the sea	None (within 50m)				
45	7.2	Historical Flood Events	0	0	0	-	-
45	7.3	Flood Defences	0	0	0	-	-
46	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
46	7.5	Flood Storage Areas	0	0	0	-	-
47	7.6	Flood Zone 2	None (within 50m)				
47	7.7	Flood Zone 3	None (within 50m)				
Page	Section	Surface water flooding >					
48 >	8.1 >	Surface water flooding >	1 in 30 year, 0.3m - 1.0m (within 50m)				
Page	Section	Groundwater flooding >					
50 >	9.1 >	Groundwater flooding >	Low (within 50m)				
Page	Section	Environmental designations >	On site	0-50m	50-250m	250-500m	500-2000m
51	10.1	Sites of Special Scientific Interest (SSSI)	0	0	0	0	0
52	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
52	10.3	Special Areas of Conservation (SAC)	0	0	0	0	0
52	10.4	Special Protection Areas (SPA)	0	0	0	0	0
52	10.5	National Nature Reserves (NNR)	0	0	0	0	0
53	10.6	Local Nature Reserves (LNR)	0	0	0	0	0
53 >	10.7 >	Designated Ancient Woodland >	0	0	0	0	4
53	10.8	Biosphere Reserves	0	0	0	0	0
54	10.9	Forest Parks	0	0	0	0	0
54	10.10	Marine Conservation Zones	0	0	0	0	0
54	10.11	Green Belt	0	0	0	0	0
54	10.12	Proposed Ramsar sites	0	0	0	0	0



54	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
55	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
55	10.15	Nitrate Sensitive Areas	0	0	0	0	0
55 >	10.16 >	Nitrate Vulnerable Zones >	2	0	0	0	4
56 >	10.17 >	SSSI Impact Risk Zones >	1	-	-	-	-
57	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
58	11.1	World Heritage Sites	0	0	0	-	-
59	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
59	11.3	National Parks	0	0	0	-	-
59 >	11.4 >	Listed Buildings >	0	4	31	-	-
61 >	11.5 >	Conservation Areas >	1	0	0	-	-
61	11.6	Scheduled Ancient Monuments	0	0	0	-	-
62	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	Agricultural designations >	On site	0-50m	50-250m	250-500m	500-2000m
63 >	12.1 >	Agricultural Land Classification >	Grade 2 (within 250m)				
64	12.2	Open Access Land	0	0	0	-	-
64	12.3	Tree Felling Licences	0	0	0	-	-
64	12.4	Environmental Stewardship Schemes	0	0	0	-	-
65	12.5	Countryside Stewardship Schemes	0	0	0	-	-
Page	Section	Habitat designations >	On site	0-50m	50-250m	250-500m	500-2000m
66 >	13.1 >	Priority Habitat Inventory >	0	0	3	-	-
67	13.2	Habitat Networks	0	0	0	-	-
67	13.3	Open Mosaic Habitat	0	0	0	-	-
67	13.4	Limestone Pavement Orders	0	0	0	-	-
Page	Section	Geology 1:10,000 scale >	On site	0-50m	50-250m	250-500m	500-2000m
68 >	14.1 >	10k Availability >	Identified (within 500m)				
69	14.2	Artificial and made ground (10k)	0	0	0	0	-
70 >	14.3 >	Superficial geology (10k) >	0	0	0	1	-



71	14.4	Landslip (10k)	0	0	0	0	-
72 >	14.5 >	Bedrock geology (10k) >	0	0	0	1	-
73	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
74 >	15.1 >	50k Availability >	Identified (within 500m)				
75	15.2	Artificial and made ground (50k)	0	0	0	0	-
75	15.3	Artificial ground permeability (50k)	0	0	-	-	-
76 >	15.4 >	Superficial geology (50k) >	2	0	0	3	-
77 >	15.5 >	Superficial permeability (50k) >	Identified (within 50m)				
77	15.6	Landslip (50k)	0	0	0	0	-
77	15.7	Landslip permeability (50k)	None (within 50m)				
78 >	15.8 >	Bedrock geology (50k) >	1	0	0	0	-
79 >	15.9 >	Bedrock permeability (50k) >	Identified (within 50m)				
79	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
80 >	16.1 >	BGS Boreholes >	0	0	1	-	-
Page	Section	Natural ground subsidence >					
81 >	17.1 >	Shrink swell clays >	Low (within 50m)				
82 >	17.2 >	Running sands >	Very low (within 50m)				
83 >	17.3 >	Compressible deposits >	Negligible (within 50m)				
84 >	17.4 >	Collapsible deposits >	Very low (within 50m)				
85 >	17.5 >	Landslides >	Very low (within 50m)				
86 >	17.6 >	Ground dissolution of soluble rocks >	Low (within 50m)				
Page	Section	Mining and ground workings >	On site	0-50m	50-250m	250-500m	500-2000m
88	18.1	BritPits	0	0	0	0	-
89 >	18.2 >	Surface ground workings >	0	4	31	-	-
90	18.3	Underground workings	0	0	0	0	0
90	18.4	Underground mining extents	0	0	0	0	-
91	18.5	Historical Mineral Planning Areas	0	0	0	0	-



91 >	18.6 >	Non-coal mining >	1	0	0	1	1
91	18.7	JPB mining areas	None (within 0m)				
92	18.8	The Coal Authority non-coal mining	0	0	0	0	-
92	18.9	Researched mining	0	0	0	0	-
92	18.10	Mining record office plans	0	0	0	0	-
92	18.11	BGS mine plans	0	0	0	0	-
93	18.12	Coal mining	None (within 0m)				
93	18.13	Brine areas	None (within 0m)				
93	18.14	Gypsum areas	None (within 0m)				
93	18.15	Tin mining	None (within 0m)				
93	18.16	Clay mining	None (within 0m)				
Page	Section	Ground cavities and sinkholes	On site	0-50m	50-250m	250-500m	500-2000m
94	19.1	Natural cavities	0	0	0	0	-
94	19.2	Mining cavities	0	0	0	0	0
94	19.3	Reported recent incidents	0	0	0	0	-
94	19.4	Historical incidents	0	0	0	0	-
95	19.5	National karst database	0	0	0	0	-
Page	Section	Radon >					
96 >	20.1 >	Radon >	Less than 1% (within 0m)				
Page	Section	Soil chemistry >	On site	0-50m	50-250m	250-500m	500-2000m
98 >	21.1 >	BGS Estimated Background Soil Chemistry >	2	2	-	-	-
98	21.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
99	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
100	22.1	Underground railways (London)	0	0	0	-	-
100	22.2	Underground railways (Non-London)	0	0	0	-	-
100	22.3	Railway tunnels	0	0	0	-	-
100	22.4	Historical railway and tunnel features	0	0	0	-	-
100	22.5	Royal Mail tunnels	0	0	0	-	-



101	22.6	Historical railways	0	0	0	-	-
101	22.7	Railways	0	0	0	-	-
101	22.8	Crossrail 2	0	0	0	0	-
101	22.9	HS2	0	0	0	0	-

Recent aerial photograph



Capture Date: 06/04/2021

Site Area: 0.08ha



Recent site history - 2018 aerial photograph



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Capture Date: 03/08/2018

Site Area: 0.08ha



Recent site history - 2009 aerial photograph



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Capture Date: 29/06/2009

Site Area: 0.08ha



Recent site history - 2000 aerial photograph



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Capture Date: 08/06/2000

Site Area: 0.08ha



Recent site history - 1999 aerial photograph



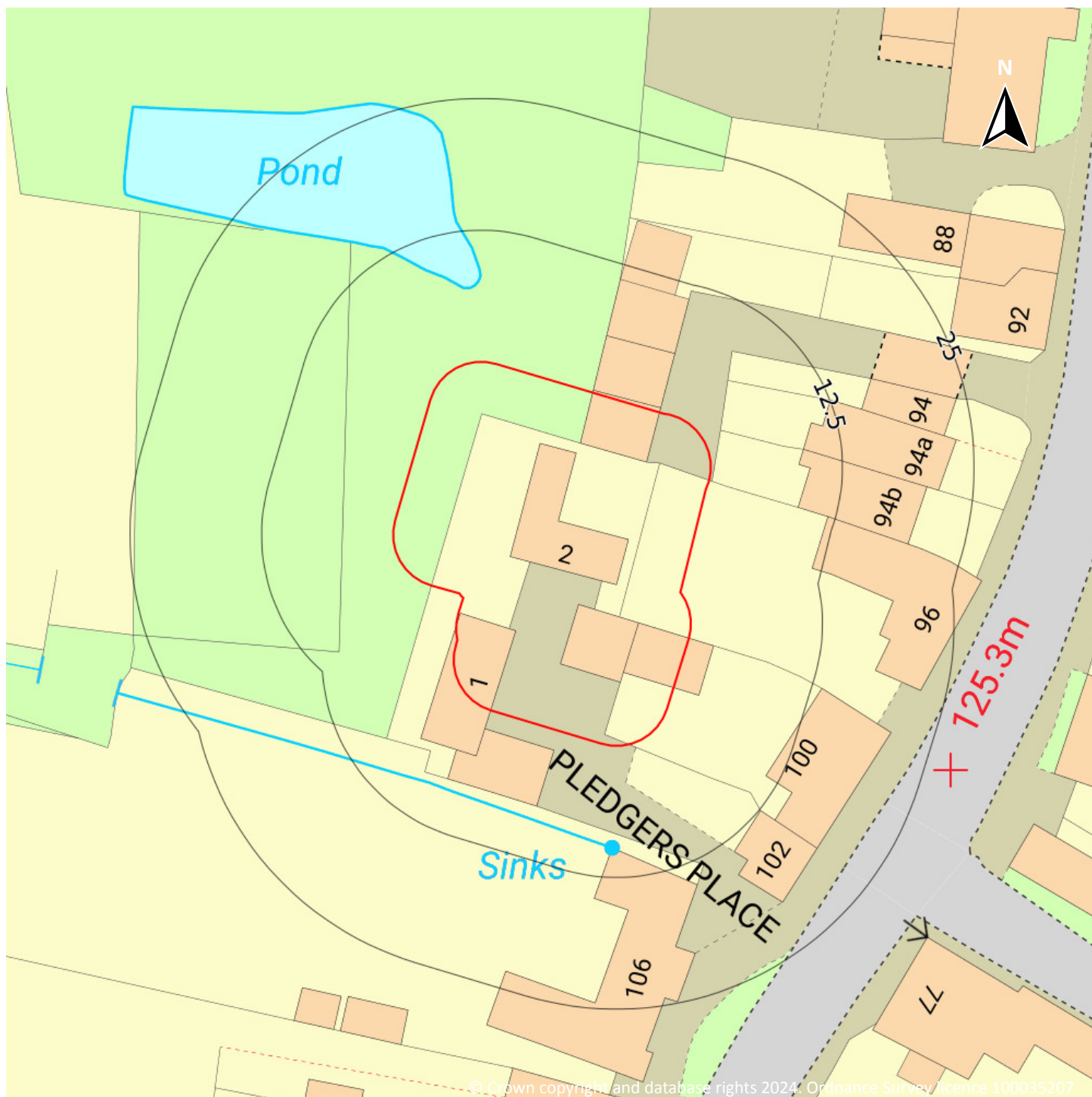
Aerial photography supplied by Getmapping PLC. © Copyright Getmapping PLC 2024. All Rights Reserved.

Capture Date: 18/07/1999

Site Area: 0.08ha



OS MasterMap site plan



Site Area: 0.08ha



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- ### 1.1 Historical industrial land uses

30

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	On site	Brewery	1896	2104487

ID	Location	Land use	Dates present	Group ID
A	35m SE	Brewery	1878	2153276
A	37m SE	Brewery	1899	2135464
A	37m SE	Brewery	1948 - 1950	2103130
A	40m E	Brewery	1904	2140678
A	43m E	Brewery	1896	2101424
1	133m N	Grave Yard	1878	2077027
2	133m NE	Smithy	1878	2089224
C	142m NW	Unspecified Pit	1948 - 1950	2135138
C	146m NW	Unspecified Ground Workings	1924	2090511
C	146m NW	Unspecified Pit	1950	2118444
C	147m NW	Unspecified Pit	1960	2103920
4	160m N	Smithy	1878	2089225
5	304m N	Pump House	1982	2089778
D	411m S	Disused Gas Works	1878	2082481
E	427m N	Unspecified Pit	1948	2138825
E	429m N	Unspecified Pit	1950	2154023
D	432m S	Gasometer	1878	2093642
E	434m N	Unspecified Pit	1950	2127791
E	434m N	Unspecified Pit	1924	2152905
E	435m N	Unspecified Pit	1960	2106350
F	459m SE	Unspecified Tank	1924	2116461
F	459m SE	Unspecified Tank	1950	2133376
F	460m SE	Unspecified Tank	1960	2152035
G	477m N	Smithy	1899	2114714
G	480m N	Smithy	1904	2100478
G	483m N	Smithy	1896	2147075
I	484m SE	Sewage Works	1981	2104830
I	484m SE	Sewage Works	1988	2149257



ID	Location	Land use	Dates present	Group ID
E	486m N	Cemetery	1960	2074572

This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m	2
----------------------------	----------

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
F	459m SE	Unspecified Tank	1921	362917
E	463m N	Unspecified Tank	1898 - 1921	371471

This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m	7
----------------------------	----------

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
B	127m N	Electricity Substation	1989	254925
B	128m N	Electricity Substation	1994	262334
B	128m N	Electricity Substation	1977	264652
3	151m S	Electricity Substation	1989 - 1994	260177
D	395m S	Electricity Substation	1977 - 1994	264418



ID	Location	Land use	Dates present	Group ID
H	482m N	Electricity Substation	1989 - 1994	252710
H	483m N	Electricity Substation	1977	253717

This data is sourced from Ordnance Survey / Groundsure.

1.4 Historical petrol stations

Records within 500m

0

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

This data is sourced from Ordnance Survey / Groundsure.

1.5 Historical garages

Records within 500m

3

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

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

ID	Location	Land use	Dates present	Group ID
D	379m S	Garage	1989	78468
D	379m S	Garage	1994	78005
D	380m S	Garage	1977	79891

This data is sourced from Ordnance Survey / Groundsure.



1.6 Historical military land

Records within 500m

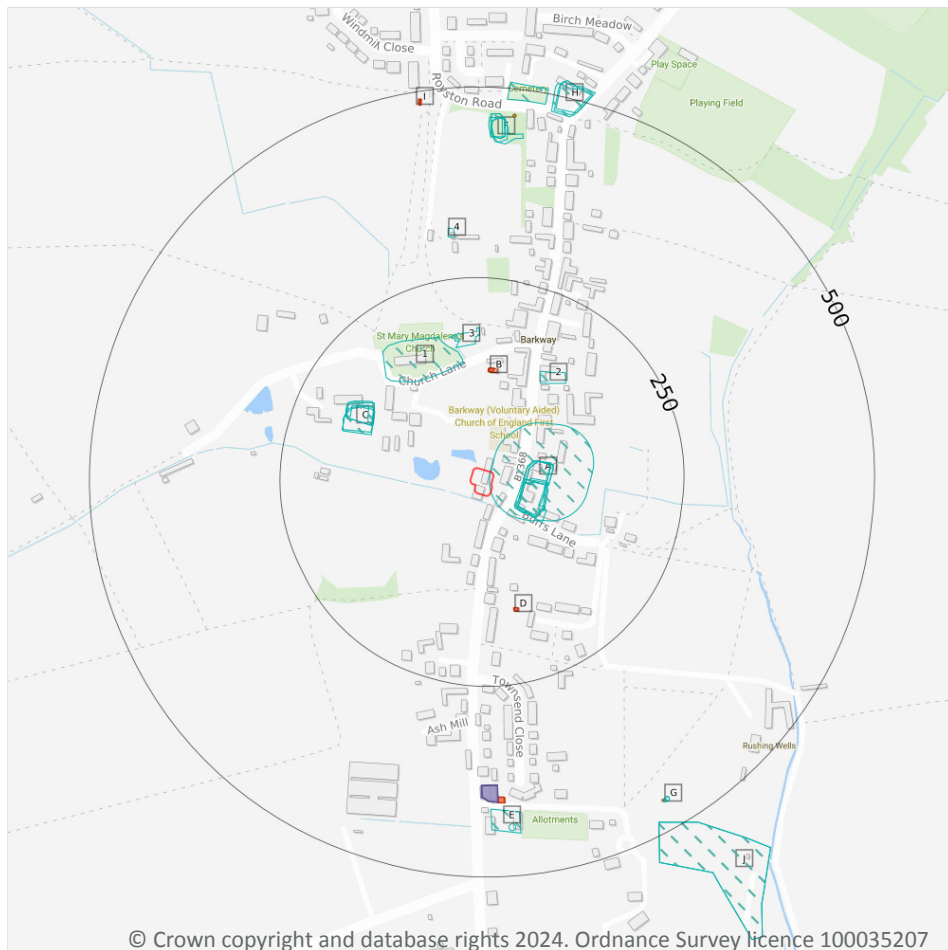
0

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
- Historical garages

2.1 Historical industrial land uses

Records within 500m

33

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 20](#) >

ID	Location	Land Use	Date	Group ID
A	On site	Brewery	1896	2104487
A	35m SE	Brewery	1878	2153276
A	37m SE	Brewery	1899	2135464



ID	Location	Land Use	Date	Group ID
A	37m SE	Brewery	1950	2103130
A	40m SE	Brewery	1948	2103130
A	40m E	Brewery	1904	2140678
A	43m E	Brewery	1896	2101424
A	43m E	Brewery	1896	2101424
1	133m N	Grave Yard	1878	2077027
2	133m NE	Smithy	1878	2089224
C	142m NW	Unspecified Pit	1948	2135138
C	144m NW	Unspecified Pit	1950	2135138
C	146m NW	Unspecified Ground Workings	1924	2090511
C	146m NW	Unspecified Pit	1950	2118444
C	147m NW	Unspecified Pit	1960	2103920
3	160m N	Smithy	1878	2089225
4	304m N	Pump House	1982	2089778
E	411m S	Disused Gas Works	1878	2082481
F	427m N	Unspecified Pit	1948	2138825
F	429m N	Unspecified Pit	1950	2154023
E	432m S	Gasometer	1878	2093642
F	434m N	Unspecified Pit	1924	2152905
F	434m N	Unspecified Pit	1950	2127791
F	435m N	Unspecified Pit	1960	2106350
G	459m SE	Unspecified Tank	1924	2116461
G	459m SE	Unspecified Tank	1950	2133376
G	460m SE	Unspecified Tank	1960	2152035
H	477m N	Smithy	1899	2114714
H	480m N	Smithy	1904	2100478
H	483m N	Smithy	1896	2147075
J	484m SE	Sewage Works	1988	2149257



ID	Location	Land Use	Date	Group ID
J	484m SE	Sewage Works	1981	2104830
F	486m N	Cemetery	1960	2074572

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 20 >](#)

ID	Location	Land Use	Date	Group ID
G	459m SE	Unspecified Tank	1921	362917
F	463m N	Unspecified Tank	1898	371471
F	463m N	Unspecified Tank	1921	371471

This data is sourced from Ordnance Survey / Groundsure.

2.3 Historical energy features

Records within 500m

11

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 20 >](#)

ID	Location	Land Use	Date	Group ID
B	127m N	Electricity Substation	1989	254925
B	128m N	Electricity Substation	1994	262334
B	128m N	Electricity Substation	1977	264652
D	151m S	Electricity Substation	1994	260177
D	151m S	Electricity Substation	1989	260177
E	395m S	Electricity Substation	1989	264418



ID	Location	Land Use	Date	Group ID
E	396m S	Electricity Substation	1994	264418
E	396m S	Electricity Substation	1977	264418
I	482m N	Electricity Substation	1994	252710
I	483m N	Electricity Substation	1977	253717
I	483m N	Electricity Substation	1989	252710

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

3

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

Features are displayed on the Past land use - un-grouped map on [page 20](#) >

ID	Location	Land Use	Date	Group ID
E	379m S	Garage	1989	78468
E	379m S	Garage	1994	78005
E	380m S	Garage	1977	79891

This data is sourced from Ordnance Survey / Groundsure.



3 Waste and landfill

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

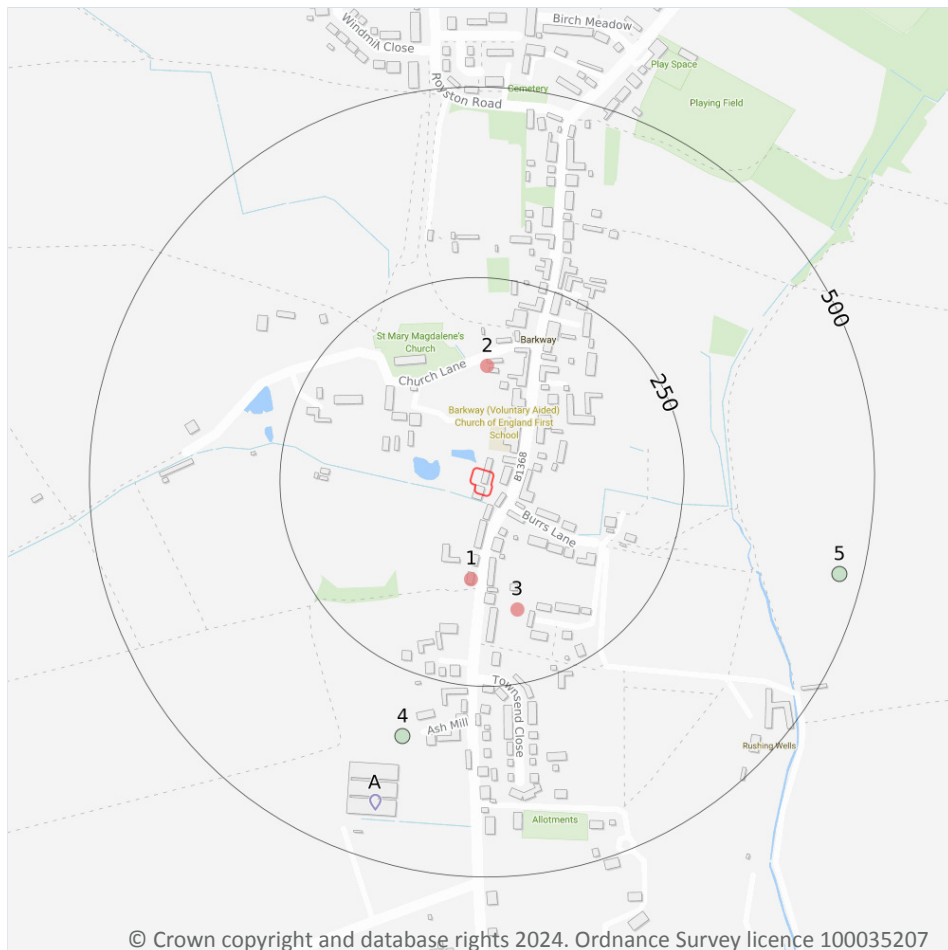
0

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.

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



4 Current industrial land use



- Site Outline
- Search buffers in metres (m)
- Recent industrial land uses
- Part A(1) industrial activities
- Pollution Incidents (EA/NRW)

4.1 Recent industrial land uses

Records within 250m

3

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on [page 26](#) >

ID	Location	Company	Address	Activity	Category
1	111m S	The Mailing Room	130-132, High Street, Barkway, Hertfordshire, SG8 8EG	Office and Shop Equipment	Industrial Products
2	135m N	Electricity Sub Station	Hertfordshire, SG8	Electrical Features	Infrastructure and Facilities
3	154m S	Electricity Sub Station	Hertfordshire, SG8	Electrical Features	Infrastructure and Facilities



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**3**

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

Features are displayed on the Current industrial land use map on [page 26 >](#)

ID	Location	Details	
A	428m S	Operator: LYE END POULTRY LLP Installation Name: Barkway Poultry Unit - EPR/YP3930UJ Process: INTENSIVE FARMING; > 40,000 POULTRY Permit Number: YP3930UJ Original Permit Number: YP3930UJ	EPR Reference: EPR/YP3930UJ Issue Date: 20/04/2021 Effective Date: 20/04/2021 Last date noted as effective: 29/10/2024 Status: Effective

ID	Location	Details	
A	428m S	Operator: Lye End Poultry LLP Installation Name: Barkway Poultry Unit - EPR/YP3930UJ Process: INTENSIVE FARMING; > 40,000 POULTRY Permit Number: MP3200SE Original Permit Number: YP3930UJ	EPR Reference: - Issue Date: 20/04/2021 Effective Date: 20/04/2021 Last date noted as effective: 21/03/2023 Status: Effective
A	428m S	Operator: Lye End Poultry LLP Installation Name: Barkway Poultry Farm EPR/YP3930UJ Process: INTENSIVE FARMING; > 40,000 POULTRY Permit Number: XP3535RD Original Permit Number: YP3930UJ	EPR Reference: - Issue Date: 22/12/2015 Effective Date: 22/12/2015 Last date noted as effective: 21/03/2023 Status: Superseded

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

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

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

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

This data is sourced from Local Authority records.

4.12 Radioactive Substance Authorisations

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

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

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

4.13 Licensed Discharges to controlled waters

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

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

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

4.14 Pollutant release to surface waters (Red List)

Records within 500m**0**

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

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

4.15 Pollutant release to public sewer

Records within 500m**0**

Discharges of Special Category Effluents to the public sewer.

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

4.16 List 1 Dangerous Substances

Records within 500m**0**

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

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

4.17 List 2 Dangerous Substances

Records within 500m**0**

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

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

4.18 Pollution Incidents (EA/NRW)

Records within 500m**2**

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

Features are displayed on the Current industrial land use map on [page 26 >](#)

ID	Location	Details	
4	334m S	Incident Date: 21/06/2011 Incident Identification: 895730 Pollutant: Atmospheric Pollutants and Effects Pollutant Description: Other Atmospheric Pollutant or Effect	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 2 (Significant)
5	470m E	Incident Date: 14/06/2001 Incident Identification: 9295 Pollutant: Organic Chemicals/Products Pollutant Description: Pesticides and Biocides	Water Impact: Category 2 (Significant) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)

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

4.19 Pollution inventory substances

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

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

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

4.20 Pollution inventory waste transfers

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

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

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

4.21 Pollution inventory radioactive waste

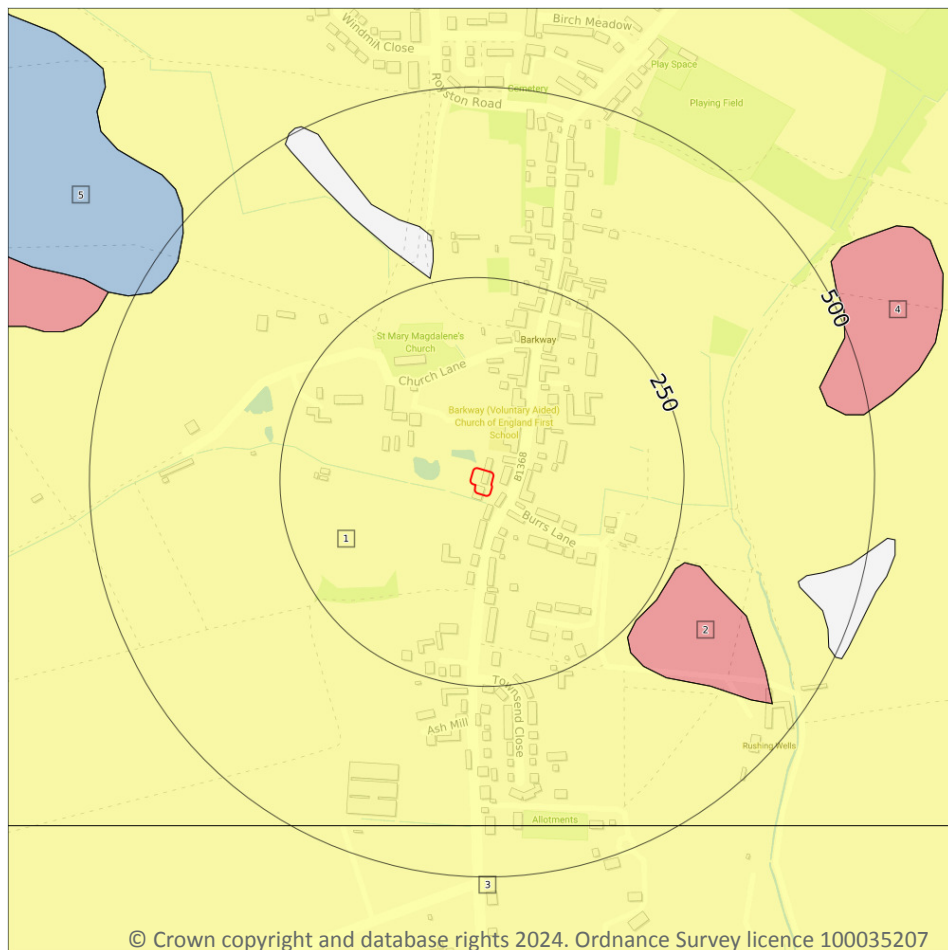
Records within 500m	0
----------------------------	----------

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

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



5 Hydrogeology - Superficial aquifer



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

5.1 Superficial aquifer

Records within 500m

5

Aquifer status of groundwater held within superficial geology.

Features are displayed on the Hydrogeology map on [page 32](#) >

ID	Location	Designation	Description
1	On site	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
2	253m SE	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

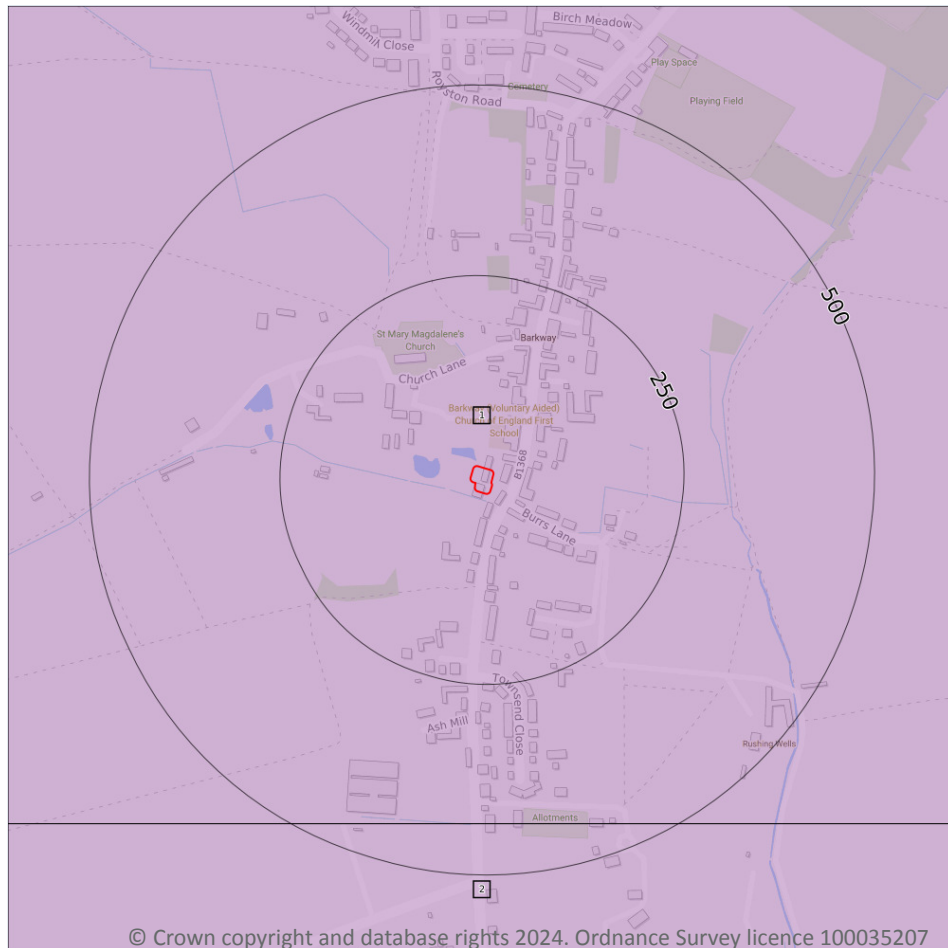


ID	Location	Designation	Description
3	433m S	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
4	443m E	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
5	474m NW	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

2

Aquifer status of groundwater held within bedrock geology.

Features are displayed on the Bedrock aquifer map on [page 34 >](#)

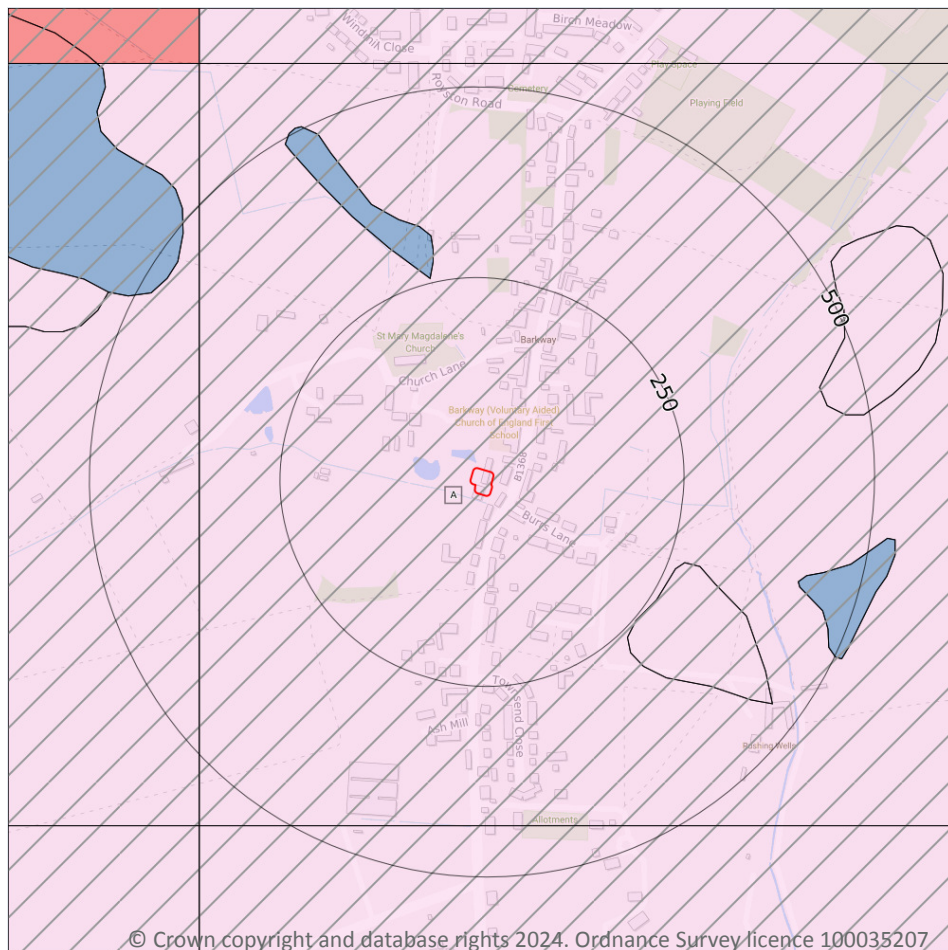
ID	Location	Designation	Description
1	On site	Principal	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers
2	433m S	Principal	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



— Site Outline

Search buffers in metres (m)

Superficial vulnerability

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

Bedrock vulnerability

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

Other information

- Unproductive aquifer
- Soluble rock risk
- Local information

5.3 Groundwater vulnerability

Records within 50m

1

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 36](#) >



ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
A	On site	Summary Classification: Secondary superficial aquifer - Medium Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Intermediate Infiltration value: 40-70% Dilution value: <300mm/year	Vulnerability: Medium Aquifer type: Secondary Thickness: <3m Patchiness value: >90% Recharge potential: Low	Vulnerability: Low 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
A	Significant soluble rocks are likely to be present. Low possibility of localised subsidence or dissolution-related degradation of bedrock occurring naturally, but may be possible in adverse conditions such as high surface or subsurface water flow.	77.0%

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

5.5 Groundwater vulnerability- local information

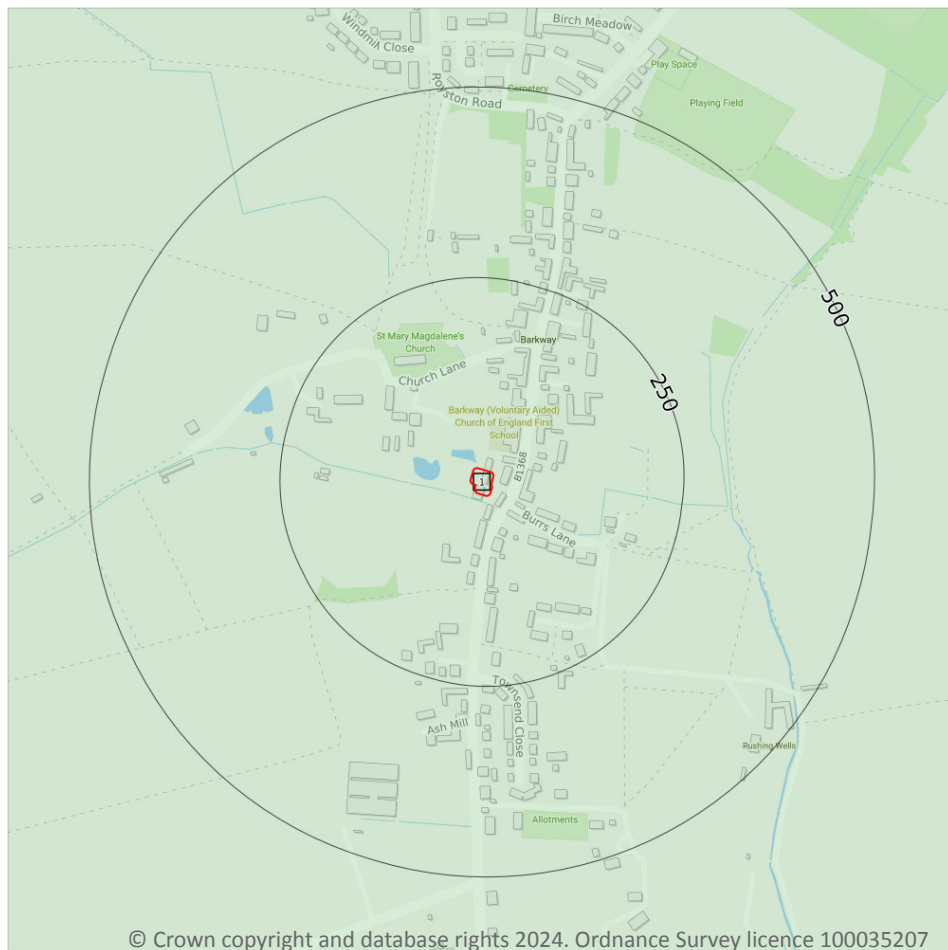
Records on site	0
------------------------	----------

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

1

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 38](#) >

ID	Location	Details	
-	1960m SE	Status: Historical Licence No: 29/38/04/0023 Details: General Farming & Domestic Direct Source: THAMES GROUNDWATER Point: WELL WITH INTERNAL BOREHOLE AT NORTH END FARM, ANSTEY Data Type: Point Name: BARKER Easting: 539600 Northing: 233900	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 20/06/1966 Expiry Date: - Issue No: 100 Version Start Date: 01/04/1995 Version End Date: -

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

5.7 Surface water abstractions

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

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

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

5.8 Potable abstractions

Records within 2000m	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	1
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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 38 >](#)

ID	Location	Type	Description
1	On site	3	Total catchment

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



5.10 Source Protection Zones (confined aquifer)

Records within 500m

0

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

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



6 Hydrology



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

6.1 Water Network (OS MasterMap)

Records within 250m

19

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

Features are displayed on the Hydrology map on [page 41](#) >

ID	Location	Type of water feature	Ground level	Permanence	Name
A	On site	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	-



ID	Location	Type of water feature	Ground level	Permanence	Name
A	9m S	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
1	10m S	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	-
A	30m W	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	-
A	36m W	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
A	79m W	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	-
B	82m W	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	127m N	Lake, loch or reservoir.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
D	128m SE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	133m N	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	-
C	146m N	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	164m N	Lake, loch or reservoir.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
E	183m E	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	183m N	Lake, loch or reservoir.	On ground surface	Watercourse contains water year round (in normal circumstances)	-



ID	Location	Type of water feature	Ground level	Permanence	Name
C	190m N	Lake, loch or reservoir.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	198m N	Inland river not influenced by normal tidal action.	Not provided	Watercourse contains water year round (in normal circumstances)	-
2	204m E	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	-
G	209m E	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	248m N	Lake, loch or reservoir.	On ground surface	Watercourse contains water year round (in normal circumstances)	-

This data is sourced from the Ordnance Survey.

6.2 Surface water features

Records within 250m	10
----------------------------	-----------

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.

Features are displayed on the Hydrology map on [page 41 >](#)

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 41 >](#)

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
A	On site	River	Quin	GB106038040120	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 41](#) >

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
-	1448m SE	River	Quin	GB106038040120 ↗	Poor	Fail	Poor	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 41](#) >

ID	Location	Name	Water body ID	Overall rating	Chemical rating	Quantitative	Year
A	On site	Cam and Ely Ouse Chalk	GB40501G400500 ↗	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

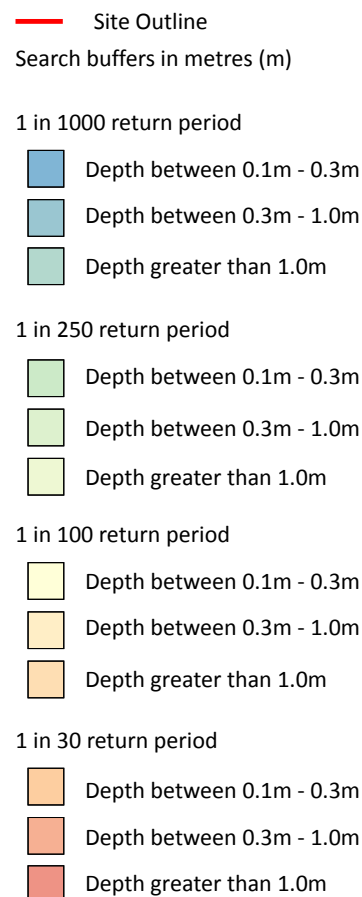
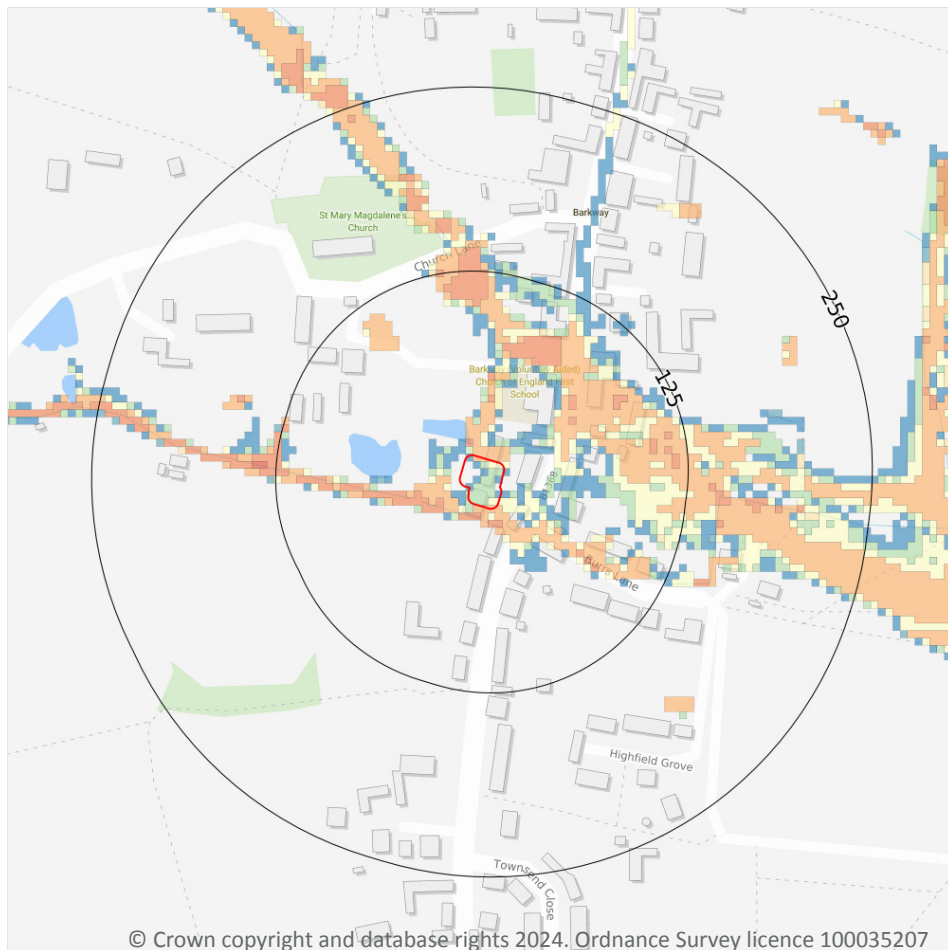
0

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 30 year, 0.1m - 0.3m

Highest risk within 50m

1 in 30 year, 0.3m - 1.0m

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

Features are displayed on the Surface water flooding map on [page 48 >](#)

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.

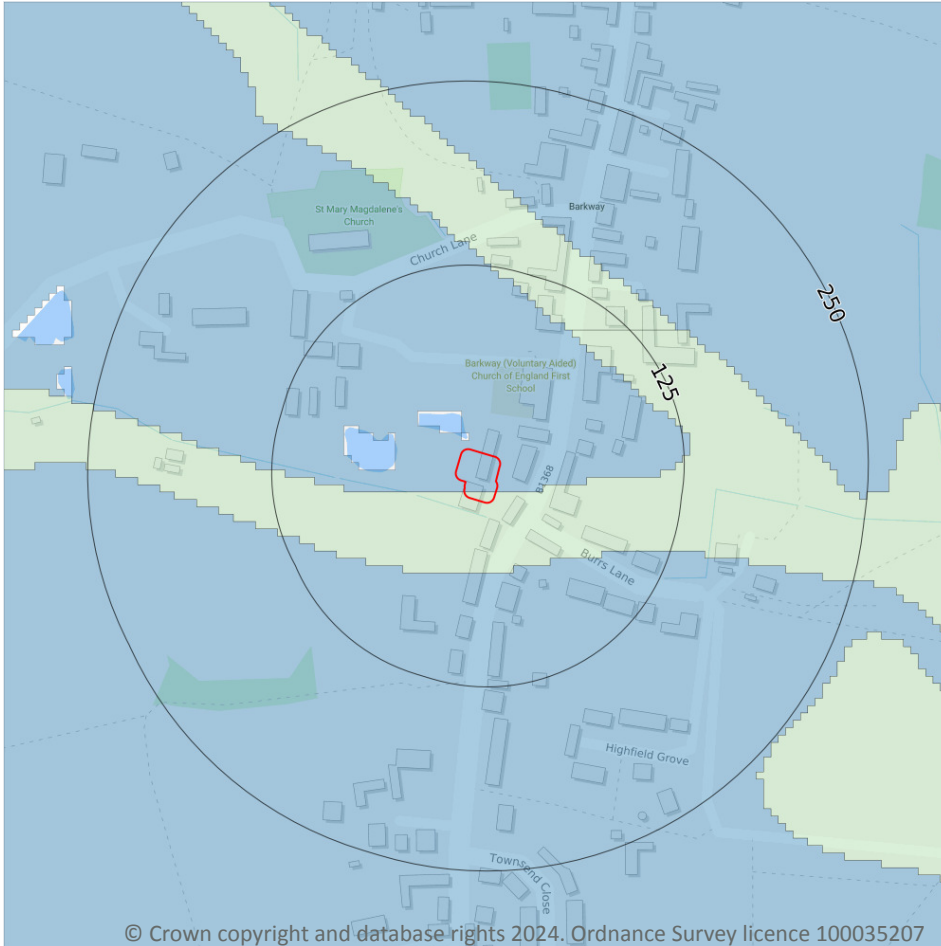
The table below shows the maximum flood depths for a range of return periods for the site.

Return period	Maximum modelled depth
1 in 1000 year	Between 0.3m and 1.0m
1 in 250 year	Between 0.1m and 0.3m
1 in 100 year	Between 0.1m and 0.3m
1 in 30 year	Between 0.1m and 0.3m

This data is sourced from Ambiantal Risk Analytics.



9 Groundwater flooding



— Site Outline
Search buffers in metres (m)

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

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9.1 Groundwater flooding

Highest risk on site

Low

Highest risk within 50m

Low

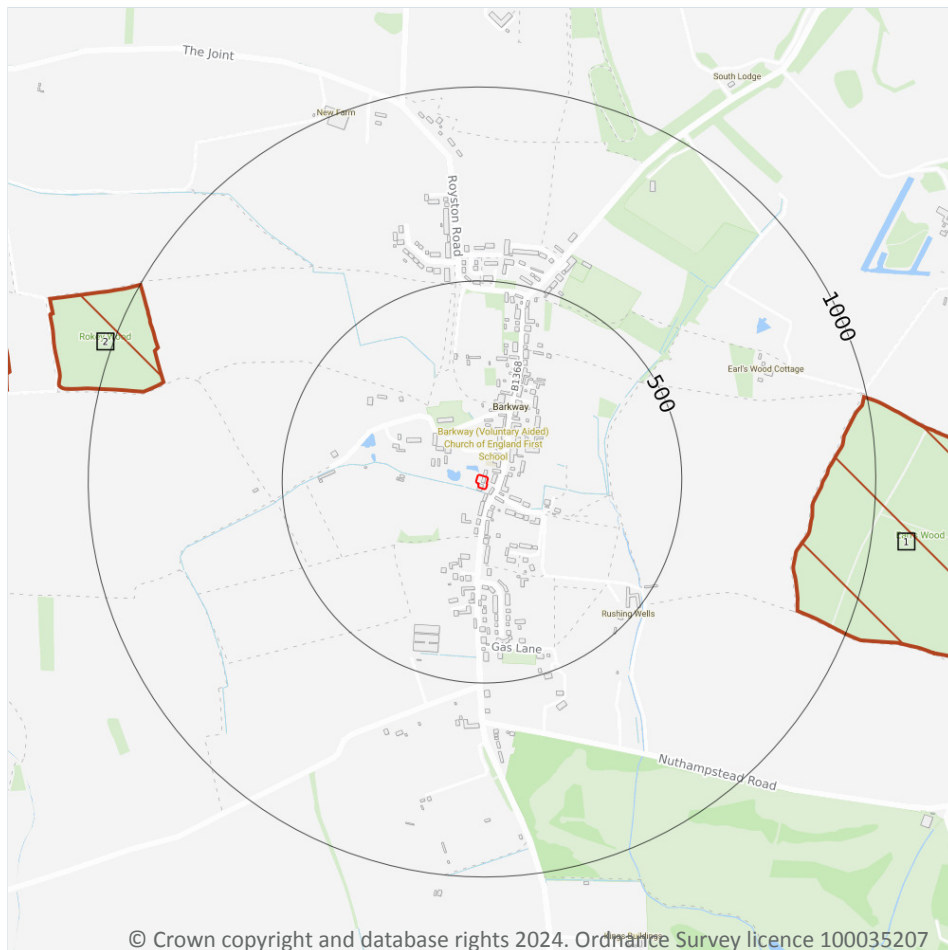
Groundwater flooding is caused by unusually high groundwater levels. It occurs when the water table rises above the ground surface or within underground structures such as basements or cellars. Groundwater flooding tends to exhibit a longer duration than surface water flooding, possibly lasting for weeks 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 50 >](#)

This data is sourced from Ambiantal Risk Analytics.



10 Environmental designations



- Site Outline
- Search buffers in metres (m)
- Designated Ancient Woodland

10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m

0

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

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

10.2 Conserved wetland sites (Ramsar sites)

Records within 2000m**0**

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

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

10.3 Special Areas of Conservation (SAC)

Records within 2000m**0**

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

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

10.4 Special Protection Areas (SPA)

Records within 2000m**0**

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

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

10.5 National Nature Reserves (NNR)

Records within 2000m**0**

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

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

10.6 Local Nature Reserves (LNR)

Records within 2000m**0**

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

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

10.7 Designated Ancient Woodland

Records within 2000m**4**

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 51 >](#)

ID	Location	Name	Woodland Type
1	815m E	Earls Wood	Ancient & Semi-Natural Woodland
2	845m W	Rokey Wood	Ancient & Semi-Natural Woodland
3	1232m W	Bush Wood	Ancient & Semi-Natural Woodland
-	1252m E	Earls Wood	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

0

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

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

10.12 Proposed Ramsar sites

Records within 2000m

0

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

This data is sourced from Natural England.

10.13 Possible Special Areas of Conservation (pSAC)

Records within 2000m

0

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

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



10.14 Potential Special Protection Areas (pSPA)

Records within 2000m

0

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

This data is sourced from Natural England.

10.15 Nitrate Sensitive Areas

Records within 2000m

0

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

This data is sourced from Natural England.

10.16 Nitrate Vulnerable Zones

Records within 2000m

6

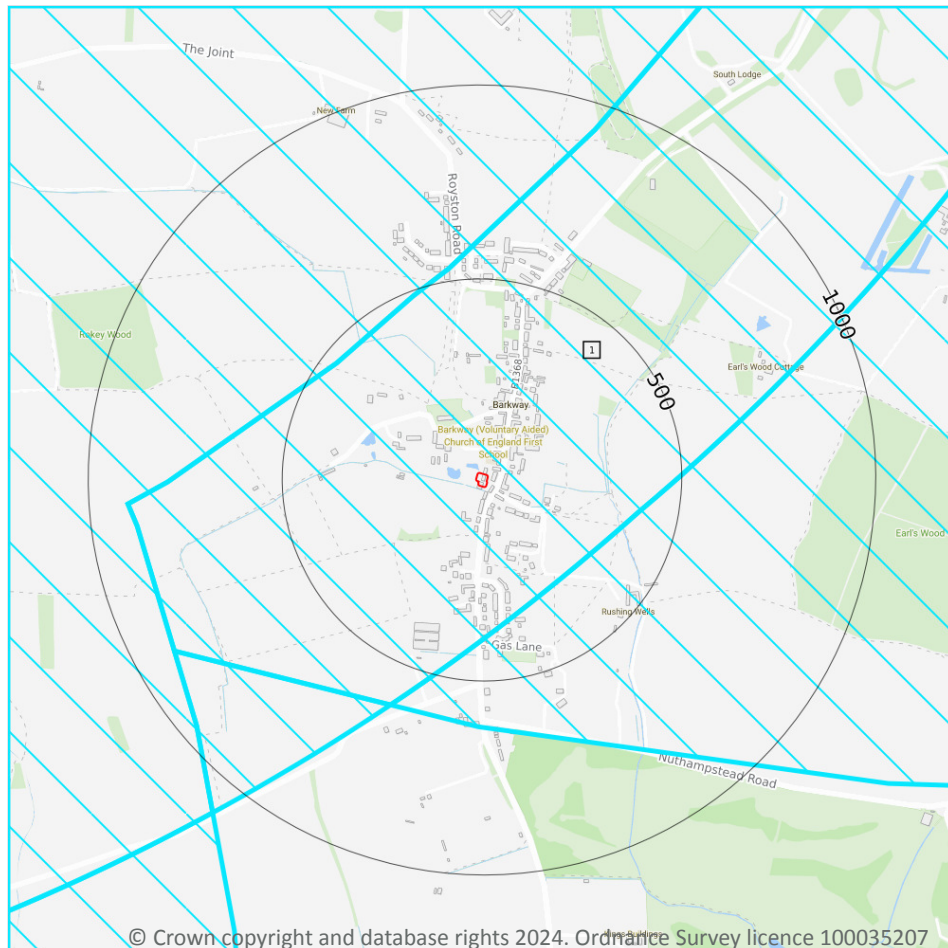
Areas at risk from agricultural nitrate pollution designated under the EC Nitrate Directive (91/676/EEC). These are areas of land that drain into waters polluted by nitrates. Farmers operating within these areas have to follow mandatory rules to tackle nitrate loss from agriculture.

Location	Name	Type	NVZ ID	Status
On site	LEE NVZ	Surface Water	443	Existing
On site	Anglian Chalk	Groundwater	71	Existing
513m N	LEE NVZ	Surface Water	443	Existing
513m N	Anglian Chalk	Groundwater	71	Existing
863m N	Ely Ouse and Cut-off channel NVZ	Surface Water	390	Existing
932m S	Buntingford Chalk	Groundwater	141	Existing

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



SSSI Impact Zones and Units



- Site Outline
- Search buffers in metres (m)
- SSSI Impact Risk Zones
- SSSI Units
- Not recorded
- Favourable
- Unfavourable - Recovering
- Unfavourable - No change
- Unfavourable - Declining
- Partially destroyed
- Destroyed

10.17 SSSI Impact Risk Zones

Records on site

1

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

Features are displayed on the SSSI Impact Zones and Units map on [page 56](#) >

ID	Location	Type of developments requiring consultation
1	On site	Infrastructure - Airports, helipads and other aviation proposals. Residential - Residential development of 100 units or more. Rural residential - Any residential development of 100 or more houses outside existing settlements/urban areas. Notes: New housing developments should assess and mitigate recreational pressure impacts to Therfield Heath SSSI with reference to the Therfield Heath Mitigation Strategy. For further advice contact LPA or Natural England's Discretionary Advice Service.

This data is sourced from Natural England.

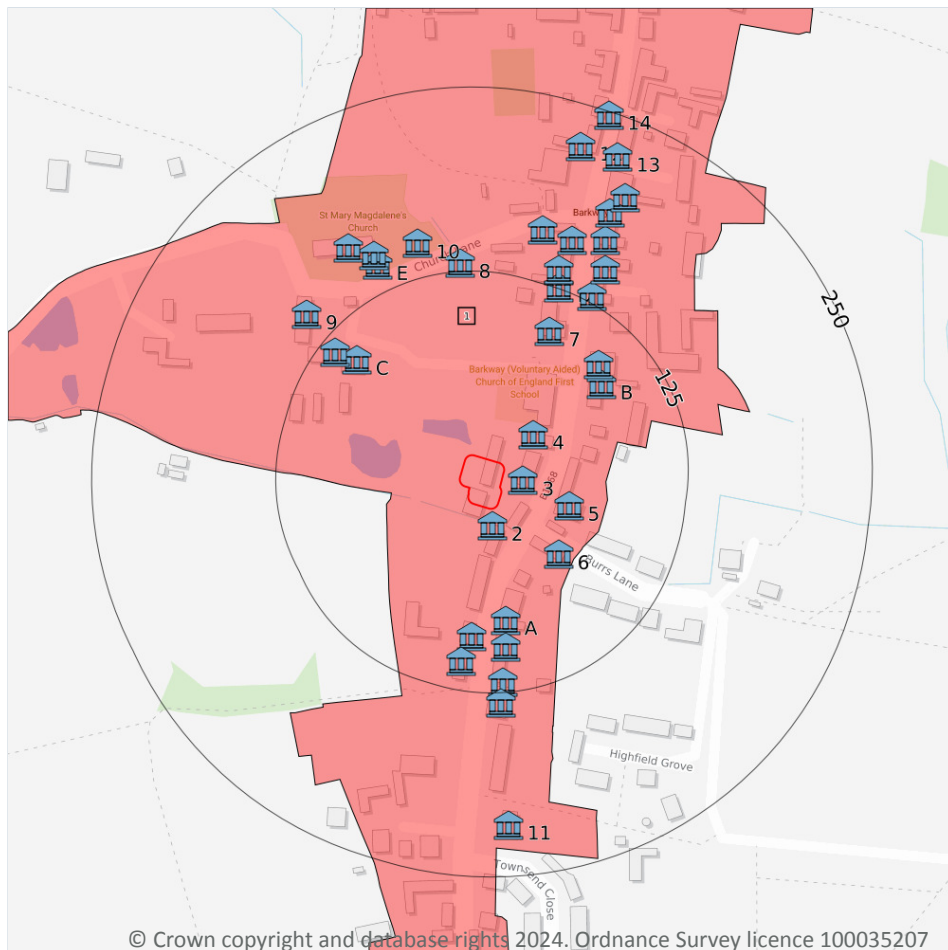
10.18 SSSI Units

Records within 2000m	0
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Divisions of SSSIs used to record management and condition details. Units are the smallest areas for which Natural England gives a condition assessment, however, the size of units varies greatly depending on the types of management and the conservation interest.

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

11 Visual and cultural designations



- Site Outline
- Search buffers in metres (m)
- Listed buildings
- Conservation areas
- Conservation areas - no data
- National Parks
- Areas of Outstanding Natural Beauty
- Registered parks and gardens
- Scheduled Monuments
- World Heritage Sites

11.1 World Heritage Sites

Records within 250m

0

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

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

11.2 Area of Outstanding Natural Beauty

Records within 250m**0**

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

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

11.3 National Parks

Records within 250m**0**

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

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

11.4 Listed Buildings

Records within 250m**35**

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

Features are displayed on the Visual and cultural designations map on [page 58 >](#)

ID	Location	Name	Grade	Reference Number	Listed date
2	12m S	106, High Street	II	1295769	27/05/1968
3	14m E	96, High Street	II	1102603	03/06/1987
4	29m NE	88, 90 And 92, High Street	II	1174440	03/06/1987
5	47m E	The Retreat	II	1347376	03/06/1987
6	53m SE	77, High Street	II	1174308	03/06/1987



ID	Location	Name	Grade	Reference Number	Listed date
A	76m S	Former Bath House Immediately South Of Number 81 (Not Listed)	II	1102597	03/06/1987
B	87m NE	The Limes	II	1174288	27/05/1968
A	88m S	Ashtree Cottage	II	1347381	27/05/1968
A	94m S	83, High Street	II	1174321	27/05/1968
B	95m NE	The Gables	II*	1102596	27/05/1968
7	95m NE	82, High Street	II	1102602	03/06/1987
C	100m NW	Manor Farm House	II	1102626	09/06/1952
A	106m S	130, High Street	II	1174920	27/05/1968
C	115m NW	Manor Farm Cottage And Attached Barn To West Of Farm House	II	1102627	03/06/1987
A	118m S	Berg Cottage	II	1347377	27/05/1968
D	126m N	Number 78 And Barkway Stores	II	1174424	27/05/1968
D	130m NE	K6 Telephone Kiosk Adjacent To Old Forge Cottage	II	1347399	03/08/1988
8	131m N	Barkway Carriage Wash Also Known As The Wagon Wash	II	1476819	31/10/2023
A	132m S	93/95 And 97, High Street	II*	1174330	27/05/1968
D	137m N	76, High Street	II	1347380	27/05/1968
E	144m NW	Cornwell Monument About 10 Metres South Of Church Of St Mary Magdalene	II	1295895	03/06/1987
9	146m NW	Numbers 25 (Tithe Cottage) 27 And 29 (Barn End)	II	1347354	03/06/1987
10	149m N	Jackson Monument About 30 Metres East Of Church Of St Mary Magdalene	II	1102625	03/06/1987
D	150m NE	Old Forge	II	1295847	27/05/1968
E	151m NW	Stallibrass Monument About 1 Metre South Of Church Of St Mary Magdalene	II	1347352	03/06/1987
D	159m N	68 And 74, High Street	II	1174411	27/05/1968
D	160m N	Numbers 1, 3 (Forge Cottage) And 5 (Rosemary Cottage)	II	1347353	27/05/1968
E	164m NW	Church Of St Mary Magdalene	I	1102624	27/05/1968
D	167m NE	45/47 And 49, High Street	II	1102595	27/05/1968
D	186m NE	43, High Street	II	1347375	03/06/1987
D	199m NE	The Oak House	II	1174252	27/05/1968



ID	Location	Name	Grade	Reference Number	Listed date
11	215m S	Townsend House	II	1102598	03/06/1987
12	222m N	62 And 64, High Street	II	1102601	10/02/1982
13	223m NE	33 And 35, High Street	II	1102594	03/06/1987
14	248m N	Milestone	II	1174396	27/05/1968

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

11.5 Conservation Areas

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

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.

Features are displayed on the Visual and cultural designations map on [page 58 >](#)

ID	Location	Name	District	Date of designation
1	On site	Barkway	North Hertfordshire	08/06/1970

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

11.6 Scheduled Ancient Monuments

Records within 250m	0
----------------------------	----------

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

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

11.7 Registered Parks and Gardens

Records within 250m

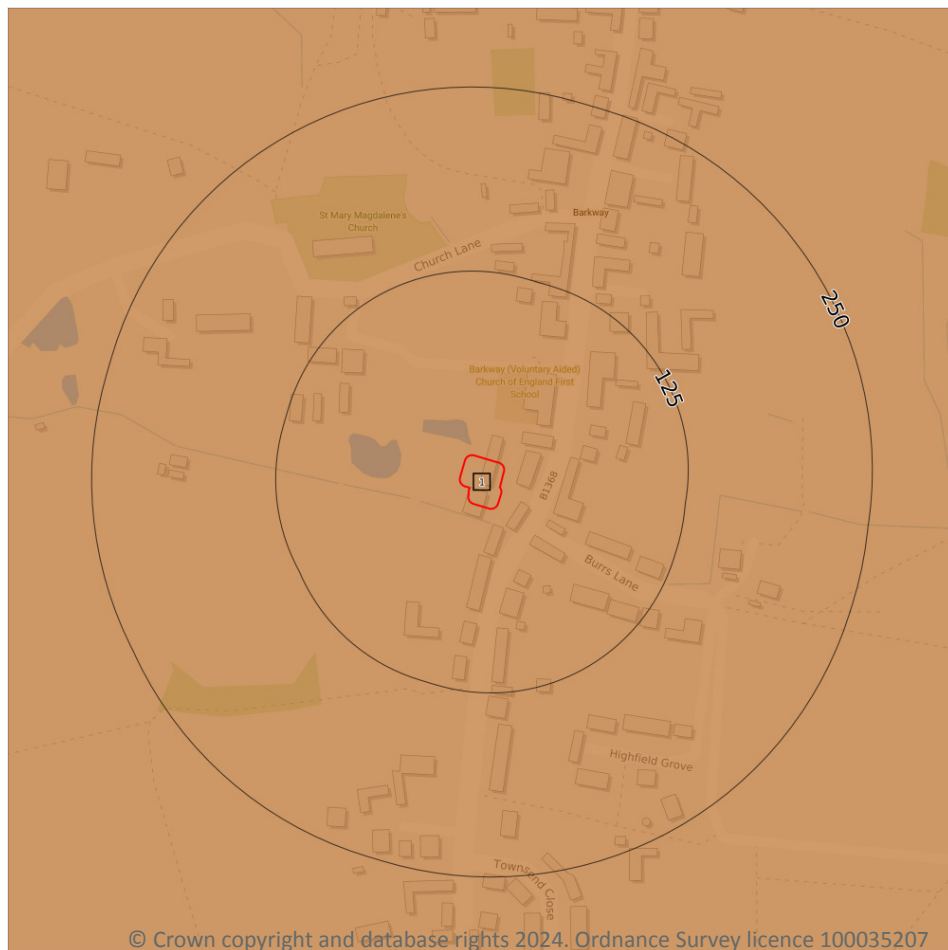
0

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

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



12 Agricultural designations



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

12.1 Agricultural Land Classification

Records within 250m

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 63](#) >

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

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

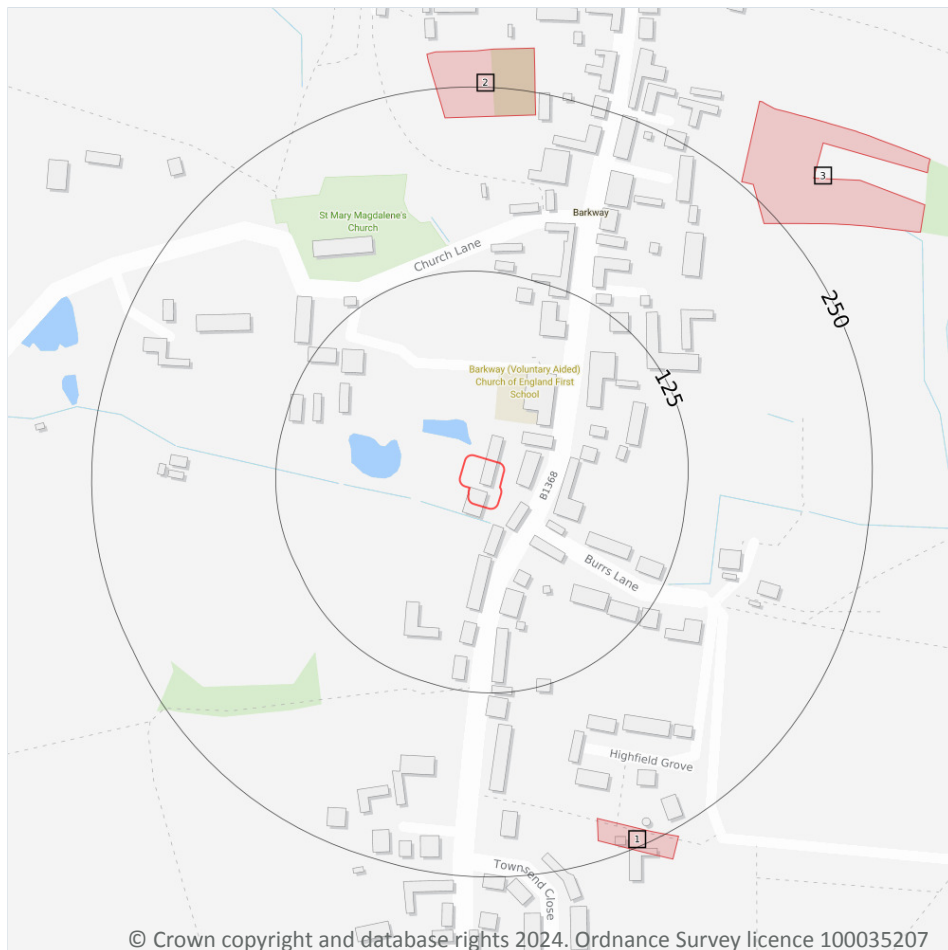
0

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.

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

3

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 66](#) >

ID	Location	Main Habitat	Other habitats
1	222m S	Traditional orchard	Overruled by Traditional Orchards HAP Inventory dataset
2	230m N	Traditional orchard	Overruled by Traditional Orchards HAP Inventory dataset
3	242m NE	Traditional orchard	Overruled by Traditional Orchards HAP Inventory dataset

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

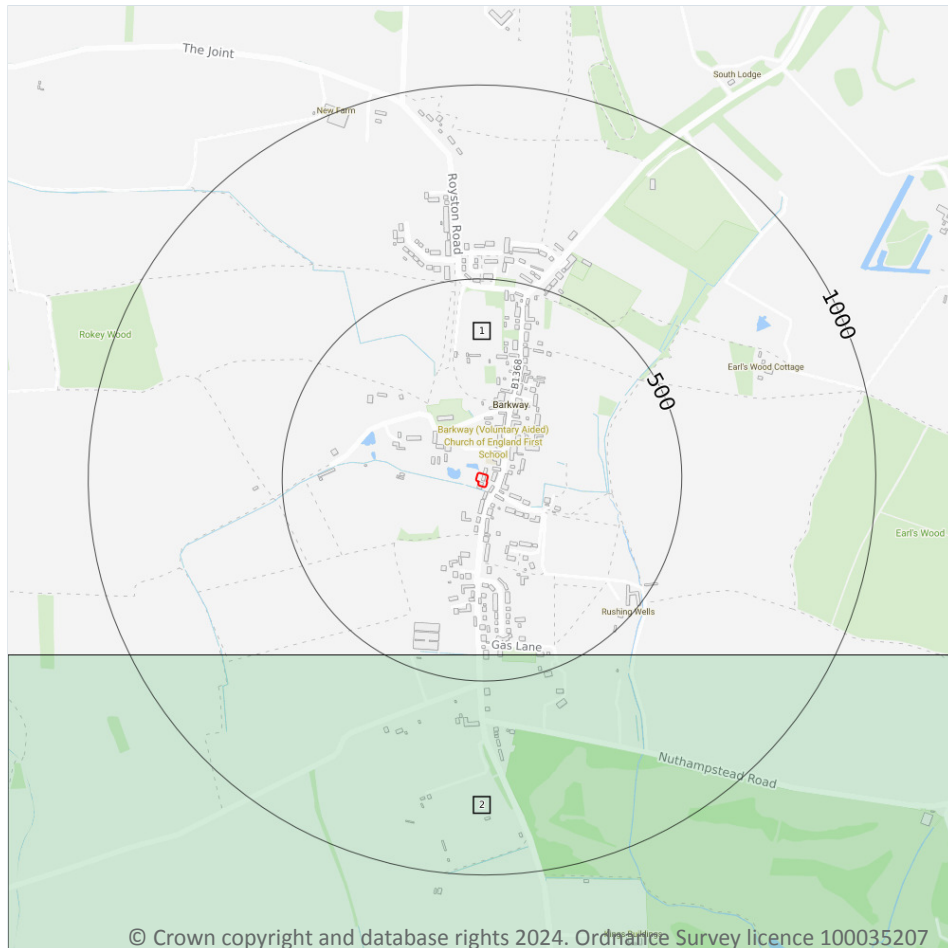
0

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

2

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 68](#) >

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	No coverage	No coverage	No coverage	NoCov
2	433m S	Full	Full	Full	No coverage	TL33SE

This data is sourced from the British Geological Survey.



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

14.2 Artificial and made ground (10k)

Records within 500m

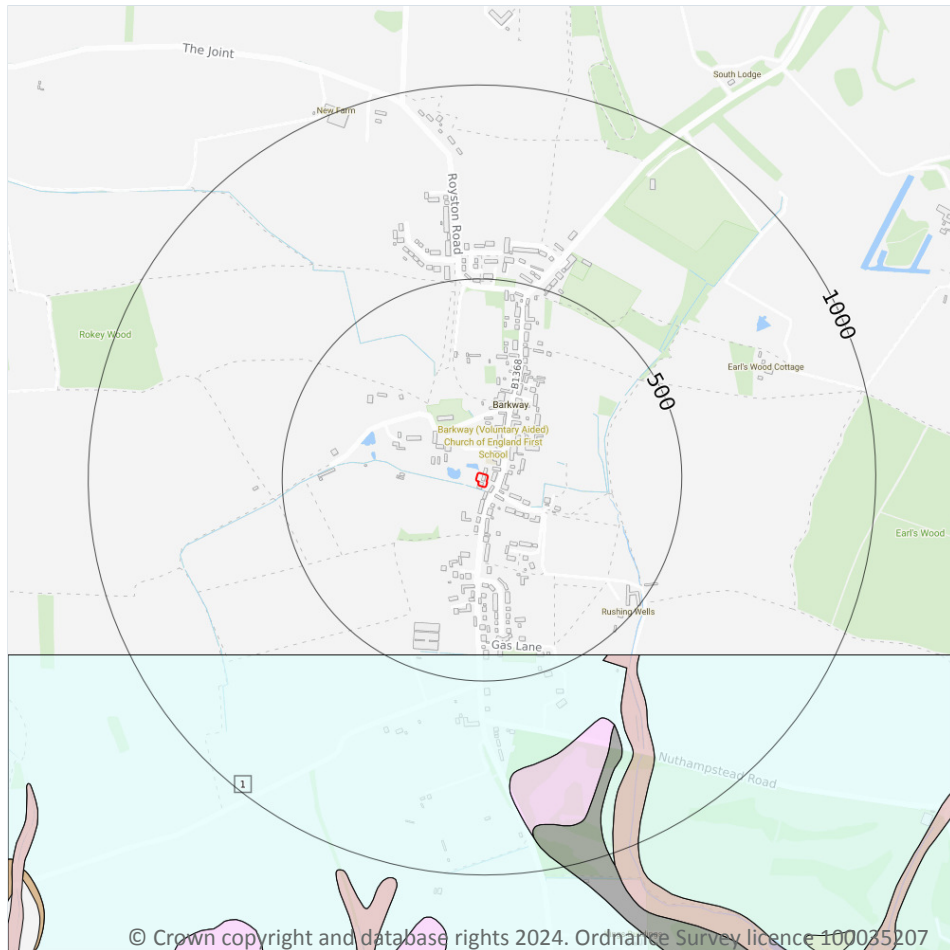
0

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

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Superficial



Site Outline

Search buffers in metres (m)

Landslip (10k)

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

14.3 Superficial geology (10k)

Records within 500m

1

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

Features are displayed on the Geology 1:10,000 scale - Superficial map on [page 70](#) >

ID	Location	LEX Code	Description	Rock description
1	433m S	TILMP-DMTN	Till, Mid Pleistocene - Diamicton	Diamicton

This data is sourced from the British Geological Survey.



14.4 Landslip (10k)

Records within 500m

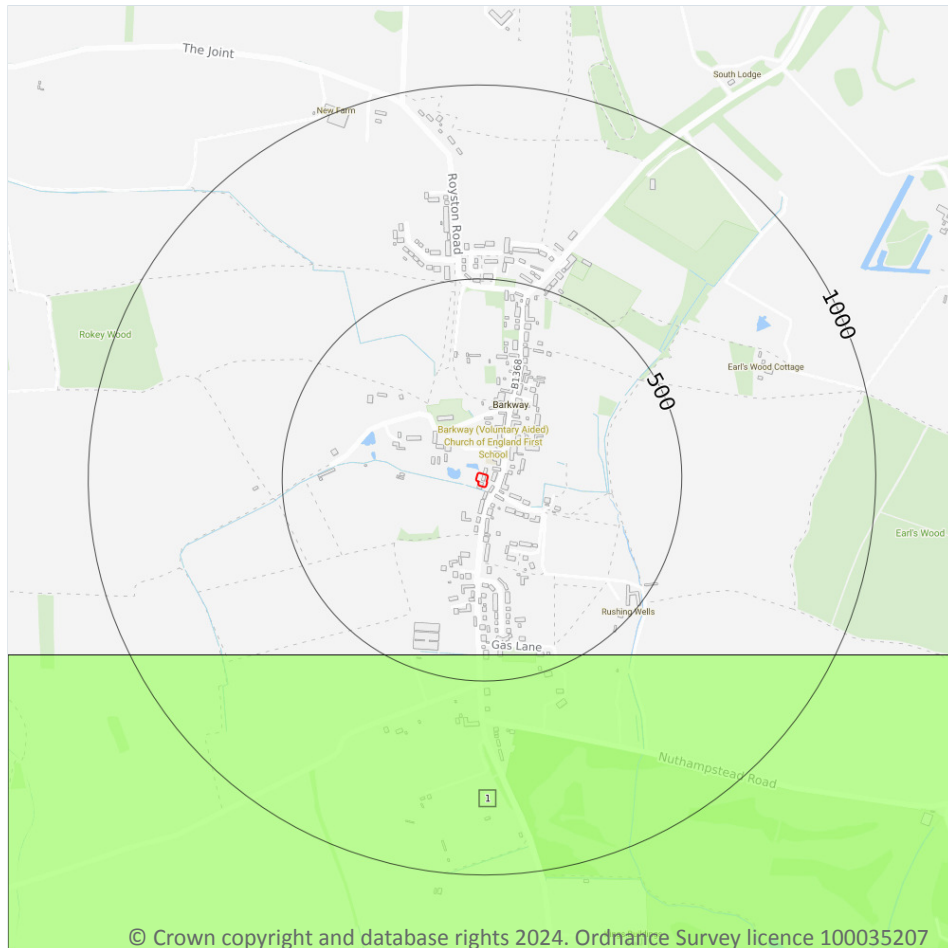
0

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

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Bedrock



— Site Outline

Search buffers in metres (m)

.... Bedrock faults and other linear features (10k)

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

14.5 Bedrock geology (10k)

Records within 500m

1

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

Features are displayed on the Geology 1:10,000 scale - Bedrock map on [page 72 >](#)

ID	Location	LEX Code	Description	Rock age
1	433m S	LESE-CHLK	Lewes Nodular Chalk Formation And Seaford Chalk Formation (undifferentiated) - Chalk	Santonian Age - Turonian Age

This data is sourced from the British Geological Survey.



14.6 Bedrock faults and other linear features (10k)

Records within 500m

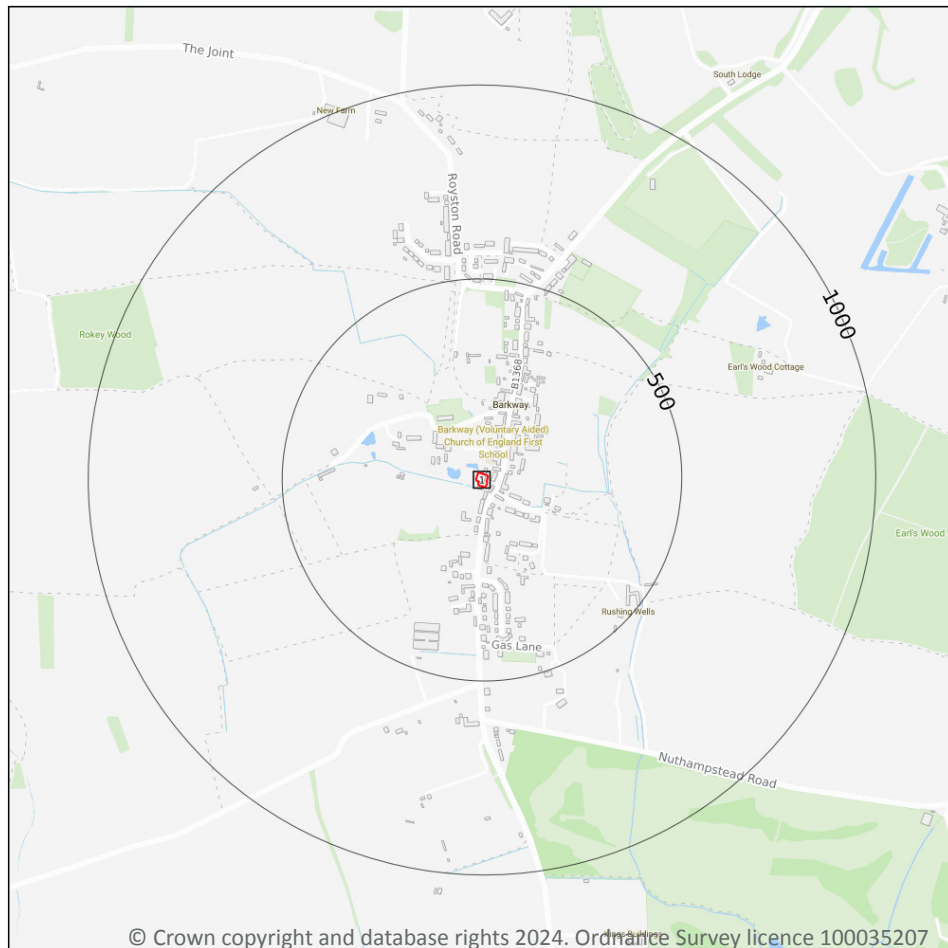
0

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

This data is sourced from the British Geological Survey.



15 Geology 1:50,000 scale - Availability



— Site Outline

Search buffers in metres (m)

□ Geological map tile

15.1 50k Availability

Records within 500m

1

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

Features are displayed on the Geology 1:50,000 scale - Availability map on [page 74](#) >

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	Full	Full	Full	Full	EW221_hitchin_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

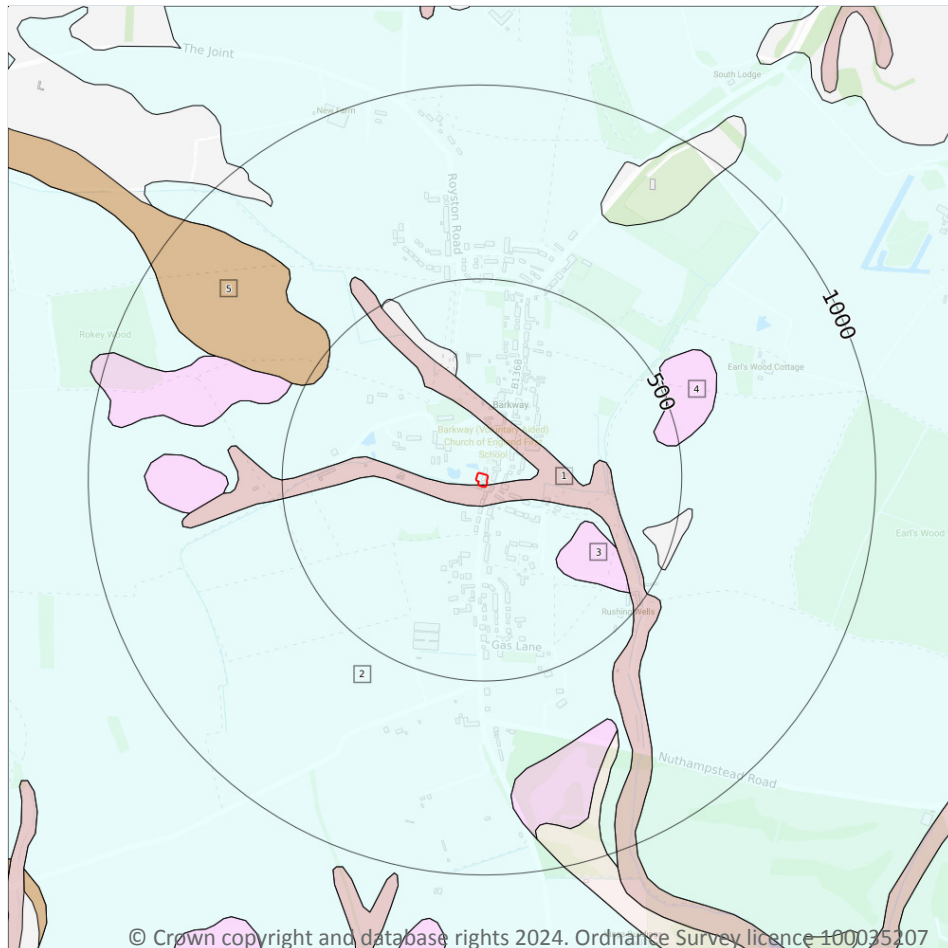
0

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

5

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 76](#) >

ID	Location	LEX Code	Description	Rock description
1	On site	HEAD-XCZSV	HEAD	CLAY, SILT, SAND AND GRAVEL
2	On site	LOFT-DMTN	LOWESTOFT FORMATION	DIAMICTON
3	253m SE	GFDMP-XSV	GLACIOFLUVIAL DEPOSITS, MID PLEISTOCENE	SAND AND GRAVEL



ID	Location	LEX Code	Description	Rock description
4	443m E	GFDMP-XSV	GLACIOFLUVIAL DEPOSITS, MID PLEISTOCENE	SAND AND GRAVEL
5	474m NW	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

2

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
On site	Mixed	Moderate	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

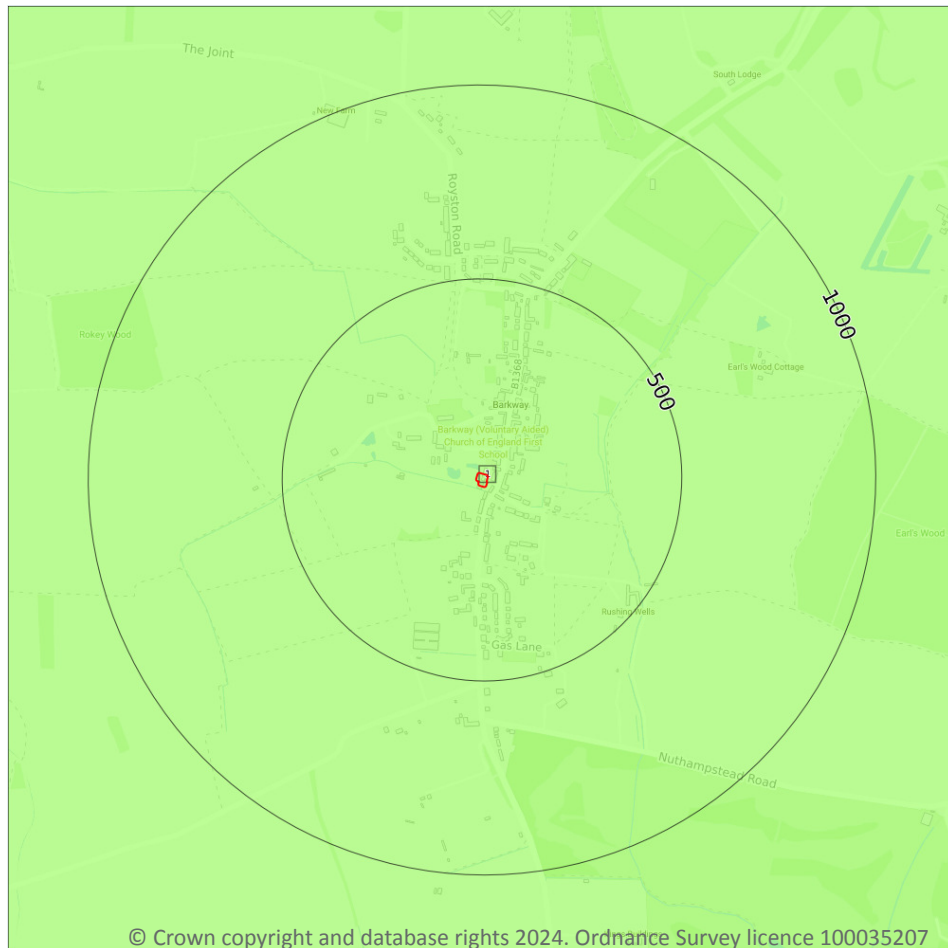
0

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 78 >](#)

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)

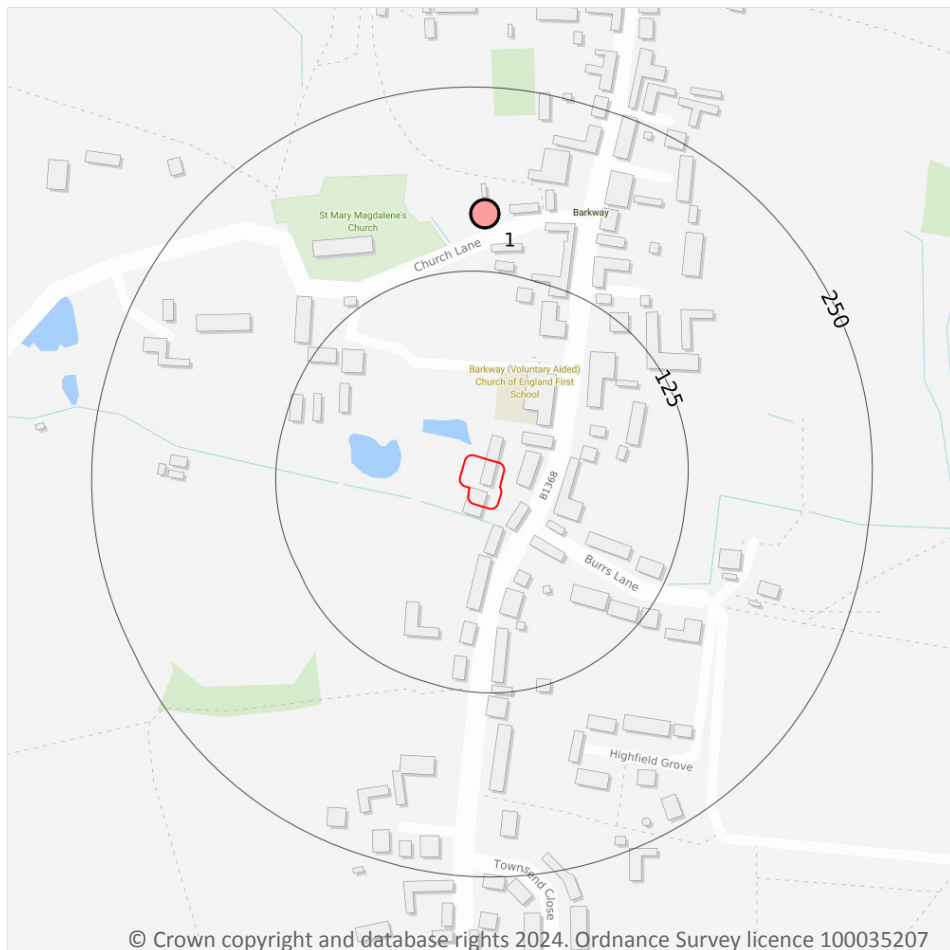
Records within 500m**0**

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



— Site Outline
Search buffers in metres (m)

- Confidential
- 0 - 10m
- 10 - 30m
- 30m+
- Unknown

16.1 BGS Boreholes

Records within 250m

1

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.

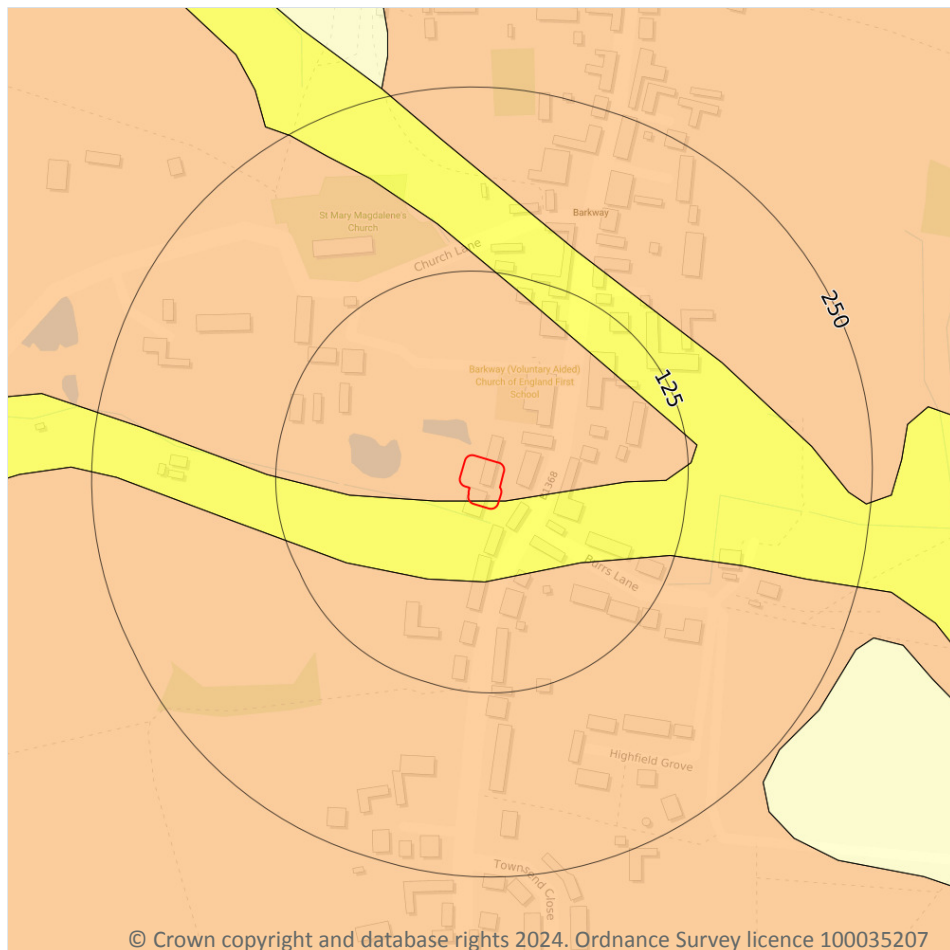
Features are displayed on the Boreholes map on [page 80](#) >

ID	Location	Grid reference	Name	Length	Confidential	Web link
1	164m N	538373 235633	66 HIGH STREET BARKWAY	90.0	N	20863180 ↗

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).

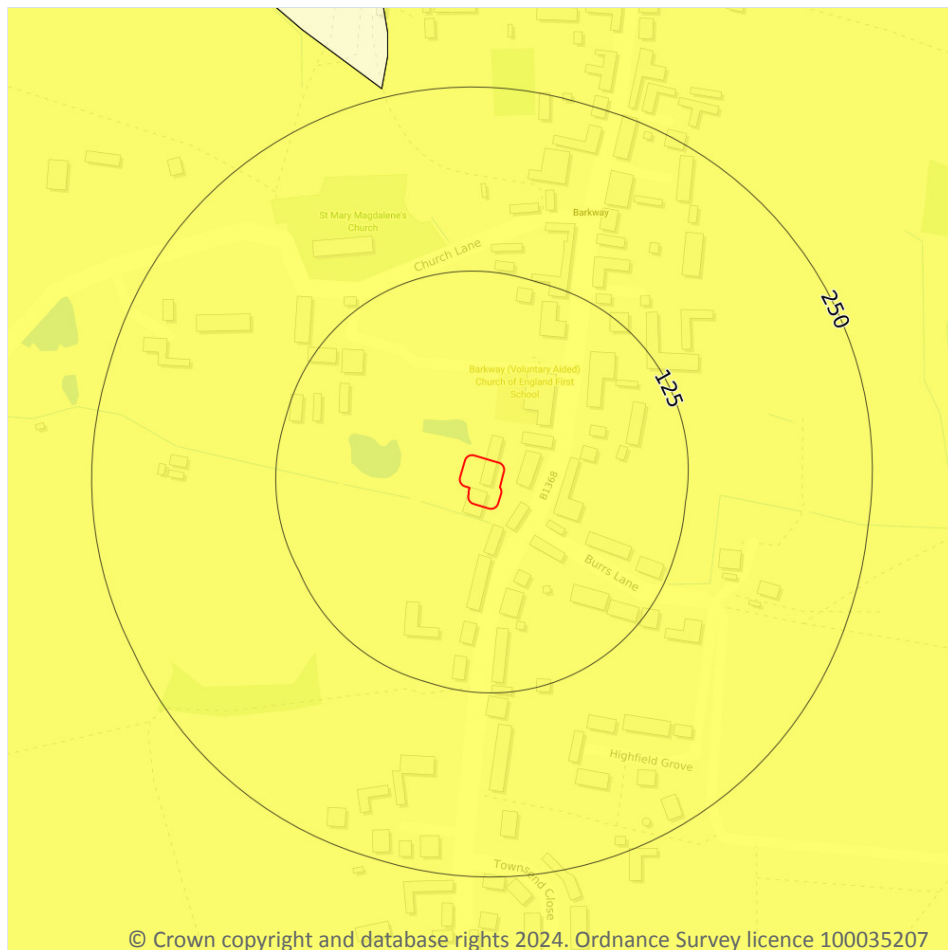
Features are displayed on the Natural ground subsidence - Shrink swell clays map on [page 81](#) >

Location	Hazard rating	Details
On site	Very low	Ground conditions predominantly low plasticity.
On site	Low	Ground conditions predominantly medium plasticity.

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

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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 82](#) >

Location	Hazard rating	Details
On site	Very low	Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly.

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

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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.

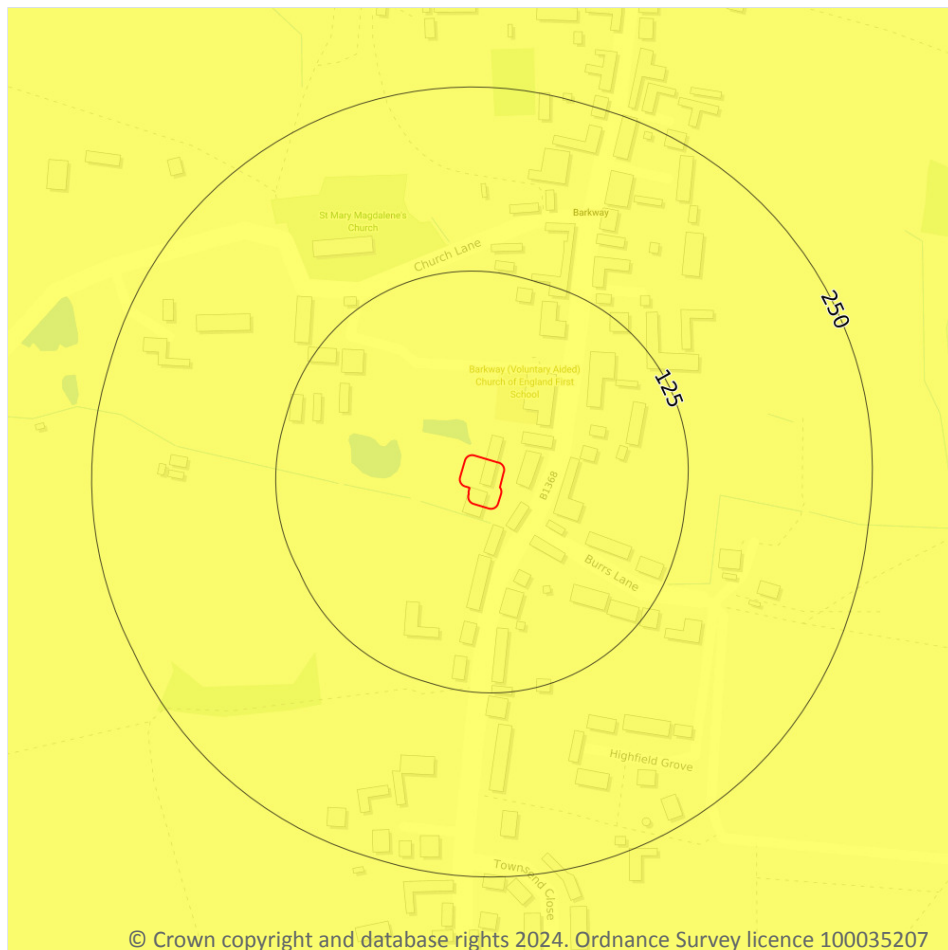
Features are displayed on the Natural ground subsidence - Compressible deposits map on [page 83](#) >

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

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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.

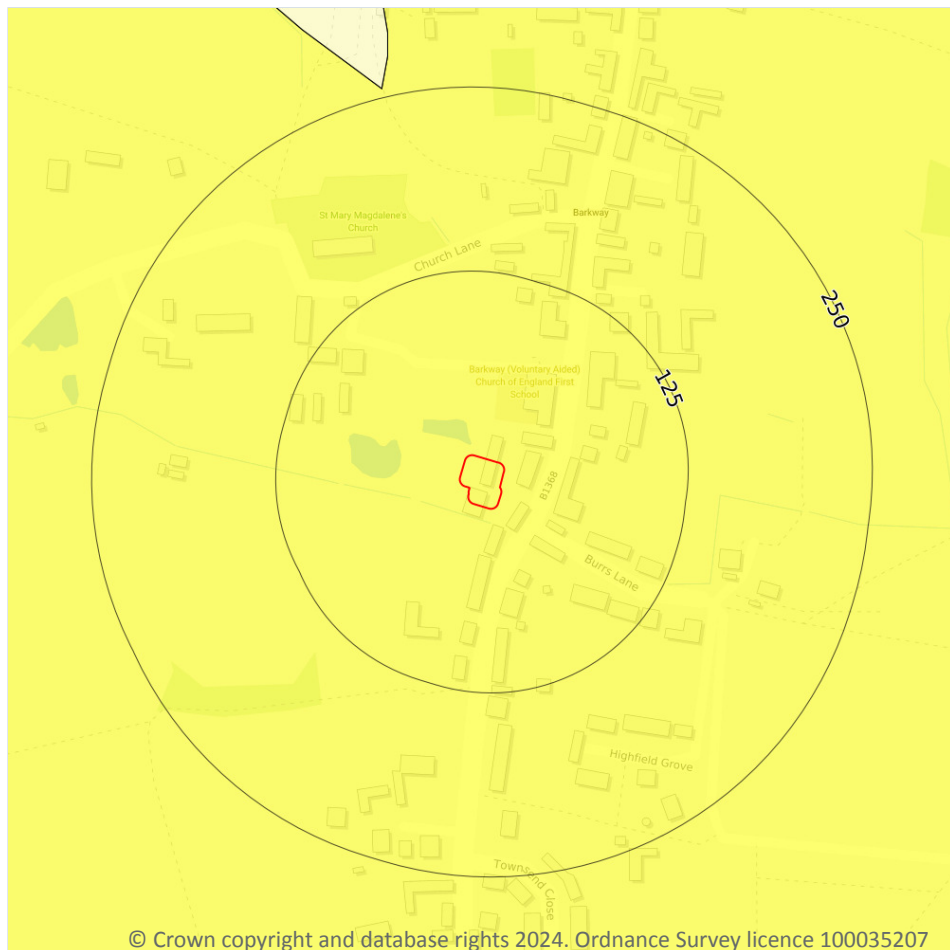
Features are displayed on the Natural ground subsidence - Collapsible deposits map on [page 84 >](#)

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

1

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.

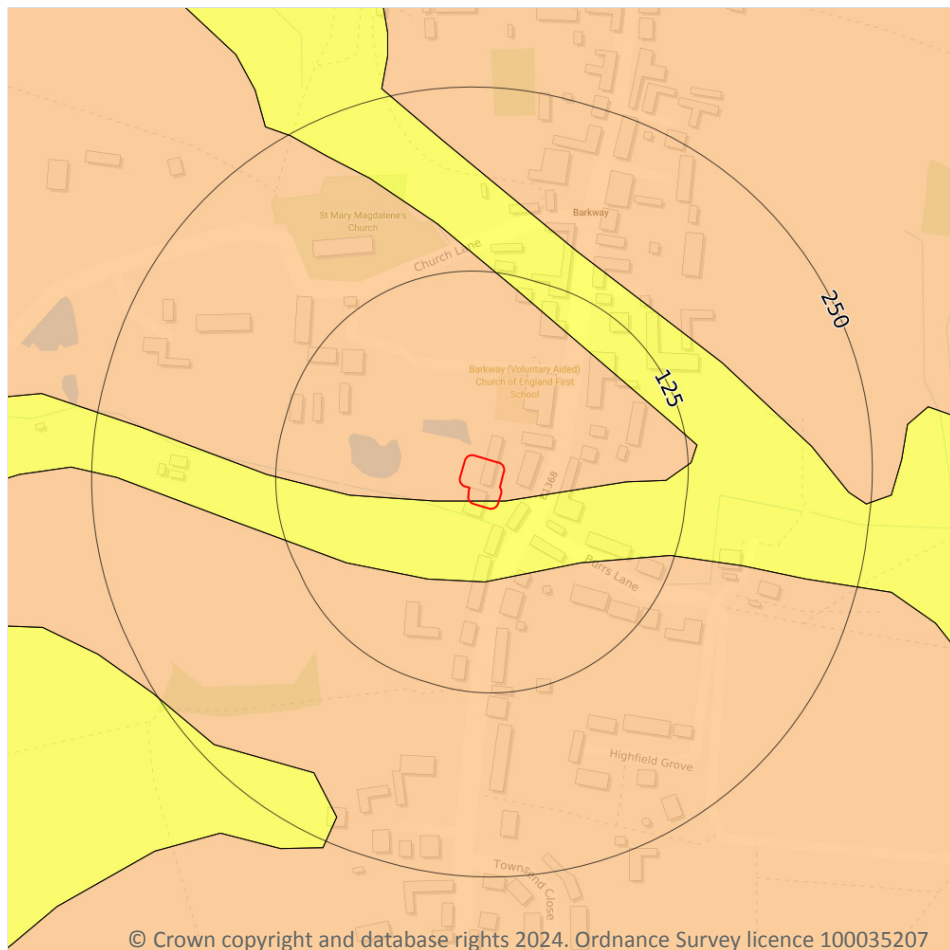
Features are displayed on the Natural ground subsidence - Landslides map on [page 85](#) >

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

This data is sourced from the British Geological Survey.



Natural ground subsidence - Ground dissolution of soluble rocks



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

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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 86](#)

Location	Hazard rating	Details
On site	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.

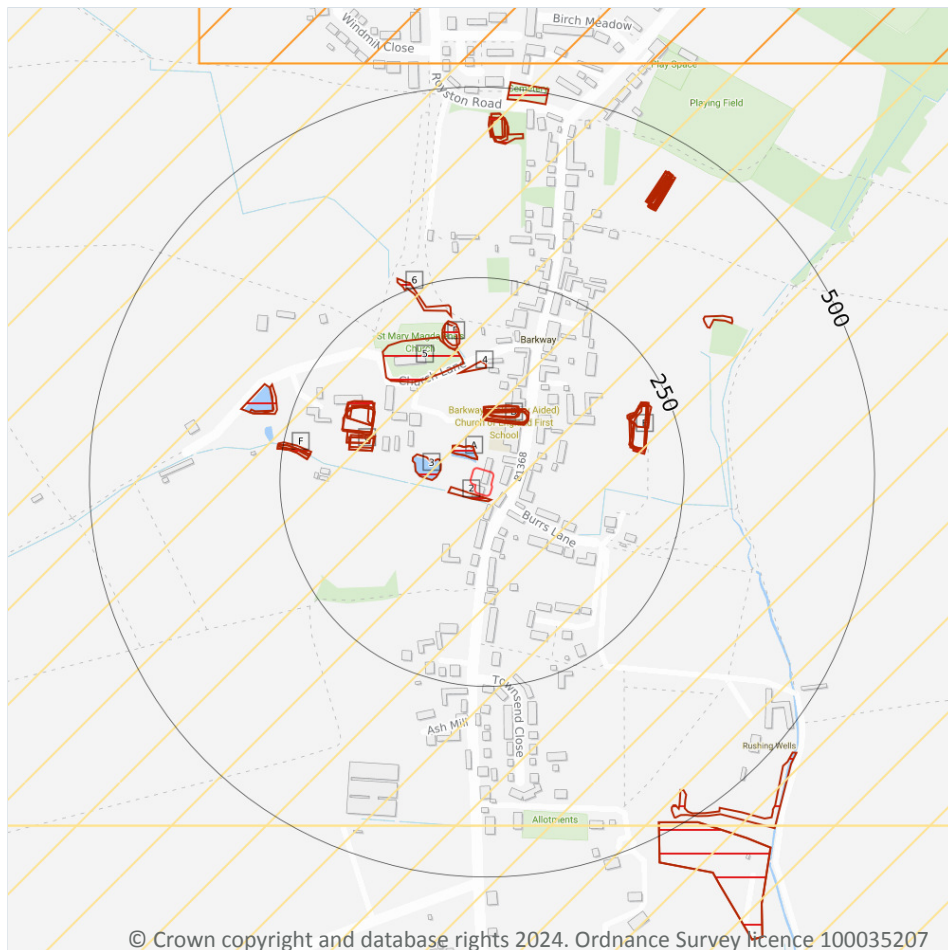


Location	Hazard rating	Details
On site	Low	Soluble rocks are present within the ground. Some dissolution features may be present. Potential for difficult ground conditions are at a level where they may be considered, localised subsidence need not be considered except in exceptional circumstances.
48m S	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.

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

0

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.

This data is sourced from the British Geological Survey.



18.2 Surface ground workings

Records within 250m

35

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 88](#) >

ID	Location	Land Use	Year of mapping	Mapping scale
2	3m S	Pond	1960	1:10560
A	12m N	Pond	1960	1:10560
A	12m N	Pond	1982	1:10000
3	41m W	Pond	1982	1:10000
B	64m N	Pond	1896	1:10560
B	64m N	Pond	1896	1:10560
B	67m N	Pond	1896	1:10560
B	67m N	Pond	1948	1:10560
B	70m N	Pond	1950	1:10560
B	72m N	Pond	1960	1:10560
B	72m N	Pond	1982	1:10000
4	127m N	Pond	1896	1:10560
5	133m N	Grave Yard	1878	1:10560
C	135m W	Pond	1896	1:10560
C	135m W	Pond	1896	1:10560
C	135m W	Pond	1896	1:10560
C	141m W	Pond	1960	1:10560
C	141m W	Pond	1982	1:10000
C	142m NW	Unspecified Pit	1948	1:10560
C	144m NW	Unspecified Pit	1950	1:10560
C	146m NW	Unspecified Ground Workings	1924	1:10560
C	146m NW	Unspecified Pit	1950	1:10560
C	147m NW	Unspecified Pit	1960	1:10560



ID	Location	Land Use	Year of mapping	Mapping scale
D	159m N	Pond	1904	1:10560
D	163m N	Ponds	1896	1:10560
E	183m E	Ponds	1960	1:10560
E	183m E	Ponds	1878	1:10560
E	186m E	Ponds	1924	1:10560
E	186m E	Ponds	1950	1:10560
E	186m E	Ponds	1948	1:10560
E	197m E	Pond	1896	1:10560
6	202m N	Pond	1896	1:10560
F	212m W	Pond	1896	1:10560
F	213m W	Pond	1896	1:10560
F	213m W	Pond	1896	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

3

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 88 >](#)

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.
8	433m S	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.
11	531m N	Not available	Chalk	C	Underground mine workings may have occurred in the past, or current mines may be operating to modern engineering standards. Potential for difficult ground conditions should 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
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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
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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.

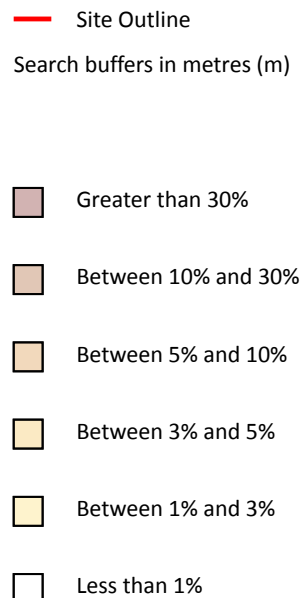
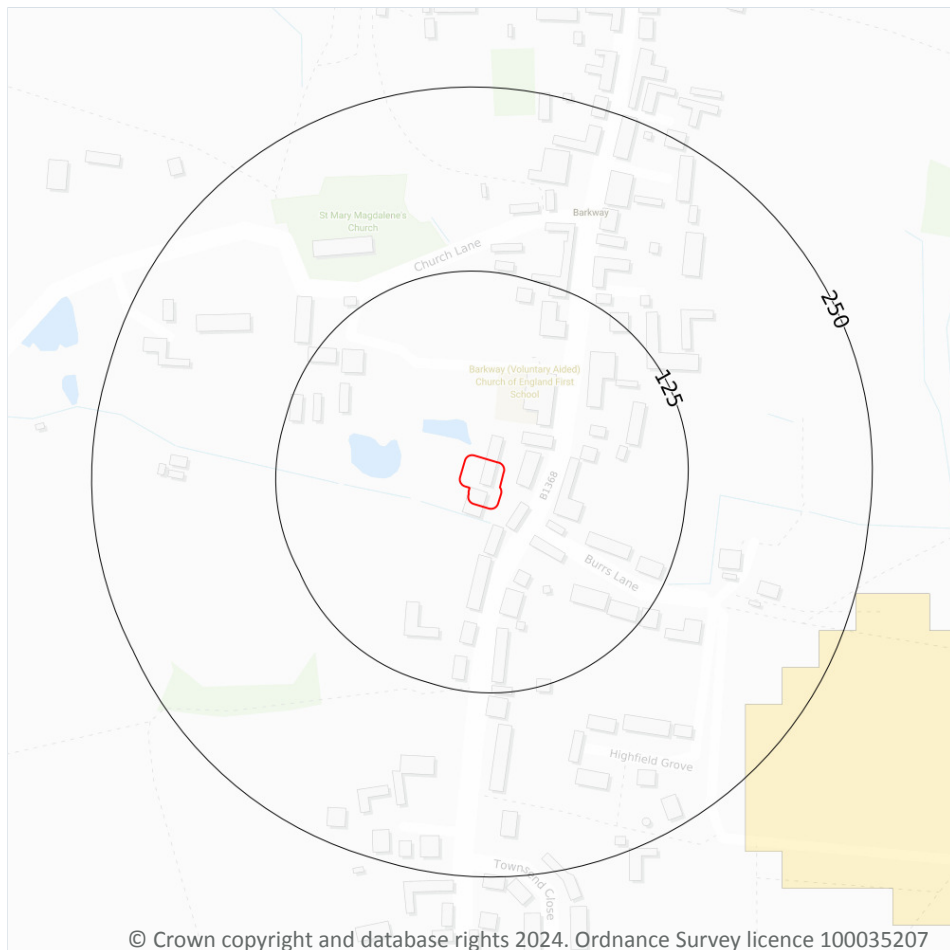
Since the database was set up in 2002 data covering most of the evaporite karst areas of the UK have now been added, along with data covering about 60% of the Chalk, and 35% of the Carboniferous Limestone outcrops. Many of the classic upland karst areas have yet to be included. Recorded so far are: Over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



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 96 >](#)

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

4

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 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg
31m N	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
48m S	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 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
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Details of all active London Underground lines, including approximate tunnel roof depth and operational hours.

This data is sourced from publicly available information by Groundsure.

22.2 Underground railways (Non-London)

Records within 250m	0
---------------------	---

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

This data is sourced from publicly available information by Groundsure.

22.3 Railway tunnels

Records within 250m	0
---------------------	---

Railway tunnels taken from contemporary Ordnance Survey mapping.

This data is sourced from the Ordnance Survey.

22.4 Historical railway and tunnel features

Records within 250m	0
---------------------	---

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

This data is sourced from Ordnance Survey/Groundsure.

22.5 Royal Mail tunnels

Records within 250m	0
---------------------	---

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



This data is sourced from Groundsure/the Postal Museum.

22.6 Historical railways

Records within 250m

0

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

This data is sourced from OpenStreetMap.

22.7 Railways

Records within 250m

0

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

This data is sourced from Ordnance Survey and OpenStreetMap.

22.8 Crossrail 2

Records within 500m

0

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

This data is sourced from publicly available information by Groundsure.

22.9 HS2

Records within 500m

0

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

This data is sourced from HS2 Ltd.



Data providers

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

Terms and conditions

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



APPENDIX 3

CLASSIFICATION OF AGGRESSIVE CHEMICAL ENVIRONMENT FOR BURIED CONCRETE

TABLE C2 – AGGRESSIVE CHEMICAL ENVIRONMENT FOR CONCRETE

(ACEC) CLASSIFICATION FOR BROWNFIELD LOCATIONS^a

Table C2 Aggressive Chemical Environment for Concrete (ACEC) classification for brownfield locations ^a								
Sulfate and magnesium						Groundwater		ACEC
Design Sulfate	2:1 water/soil extract ^b		Groundwater		Total potential sulfate ^c	Static water	Mobile water	Class for location
Class for location								
1	2	3	4	5	6	7	8	9
	(SO ₄ mg/l)	(Mg mg/l)	(SO ₄ mg/l)	(Mg mg/l)	(SO ₄ %)	(pH) ^d	(pH) ^d	
DS-1	< 500		< 400		< 0.24	≥ 2.5	> 6.5 ^d 5.5–6.5 4.5–5.5 2.5–4.5	AC-1s AC-1 AC-2z AC-3z AC-4z
DS-2	500–1500		400–1400		0.24–0.6	> 5.5 2.5–5.5	> 6.5 5.5–6.5 4.5–5.5 2.5–5.5	AC-1s AC-2 AC-2s AC-3z AC-4z AC-5z
DS-3	1600–3000		1500–3000		0.7–1.2	> 5.5 2.5–5.5	> 6.5 5.5–6.5 2.5–5.5	AC-2s AC-3 AC-3s AC-4 AC-5
DS-4	3100–6000	≤ 1200	3100–6000	≤ 1000	1.3–2.4	> 5.5 2.5–5.5	> 6.5 2.5–6.5	AC-3s AC-4 AC-4s AC-5
DS-4m	3100–6000	> 1200 ^e	3100–6000	> 1000 ^e	1.3–2.4	> 5.5 2.5–5.5	> 6.5 2.5–6.5	AC-3s AC-4m AC-4ms AC-5m
DS-5	> 6000	≤ 1200	> 6000	≤ 1000	> 2.4	> 5.5 2.5–5.5	≥ 2.5	AC-4s AC-5
DS-5m	> 6000	> 1200 ^e	> 6000	> 1000 ^e	> 2.4	> 5.5 2.5–5.5	≥ 2.5	AC-4ms AC-5m

Notes

- a** Brownfield locations are those sites, or parts of sites, that might contain chemical residues produced by or associated with industrial production (Section C5.1.3).
- b** The limits of Design Sulfate Classes based on 2:1 water/soil extracts have been lowered from previous Digests (Box C7).
- c** Applies only to locations where concrete will be exposed to sulfate ions (SO₄), which may result from the oxidation of sulfides such as pyrite, following ground disturbance (Appendix A1 and Box C8).
- d** An additional account is taken of hydrochloric and nitric acids by adjustment to sulfate content (Section C5.1.3).
- e** The limit on water-soluble magnesium does not apply to brackish groundwater (chloride content between 12 000 mg/l and 17 000 mg/l). This allows 'm' to be omitted from the relevant ACEC classification. Seawater (chloride content about 18 000 mg/l) and stronger brines are not covered by this table.

Explanation of suffix symbols to ACEC Class

- Suffix 's' indicates that the water has been classified as static.
- Concrete placed in ACEC Classes that include the suffix 'z' have primarily to resist acid conditions and may be made with any of the cements in Table D2 on page 42.
- Suffix 'm' relates to the higher levels of magnesium in Design Sulfate Classes 4 and 5.

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