



Phase 1 Desk Study

Sperberry Hill Solar and BESS

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Disclaimer: Please note that this report is based on specific information, instructions, and information from our Client and should not be relied upon by third parties.



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[1] Introduction

[1.1] Instruction

ByrneLooby Partners (UK) Ltd (Ayesa) was instructed by Brockwell Energy to carry out a Phase 1 Preliminary Geo-Environmental Assessment Desk Study of the proposed Sperberry Hill Solar and Battery Energy Storage System (BESS) site at Sperberry Hill, St Ippolyts, Hitchin, SG4 7NR, located on existing farmland south of the existing National Grid Wymondley Substation. This report has been commissioned prior to an intrusive ground investigation in order to aid in the design of foundations and to help discharge any contaminated land planning conditions relating to the redevelopment.

[1.2] Purpose of Report

The purpose of this report is to provide an initial assessment of the risk from encountering potential contamination and an understanding of the underlying ground conditions to provide baseline information for foundation design, satisfying Part 1 of Condition 5 of planning approval (Ref. 24/02455/FP).

This report is intended to summarise the findings of Ayesa's review of the existing relevant geo-environmental information from the review of publicly available information and that purchased through the Groundsure database, alongside documents made available by the Client for review.

The scope of this report includes:

- Walkover survey to assess the current site condition.
- A summary of the site, its location and surroundings, including a description of historical and current land uses and observations from a site walkover.
- A review of Groundsure supplied site information and a summary of issues of geo-environmental relevance to the proposed development.
- Review non-coal mining risk data.
- Review of British Geological Survey (BGS) maps to assess the underlying geological setting.
- The development of a Conceptual Site Model (CSM) to establish the contaminant-pathway receptor linkages from the human health, infrastructure and controlled water risk perspectives.
- Summary of the environmental risks associated with developing the site.
- Proposed intrusive investigation.

This report has been produced by the review of data contained within the Groundsure Insights report (Ref. GS-WTH-6E8-16U-IPQ) and publicly available information accessed on the internet.

This report complies with the relevant principles and requirements of a range of guidance with regards to potentially contaminated land, including but not limited to:

- Part IIA of the Environment Protection Act, 1990;
- Contaminated Land (England) (Amendment) Regulations 2012 and Contaminated Land Statutory Guidance (DEFRA, April 2012);
- National Planning Policy Framework (HCA, February 2025);
- BS5930:2015 +A1:2020: “Code of practice for site investigations”;
- BS10175: 2011 +A2:2017 “Investigation of Potentially Contaminated Sites - Code of Practice”;
- The Building Regulations 2010. Part C (HM Government 2013);
- Environment Agency Online Guidance (October 2020): Land Contamination Risk Management Land Contamination (LCRM) (which replaced Report CLR11 (2004) Model Procedures for the Management of Land Contamination);
- Environment Agency (2011) Report GPLC1 “Guiding Principles for Land Contamination”; and,
- Environment Agency (2017) “The Environment Agency’s Approach to Groundwater Protection” November 2017 Version 1.1.

The ‘Service Constraints, Report Limitations & Planning Requirements’ are presented in **Appendix A**, and a description of Environmental Risk Assessment Methodology and Terminology is presented in **Appendix B**.

[1.3] Proposed Development

The site is understood to cover an area of approximately 35.5 ha. The proposed development will comprise the following elements:

- Solar farm with associated battery energy storage site (BESS) and ancillary infrastructure.
- Construction of an access road running north to Stevenage/Blakemore End Road connecting to National Grid Wymondley Substation.

The proposed development will also include surface water drainage features and control rooms, CCTV, access tracks, palisade fencing, and landscape works. The red line site boundary is shown on Axis drawing ref. 3732-01-01 Site Location Plan, shown in **Appendix C**.

The proposed site layout along with site boundary is shown on Axis drawing ref. 3732-01-03 Proposed Site Layout, shown in **Appendix C**.

[1.4] Groundsure Report

A ‘Groundsure Insight’ report for the site was obtained (Ref. GS-WTH-6E8-16U-IPQ) to provide information from authoritative, environmental, and geological datasets which is summarised within this report. The purchased Groundsure reports and historic maps are presented within **Appendix D**.

[2] The Site

[2.1] Site Location

Table 2.1 below provides details of the location and size of the site, including site address and/ or nearest postcode, grid reference and current land use both on and in the vicinity. The site location and approximate site boundary are shown in **Figure 1**.

Table 2.1 Site Location

Site Location	
Site Address	Sperberry Hill, St Ippolyts, Hitchin, SG4 7NR
Site Access	North: via Sperberry Hill or Stevenage Road Southwest: via Tittendell Ln or Little Almshoe Ln
Nearest Town/City	St Ippolyts
Postcode (Nearest)	SG4 7NR
Grid Reference (centre)	TL 20633 26383
Size of Site (Approx.)	35.5 ha
Site Shape	Irregular, multi-lobed polygon narrowing along the north south orientation in the centre; thin boundary extending north from the site along the proposed/existing access route.
Topography	The site occupies gently rolling farmland on a gradual southward falling slope, with modest variations in elevation (97mOD in the north to ~85mOD in the south) and no pronounced irregular relief.
Current Land Use	The site is currently existing agricultural farmland.

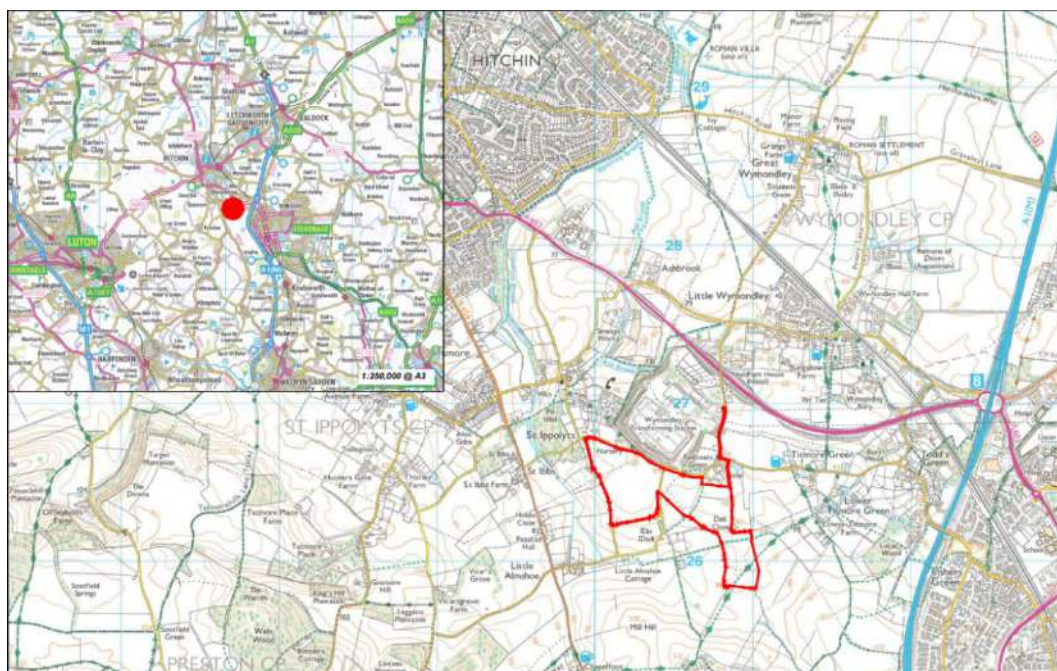


Figure 1: Approximate Site Location and Site Boundary (Source: Axis Drawing as provided by Brockwell Energy)

[2.2] Site Description

A description of the site surrounding land use is presented in **Table 2.2**, and a description of the site based on publicly available information is presented in **Table 2.3**.

Table 2.2 **Surrounding Land Use**

Surrounding Land Use	
North	The National Grid Wymondley Substation and the village of St Ippolyts lies immediately to the north of the site, beyond which are residential areas and local amenities, with Wymondley and Hitchin further north.
East	The land to the east comprises mainly agricultural fields and open countryside, with scattered farm buildings and the village of Titmore Green nearby.
South	To the south, the landscape continues as rural farmland with pasture and arable fields extending towards Little Almshoe and Mill Hill.
West	The western boundary adjoins further agricultural land and hedgerow field boundaries, leading towards St Ippolyts village centre and residential properties on the edge of the village.

Table 2.3 **Site Description**

Site Description
A site walkover was undertaken by Ayesa on 02 October 2025. Photographs from the walkover are presented in Appendix E. • The site comprised agricultural farmland. • The site spanned several agricultural land parcels, located to the south of St Ippolyts and accessed via local lanes (Sperberry Hill, Little Almshoe Lane, Tittendell Lane) connecting to London Road and Stevenage Road (and further to the A602). • The site was predominantly covered by improved grassland and arable fields, divided by established hedgerows and post-and-wire fencing. • The site was bounded by further agricultural land to the west and south, with residential properties in the village of St Ippolyts situated to the north, with The Farmhouse at Redcoats hotel and restaurant and residential land forming part of the northeastern boundary. • Scattered farm buildings and rural infrastructure, including barns and agricultural storage areas, were present on adjacent land, particularly around the Wyck Estate winery and Little Almshoe. • Overhead electricity lines traverse portions of the site, supported by either smaller wooden poles or larger metal tower structures. • A network of minor drainage ditches runs along some field boundaries, flowing generally northeast toward Ashbrook and Wymondley, with Ippolyts Brook flowing to the southeast of the site. • A cleared area in the southern corner of the central parcel of the site contained an smouldering fire. • A large tank marked as containing gas oil is located in the northeast of the site next to the proposed access road. • The surrounding area is predominantly rural in character, with open views across farmland and distant residential development visible toward Hitchin and Wymondley. • A gas pipeline marker was noted in the southern parcel of the site, and it was confirmed in the Groundsure Report that there is a high-pressure gas pipeline (National Grid Great Wilbraham to Whitwell) running northeast to southwest across the southern section of the site.

[3] Site History and Mapping

[3.1] Historical Mapping

The following summary of the site's history is based on a review of historical Ordnance Survey mapping and associated available online sources. The Ordnance Survey maps date from 1881 to the current 2025 National Grid OS plans. The historical plans reviewed have been reproduced in **Appendix D**. The key points of the historical development of the site and surrounding area are summarised below in **Table 3.1** below.

Table 3.1 Key Points of Site Development (1857 - 2025) and Surrounding Area

OS Map Edition	Site	Surrounding Area
1881 County Series Plan 1:2,500	The site is made up of agricultural arable fields, with climbing topography towards the north and northwest of the site. Footpaths run across the site. A drain is indicated running across the southern parcel of the site in an east to west direction. A chalk pit is present at the southern boundary of the south parcel of the site.	The site is surrounded by further arable fields. Earthworks present at Joyner's Folly, 10m west of the site. An old gravel pit is indicated approx. 15m west of the western site boundary. Multiple gravel pits are present approx. 450m southwest; 200m northwest; 350m north; 2 no. 400m north; and north of the site. A foundry is present approx. 450m northwest in St Ippolyts, as is a graveyard 350m. A chalk pit is located approx. 500m east of the site.
1884 County Series Plan 1:10,560	No significant changes noted.	Earthworks are present within 50m of the southwest corner of the site. A well is present within 50m east of the site, with multiple wells present within 500m west of the site. An iron foundry is now indicated approx. 300m to the northwest. A Smithy is located approx. 450m southwest of the site. Earthworks are present approx. 550m to the northeast of the site.
1896-97 County Series Plan 1:10,560	No significant changes noted.	The well within 50m to the northeast is no longer indicated, as is another well to the southwest. Multiple wells are now present within Titmore Green to the north. A gravel pit is indicated approx. 500m southwest; another approx. 300m north; and another approx. 250m

					northwest. The earthworks within 50m of the southwest corner are now labelled as an old gravel pit. Multiple pumps are now present within 500m of the site. The earthworks approx. 550m to the northeast of the site are now labelled as a chalk pit. A water dell is present approx. 750m to the northwest.
1898	County	Series	Plan	The chalk pit at the southern boundary of the south parcel of the site is no longer indicated.	The gravel pit 400m north of the site is no longer indicated.
1922	County	Series	Plan	No significant changes noted.	A well is now present in Ippolyts to the northwest. A reservoir and pumping house are now present approx. 500m northeast of the site. The gravel pits 300m north and 250m are no longer indicated; likewise with the chalk pit 500m northeast. The Smithy approx. 450m southwest of the site is no longer indicated.
1922-25	County	Series	Plan	No significant changes noted.	Partial coverage – no coverage north of the site. No significant changes noted.
1924	County	Series	Plan	No significant changes noted.	No significant changes noted.
1946-47	County	Series	Plan	No significant changes noted.	No significant changes noted.
1946-49	County	Series	Plan	No significant changes noted.	Three large gravel pits are now present approx. 800m southwest.
1959	Provisional	Plan	1:10,560	No significant changes noted.	Unidentified (presumed gravel) pits are present approx. 400m north of the site. A recreation ground is located approx. 600m to the northeast. The three large gravel pits are approx. 800m southwest are now indicated as disused. The iron foundry approx. 300m northwest is now indicated as works. The reservoir and pumping house are no longer indicated.
1964	Provisional	Plan	1:10,560	No significant changes noted.	Partial coverage – no coverage west of the site. No significant changes noted.

1972 and 1972-73 Series Plan 1:2,500	County	The chalk pit southern boundary of the south parcel of the site is no longer indicated.		Partial coverage in the southeast, northwest and west map areas. A pond is now indicated within 10m west of the access road, and a well nearby is no longer indicated; similarly with a well approx. 150m south. National Grid Wymondley Transforming Substation is now indicated immediately adjacent to the northern boundary of the site, with associated pylons indicated running across the western parcel of the site. A gravel pit approx. 300m north is presumed to have been backfilled when the substation was constructed, and a new substation is now indicated approx. 300m north of the site. A substation is indicated 275m northwest of the site. A gravel pit is located approx. 300m north of the site. The gravel pit approx. 450m southwest is no longer indicated.
1976 Provisional Plan 1:10,560		No significant changes noted.		No significant changes noted.
1980 National Grid Plan 1:10,000		No significant changes noted.		A nursery is indicated approx. 18m northeast of the site. The gravel pit approx. 300m north of the site is now indicated as disused. Further drains exist to the south and west of the site. An oil depot is now indicated approx. 450m north of the site adjacent to the Little Wymondley bypass. Sewage works are now present approx. 750m north of the site. A sand pit is now present approx. 800m west of the site.
1981 National Grid Plan 1:2,500		Partial coverage – no coverage of the site.		The earthworks at Joyner's Folly 10m west of the site are now indicated as a refuse tip.
1986 National Grid Plan 1:2,500		No significant changes noted.		The gravel pit approx. 300m north of the site is now marked as disused.
1991 National Grid Plan 1:10,000		Partial coverage – no coverage of the site.		Partial coverage – no coverage east of the site. The nursery approx. 18m is no longer indicated.
1993 and 1992-1993 Grid Plan 1:2,500		No significant changes noted.		Partial coverage in the northwest, north, northeast and east map areas.

					No significant changes noted.
2001	National	Grid	Plan	No significant changes noted.	No significant changes noted.
1:10,000					
2003	Landline	Plan	1:2,500	No significant changes noted.	The refuse tip at Joyner's Folly 10m west of the site is now marked as scrub and rough grassland.
2010	National	Grid	Plan	No significant changes noted.	A cemetery is now indicated approx. 250m northwest of the site in St Ippolyts. The sewage works approx. 750m north are no longer indicated.
1:10,000					
2025	National	Grid	Plan	No significant changes noted.	The oil depot and cemetery are no longer labelled on the map.
1:10,000					

[4] Environmental Setting

The anticipated environmental setting (geology, hydrogeology, hydrology, landfill etc.) for the site are summarised and discussed within **Tables 4.1 to 4.10** below. Full listings are provided in the Groundsure® Report, as presented in **Appendix D**.

Table 4.1: Geology (Source: British Geological Survey (BGS) mapping)

Geology Type		Description
Artificial/ Ground	Infilled	Small pockets of worked ground exist on the west, south and east site boundaries, with one pocket of made ground at the far north of the access road where the site connects to the National Grid Wymondley Substation. The majority of the site is primarily undeveloped agricultural land with no other records of significant infilling or reworked ground.
Superficial		Superficial deposits comprising Glaciofluvial Deposits (Mid Pleistocene sand and gravel) and Lowestoft Formation (Diamicton) are recorded across much of the site. Head deposits are indicated close to the drain in the southeast of the site.
Bedrock		The superficial deposits are underlain by the Chalk Group (Holywell Nodular Chalk Formation and New Pit Chalk Formation - Cenomanian), comprising hard white chalk with shell and flints.
Faults		No mapped geological faults are recorded within the site boundary; however, 3 buried channels are recorded within 500m.
Other sources	Information	No boreholes are recorded directly on-site; however, 18 historical BGS boreholes are present within 250m. One such borehole approx. 96m west of the site boundary describes the strata as gravel to 9m, then clay to 12m, then chalk to 24m.

Table 4.2 Hydrogeology

Type	Description
Aquifer	Superficial: Mixture of Secondary A mainly in the west of the site (Glaciofluvial Deposits), and Secondary Undifferentiated across the centre and southeast of the site, with variable permeability (Lowestoft Formation). Bedrock: The underlying Chalk Group bedrock is designated as a Principal Aquifer, representing a highly permeable and regionally significant groundwater resource. High permeability fracture flow is identified on site.
Groundwater Classification	The Chalk Principal Aquifer is described as a highly productive water-bearing formation, capable of supporting baseflows to rivers and providing local and strategic water supply. Groundwater movement is generally through both matrix and fracture flow within the chalk. The Upper Bedford Ouse Chalk WFD groundwater body is identified on site.
Groundwater Abstraction Licenses	No licensed groundwater abstractions are recorded on-site. However, two licensed groundwater abstractions are recorded within 1km of the site boundary, with one approx. 408m north.
Source Protection Zones (SPZs)	The site lies partially within a Source Protection Zone 3 (SPZ3) (total catchment), with outer and inner catchment SPZs within 500m of the site.
Groundwater Vulnerability	The site is located predominantly within an area of medium groundwater vulnerability, however the northwest of the site lies within an area of high groundwater vulnerability (superficial), as does the southern lobe (bedrock).

Table 4.3 Hydrology

Type	Description
Surface Water Feature	Two surface water features are identified as running across the site, both inland rivers not influenced by normal tidal action, and are located within the southern part of the site. A lake is present approx. 16m east of the proposed access road, and a watercourse is present approximately 50m to the northwest of the site boundary.
Surface Water Classification	The River Purwell surface water body catchment is identified on site.
Surface Water Abstraction Licenses	There are 3 identified potable abstractions within 2km of the site, with the nearest being approx. 408m north.
Flooding	The Groundsure report indicates that areas within Flood Zones 2 and 3 extend into the southern part of the site, with a high risk of fluvial flooding. The site also lies within an area of high groundwater flood risk and 1-in-30-year surface water flood potential (>1.0 m depth within 50 m). No historical flood events or formal flood defences are recorded within the site boundary.

Table 4.4 Mining and Mineral Extraction

	Description
Mining/ Historical Workings/ Natural Cavities	<u>Coal Mining:</u> The site is not located within a coal mining area. There are 5 records on the BritPits database, including gravel pits and surface ground workings identified within 500m of the site. No records of underground mining activity were identified within 500m. <u>Non-Coal Mining:</u> Historical mapping and BGS data indicate one unspecified pit on-site (1884) and multiple gravel pits and surface ground workings within 500m, the closest located 11m southwest of the site, however many are of features still present with negligible risk. There are 3 historical mineral planning areas identified, all of sand and gravel surface mineral workings; 1 is located on site with a valid planning status, and a further 2 are located off site, one refused (10m southwest) and another valid (179m north). The potential for non-coal (chalk) mining records has been assessed. The risk is defined as underground mine workings are uncommon, although the geology is similar to that worked elsewhere. Potential for difficult ground conditions are unlikely.

Table 4.5 Ground Stability

Hazard Type	Description
Shrinking/ Swelling Clays	Low hazard potential.
Running Sand	Very low hazard potential.
Compressible Ground	Generally negligible, locally very low hazard potential.
Collapsible Ground	Very low hazard potential.
Landslides	Very low hazard potential.
Ground Dissolution	Very low hazard potential.

Table 4.6 Landfill/ Waste Sites (within 250 m)

Description	
Active or recent landfill sites	None identified within 500 m of the site.
Historical landfill sites	Several historical landfill records are identified within 500m, the closest being Tittendell Pit, approximately 44m southwest of the site with records suggesting operation between 1964 and 1975. Additional historical landfills are recorded to the north and northwest (Little Wymondley Gravel Pit and Quarry, Wymondleybury, and Titmore Green Road) at distances of 173–340m based on the red line boundary, but a far greater distance than the site itself.
Licensed waste sites	None identified within 500 m of the site.
Licensed pollutant releases/discharges	There are 2 licensed pollutant release locations; one at a National Grid site within 500m west for gas processes, and another 475m northwest for non-ferrous metal foundry processes. There are also multiple records of licensed discharges to controlled waters identified within 500m of the site, the closest being at Redcoats Farmhouse Hotel, and all of which are related to the discharge of sewage.
Waste Exemptions	The nearest exemption is located approximately 10m northeast, associated with agricultural farm waste. Further exemptions are recorded between 100-470 m from the site, linked to waste storage and treatment at local farms and pits.

Table 4.7 Radon and UXO

Description	
Radon	The site is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.
UXO	The site is within an area of low UXO risk. Zetica – UXO Bomb Risk Map presented in Appendix F .

Table 4.8 Environmental Habitat and Cultural Designations

Description	
Land Based Designation	The site lies within the North Hertfordshire (London) Green Belt. No Sites of Special Protection Areas (SPAs), Special Areas of Conservation (SACs), Special Scientific Interest (SSSIs), National or Local Nature Reserves (NNRs and LNRs), or Ramsar sites are recorded within 1km. There are 6 Designated Ancient Woodland sites identified within 2km of the site.
National Habitat Network All Habitats Combined (England)	None identified.
Land-Based Schemes	There is an Environmental Stewardship Scheme identified on site, and another within 100m west.

	There are also 4 Countryside Stewardship Schemes identified on site (higher to middle tier), with a further 5 within 250m of the site.
Non-Statutory	None identified.
Nitrate Vulnerable Zone (NVZ)	The entirety of the site lies within a designated Nitrate Vulnerable Zone, between the Great Ouse NVZ (surface water) and Anglian Chalk (groundwater).
Agricultural Designations	Agricultural Land Classification (ALC) mapping identifies the site as a mixture of predominantly Grade 3a (Good Quality) and Grade 2 (Very Good Quality), capable of supporting a wide range of crops. Small portions to the north fall within Grade 3 (Good to Moderate Quality). There is one Tree Felling Licence (Conditional Selective Fell/Thin) immediately adjacent to the western site boundary.
Habitat Designations	The Groundsure report records Priority Habitats (predominantly deciduous woodland) adjacent to the north and west site boundaries, with additional Priority Habitat designations within 250m.
Visual and Cultural Designations	The St Ippolyts Conservation Area is identified within 250m of the site, as are 5 listed buildings; 4 of which form the Redcoats Farm estate within 100m of the north of the site.

Table 4.9 Potentially Contaminative Industry (On-site)

Description

A historical chalk pit at the southern boundary of the south parcel of the site is an area of potentially contaminative industry on site. Present-day features include electrical pylons and underground utility infrastructure, which are not considered contaminative land uses. There is large tank marked as containing gas oil, likely for tractor refuelling, located in the northeast of the site next to the proposed access road which is potentially contaminative.

Table 4.10 Potentially Contaminative Industry (within 250 m)

Description

The Groundsure report identifies several historical land uses within 250m that may be classed as potentially contaminative. These include former gravel pits, chalk pits and unspecified ground workings located to the southwest and northwest of the site, and a nursery (approximately 18 m northeast) recorded on mapping from 1980. A refuse heap was also noted around 24m southwest between 1980 and 1991. These are the sources that are most likely to affect the subject site.

Other notable historical features include an iron foundry, smithy, graveyard, sewage works, reservoir and pumping station, and the National Grid Wymondley Substation, alongside multiple wells and pumps. None of these features remain in active use, and all are considered historic, small-scale, and, given the distance from the site, pose a low risk to the proposed development.

There are no sites designated on the Contaminated Land Register within 500m of the site. There are however 2 licensed pollutant release locations; one at a National Grid site within 500m west for gas processes, and another 475m northwest for non-ferrous metal foundry processes. There are also multiple records of licensed discharges to controlled waters identified within 500m of the site, the closest being at Redcoats Farmhouse Hotel, and all of which are related to the discharge of sewage.

[5] Additional Information

[5.1] Previous Reports

No previous ground investigation (GI) reports for the site have been prepared by Ayesa. Similarly, no third-party GI reports have been provided to Ayesa for review.

[5.2] Historical Coal Mining

The site is not located within a coal mining area as defined by the Coal Authority.

[6] Preliminary Environmental Risk Assessment

[6.1] Introduction

The risk posed by any contaminants in soil or groundwater will depend on the nature of the hazard, the probability of exposure, the pathway by which exposure occurs, and the likely effects on the receptors. A contaminant is defined as a substance that has the potential to cause harm, while a risk is considered to exist if such a substance is present in sufficient concentration to cause harm and a pathway exists for a receptor to be exposed to the substance.

The following sections discuss all the identified potential on and off-site sources, pathways, and receptors in the context of the proposed development and plausible pollutant linkages which may represent a risk to identified receptors such as human health and/or controlled waters from the data gained from the desk study. At this stage, the assessment is qualitative and aimed to determine all pollutant linkages, irrespective of significance or allowing for uncertainty.

Three impact potentials exist for any given site, these are:

- The site impacting upon itself;
- The site impacting on its surroundings; and,
- The surroundings impacting on the site.

All three impacts need to be considered in a risk assessment.

A Source, Pathway, Receptor analysis has been undertaken for the site based on the information provided in the preceding sections. This is presented as **Tables 6.1 to 6.3** and further information about the risk classification scheme is included within **Appendix B**.

Sources; these are potential or known sources of contamination that may relate to a former land use or present site feature or process (e.g., railway sidings).

Pathways; a pathway is defined as a mechanism or route by which a contaminant encounters or otherwise affects a receptor. Pathways by which the identified receptors may be impacted upon in the context of the proposed development.

Receptors; receptors are defined as people, living organisms, ecological systems, controlled waters, atmosphere, structures, and utilities that could be adversely affected by contaminant(s).

[6.2] Conceptual Site Model

Based on the data available the following Conceptual Site Model has been developed. **Tables 6.1 to 6.4** show the various components of the potential “source–pathway–receptor” pollutant linkages identified at the site.

Table 6.1 Potential Source of Contamination

Location	Source	Contaminant Type
On-site	Locally a historical chalk pit at the southern boundary of the south parcel of the site and tractor refuelling tank, but not sitewide.	Contaminants may include: Hydrocarbons (PAH/TPH); Heavy Metals//Phytotoxic Elements; Asbestos; Hazardous Ground Gases; and Alkaline Leachates.
Off-site	Most significant to site: former gravel pits, refuse tip and nursery. Other gravel pits, chalk pits, iron foundry, smithy, graveyard, sewage works, reservoir and pumping station, as well as the National Grid Wymondley Substation are likely to be too remote to have an adverse effect on the subject site.	Contaminants relating to the identified sources may include: Hydrocarbons (PAH/TPH); Heavy Metals//Phytotoxic Elements; Asbestos; Hazardous Ground Gases; Unknown Mixed Wastes; Inorganics; and Phenols and Cyanides.

Table 6.2 Potential Pathways

Pathways
Dermal contact, ingestion, and inhalation. Plant Uptake & Ingestion by fauna. Migration of Contaminated Groundwater (Vertical/Lateral). Migration and accumulation of hazardous ground gasses and vapours (vertical/lateral) leading to asphyxiation (carbon dioxide) or explosion (methane, hydrocarbons).

Table 6.3 Potential Receptors

Receptors
<u>Human Health:</u> Construction workers. Future site maintenance workers. <u>Plant Life:</u> On & Off-site flora and fauna. <u>Controlled Waters:</u> Superficial: Secondary A aquifer – moderately productive aquifer. Bedrock: Chalk Principal aquifer – highly productive aquifer.

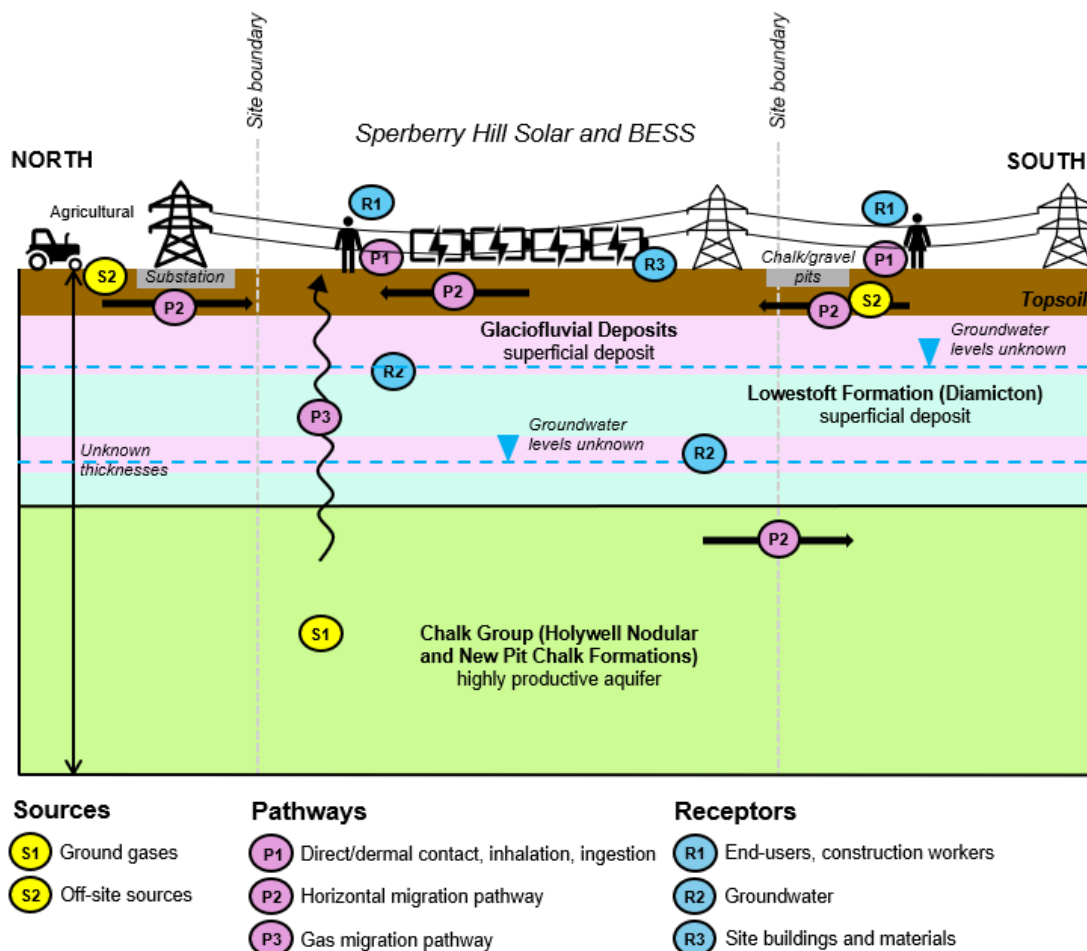


Figure 6.1 - Preliminary Conceptual Site Model

Table 6.4 Preliminary Conceptual Site Model

Source	Pathway	Receptor	Con	Prob	Risk	Mitigation/Investigation
On-site: Generally, none except the following highly localised features: A historical chalk pit at the southern boundary of the south parcel of the site. Agricultural plant refuelling tank. Contaminants relating to the identified sources may include: Hydrocarbons (PAH/TPH); Heavy Metals/Phytotoxic Elements; Asbestos; and Hazardous Ground Gases.	Dermal contact, ingestion, and inhalation	<u>Human Health:</u> Construction workers. Future site / commercial users.	Md	UI	L	Construction workers should employ appropriate PPE and standard site safety measures during construction. Due to the proposed development of the site, staff exposure to any possible in-ground contamination will generally be limited to the BESS area away from the recognised sources of contamination. However, a limited scope of contamination, sampling and analysis undertaken alongside an envisaged geotechnical investigation should be undertaken to confirm.
	Direct contact	<u>Plant Life:</u> On-site flora and fauna.	Mi	UI	VL	Limited scope of sampling should be considered in area of localised sources to ascertain whether renewed planting media is required.
	Migration of contaminated groundwater (vertical/lateral).	<u>Controlled Waters:</u> Superficial: Secondary A aquifer – moderately productive aquifer. Bedrock: Chalk Principal aquifer – highly productive aquifer.	Md	Lw	M/L	There is a potential for infill material within the backfilled chalk pit, or spills from the refuelling tank to leach and migrate to the underlying aquifers. Although these are highly localised features, some limited investigation in these areas in this regard would be recommended.
	Migration and accumulation of hazardous ground gasses and vapours (vertical/lateral) leading to asphyxiation (carbon dioxide)	<u>Human Health:</u> Construction workers. Future site users.	Sv	UI	M/L	The potential for infill materials within the chalk pit to generate ground gas cannot be discounted, although the pit's localised nature means it is unlikely to affect the site as a whole. Localised investigation and monitoring in this regard would be recommended.

	or explosion (methane, hydrocarbons).					
	Direct contact	<u>Water Supply Pipe Material:</u> Proposed water supply pipes.	Mi	UI	VL	Undertake soil sample analysis to complete a UKWIR Water Pipe Assessment if pipes are to be installed within the vicinity of the identified sources.
Off-site: Most significant to site: former gravel pits, refuse tip and nursery. Contaminants relating to the identified sources may include: Hydrocarbons (PAH/TPH); Heavy Metals/Phytotoxic Elements; Asbestos; Hazardous Ground Gases; Unknown Mixed Wastes; Inorganics; and Phenols and Cyanides.	Dermal contact, ingestion, and inhalation	<u>Human Health:</u> Construction workers. Future site / commercial users.	Md	UI	L	Construction workers should employ appropriate PPE and standard site safety measures during construction. Due to the proposed development of the site, staff exposure to any possible in-ground contamination will generally be limited to the BESS area away from the recognised sources of contamination. However, a limited scope of contamination, sampling and analysis undertaken alongside an envisaged geotechnical investigation should be undertaken to confirm.
	Direct contact	<u>Plant Life:</u> On-site flora and fauna.	Mi	UI	VL	Limited scope of sampling should be considered in area of neighbouring localised sources to ascertain whether renewed planting media is required.
	Migration of contaminated groundwater (vertical/lateral).	<u>Controlled Waters:</u> Superficial: Secondary A aquifer – moderately productive aquifer. Bedrock: Chalk Principal aquifer – highly productive aquifer.	Md	Lw	M/L	The potential for infill materials within the chalk, gravel pit and refuse tip to generate ground gas cannot be discounted, although the pit's/tip's localised nature means they are unlikely to affect the site as a whole. Localised investigation and monitoring in this regard would be recommended.
	Migration and accumulation of hazardous ground gasses and vapours	<u>Human Health:</u> Construction workers. Future site users.	Sv	Lw	M	The potential for infill materials within the chalk/gravel pits, and particularly the refuse tip, to generate ground gas cannot be discounted, although the pit's/tip's localised nature means it is unlikely to affect the site

	(vertical/lateral) leading to asphyxiation (carbon dioxide) or explosion (methane, hydrocarbons).					as a whole. Localised investigation and monitoring in this regard would be recommended.
KEY: Consequence: Sv = Severe, Md = Medium, Mi = Mild, Mr = Minor Probability: Hi = High, Li = Likely, Lw = Low Likelihood, UI = Unlikely Risk: VH = Very High, H = High, M = Moderate, M/L = Moderate/Low, L = Low, VL = Very Low						
Pollutant Linkage Assessment Summary: The pollutant linkage assessment has indicated that the site represents a low risk to human health, moderate/low to human health from ground gas, a very low risk to plant life, a moderate/low risk to controlled waters, and a very low risk to water supply pipe material in the context of the current site status.						

[7] Geotechnical Considerations

[7.1] Introduction

In addition to the environmental hazards, there are also geotechnical hazards associated with the stability of ground. Local Authorities follow the National Planning Policy Framework (NPPF, 2019) which requires that “site is suitable for its new use taking account of ground conditions and land instability, including from natural hazards or former activities such as mining.”

A summary of the geotechnical considerations is provided in **Table 7.1** below:

Table 7.1 Geotechnical Design Considerations

Hazard Type	Description
Ground Stability	The potential for ground instability principally comes from shrink swell clay risks. Foundations at the site should be designed to accommodate this.
Geotechnical Hazards (Mining)	Although chalk workings are shown to encroach on the site, they are highly localised in extent and unlikely to present significant geotechnical difficulties to the development. There is no evidence of underground workings at the site.
Site Clearance	None required. Development is for BESS facility on agricultural land.
Trees	No trees on the current site area of the proposed site area.
Existing Buildings / Obstructions	No existing buildings in area of proposed development.
Foundations	BESS / Panel foundation designs to be confirmed following ground investigation.
Groundwater	Groundwater conditions to be confirmed following groundwater investigation.
Earthworks	Some cut and fill required to form a level development platform.
Slopes	Slope stability is considered a low risk for the proposed development.
Retaining Structures	Retaining structures are not considered to be relevant to the proposed development.
Ground Aggressivity	There is a low potential for the Lowestoft Formation Diamicton to have slightly elevated levels of sulphate that could affect below ground concrete.

[8] Conclusions and Recommendations

[8.1] Environmental

The site is comprised of approximately 36ha of undeveloped agricultural farmland.

Natural ground conditions at the site are indicated to comprise strata of glaciofluvial deposits (sand and gravel) and Lowestoft Formation (Diamicton) overlying Chalk Group (Holywell Nodular Chalk Formation and New Pit Chalk Formation – Cenomanian).

Based on the information presented within this report and with due regard to the proposed development, it is the opinion of Ayesa that the site generally represents a **low** risk to human health, **moderate** risk to human health from ground gas, and a **moderate/low** risk to controlled waters. It should be noted that the identified sources of potential contamination should by no means be considered as sitewide and rather they are only likely to affect specific parts of the site in their vicinity.

[8.2] Geotechnical

Although there is limited evidence to suggest that the site will suffer from difficult ground conditions with respect to the foundations of the proposed panels and BESS containers, a ground investigation is recommended to provide information to assist in the design and construction of the scheme.

[8.3] Recommendations

We understand that development of the site is for a solar and BESS facility, with associated access roads and infrastructure has planning consent and a condition relating to contaminated land. To that end, this report will satisfy the first part, but additional tasks are likely to be required to be undertaken for it to be fully discharged:

- Location-specific geo-environmental testing of the soils and groundwater during the geotechnical site investigation should be carried out in order to appropriately assess the presence of contaminants from the identified localised potential contamination sources.
- Gas and groundwater (if present) monitoring should be carried out for an appropriate length of time, with visits ideally at periods of low or falling barometric pressure. Again, this should be focussed on the localised sources of ground gas identified on or close to the site.
- Should soil, gas or groundwater concentrations be assessed to pose a potentially unacceptable risk to future site users, construction workers or the wider environment, then risk mitigation measures will be required for the proposed site development.
- Any surplus soils arising from the development works should be chemically tested to enable an assessment of disposal or reuse options to be carried out.
- If significant contamination is found that requires more detailed consideration of remedial works, then a more detailed remediation options appraisal will be carried out and a remediation strategy prepared.

[8.4] Health and Safety

As outlined within the HSE publication “Successful Health and Safety Management – HSG65” this report should inform your development of safe systems of work and information as an input into the safety management system. The contents of this report may be used to supplement the contents of the Health and Safety File as required under the Construction Design and Management (CDM) Regulations 2015.

[9] References

1. British Standards Institute, (BSI), BS 10175:2011+A2:2017, Investigation of Contaminated Sites – Code of Practice
2. British Standards Institute, (BSI), BS5930:2015+A1:2020) Code of practice for ground investigations
3. British Standards Institute, (BSI), BS EN 1997-1:2004 Incorporating corrigendum February 2009, Eurocode 7 – Geotechnical Design – Part 1: General rules.
4. British Standards Institute, (BSI), BS EN 1997-2:2007 Incorporating corrigendum June 2010, Eurocode 7 – Geotechnical Design – Part 2: Ground Investigation and testing.
5. British Standards Institute, (BSI), BS 8485:2015, Code of Practice for the characterization and remediation from Ground Gas in affected developments
6. British Standards Institute, (BSI), BS 8576:2013, Guidance on investigations for Ground Gas – Permanent gases and Volatile Organic Compounds (VOCs)
7. Building Research Establishment Special Digest 1 Third Edition. Concrete in Aggressive Ground (2005)
8. Building Research Establishment (BRE) BR211, Radon; Guidance on Protective Measures for New Buildings (2015)
9. Construction Industry Research and Information Association (CIRIA), Report 132, A Guide to Safe working on Contaminated Sites (1996).
10. Construction Industry Research and Information Association (CIRIA). 2001, C522 Contaminated land risk assessment, A guide to good practice.
11. Construction Industry Research and Information Association (CIRIA). 2007, Report C665, Assessing Risk Posed by on Hazardous Ground Gases to Buildings
12. Department for Communities and Local Government (DCLG), 2012, National Planning Policy Framework.
13. Department for Environment Food and Rural Affairs (DEFRA), 2012, Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance.
14. Environment Agency Guidance Land Contamination Risk Management (LCRM) October 2020.
15. Health and Safety Executive (HSE) 'Protection of workers and the general public during the Development of Contaminated Land (1991).
16. Ministry of Housing, Communities & Local Government; Revised National Planning Policy Framework (NPPF); February 2025.

Appendix A – Service Constraints Report Limitations & Planning Requirements

Service Constraints, Report Limitations & Planning Requirements

This consultancy contract, report, and the site investigation (together comprise the "Services") were compiled and carried out by ByrneLooby Partners UK Limited (ByrneLooby) for the client named at the front of the report (the "client") on the basis of a defined programme and scope of works and the terms of a contract between ByrneLooby and the "client." The Services were performed by ByrneLooby with all reasonable skill and care ordinarily exercised by a reasonable environmental consultant at the time the Services were performed. Further, and in particular, the Services were performed by ByrneLooby taking into account the limits of the scope of works required by the client, the prevailing site conditions, the time scale involved and the resources, including financial and manpower resources, agreed between ByrneLooby and the client. ByrneLooby Partners UK Limited cannot accept responsibility to any parties whatsoever, following the issue of this report, for any matters arising which may be considered out with the agreed scope of works.

Other than that, expressly contained in the above paragraph, ByrneLooby provides no other representation or warranty whether express or implied, is made in relation to the Services. Unless otherwise agreed this report has been prepared exclusively for the use and reliance of the client in accordance with generally accepted consulting practices and for the intended purposes as stated in the agreement under which this work was completed. This report may not be relied upon, or transferred to, by any other party without the written agreement of a Director of ByrneLooby. If a third party relies on this report, it does so wholly at its own and sole risk and ByrneLooby disclaims any liability to such parties.

It is ByrneLooby's understanding that this report is to be used for the purpose described in the introduction to the report. That purpose was a significant factor in determining the scope and level of the Services. Should the purpose for which the report is used, or the proposed use of the site change, this report may no longer be valid and any further use of, or reliance upon the report in those circumstances by the client without ByrneLooby's review and advice shall be at the client's sole and own risk.

The information contained in this report is protected by disclosure under Part 3 of the Environmental Information Regulations 2004 pursuant to the provisions of Regulation 12(5) without the consent in writing of a Director of ByrneLooby Partners UK Limited.

The report has been prepared at the date shown on the front page and should be read in light of any subsequent changes in legislation, statutory requirements, and industry practices. Ground conditions can also change over time and further investigations, or assessment should be made if there is any significant delay in acting on the findings of this report. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of ByrneLooby. In the absence of such written advice of ByrneLooby, reliance on the report in the future shall be at the client's own and sole risk. Should ByrneLooby be requested to review the report in the future, ByrneLooby shall be entitled to additional payment at the then existing rate, or such other terms as may be agreed between ByrneLooby and the client.

The observations and conclusions described in this report are based solely upon the Services that were provided pursuant to the agreement between the client and ByrneLooby. ByrneLooby has not performed any observations, investigations, studies or testing not specifically set out or mentioned within this report. ByrneLooby is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the Services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this report, ByrneLooby did not seek to evaluate the presence on or off the site of electromagnetic fields or materials in buildings (i.e., materials inside or as part of the building fabric) such as asbestos, lead paint, radioactive or hazardous materials.

The Services are based upon ByrneLooby's observations of existing physical conditions at the site gained from a walkover survey of the site together with ByrneLooby's interpretation of information including documentation, obtained from third parties and from the client on the history and usage of the site. The findings and recommendations contained in this report are based in part upon information provided by third parties, and whilst ByrneLooby Partners UK Limited have no reason to doubt the accuracy and that it has been provided in full from those it was requested from, the items relied on have not been verified. No responsibility can be accepted for errors within third party items presented in this report. Further ByrneLooby was not authorised and did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the Services. ByrneLooby is not liable for any inaccurate information or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to ByrneLooby and including the doing of any independent investigation of the information provided to ByrneLooby save as otherwise provided in the terms of the contract between the client and ByrneLooby.

Where field investigations have been carried out these have been restricted to a level of detail required to achieve the stated objectives of the work. Ground conditions can also be variable and as investigation excavations only allow examination of the ground at discrete locations. The potential exists for ground conditions to be encountered which are different to those considered in this report. The extent of the limited area depends on the soil and groundwater conditions, together with the position of any current structures and underground facilities and natural and other activities on site. In addition, chemical analysis was carried out for a limited number of parameters [as stipulated in the contract between the client and ByrneLooby based on an understanding of the available operational and historical information, and it should not be inferred that other chemical species are not present.

The groundwater conditions entered on the exploratory hole records are those observed at the time of investigation. The normal speed of investigation usually does not permit the recording of an equilibrium water level for any one water strike. Moreover, groundwater levels are subject to seasonal variation or changes in local drainage conditions and higher groundwater levels may occur at other times of the year than were recorded during this investigation.

Any site drawing(s) provided in this report is (are) not meant to be an accurate base plan but is (are) used to present the general relative locations of features on, and surrounding, the site.

Throughout the report the term ‘geotechnical’ is used to describe aspects relating to the physical nature of the site (such as foundation requirements) and the term ‘geo-environmental’ is used to describe aspects relating to ground-related environmental issues (such as potential contamination). However, it should be appreciated that this is an integrated investigation, and these two main aspects are inter-related. The geo-environmental sections are written in broad agreement with BS 10175:2011+A2 2017. For the geotechnical aspects of the report, the general requirements of Eurocode 7 (BS EN 1997-2:2007) are to produce a Ground Investigation Report (GIR) which shall form part of the Geotechnical Design Report (GDR). The geotechnical section of this report is intended to fulfil the general requirements of the GIR as outlined in BS EN 1997-2, Section 6. The GIR contains the factual information including geological features and relevant data, and a geotechnical evaluation of the information stating the assumptions made in the interpretation of the test results. This report shall not be considered as being a GDR.

Planning Requirements

The National Planning Policy Framework (NPPF, 2019) emphasises the presumption in favour of sustainable development. Paragraph 11, which defines the presumption in favour of sustainable development, has two similar clauses which related to potentially contaminated land and sensitive receptors:

11) Plans and decisions should apply a presumption in favour of sustainable development.

*For **plan-making** this means that:*

b) strategic policies should, as a minimum, provide for objectively assessed needs for housing and other uses, as well as any needs that cannot be met within neighbouring areas, unless:

i) the application of policies in this Framework that protect areas or assets of particular importance provides a strong reason for restricting the overall scale, type or distribution of development in the plan area;

*For **decision-taking** this means:*

d) where there are no relevant development plan policies, or the policies which are most important for determining the application are out-of-date, granting permission unless:

ii) the application of policies in this Framework that protect areas or assets of particular importance provides a clear reason for refusing the development proposed

In accordance with the NPPF, areas or assets of particular importance are defined as:

Habitats sites (and those sites listed in paragraph 176 – potential Special Protection Areas and Possible Areas of Conservation; listed or proposed Ramsar sites; and sites identified, or required, as compensatory measures for adverse effects on habitats

sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites) and/or designated as Sites of Special Scientific Interest; land designated as Green Belt, Local Green Space, an Area of Outstanding Natural Beauty, a National Park (or within the Broads Authority) or defined as Heritage Coast; irreplaceable habitats; designated heritage assets (and other heritage assets of archaeological interest referred to in footnote 63 (Non-designated heritage assets of archaeological interest, which are demonstrably of equivalent significance to scheduled monuments, should be considered subject to the policies for designated heritage assets.); and areas at risk of flooding or coastal change.

Paragraph 118 states that planning policies and decisions should:

- *give substantial weight to the value of using suitable brownfield land within settlements for homes and other identified needs, and support appropriate opportunities to remediate despoiled, degraded, derelict, contaminated or unstable land;*

Paragraph 170 clarifies that enhancing the natural environment includes:

Planning policies and decisions should contribute to and enhance the natural and local environment by:

- *protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);*
- *recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;*
- *maintaining the character of the undeveloped coast, while improving public access to it where appropriate;*
- *minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;*
- *preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and*
- *remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.*

Paragraph 180 of NPPF states that planning policies and decisions should ensure the following:

- *Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development.*

Paragraph 178 of NPPF states that planning policies and decisions for developments should also ensure that:

- a) a site is suitable for its proposed use taking account of ground conditions and any risks arising from land instability and contamination. This includes risks arising from natural hazards or former activities such as mining, and any proposals for mitigation including land remediation (as well as potential impacts on the natural environment arising from that remediation);*
- b) after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990; and*
- c) adequate site investigation information, prepared by a competent person, is available to inform these assessments.*

Paragraph 179 states that where a site is affected by contamination or land stability issues, responsibility for securing a safe development rest with the developer and/or landowner.

This report has been prepared and authorised by staff that are competent as defined in the NPPF.

Unexploded Ordnance

Clients have a legal duty under the CDM 2015 Regulations to provide designers and contractors with project-specific health and safety information needed to identify hazards and risks. This includes the possibility of unexploded ordnance (UXO) being encountered on the site. Further details are given in CIRIA Report C681 (Stone et al 2009). A non-UXO specialist screening exercise has been carried out for the site by considering any evidence of UK defence activities on or near the site evident from the gathered desk study information and the unexploded aerial delivered bomb (UXB) regional risk maps produced by Zetica. Other data sources are available, but as a first stage screening exercise the freely available Zetica maps have been used. The level of risk stated is that determined by Zetica, a company experience in the desk study, field investigation and clearance of UXO/UXB.

Appendix B – Environmental Risk Assessments Methodology and Terminology

Environmental Risk Assessment Methodology & Terminology

Legislation Overview

This report includes hazard identification and environmental risk assessment in line with the risk-based methods referred to in relevant UK legislation and guidance. Government environmental policy is based upon a “suitable for use approach,” which is relevant to both the current use of land and also to any proposed future use. The contaminated land regime is the statutory regime for remediation of contaminated land that causes an unacceptable level of risk and is set out in Part 2A of the Environmental Protection Act 1990 (“EPA 1990”). The main objective of introducing the Part IIA regime is to provide an improved system for the identification and remediation of land where contamination is causing unacceptable risks to human health, or the wider environment given the current use and circumstances of the land. Part IIA provides a statutory definition of contaminated land under Section 78A(2) as:

“any land which appears to the Local Authority in whose area it is situated to be in such a condition, by reason of substances in, on, or under the land, that:

- a) Significant harm is being caused or there is a significant possibility of such harm being caused;

or

- b) Pollution of controlled waters is being, or is likely to be, caused.”

In order to assist in establishing if there is a “significant possibility of significant harm” there must be a “contaminant linkage” for potential harm to exist. That means there must be a source(s) of contamination, sensitive receptors present and a connection or pathway between the two. This combination of contaminant-pathway-receptor is termed a “contaminant linkage or CPR linkage.”

Part IIA of The Environmental Protection Act 1990 is supported by a substantial quantity of guidance and other Regulations. Key implementing legislation of the Part 2A regime includes the Contaminated Land (England) Regulations 2006 (SI 2006/1380) as amended by the overarching legislation for the contaminated land regime, which implements the provisions of Part IIA of the Environmental Protection Act 1990 (as inserted by section 57 of the Environment Act 1995), came into force on 14th July 2000 together with recent amended regulations: Contaminated Land (England) (Amendment) Regulations 2012 (SI 2012/263). Revised Contaminated Land Statutory Guidance was published by DEFRA in April 2012. Part IIA defines the duties of Local Authorities in dealing with it. Part IIA places contaminated land responsibility as a part of planning and redevelopment process rather than Local Authority direct action except in situations of very high pollution risk.

In the planning process guidance is provided by National Planning Policy Framework (NPPF) of July 2018 which requires that a site which has been developed shall not be capable of being determined “contaminated land” under Part IIA. In practice, Planning Authorities require sites being developed to have a lower level of risk post development than the higher level of risk that is required in order to determine a site as being contaminated in accordance with Part IIA. This is to ensure that there is a suitable zone of safety below the level for Part IIA determination

and prevent recently developed sites becoming reclassified as contaminated land if there are future legislative or technical changes (e.g., a substance is subsequently found to be more toxic than previously assessed this increases its hazard).

The criteria for assessing concentrations of contaminants and hence determining whether a site represents a hazard are based on a range of techniques, models and guidance. Within this context it is relevant to note that Government objectives are:

- a) to identify and remove unacceptable risks to human health and the environment;
- b) to seek to bring damaged land back into beneficial use;
- c) to seek to ensure that the cost burdens faced by individuals, companies and society as a whole are proportionate, manageable and economically sustainable.

These three objectives underlie the "suitable for use" approach to risk management and remediation of contaminated land. The "suitable for use" approach focuses on the risks caused by land contamination. The approach recognises that the risks presented by any given level of contamination will vary greatly according to the use of the land and a wide range of other factors, such as the underlying geology of the site. Risks therefore should be assessed on a site-by-site basis.

The "suitable for use" approach then consists of three elements:

- a) ensuring that land is suitable for its current use - in other words, identifying any land where contamination is causing unacceptable risks to human health and the environment, assessed on the basis of the current use and circumstances of the land, and returning such land to a condition where such risks no longer arise ("remediating" the land); the contaminated land regime provides the regulatory mechanisms to achieve this;
- b) ensuring that land is made suitable for any new use, as planning permission is given for that new use - in other words, assessing the potential risks from contamination, on the basis of the proposed future use and circumstances, before official permission is given for the development and, where necessary to avoid unacceptable risks to human health and the environment, remediating the land before the new use commences; this is the role of the town and country planning and building control regimes; and
- c) limiting requirements for remediation to the work necessary to prevent unacceptable risks to human health or the environment in relation to the current use or future use of the land for which planning permission is being sought - in other words, recognising that the risks from contaminated land can be satisfactorily assessed only in the context of specific uses of the land (whether current or proposed), and that any attempt to guess what might be needed at some time in the future for other uses is likely to result either in premature work (thereby running the risk of distorting social, economic and environmental priorities) or in unnecessary work (thereby wasting resources).

The mere presence of contaminants does not therefore necessarily warrant action, and consideration must be given to the scale of risk involved for the use that the site has and will have in the future.

Overall Methodology

The work presented in this report has been carried out in general accordance with recognised best practice as detailed in guidance documents such as in the EA online guidance: Land Contamination: Risk Management (LCRM) (Environment Agency, 2020), and BS10175:2011+A2 2017. Important aspects of the risk assessment process are transparency and justification. The particular rationale behind the risk assessments presented is given in this appendix.

The first stage of a two-staged investigation and assessment of a site is the Preliminary Investigation (BS 10175:2011), often referred to as the Phase 1 Study, comprising desk study and walk-over survey, which culminates in the Preliminary Risk Assessment. A preliminary conceptual site model (CSM) is developed which identifies potential geotechnical and geo-environmental hazards and the qualitative degree of risk associated with them. From the geo-environmental perspective, the Hazard Identification process uses professional judgement to evaluate all the hazards in terms of potential contaminant linkages (of contaminant source-pathway-receptor). Potential contaminant linkages are potentially unacceptable risks in terms of the current contaminated land regime legal framework and require either remediation or further assessment. These are normally addressed via intrusive ground investigation and generic risk assessment.

The second stage is the Ground Investigation, Generic Risk Assessment and Geotechnical Interpretation. This represents the further assessment mentioned above. The scope of the Ground Investigation is based on the findings of the Preliminary Risk Assessment and is designed to reduce uncertainty in the geotechnical and geo-environmental hazard identification. The Ground Investigation comprises fieldwork, laboratory testing and usually also on-site monitoring. The Ground Investigation may include the Exploratory, Main and Supplementary Investigations described in BS 10175:2011+A2 2017. The results of the Ground Investigation reduces uncertainty in the geotechnical and geo-environmental risks. Depending on the findings more detailed investigations or assessments may be required.

Preliminary Risk Assessment

Current practice recommends that the determination of potential liabilities that could arise from land contamination be carried out using the process of risk assessment, whereby “risk” is defined as:

- “(a) The probability, or frequency, or occurrence of a defined hazard; and
- (b) The magnitude (including the seriousness) of the consequences.”

The UK’s approach to the assessment of environmental risk is set out in by the Department of the Environment Transport and the Regions (2000) publication “A Guide to Risk Assessment and Risk Management for Environmental Protection” (also called Greenleaves II). This established an iterative, systematic staged process which comprises:

- a) Hazard identification;
- b) Hazard assessment;
- c) Risk estimation;
- d) Risk evaluation;
- e) Risk assessment;

At each stage during the development process, the above steps are repeated as more detailed information becomes available for the site.

For an environmental risk to be present, all three of the following elements must be present:

- Source/Contaminant: hazardous substance that has the potential to cause adverse impacts;
- Receptor: target that may be affected by contamination: examples include human occupants/users of site, water resources (rivers or groundwater), or structures;
- Pathway: a viable route whereby a hazardous substance may come into contact with the receptor.

The absence of one or more of each component (contaminant, pathway, receptor) would prevent a contaminant linkage being established and there would be no significant environmental risk.

The identification of potential contaminant linkages is based on a Conceptual Model of the site, which is subject to continual refinement as additional data becomes available. As part of a Preliminary Risk Assessment (Desk Study and site walk over) a Preliminary Conceptual Site Model (PCSM) is formed. Based on the PCSM, potential contaminant linkages can be assessed. If the PCSM and hazard assessment indicate that a contaminant linkage is not of significance then no further assessment or action is required for this linkage. For each significant and potential linkage, a risk assessment is carried out. The linkages which potentially pose significant risks may require a variety of responses ranging from immediate remedial action or risk management or, more commonly, further investigation and risk assessment. This next stage is termed a Phase II Main Site Investigation and should provide additional data to allow refinement of the Conceptual Site Model and assess the level of risk from each contaminant linkage.

Definition of Risk Assessment Terminology

CIRIA Report C552, Contaminated Land Risk Assessment A Guide to Good Practice, 2001 sets out a methodology for estimating risk. The methodology for risk evaluation is a qualitative method for interpreting the output for the risk estimation stage of the assessment. It involves the classification of the:

- Magnitude of the potential consequence (severity) of risk occurring.
- Magnitude of the probability (likelihood) of the risk occurring.

The classification of consequence and probability are set out in table B1 and B2 below:

Table B1 Classification of Consequence

Classification	Definition	Examples
Severe (Sv)	Short term (acute) risk to human health likely to result in “significant harm” as defined by the Environment protection Act 1990, Part IIA. Short term risk of pollution of controlled waters. Catastrophic damage to buildings / property. A short-term risk to a particular ecosystem, or organism forming part of such ecosystem	High concentrations of cyanide on the surface of an informal recreation area Major spillage of contaminants from site into controlled water. Explosion causing building collapse (can also equate to a short-term human health risk if buildings are occupied.)
Medium (Md)	Chronic damage to Human Health (“significant harm”). Pollution of controlled waters. A significant change in a particular ecosystem, organism forming part such ecosystem.	Concentrations of contaminants from site exceeding generic or site-specific screening criteria. Leaching of contaminants into a major or minor aquifer. Death of species within a designated nature reserve.
Mild (Mi)	Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures, and services. Damage to sensitive buildings / structures / services or the environment.	Pollution of non-classified groundwater. Damage to building, rendering it unsafe to occupy (e.g., foundation damage resulting in instability)
Minor (Mr)	Harm, although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve. Non-permanent health effects to human health (easily prevented by measures such as protective clothing etc). Easily repairable effects of damage to buildings, structures, and services.	The presence of contaminants at such concentrations that protective equipment is required during site work. The loss of plants in a landscaping scheme. Discolouration of concrete.

The classification of consequence does not take into account the probability of the consequence being realised. Therefore there may be more than one consequence for a particular pollutant linkage. Both a severe and medium classification can result in death. Severe relates to short term (acute) risk while medium relates to long term (chronic) risk. Mild relates to significant harm but to less sensitive receptors. Minor classification relates to harm which is not significant but could have a financial cost.

Table B2 Classification of Probability

Classification	Definition
High likelihood (Hi)	There is a pollutant linkage and an event that either appears very likely in the short term and almost inevitable in the long term, or there is evidence at the receptor or harm or pollution.
Likely (Li)	There is a pollutant 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 (Lw)	There is a pollutant 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 event would take place and is less likely in the short term.
Unlikely (UI)	There is a pollutant linkage, but circumstances are such that it is improbable that an event would occur even in the very long term.

The classification gives a guide as to the severity and consequence of identified risk when compared with other risk presented on the site. It should be noted that if a risk is identified it cannot be classified as “no risk” but as “very low risk”. Differing stakeholders may have a different view on the acceptability of a risk.

Once the consequence and probability have been classified these can be compared using a matrix (**Table B3**) to identify an overall risk category. These categories and the actions required are categorised in **Table B4**.

Table B3 Risk Evaluation Matrix

		Consequence			
		Severe (Sv)	Medium (Md)	Mild (Mi)	Minor (Mr)
Probability	High likelihood (Hi)	Very High Risk (VH)	High Risk (H)	Moderate Risk (M)	Mod/Low Risk (M/L)
	Likely (Li)	High Risk (H)	Moderate Risk (M)	Mod/Low Risk (M/L)	Low Risk (L)
	Low likelihood (Lw)	Moderate Risk (M)	Mod/Low Risk (M/L)	Low Risk (L)	Very Low Risk (VL)
	Unlikely (UI)	Mod/Low Risk (M/L)	Low Risk (L)	Very Low Risk (VL)	Very Low Risk (VL)

Table B4 Risk Categorisations

Very High Risk (VH)	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. This 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 Risk (H)	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) is required and remedial works may be necessary in the short term and are likely over the longer-term.
Moderate Risk (M)	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. Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer-term.
Low Risk (L)	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 Risk (VL)	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.

Generic Quantitative Risk Assessment

In the following sections the current UK guidance on risks to the following receptors are discussed: human health, plant life and controlled waters

Human Health

The overall methodology for assessing the risk to human health from potential contaminants in soil is set out in the Environment Agency's guidance "Using Soil Guideline Values" SC050021/SGV Introduction, March 2009 and using the CLEA 1.06 model software (and CLEA 1.071 for nickel). The generic assessment criteria are in accordance with the following:

- Science Report SC050021/SR2: Human health toxicological assessment of contaminants in soil;
- Science Report SC050021/SR3: Updated technical background to the CLEA model;
- Science Report SC050021/SR4: CLEA Software (Version 1.071, 2014) & Handbook;
- Toxicological reports and SGV technical notes;
- Toxicological data published by LQM/CIEH (2009) and CL:AIRE/EIC/AGS (2009);
- DEFRA Development of Category 4 Screening Levels for assessment of land affected by contamination - SP1010 (December 2013);
- LQM/CIEH Suitable 4 Use Levels (S4ULs) for Human Health Risk Assessment; and,
- Toxicology review published by the European Food Safety Authority for nickel (2015).

In March 2014 six 'proposed' Category 4 Screening Levels (pC4SL) were issued by Defra. These screening values are considered to be within Category 4 as defined in the Contaminated Land Statutory Guidance and indicate safe levels for new developments passing through the planning system. The SGV for lead has been withdrawn, and the pC4SL for lead has been derived using current best practice. In January 2015 LQM/CIEH published S4ULs for 89 contaminants in accordance with the C4SL methodology.

Note that groundwater contamination may pose a risk to human health but that there are no relevant generic assessment criteria available for comparison. ByrneLooby has derived our own assessment criteria for this.

Phytotoxic Risks

Generic assessment of phytotoxicity is by comparison with guideline values presented in the British Standard for Topsoil and the MAFF document "Code of Good agricultural practice for the protection of soil", October 1998. This is in accordance with LCRM's reference to DEFRA notice CLAN 4/04.

Controlled Waters

Risks to controlled waters (groundwater and surface waters) from contaminants are assessed in accordance with the EA documents “The Environment Agency’s Approach to Groundwater Protection” (2017) and Remedial Targets Methodology (RTM, 2006). Pollutant inputs from contaminated land sites are considered as passive inputs under the European Water Framework Directive (2000/60/EC) (WFD) and its daughter Directives, and as such are regulated under the Environment Agency’s ‘limit’ pollution objective. Acceptable water quality targets (WQT) are defined for protection of human health (based on Drinking Water Standards (DWS)) and for protection of aquatic ecosystems (Environmental Quality Standards (EQS)). The risk posed to controlled waters from total soil concentrations cannot be directly assessed. The risk is assessed either by comparison of results of leachate tests carried out on soil samples, or from the direct testing of samples of groundwater to screening criteria. Leachate testing generally forms a conservative assessment and is not appropriate for organic contaminants.

CURRENT GUIDANCE ON INTERPRETATION OF CHEMICAL ANALYSIS OF SOILS

Contaminated land is defined under law through Part IIA of the Environmental Protection Act 1990, implemented through Section 57 of the Environment Act 1995. This supports a 'suitable for use' based approach to the risk assessment of potentially contaminated land. The site-specific risk assessment is based upon assessment of plausible contaminant linkages, referred to as the contaminant-pathway- receptor model, based upon the current or proposed use of the site.

Before undertaking a risk assessment, a conceptual site model is devised in order to identify the potential contaminants, pathways and receptors. The individual contaminants, pathways and receptors then need to be further investigated in order to refine the initial assessment and risk assessment undertaken.

In March 2002, the Department for Environment, Food and Rural Affairs (DEFRA) and the Environment Agency published the Contaminated Land Exposure Assessment (CLEA) Model and a series of related reports. These were designed to provide a scientifically based framework for the assessment of chronic risks to human health from contaminated land. These reports (CLR7-10) together with associated "SGV" documents were withdrawn and the following documents have been published as revised guidance to the CLEA assessment:

- Environment Agency : 2008: Using Soil Guideline Values SC050021/SGV Introduction, March 2008.
- Environment Agency : 2008: Science Report SC050021/SR2: Human health toxicological assessment of contaminants in soil.
- Environment Agency : 2008: Science Report SC050021/SR3: Updated technical background to the CLEA model.
- Environment Agency : 2008 : Compilation of Data for Priority Organic Contaminants for Derivation of Soil Guideline Values Science report SC050021/SR7
- Environment Agency : Science Report SC050021/SR4: CLEA Software (Version 1.071, 2015) & Handbook.
- DEFRA Development of Category 4 Screening Levels for assessment of land affected by contamination - SP1010 (December 2013).
- LQM/CIEH Suitable 4 Use Levels for Human Health Risk Assessment.

Additional guidance on statistical assessment replacing CLR 7 is partly provided in:

- CL:AIRE: 2009: Guidance on Comparing Data With a Critical Concentration

A different approach to the statistical appraisal of data is required depending on whether the assessment of risk is to assess whether land is Contaminated Land in accordance with regulations, or whether the assessment is to assess whether the site is suitable for new

development in accordance with Planning guidance. This is discussed further in CL:AIRE: 2009 “Guidance on Comparing Data With a Critical Concentration”.

The introduction of the Contaminated Land (England) (Amendment) Regulations 2012 and Contaminated Land Statutory Guidance (DEFRA, 2012) reassessed the CLEA Model and the derived SGVs (and associated GACs calculated using the model). This re-assessment concluded that the SGVs/GACs were conservative screening criteria for determining the suitability of soil with regard to the risk to human health under the planning regime and defined a new upper limit for planning purposes which is the boundary between the new Category 3 and 4. In March and September 2014 DEFRA issued guidance on these new Category 4 Screening Levels (C4SL) and these are discussed further below.

Soil Guideline Values

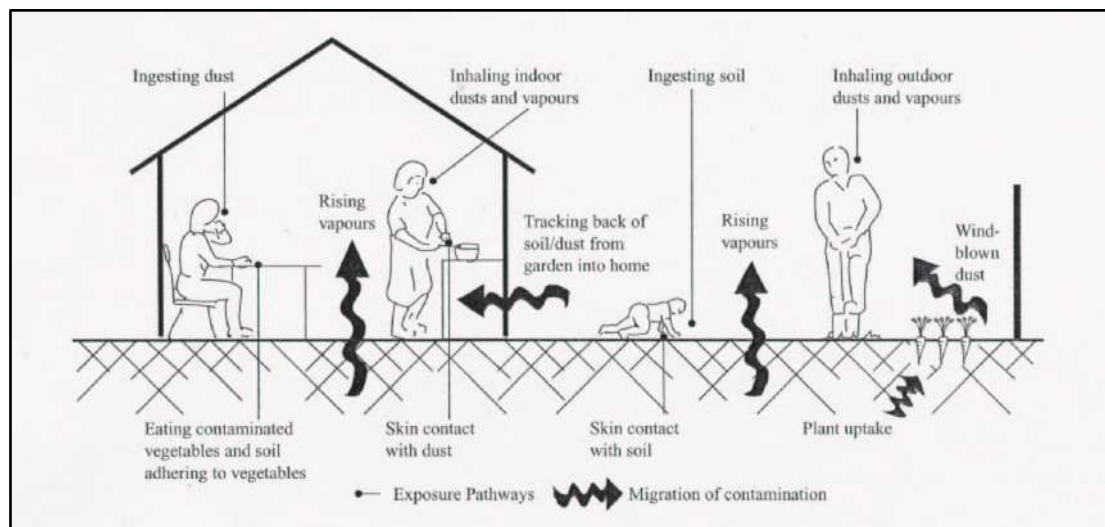
A program for the derivation of SGVs based on the above guidance is provided by the Environment Agency and is entitled “CLEA Software Version 1.06”. These reports, together with supporting toxicology reviews (“Tox” or Supplementary Information Reports) for individual substances (which will be gradually updated), Soil Guideline Value Reports and other guidance referred to in the above documents, provide guidance and the scientific basis for assessing the risk to human health from potential contaminants. Soil Guideline Value Reports (SGV Reports) have been published for a number of contaminants and these are published on the Environment Agency website. Eventually the reports will include SGVs for:

- heavy metals and other inorganic compounds: arsenic, cadmium, chromium, cyanide, lead (now withdrawn), mercury nickel (now withdrawn), and selenium;
- benzene, ethylbenzene, toluene, and xylenes;
- phenol;
- dioxins and dioxin-like polychlorinated biphenyls (PCBs);
- polycyclic aromatic hydrocarbons (PAHs) – 11 substances.

In September 2015, CLEA was re-issued as ‘CLEA Version 1.071’. Currently, the software has been used to produce an in-house GAC for nickel, following with withdrawal of the SGV.

In addition, CIEH through LQM and the EIC have published generic assessment criteria (GACs) for a wide variety of other parameters including metals, hydrocarbons, chlorinated aliphatic compounds, PAHs and explosive substances for three standard land uses. These have been produced to supplement the Environment Agency guidance. These GACs will be replaced by SGVs when or if the Environment Agency publishes any more SGVs.

The CLEA model has been developed to calculate an estimated tolerable daily soil intake (TDSI) for site users given a set ‘default’ exposure pathways. Ten human exposure pathways are covered in the CLEA model as presented below:



- Ingestion:
 - ingestion of outdoor soil;
 - ingestion of indoor dust;
 - ingestion of home-grown vegetables;
 - ingestion of soil attached to home grown vegetables.
- Dermal Contact:
 - dermal contact with outdoor soil;
 - dermal contact with indoor dust.
- Inhalation:
 - inhalation of outdoor dust;
 - inhalation of indoor dust;
 - inhalation of outdoor soil vapour;
 - inhalation of indoor soil vapour.

It should be noted that there are other potential exposure pathways on some sites not included in the CLEA model e.g., certain organic compounds can pass through plastic water pipes into drinking water supply.

The presence and/or significance of each of the above exposure pathways are dependent on the type of land use being considered and the nature of the contaminant under scrutiny. Accordingly, the CLEA model considers for principle 'default' land use types and makes a series of 'default' assumptions with regard to human exposure frequency, duration and critical human target groups for each land use considered:

- residential land use;
- allotments;
- commercial and industrial land use.

The land use categories defined in the CLEA are detailed below.

Residential: This land use category assumes that people live in a variety of dwellings including terraced, detached and semi-detached houses up to two storeys high. The structure of buildings varies. Default parameters for building materials and building design are included in CLEA documents to calculate the relevant multi-layer diffusion coefficients for vapour intrusion and to model indoor vapour intrusion. The CLEA model assumes that regardless of the style of housing the residents will have access to either a private garden or community open space nearby, and that soil tracked into the home will form indoor dust. It allows for the ingestion pathways from home grown vegetables.

Allotments: The CLEA model incorporates an assessment of land provided by local authorities specifically for people to grow fruit and vegetables for their own consumption. Consumption of such fruit and vegetables present several exposure pathways; plants absorb contaminants mainly via water uptake through roots, the contaminants move to edible portions of plants via translocation and contaminated soil particles become trapped in the skin and between leaves. At present the model fails to account for exposure through the consumption of animals, and their products (e.g., eggs), which have been reared on contaminated land.

Commercial/Industrial: Although there are a wide variety of workplaces and work-related activities, the CLEA assessment of this land-use assumes that work occurs in a permanent, three-storey structure, where employees spend most time indoors, conducting office-based or light physical work. The model assumes employees sit outside during breaks for most of the year. Limitations in applying this land-use to different industries is detailed in EA publication “Updated technical background to the CLEA model” (2011). The generic model assumes that the site would not be covered by hard standing. Risk of exposure to contaminants would be clearly less where commercial land is essentially all buildings and hard standing.

Based on the assumptions of each land use and the associated applicable exposure pathways, a ‘Soil Guideline Value’ (SGV) may be calculated for each contaminant under consideration for a particular land use in order to determine whether certain contaminant soil concentrations pose a significant risk to human health. The primary purpose of the CLEA SGVs are as ‘trigger values’ – indicators to a risk assessor that soil concentrations below this level require no further assessment as it can be assumed that the soil is suitable for the proposed use. Where soil concentrations occur above the SGV then further assessment of the results is required. The Contaminated Land (England) (Amendment) Regulations 2012 and Contaminated Land Statutory Guidance (DEFRA, 2012) which came into force in early April 2012 provides new clarity on the assessment of risk where soil concentrations exceed the SGV. The guidance introduces a four-stage classification system relating to concentration of contaminants and the assessed risk which indicates appropriate actions. Category 1 and 2 sites are classified as “Contaminated Land” as defined in Part IIA of The Environmental Protection Act (1990). Category 3 and 4 sites are not considered as “Contaminated Land” in accordance with the Act. This can be explained using the figure on the following page.

There are also difficulties in establishing soil concentrations of contaminants beyond which risks from exposure to these contaminants would be ‘unacceptable’ and that they would lead to “significant possibility of significant harm” as defined in Part IIA of The Environmental Protection Act (1990) and determine that the land is “contaminated.” This ultimately requires detailed ‘toxicological’ information of the health effects of individual contaminants and also a scientific judgement on what constitutes an ‘unacceptable’ risk. It is for local authorities or the Environment Agency to determine whether a particular site is contaminated land, and it is for local Planning Authorities to determine whether land affected by contamination can be redeveloped.

Given the SGVs have been derived only for a limited number of contaminants and there was little prospect of further SGVs being published, two professional groupings have produced Generic Assessment Criteria (GACs) in accordance with the CLEA model for a large number of additional contaminants. These GACs were recognised in the new Contaminated Land Statutory Guidance (DEFRA, 2012) and have been produced as follows:

- *LQM/CIEH : 2009 Nathaniel CP, McCaffrey C, Ashmore MH, Cheng NPS GROUP, Gillett A, Ogden R & Scott D : 2009 . The LQM/CIEH Generic Assessment Criteria for Human Health Risk Assessment (2nd edition). Land Quality Press, Nottingham.*
- *CL:AIRE/EIC/AGS: 2009 : Soil Generic Assessment Criteria (GAC) for Human Health Risk Assessment. Contaminated Land: Applications in Real Environments, Environment Industries Commission & Association of Geotechnical and Environmental Specialists. December 2009.*

Category 4 Screening Levels and LQM/CIEH Suitable 4 Use Levels

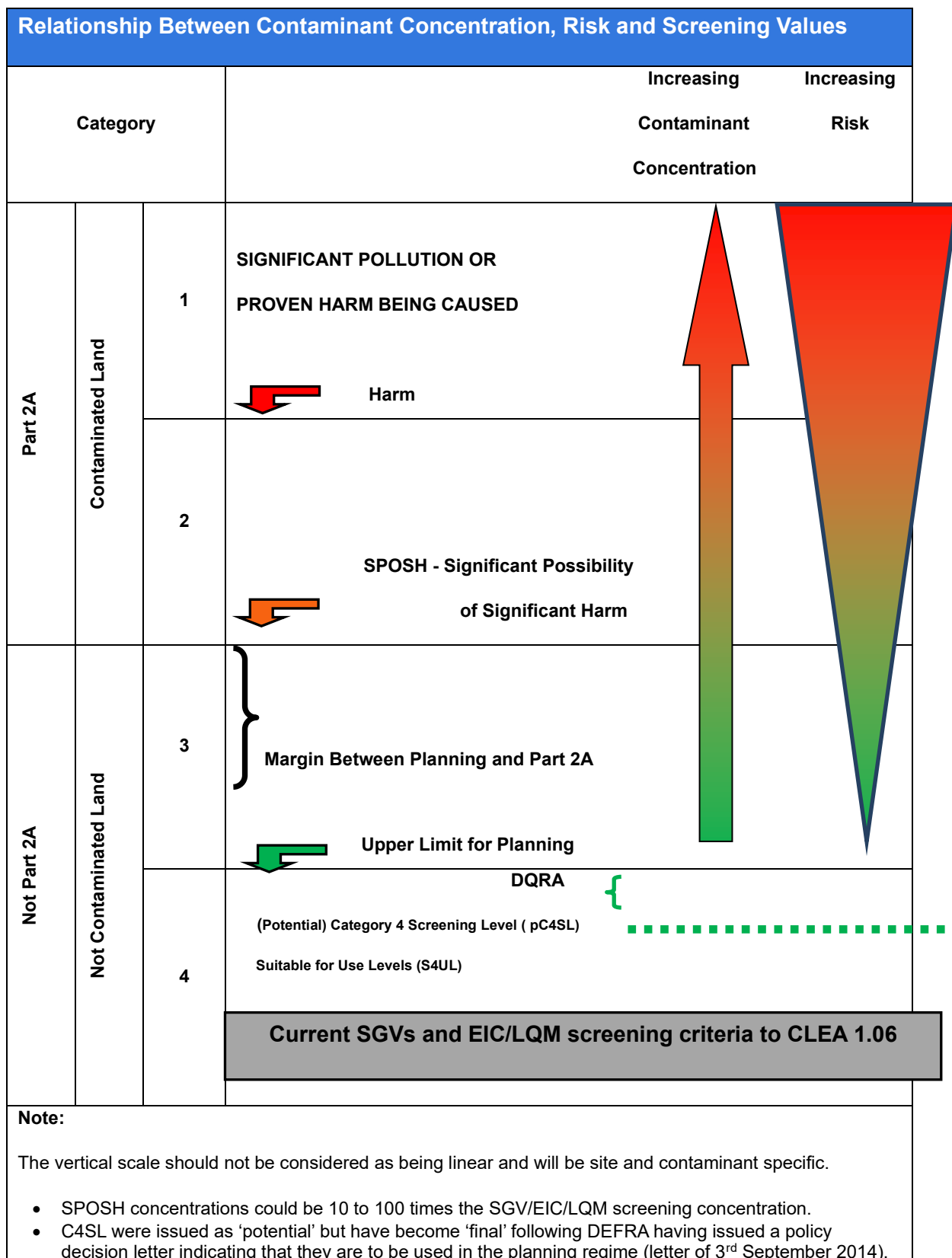
For new developments progressing through the planning regime, it is desirable that the soil concentrations are within Category 4 where there is a valid contaminant linkage. The upper boundary between Category 4 and 3 is not defined in the guidance. This boundary can also be better defined by carrying out a Detailed Quantified Risk Assessment (DQRA) and this is discussed later in this appendix.

In December 2013 Defra issued the findings of a research project undertaken by CL:AIRE to set out the framework by which potential Category 4 Screening Levels (pC4SL) may be derived. The report was not designed to produce ‘final’ C4SL as the steering group producing the report believes that final C4SL should be set by a ‘relevant authority’ (e.g., Defra), the toxicological framework proposed has not been reviewed by the Committee on Toxicity and the document has yet to be subject to peer review.

In March 2014, appendices to the main Defra report were published detailing the derivation of pC4SL for 6 contaminants and other appendices regarding a review of the CIEH/CL:AIRE statistics guidance and sensitivity analysis. For each contaminant, a range of pC4SL have been produced relating to modifying toxicological parameters only, modifying exposure parameters only or by modifying both. It should be noted that the pC4SL produced for lead (the SGV was withdrawn in 2011) has undertaken a relatively large toxicological review in relation to modelling blood lead concentrations. pC4SL have been produced for:

- Arsenic;
- Benzene;
- Benzo(a)pyrene (as a surrogate marker for PAHs);
- Cadmium;
- Chromium (VI); and
- Lead

As previously discussed the values were initially published as ‘potential’ C4SL but have become ‘final’ following DEFRA having issued a policy decision letter indicating that they are to be used in the planning regime (letter of 3rd September 2014). It is considered that the pC4SL provide a simple test for deciding whether land is suitable for use without any remediation. The pC4SL represent a new set of screening levels that are more pragmatic (but strongly precautionary) compared to the existing soil guideline values (SGVs and the other GACs calculate in accordance with the existing CLEA methodology). The pC4SL provide cautious estimates of contaminant concentrations in soil that are still considered to present an acceptable level of risk, within the context of Part 2A, by combining information on toxicology, exposure assessment and normal levels of exposure to these contaminants. pC4SL values should not be seen as ‘SPOH values.’ Exceeding a pC4SL means that further investigation is required, not that the land is necessarily contaminated. In January 2015, LQM published Suitable 4 Use Levels (S4ULs) for a further 89 contaminants using the Defra C4SL methodology. In a similar manner to the pC4SLs, no authoritative review has been undertaken although the approach and quality of the work undertaken is widely accepted as being of high quality.



Lead:

The SGV for lead was withdrawn in 2011 and is not used in this report. The pC4SL for lead provides a technically robust and conservative assessment tool using significantly updated toxicological modelling in line with current scientific understanding of lead toxicology.

Nickel

The SGV for nickel was withdrawn in 2015 and is not used in this report. In-house GACs for nickel have been produced using the updated toxicological review by the EFSA and the CLEA 1.071 software.

Public Open Space

The Defra report (December 2013) has also introduced exposure scenarios for two other commonly occurring land uses which require assessment (under the planning and Part 2A regimes) on a relatively frequent basis. These exposure scenarios are:

- Public Open Space – Space Near Residential Housing (POS_{resi}); and,
- Public Open Space – Public Park (POS_{park}).

Potential use of pC4SL relating to Public Open Space (POS) require care due to the significant variability in exposure characteristics. For example, POS may include:

- Children's play areas, public parks where children practise sport several times a week and teenagers only once a week;
- Grassed areas adjacent to residential properties which are rarely used;
- Dedicated sports grounds where exposure is only to players and groundworkers; and,
- Nature reserves or open ground with low level activity (for example, dog walking).

Within the Defra report (December 2013) the following exposure scenarios have been modelled as these are considered the most important for potential exposure for the critical receptor i.e., young children:

- Green open space close to housing, including tracking back of soil (POS_{resi}); and
- Park-type scenario where distance is considered sufficient to discount tracking back of soil (POS_{park}).

Detailed Quantified Risk Assessment (DQRA)

SGVs, GACs, pC4SL and S4ULs are based on a number of basic assumptions. There are two main options for developing Site Specific Assessment Criteria (SSAC) by adjusting the CLEA model so that they have greater relevance to the site:

- **Simple adjustment of the generic SGV / C4SL model.** Such adjustment is restricted to the choice of exposure routes selected for the generic land use, building type, soil type and soil organic matter content within the CLEA software.
- **Detailed adjustment.** It may be relevant to make greater modifications to the model due to the specific use of the land in question. This can include modification to any parameter value, including exposure assumptions, building parameters, and the choice and application of fate and transport models. This is equally relevant to site-specific modifications of existing generic land uses, the development of new land uses, and the inclusion of additional exposure pathways. Much of this can be undertaken using the CLEA software. Depending on the complexity of the detailed adjustments required, it may be necessary to use other tools either alone or in conjunction with the CLEA software. Both options should follow established protocols for DQRA and require sufficient justification and supporting information for the adjustments made. Detailed adjustments are likely to require substantially greater technical justification and supporting documentation, especially if modifications are based on information not contained within the SGV framework documents.

The two choices present the risk assessor with three options/decisions:

1. Use a published SGV/GAC/pC4SL/S4UL if it can be demonstrated that the assumptions inherent in the value are appropriate to the site in question. If they are not, proceed to either option 2 or 3 below.
2. Make simple site-specific adjustments to the generic exposure model used to derive the SSAC. Three examples of when this could be appropriate are:
 - a. High density residential development with no exposed contaminated soil at surface. It is appropriate in this case to consider the relevance of direct contact pathways and consumption of homegrown produce.
 - b. Soil type is significantly different (specifically when soil type is likely to be less protective e.g., made ground) to that assumed in the SGV/GAC/pC4SL/S4UL.
 - c. Soil organic matter content is significantly different to that assumed in the derivation of the SGV/GAC/pC4SL/S4UL.
3. If simple adjustments are not sufficient to reflect site conditions, undertake a DQRA. This may be undertaken using the CLEA software or by using an alternative risk assessment methodology that is relevant, appropriate, authoritative, and scientifically based. Changes to toxicological end points may also be considered, although this should only be undertaken by a toxicology expert. In the context of this

guidance, simple adjustments of a generic land use scenario for soil type or SOM content for example are not considered sufficient to be classed as a DQRA.

DQRAs should be conducted with the agreement of the local authority (or the Environment Agency) since it is the authority that determines whether land is Contaminated Land or whether Planning Permission for a new development may be granted.

Representative Data

The type, quantity and quality of the available soil data influence the method chosen to obtain a site representative soil concentration that is compared with an SGV/GAC/pC4SL/S4UL in the screening process. The soil data should be representative of the exposure scenario being considered. This can include factors such as:

- Averaging area over which exposure occurs;
- Sample depth; and,
- Heterogeneity of soil.

where the 'averaging area' is defined as:

“That area (together with a consideration of depth) of soil to which a receptor is exposed or which otherwise contributes to the creation of hazardous conditions”.

Site investigations take discrete samples from a given area (and to a certain depth). It has to be assumed that these samples are to some degree representative of the contaminant concentration throughout that volume of soil. The critical soil volume (taking into account area and depth) which might be usefully compared with an SGV/GAC/pC4SL/S4UL is a site-specific decision, but a starting point is the generic land use scenarios used in the derivation of the SGV/GAC/pC4SL/S4UL. The critical soil volume depends on two factors:

- Contaminant distribution and vertical profile (bands of highly contaminated material or lateral hot spots should not necessarily be averaged out with more extensive cleaner areas of soil without justification)
- Contribution to average exposure underpinning the SGV. Direct contact exposure pathways depend on the adult or child coming into contact with near-surface soils and the area over which that exposure occurs is usually important (i.e., the averaging area). Vapour pathways are less dependent on surface area, for example vapour intrusion may result from a highly concentrated hot spot beneath a building leading to elevated average indoor air concentrations. For the three standard land uses for which SGVs are derived, relevant considerations are:
- For the standard **residential or allotment land use**, the critical soil volume is the area of an individual garden, communal play area or working plot from the surface to a depth of between 0.50m and 1.00m. This is the ground over which children are most likely to come into contact with soil or from which vegetable and fruit produce will be harvested. In the case of volatile contaminants, it may also be appropriate to consider the volume of soil underneath the footprint of the building

although vapour intrusion may be driven by a soil volume much smaller than this if the contaminant source is highly concentrated.

- For the standard **commercial land use**, the critical soil volume has to be decided on a case-by-case basis due to the wide range of possible site layouts. However, for non-volatile contaminants, landscaped and recreational areas around the perimeter of office buildings are likely to be most important. For volatile contaminants, the footprint occupied by the building itself should also be considered.
- For **most exposure pathways**, the contamination is assumed to be at or within one metre of the surface.

The use of averaging areas must be justified on the basis of relevance to the exposure scenario. SGVs are relevant only when the exposure assumptions inherent in them are appropriate for the identified exposure averaging area. Further guidance on critical soil volumes and the consideration of averaging exposure areas can be found in:

- *Secondary model procedure for the development of appropriate soil sampling strategies for land contamination (Environment Agency, 2000);*
- *Guidance on comparing soil contamination data with a critical concentration (CIEH/CL:AIRE, 2009); and*
- *Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination – Appendix I (Defra December 2013, March 2014)*

It is the mean soil concentration for the individual contaminant within an individual averaging area, which is compared to the SGV. However, as contaminant concentrations vary across a site, and sampling and analysis will introduce measurement errors, the comparison between measured mean concentration and the SGV must take this uncertainty into account.

There are two principal options available to obtain site representative soil concentrations from a site investigation dataset; statistical and non-statistical methods. Data objectives, quality and quantity are likely to determine which approach is most appropriate. If statistical methods such as those presented in CIEH/CL:AIRE (2011) are to be used, sufficient data need to be available or obtained. No one single statistical approach is applicable to all sites and circumstances. The wider range of robust statistical techniques developed by organisations including the US Environmental Protection Agency (USEPA) are also important tools. Risk assessors should choose an appropriate statistical approach on the basis of the specific site and the decision that is being made. For further guidance on the appropriate use of statistical approaches, refer to USEPA 2006 or good environmental monitoring statistics textbooks.

When statistical approaches are inappropriate (this will depend on the objectives of the site investigation), individual or composite samples should be compared directly to the SGV. Guidance on use of alternative data handling approaches such as the use of composite sampling can be found in documents such as:

- *Verification of remediation of land contamination* (Environment Agency, 2010);
- *Sampling and testing of wastes to meet landfill Waste Acceptance Criteria* (Environment Agency, 2005);
- *Guidance on choosing a sampling design for environmental data collection* (USEPA, 2002); and,
- *Soil Quality – Sampling, ISO 10381 series* (ISO, 2002–2007).

The statistical tests should not be used as arbiters for decisions under Part 2A. They are an additional, useful line of evidence to assist in decision-making. The implications of the basis for the derivation of the site representative soil concentration must be taken into account in any decision-making process and clearly documented.

Where the statistical tests are conducted in accordance with the method described in CL:AIRE 2009:

- For the Planning situation, it has to be demonstrated that the concentration of contaminants is low compared to the pC4SL/S4UL or SSAC. All of the test data should be below the screening criteria and no statistical analysis is required or if there are exceedances of the criteria then a statistical assessment is required. For the statistical assessment this decision is based on whether there is at least a 95% confidence level that the true mean of the dataset is lower than the screening criteria.
- For the Part 2A scenario the regulator needs to determine whether the concentration of contaminants is greater than the SGV/GAC/pC4SL/S4UL or SSAC. This decision is based on whether there is at least a 95% confidence level that the true mean of the dataset is higher than the SSAC. However, the regulator may proceed with determination if there is just a 51% probability, “on the balance of probabilities.”

If the screening levels are exceeded then more sophisticated quantitative risk assessment can be undertaken or remedial action may be taken to break the contaminant linkages. The benefits of undertaking a quantitative risk assessment must be weighed against the likelihood that it will bring about cost savings in the proposed remediation. Further information about the use of soil guideline values is provided in Environment Agency : 2008: Using Soil Guideline Values SC050021/SGV Introduction, March 2008.

Generic Risk Assessment Criteria For Risk To Plants

Soil contaminants, if present at sufficient concentrations, can have an adverse effect on the plant population. Phytotoxic effects can be manifested by a variety of responses, such as growth inhibition, interference with plant processes, contaminant-induced nutrient deficiencies and chlorosis (yellowing of leaves). All chemicals are probably capable of causing phytotoxic effects. Thus, the phytotoxic potential of substances is dependent on the concentrations capable of having adverse effects on plants and the concentrations likely to be found at contaminated sites. Phytotoxicity is a difficult parameter to quantify given that experimental techniques vary widely, and variations exist in plant tolerances, soil effects and synergistic/antagonistic reactions between chemicals. Contaminants may be taken up and accumulated by plants through a range of mechanisms. The principal pathways are active and/or passive uptake through the plant root, adsorption to root surfaces and volatilisation from the soil surface followed by foliar uptake. After plant uptake, contaminants may be metabolised or excreted, or they may be bioaccumulated and this is highly species dependant. Many of the substances capable of adversely affecting vegetation exert this effect because of their water solubility, a characteristic that could result in their transport from contaminated sites into adjacent locations where the chemical may generate a phytotoxic response. This could be important if, for example, the adjacent site has important conservation status.

The concentration in soil at which substances become phytotoxic depend on a range of factors including plant type, soil type, pH, the form and availability of the contaminant and other vegetation stress factors that may be present (such as drought). Some plants (including some rare plants) will only grow in soils where there are relatively high concentrations which would be phytotoxic to other species. Whilst many contaminants may be phytotoxic, data are limited. Some heavy metals are essential as trace elements for plant growth but may become toxic at higher concentrations.

ByrneLooby has carried out a review of a number of current and former guidance documents and other texts on phytotoxicity. It is not possible to produce a definitive list of phytotoxic substances on account of the variables mentioned above. However, a number of metals are repeatedly cited as commonly occurring priority pollutants. As a result, the following list is adopted by ByrneLooby as indicators of the potential for phytotoxicity: As, Cr, Cu, Ni and Zn (note that Boron has been excluded from this list because the more modern studies do not assess this).

As the CLEA framework is a risk-based approach, applied to humans, an alternative strategy is required to assess the risk to plants from substances that are phytotoxic. Reference to published criteria and background concentrations can help put site data into context. Published assessment criteria for the protection of plant life from a number of countries are given in the following Table. The most authoritative source is the British Standard for topsoil, but this only lists three elements. LCRM states that the ICRCL Guidance Note 70/90 can be used for initial screening criteria. This approach has been adopted by ByrneLooby where BS3882 is lacking, but where an ICRCL 70/90 criterion is lacking, the lowest criterion in Table below from, firstly UK, and, secondly, European and then other worldwide criteria. The adopted criteria are highlighted in the table 3.8. The MAFF value of 250 mg/kg has been chosen for As over the ICRCL value of 50 mg/kg as MAFF explains the 50 is applicable to vegetables and human health, whereas 250 is applicable to the plants themselves.

Table B.5: Published Assessment Criteria for Phytotoxic Elements (mg/kg)

Reference	As	CR (Total)	Cr (III)	Cr (VI)	Cu	Ni	Zn
British Standard for topsoil (BS3882:2007)	-	-	-	-	200 (pH >7) 135 (pH 6-7) 100 (pH 5.5-6.0)	110 (pH >7) 75 (pH 6-7) 60 (pH 5.5-6.0)	300 (pH >7) 200 (pH 6-7) 200 (pH 5.5-6.0)
MAFF Code of Good Agricultural Practice for the Protection of Soil (1998)	250	-	400 for sites containing sewage and sludge	-	500 (grass) but may fall to 250 for clover and sensitive species (at pH>6)	110 (pH>7) 75 (pH 6-7) 60 (pH 5.5-6.0)	1000 (clover & grass at pH 6), may fall to 300 for sensitive species (at pH 6-7)
ICRCL 59/83 (1987) now withdrawn for human health assessment	-	-	-	-	130	70	300
ICRCL 70/90 (1990) threshold trigger value	50	-	-	25 *	250	-	1000
Dutch ecotoxicological intervention value (Swartjes 1993 & 1994)	40	230	-	7	190	-	-
Australian Guideline B(1) (1999), Interim Urban Ecological Investigation Level (EIL). Soils not generally considered phytotoxic below these EILs.	20	-	400	1	100	60	200
New Zealand guidelines for timber treatment sites (1977), estimated based on Cu bioavailability *	-	-	-	-	500 - 1000 clay soils	-	-

New Zealand guidelines for timber treatment sites (1977), soil criteria for protection of plant life (residential/ agricultural setting)	10-20	-	600	25	130	-	-
Note: * Cr (VI) is only likely to be present in as a significant proportion of total Cr where pH >12 so this does not routinely need to be tested for regarding plant health.							

Current Guidance For Controlled Waters Risk Assessment

Summary of Regulatory Context

Government policy is based upon a “suitable for use approach,” which is relevant to both the current use of land and also to any proposed future use. When considering the current use of land, Part IIA of the Environment Protection Act 1990 ^[4] (EPA 1990) provides the regulatory regime, which was introduced by Section 57 of the Environment Act 1995 ^[5], which came into force in England on 1 April 2000. The main objective of introducing the Part IIA regime is to provide an improved system for the identification and remediation of land where contamination is causing unacceptable risks to human health, controlled waters or the wider environment given the current use and circumstances of the land. Part IIA provides a statutory definition of contaminated land under Section 78A(2) as:

“any land which appears to the Local Authority in whose area it is situated to be in such a condition, by reason of substances in, on, or under the land, that:

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

Part IIA provides a statutory definition of the pollution of controlled waters under Section 78A(9) as:

*“the entry into controlled waters of **any** poisonous, noxious or polluting matter or **any** solid waste matter”*

Part IIA is supported by a substantial quantity of guidance and other Regulations, especially for England, The Contaminated Land (England) (Amendment) Regulations 2012 and Contaminated Land Statutory Guidance (DEFRA, 2012) which came into force in early April 2012. The document re-confirms the duties of Enforcing Authorities in dealing with contamination including the role of the Environment Agency which has powers under Part 7 of The Water Resources Act (1991) to take action to prevent or remedy the pollution of controlled waters, including circumstances where the pollution arises from contamination in the land.

Part IIA introduces the concept of a contaminant linkage; where for potential harm to exist, there must be a connection between the source of the hazard and the receptor via a pathway. Risk assessment in contaminated land is therefore directed towards identifying the contaminants, pathways and receptors that can provide contaminant linkages. This is known as the contaminant-pathway-receptor link (CPR or contaminant linkage).

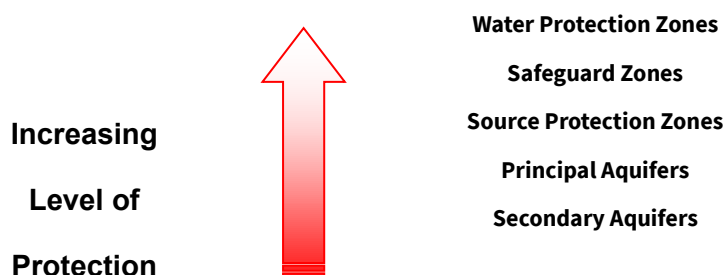
Part IIA places contaminated land responsibility as a part of the planning and redevelopment process rather than Local Authority or Environment Agency taking direct action except in situations of very high pollution risk or where harm is occurring. In the planning process guidance is provided by National Planning Policy Framework (NPPF) of March 2012. This requires that a site which has been developed shall not be capable of being determined “contaminated land” under Part IIA. Therefore, appropriate risk-based investigation is required to identify the contaminant linkages that can then be assessed, and then mitigated using methods that can be readily agreed with the planners.

Environment Agency Guidance

Legislation and guidance surrounding the protection of controlled waters in the UK is numerous and can be complex. The Environment Agency’s overall position on groundwater is *“To protect and manage groundwater resources for present and future generation in ways that are appropriate for the risks that we identify”* (The Environment Agency’s Approach to Groundwater Protection, 2017). In brief, the core objectives of the existing legislation serve to enforce this position.

In 1992, the National Rivers Authority published their Policy and Practice for the Protection of Groundwater (PPPG), this document was influential as it provided a focus for key developments such as Source Protection Zones (SPZs) and Groundwater Vulnerability Maps. The Policy was then revised in 1998, since which there have been substantial changes in legislation, driven by Europe. Key European Directives relating to groundwater include the Groundwater Directive (80/68/EEC) and the Water Framework Directive (2000/60/EC). Aspects of these directives are controlled by primary UK legislation such as the Water Resources Act 1991 as amended by the Water Act 2003. Further to legislative changes, gaps identified in the 1998 PPPG required addressing. These changes are reflected in the Environment Agency Policy document *The Environment Agency’s Approach to Groundwater Protection* of March 2017.

The Environment Agency follows a tiered, risk-based approach to drinking water protection, and this should be taken into account when carrying out controlled waters risk assessment:



Tools available for Risk Assessment of Controlled Waters

In order for a developer of a potentially contaminated site to fulfil their obligations under the legislation, a site assessment would be required to be undertaken in order to identify any potential risks to controlled waters and to derive suitable clean-up criteria if necessary to ensure the protection of controlled waters. A number of tools are available for this purpose.

Three main stages apply to any risk assessment of controlled waters, these are:

- i. Risk Screening (devise Conceptual Site Model, making reference to groundwater vulnerability maps, site setting etc)
- ii. Generic Risk Assessment (using the EA Remedial Targets Methodology – Tier 1 - Comparison of groundwater data with relevant standards)
- iii. Detailed Quantitative Risk Assessment (Consideration of aquifer properties and site-specific parameters, using the EA Remedial Targets Methodology - Tiers 2 & 3)

The process is summarised below (Taken from the Environment Agency GP3 consultation document, 2006):

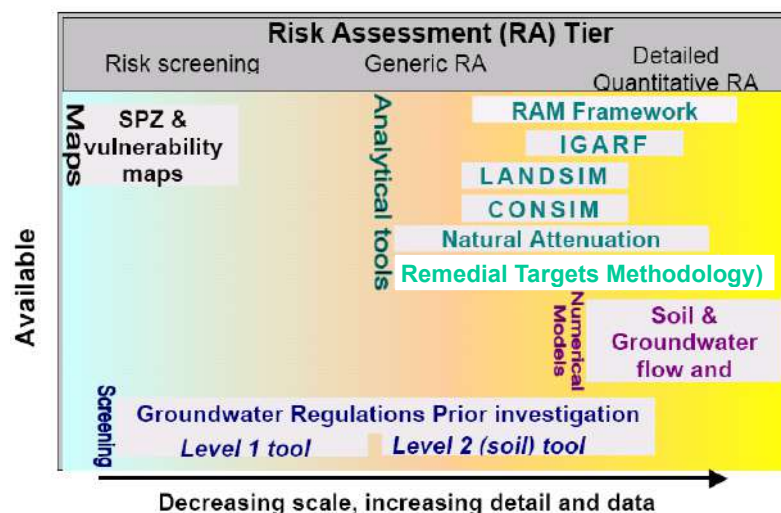


Figure 1-1 Environment Agency groundwater assessment tools, mapped against the different levels of risk assessment.

When assessing groundwater impact the Environment Agency advocate the application of their framework methodology "Remedial Targets Methodology – Hydrogeological Risk Assessment for Land Contamination" Environment Agency (2006). The methodology has four tiers of assessment:

- **Tier 1** utilises either a soil concentration (calculation of pore water concentrations based on partitioning calculations), leaching test or pore-water concentration of

perched water as a source concentration input and these are contrasted directly to water quality standards. No dilution or attenuation is considered at Level 1.

- **Tier 2 (groundwater)** considers dilution of the contaminant within the underlying receiving groundwater or surface water body. To determine a dilution, factor the infiltration rate of pore water and the discharge of groundwater beneath the source must be determined. Level 2 Assessment comprises a comparison between measured groundwater concentrations with to water quality standards.
- **Tier 3** considers natural attenuation in the form of dispersion, retardation and degradation of the contaminant. As the levels are progressed, the assessment becomes increasingly more detailed and less conservative as the data requirements are increased with each successive tier. The Environment Agency has released Excel Worksheets to carry out basic calculations using a conservative approach up to Tier 3. However, in this case the conceptual model is a simple one and assumes there is a simple migration of contaminants from the source zone into the aquifer receptor. Using these worksheets requires a sensitivity analysis showing how by varying each parameter, what effect it might have on the outcome of the assessment. Groundwater conceptual models are not always this simple.
- **Tier 4** is for more complex conceptual models where multiple sources, multiple pathways, multiple receptors and complex water balances can be assessed.

The Environment Agency developed a spreadsheet-based code to support the Remedial Target Methodology, and the code is capable of undertaking assessments for Tiers 1 to 3. Tier 4 assessment is not supported by the spreadsheet-based code.

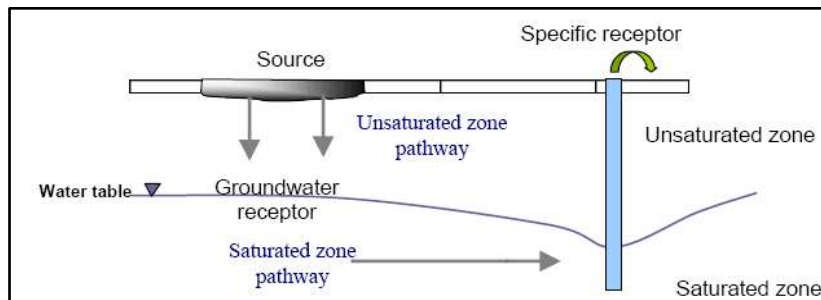
A more advanced code, ConSim 2, developed on behalf of the Environment Agency to support the Remedial Targets Methodology, allows for the introduction of additional geological horizons and is used mainly to determine the concentrations reaching a receptor and the timescales over which this may happen.

The codes assess only the dissolved phase contaminants. There are many further codes commercially available for use in controlled waters risk assessment, particularly for more complex situations, however, these should be used with caution and only once agreement has been obtained from the Environment Agency. All have the overall aim of the estimation of risk from contaminant linkages and the protection of controlled waters.

General notes on each stage of the controlled waters risk assessment process

Risk Screening

The understanding of the Conceptual Site Model (CSM) is the key to assessing any site. Using a robust CSM, potential pathways or receptors may be screened out from any further assessment at an early stage. For example, if the pathway through the unsaturated zone is blocked by the presence of a significant thickness of low permeability clay. A greater understanding of the CSM is achieved with each tier of risk assessment. An example of a basic Source-Pathway-Receptor concept is given below (taken from the Environment Agency GP3, 2006):



Generic Risk Assessment

When undertaking the Generic Hydrogeological Risk Assessment (EA Remedial Targets Methodology Tier 1), comparison of chemical analytical results is made with screening criteria. Published values of screening criteria with which chemical test results can be compared are published in the following guidance:

There is a hierarchy of screening criteria which is as follows:

- Updated Recommendations on Environmental Technical Standards, River Basin Management (2015-21), April 2012 by the UK Technical Advisory Group on the Water Framework Directive;
- Environmental Quality Standards (EQS) for freshwaters based on The EC Dangerous Substances Directive (76/464/EEC and Daughter Directives);
- Surface Waters (Abstraction for Drinking Water)(Classification) Regulations (1996)
- Surface Waters (Fishlife) (Classification) Regulations (1997)
- UK Drinking Water Standards (DWS) (Water Supply (Water Quality) Regulations 2000);
- Dutch Ministry of Housing, Spatial Planning and Environment (2001) Intervention Values and Target Values – soil quality standards;
- World Health Organisation Guidelines for Drinking Water (2004).

Should the Level 1 or 2 assessments indicate threshold levels to be exceeded, then there are three alternative ways in which to proceed:

- To devise suitable remedial solutions;
- To carry out more investigation, sampling and analysis;

- To conduct a site-specific Detailed Quantitative Risk Assessment (DQRA) to whether or not the soil materials are suitable for their site-specific intended use or to devise a site-specific clean-up level.

Detailed Quantitative Risk Assessment (DQRA)

The decision to carry out a DQRA will be dependent on the extent and implications of the initial qualitative and generic assessment. The scope of any such assessment will be accurately defined by the outcomes of the former two stages. The CSM will be sufficiently refined by this stage that only certain contaminants of concern, certain pathways and certain receptors will require further assessment, the remainder having been screened out.

Additional site-specific data is normally required for this stage of assessment, as explained above, more processes that are capable of affecting contaminant concentrations are considered (such as dilution and attenuation).

Remediation criteria derived will therefore be specific to each site and will be based on a detailed assessment of the potential impact at the identified receptor or *compliance point*. A greater level of confidence can be placed on the predicted impact on the compliance point following a DQRA.

Definition of Controlled Waters

The term ‘controlled waters’ is defined in Section 104 of the Water Resources Act 1991 as:

“Territorial Waters...which extend seawards for three miles..., coastal waters..., inland freshwaters, waters in any relevant lake or pond or of so much of any relevant river or watercourse as is above the freshwater limit, and ground waters, that is to say, any waters contained in underground strata.”

Note that the definition of groundwater under the Water Resources Act 1991 includes all water within underground strata (including soil / pore water in the unsaturated zone). The definition of groundwater under the Groundwater Directive however is limited to water in the saturated zone. For the purposes of Part IIA of the Environmental Protection Act 1990, the Environment Agency recommends that the groundwater within the saturated zone only is considered as the receptor (rather than soil / pore water).

Environment Agency's Aquifer Designations

The Environment Agency have classified different types of aquifers from which groundwater can be extracted. The aquifer designations reflect the importance of aquifers in terms of groundwater as a resource (drinking water supply) but also their role in supporting surface water flows and wetland ecosystems. The aquifer designation data is based on geological mapping provided by the British Geological Survey.

The maps are split into two different types of aquifer designation:

- **Superficial (Drift)** – permeable unconsolidated (loose) deposits.
- **Bedrock (Solid)** – solid permeable formations e.g., sandstone, chalk, limestone.

The aquifer designations displayed on the Environment Agency maps are as follows:

- **Principal Aquifers (formerly termed Major Aquifers)** – These are layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as a major aquifer.
- **Secondary Aquifers (formerly termed Minor Aquifers)** – These include a wide range of rock layers or drift deposits with an equally wide range of water permeability and storage. Secondary aquifers are subdivided into two types:
 - **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;
 - **Secondary B** - predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers.
 - **Secondary Undifferentiated** - has been assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.
- **Unproductive Strata (formerly termed Non-Aquifer)** – These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.

Hazardous and Non-Hazardous Substances

The Groundwater (England and Wales) Regulations 2009 control the disposal to the hydrogeological environment of potentially polluting substances which are divided into Hazardous Substances and Non-hazardous Contaminants (this roughly approximates to the former List 1 and List 2 substances).

Hazardous Substances are the most damaging and toxic and must be prevented from directly or indirectly entering the groundwater environment. Hazardous Substances include mineral oils and hydrocarbons, pesticides, biocides, herbicides, solvents and some metals. Discharge of Hazardous Substances to Controlled Waters must be prevented.

Non-hazardous Pollutants are any contaminants other than Hazardous Substances. Non-hazardous Pollutants are potentially toxic but are less harmful than Hazardous Substances, but their direct discharge to groundwater is generally not permitted and any indirect discharge to groundwater must be limited and be controlled by technical precautions in order to prevent pollution. Non-hazardous Pollutants include ammonia and nitrites, many metals and fluorides.

Management Of Contaminated Land

When risk assessment of the site has been completed and this indicates that remedial works are required, the main guidance in managing this process is set out in the DEFRA/EA online guidance LCRM (2020) “Land Contamination: Risk Management” The stages of managing remediation are as follows:

- (a) Options Appraisal and develop Remediation Strategy;
- (b) Develop Implementation Plan and Verification Plan;
- (c) Remediation, Verification and Monitoring.

The Remediation Strategy sets out the remediation targets, identifies technically feasible remedial solutions and presents an evaluation of the options so that these can be assessed enabling that the most suitable solution is adopted. An outline of the proposed remedial method should be presented. Agreement should be sought of the appropriate statutory bodies for the Remediation Strategy before proceeding to the next stage.

The Implementation Plan is a detailed method statement setting out how the remediation is to be carried out including stating how the site will be managed, welfare procedures, health and safety considerations together with practical measures such as details of temporary works, programme of works, waste management licences and regulatory consents required. Agreement should again be sought of the appropriate statutory bodies for this Plan.

The Verification Plan sets out the requirements for gathering data to demonstrate that the remediation has met the required remediation objectives and criteria. The Verification Plan presents the requirements for a wide range of issues including the level of supervision, sampling and testing regimes for treated materials, waste and imported materials, required monitoring works during and post remediation, how compliance with all licenses and consents will be checked etc. Agreement should again be sought of the appropriate statutory bodies for the Verification Plan. On completion of the remediation a Verification Report should be produced to provide a complete record of all remediation activities on-site and the data collected as required in the Verification Plan. The Verification Report should demonstrate that the remediation has met the remedial targets to show that the site is suitable for the proposed use.

Glossary

TERMS		UNITS	
AST	Above Ground Storage Tank	m	Metres
BGS	British Geological Survey	km	Kilometres
BSI	British Standards Institute	%	Percent
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes	%v/v	Percent volume in air
CIEH	Chartered Institute of Environmental Health	mb	Milli Bars
CIRIA	Construction Industry Research Association		(atmospheric pressure)
CLEA	Contaminated Land Exposure Assessment	l/hr	Litres per hour
CSM	Conceptual Site Model	ha	Hectare (10,000m ²)
DNAPL	Dense Non-Aqueous Phase Liquid (chlorinated solvents, PCB)	µg/l	Micrograms per Litre
DWS	Drinking Water Standard		(parts per billion)
EA	Environment Agency	ppb	Parts Per Billion
EQS	Environmental Quality Standard	mg/kg	Milligrams per kilogram
GAC	General Assessment Criteria		(parts per million)
GL	Ground Level	ppm	Parts Per Million
GSV	Gas Screening Value	mg/m ³	Milligram per metre cubed
HCV	Health Criteria Value	Mg/m ³	Megagram per metre cubed
LNAPL	Light Non-Aqueous Phase Liquid (petrol, diesel)	µg/m ³	Microgram per metre cubed
ND	Not Detected	m bgl	Metres Below Ground Level
LMRL	Lower Method Reporting Limit	m bcl	Metre Below Cover Level
NR	Not Recorded	mOD	Metres Above Ordnance Datum (sea level)
OD	Ordnance Datum	kN/m ²	Kilo Newtons per metre squared
PAH	Poly Aromatic Hydrocarbon	kPa	Kilo Pascal – same as kN/m ²
PCB	Poly-Chlorinated Biphenyl	µm	Micro metre
PID	Photo Ionisation Detector		
PCSM	Preliminary Conceptual Site Model		
SGV	Soil Guideline Value		
TPH (CWG)	Total Petroleum Hydrocarbon (Criteria Working Group)		
SPT	Standard Penetration Test		
SVOC	Semi Volatile Organic Compound		
UST	Underground Storage Tank		
VCCs	Vibro Concrete Columns	VSCs	Vibro Stone Columns
VOC	Volatile Organic Compound		

Appendix C – Site Layout Drawings



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2024 Ordnance Survey 0100031673



revision: H desc:

date: 24-02-25



- Application Site
- Deer / Stock Fence
- Solar PV Arrays
- String Inverter
- Transformer Station
- Battery Container
- Battery Transformer Unit
- Other Building (Labelled)
- Existing Access Track Upgraded
- Proposed Access Track
- Proposed Compound Areas
- Archaeologically Sensitive Area
- Surface Water Attenuation Basin
- CCTV

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axis.co.uk



Client
Brockwell Storage and Solar Ltd
Project
Sperberry Hill Solar Array and BESS
Drawing Title

General Arrangement

Scale
1:5000 @A3
Date
October 2024

Status
Planning
Drawn
TR
Checked
ToK

Dwg no
3732-01-03
Rev
H

Appendix D – Groundsure Report and Historical Ordnance Survey Plans

Sperberry Hill Solar

Order Details

Date: 01/10/2025
Your ref: Sperberry Hill Solar
Our Ref: GS-WTH-6E8-16U-IPQ

Site Details

Location: 520503 226370
Area: 35.59 ha
Authority: [North Hertfordshire District Council](#) ↗



[Summary of findings](#)

[p. 2 >](#)

[Aerial image](#)

[p. 9 >](#)

[OS MasterMap site plan](#)

N/A: >10ha

[Insight User Guide](#) ↗

Summary of findings

Page	Section	Past land use >	On site	0-50m	50-250m	250-500m	500-2000m
14 >	1.1 >	Historical industrial land uses >	1	13	8	38	-
17 >	1.2 >	Historical tanks >	0	0	1	8	-
17 >	1.3 >	Historical energy features >	0	0	0	4	-
18	1.4	Historical petrol stations	0	0	0	0	-
18	1.5	Historical garages	0	0	0	0	-
18	1.6	Historical military land	0	0	0	0	-
Page	Section	Past land use - un-grouped >	On site	0-50m	50-250m	250-500m	500-2000m
19 >	2.1 >	Historical industrial land uses >	1	18	12	51	-
23 >	2.2 >	Historical tanks >	0	0	2	12	-
23 >	2.3 >	Historical energy features >	0	0	0	7	-
24	2.4	Historical petrol stations	0	0	0	0	-
24	2.5	Historical garages	0	0	0	0	-
Page	Section	Waste and landfill >	On site	0-50m	50-250m	250-500m	500-2000m
25	3.1	Active or recent landfill	0	0	0	0	-
25 >	3.2 >	Historical landfill (BGS records) >	0	1	0	0	-
26 >	3.3 >	Historical landfill (LA/mapping records) >	0	1	0	0	-
26 >	3.4 >	Historical landfill (EA/NRW records) >	0	1	3	1	-
27	3.5	Historical waste sites	0	0	0	0	-
27	3.6	Licensed waste sites	0	0	0	0	-
28 >	3.7 >	Waste exemptions >	0	1	4	28	-
Page	Section	Current industrial land use >	On site	0-50m	50-250m	250-500m	500-2000m
31 >	4.1 >	Recent industrial land uses >	1	2	9	-	-
32	4.2	National Geographic Database (NGD) - Current or recent tanks	0	0	0	-	-
32	4.3	Current or recent petrol stations	0	0	0	0	-
33 >	4.4 >	Electricity cables >	2	2	2	0	-
33 >	4.5 >	Gas pipelines >	1	0	0	0	-



34	4.6	Sites determined as Contaminated Land	0	0	0	0	-
34	4.7	Control of Major Accident Hazards (COMAH)	0	0	0	0	-
34	4.8	Regulated explosive sites	0	0	0	0	-
34	4.9	Hazardous substance storage/usage	0	0	0	0	-
34	4.10	Historical licensed industrial activities (IPC)	0	0	0	0	-
35	4.11	Licensed industrial activities (Part A(1))	0	0	0	0	-
35 >	4.12 >	<u>Licensed pollutant release (Part A(2)/B) ></u>	0	0	0	2	-
35	4.13	Radioactive Substance Authorisations	0	0	0	0	-
35 >	4.14 >	<u>Licensed Discharges to controlled waters ></u>	0	3	1	8	-
37	4.15	Pollutant release to surface waters (Red List)	0	0	0	0	-
38	4.16	Pollutant release to public sewer	0	0	0	0	-
38	4.17	List 1 Dangerous Substances	0	0	0	0	-
38	4.18	List 2 Dangerous Substances	0	0	0	0	-
38	4.19	Pollution Incidents (EA/NRW)	0	0	0	0	-
38	4.20	Pollution inventory substances	0	0	0	0	-
39	4.21	Pollution inventory waste transfers	0	0	0	0	-
39	4.22	Pollution inventory radioactive waste	0	0	0	0	-
Page	Section	<u>Hydrogeology ></u>	On site	0-50m	50-250m	250-500m	500-2000m
40 >	5.1 >	<u>Superficial aquifer ></u>	Identified (within 500m)				
43 >	5.2 >	<u>Bedrock aquifer ></u>	Identified (within 500m)				
45 >	5.3 >	<u>Groundwater vulnerability ></u>	Identified (within 50m)				
49 >	5.4 >	<u>Groundwater vulnerability- soluble rock risk ></u>	Identified (within 0m)				
50	5.5	Groundwater vulnerability- local information	None (within 0m)				
51 >	5.6 >	<u>Groundwater abstractions ></u>	0	0	0	2	8
54 >	5.7 >	<u>Surface water abstractions ></u>	0	0	0	0	1
54 >	5.8 >	<u>Potable abstractions ></u>	0	0	0	1	2
55 >	5.9 >	<u>Source Protection Zones ></u>	1	0	0	2	-
55	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



56 >	6.1 >	Water Network (OS MasterMap) >	4	3	9	-	-
58 >	6.2 >	Surface water features >	1	2	5	-	-
58 >	6.3 >	WFD Surface water body catchments >	1	-	-	-	-
59 >	6.4 >	WFD Surface water bodies >	0	0	0	-	-
59 >	6.5 >	WFD Groundwater bodies >	1	-	-	-	-
Page	Section	River and coastal flooding >	On site	0-50m	50-250m	250-500m	500-2000m
60 >	7.1 >	Risk of flooding from rivers and the sea >	High (within 50m)				
61	7.2	Historical Flood Events	0	0	0	-	-
61	7.3	Flood Defences	0	0	0	-	-
61	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
61	7.5	Flood Storage Areas	0	0	0	-	-
62 >	7.6 >	Flood Zone 2 >	Identified (within 50m)				
63 >	7.7 >	Flood Zone 3 >	Identified (within 50m)				
Page	Section	Surface water flooding >					
64 >	8.1 >	Surface water flooding >	1 in 30 year, Greater than 1.0m (within 50m)				
Page	Section	Groundwater flooding >					
66 >	9.1 >	Groundwater flooding >	High (within 50m)				
Page	Section	Environmental designations >	On site	0-50m	50-250m	250-500m	500-2000m
67 >	10.1 >	Sites of Special Scientific Interest (SSSI) >	0	0	0	0	2
68	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
68	10.3	Special Areas of Conservation (SAC)	0	0	0	0	0
68	10.4	Special Protection Areas (SPA)	0	0	0	0	0
68	10.5	National Nature Reserves (NNR)	0	0	0	0	0
69	10.6	Local Nature Reserves (LNR)	0	0	0	0	0
69 >	10.7 >	Designated Ancient Woodland >	0	0	0	0	6
69	10.8	Biosphere Reserves	0	0	0	0	0
70	10.9	Forest Parks	0	0	0	0	0
70	10.10	Marine Conservation Zones	0	0	0	0	0
70 >	10.11 >	Green Belt >	1	0	0	0	2



70	10.12	Proposed Ramsar sites	0	0	0	0	0
71	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
71	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
71	10.15	Nitrate Sensitive Areas	0	0	0	0	0
71 >	10.16 >	Nitrate Vulnerable Zones >	4	0	0	0	1
73	10.17	SSSI Impact Risk Zones	0	-	-	-	-
74 >	10.18 >	SSSI Units >	0	0	0	0	2
Page	Section	Visual and cultural designations >	On site	0-50m	50-250m	250-500m	500-2000m
75	11.1	World Heritage Sites	0	0	0	-	-
76	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
76	11.3	National Parks	0	0	0	-	-
76 >	11.4 >	Listed Buildings >	0	3	2	-	-
77 >	11.5 >	Conservation Areas >	0	0	1	-	-
77	11.6	Scheduled Ancient Monuments	0	0	0	-	-
77	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	Agricultural designations >	On site	0-50m	50-250m	250-500m	500-2000m
78 >	12.1 >	Agricultural Land Classification >	Grade 2 (within 250m)				
80	12.2	Open Access Land	0	0	0	-	-
80 >	12.3 >	Tree Felling Licences >	1	0	0	-	-
81 >	12.4 >	Environmental Stewardship Schemes >	1	0	1	-	-
81 >	12.5 >	Countryside Stewardship Schemes >	4	2	3	-	-
Page	Section	Habitat designations >	On site	0-50m	50-250m	250-500m	500-2000m
82 >	13.1 >	Priority Habitat Inventory >	2	12	14	-	-
84	13.2	Habitat Networks	0	0	0	-	-
84	13.3	Open Mosaic Habitat	0	0	0	-	-
84	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
85 >	14.1 >	10k Availability >	Identified (within 500m)				
86 >	14.2 >	Artificial and made ground (10k) >	4	5	7	15	-

88 >	14.3 >	Superficial geology (10k) >	10	2	16	16	-
91	14.4	Landslip (10k)	0	0	0	0	-
92 >	14.5 >	Bedrock geology (10k) >	2	0	0	5	-
93 >	14.6 >	Bedrock faults and other linear features (10k) >	0	0	3	0	-
Page	Section	Geology 1:50,000 scale >	On site	0-50m	50-250m	250-500m	500-2000m
94 >	15.1 >	50k Availability >	Identified (within 500m)				
95 >	15.2 >	Artificial and made ground (50k) >	1	3	1	3	-
96 >	15.3 >	Artificial ground permeability (50k) >	1	3	-	-	-
97 >	15.4 >	Superficial geology (50k) >	8	0	5	6	-
98 >	15.5 >	Superficial permeability (50k) >	Identified (within 50m)				
99	15.6	Landslip (50k)	0	0	0	0	-
99	15.7	Landslip permeability (50k)	None (within 50m)				
100 >	15.8 >	Bedrock geology (50k) >	1	0	0	6	-
101 >	15.9 >	Bedrock permeability (50k) >	Identified (within 50m)				
101 >	15.10 >	Bedrock faults and other linear features (50k) >	0	0	2	1	-
Page	Section	Boreholes >	On site	0-50m	50-250m	250-500m	500-2000m
102 >	16.1 >	BGS Boreholes >	0	0	18	-	-
Page	Section	Natural ground subsidence >					
104 >	17.1 >	Shrink swell clays >	Low (within 50m)				
106 >	17.2 >	Running sands >	Very low (within 50m)				
108 >	17.3 >	Compressible deposits >	Moderate (within 50m)				
110 >	17.4 >	Collapsible deposits >	Very low (within 50m)				
111 >	17.5 >	Landslides >	Low (within 50m)				
113 >	17.6 >	Ground dissolution of soluble rocks >	Very low (within 50m)				
Page	Section	Mining and ground workings >	On site	0-50m	50-250m	250-500m	500-2000m
115 >	18.1 >	BritPits >	0	1	0	4	-
117 >	18.2 >	Surface ground workings >	1	20	18	-	-
119	18.3	Underground workings	0	0	0	0	0
119	18.4	Underground mining extents	0	0	0	0	-



119 >	18.5 >	Historical Mineral Planning Areas >	1	1	1	0	-
120 >	18.6 >	Non-coal mining >	2	0	0	0	2
120	18.7	JPB mining areas	None (within 0m)				
121	18.8	The Coal Authority non-coal mining	0	0	0	0	-
121	18.9	Researched mining	0	0	0	0	-
121	18.10	Mining record office plans	0	0	0	0	-
121	18.11	BGS mine plans	0	0	0	0	-
122	18.12	Coal mining	None (within 0m)				
122	18.13	Brine areas	None (within 0m)				
122	18.14	Gypsum areas	None (within 0m)				
122	18.15	Tin mining	None (within 0m)				
122	18.16	Clay mining	None (within 0m)				
Page	Section	Ground cavities and sinkholes	On site	0-50m	50-250m	250-500m	500-2000m
123	19.1	Natural cavities	0	0	0	0	-
123	19.2	Mining cavities	0	0	0	0	0
123	19.3	Reported recent incidents	0	0	0	0	-
123	19.4	Historical incidents	0	0	0	0	-
Page	Section	Radon >					
125 >	20.1 >	Radon >	Between 1% and 3% (within 0m)				
Page	Section	Soil chemistry >	On site	0-50m	50-250m	250-500m	500-2000m
127 >	21.1 >	BGS Estimated Background Soil Chemistry >	33	14	-	-	-
130	21.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
130	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
131	22.1	Underground railways (London)	0	0	0	-	-
131	22.2	Underground railways (Non-London)	0	0	0	-	-
131	22.3	Railway tunnels	0	0	0	-	-
131	22.4	Historical railway and tunnel features	0	0	0	-	-
131	22.5	Royal Mail tunnels	0	0	0	-	-



132	22.6	Historical railways	0	0	0	-	-
132	22.7	Railways	0	0	0	-	-
132	22.8	Crossrail 2	0	0	0	0	-
132	22.9	HS2	0	0	0	0	-

Recent aerial photograph



Capture Date: 15/06/2022

Site Area: 35.59ha



Recent site history - 2019 aerial photograph



Capture Date: 14/09/2019

Site Area: 35.59ha



Recent site history - 2010 aerial photograph



Capture Date: 27/04/2010

Site Area: 35.59ha



Recent site history - 2000 aerial photograph



Capture Date: 10/06/2000

Site Area: 35.59ha



Recent site history - 1999 aerial photograph

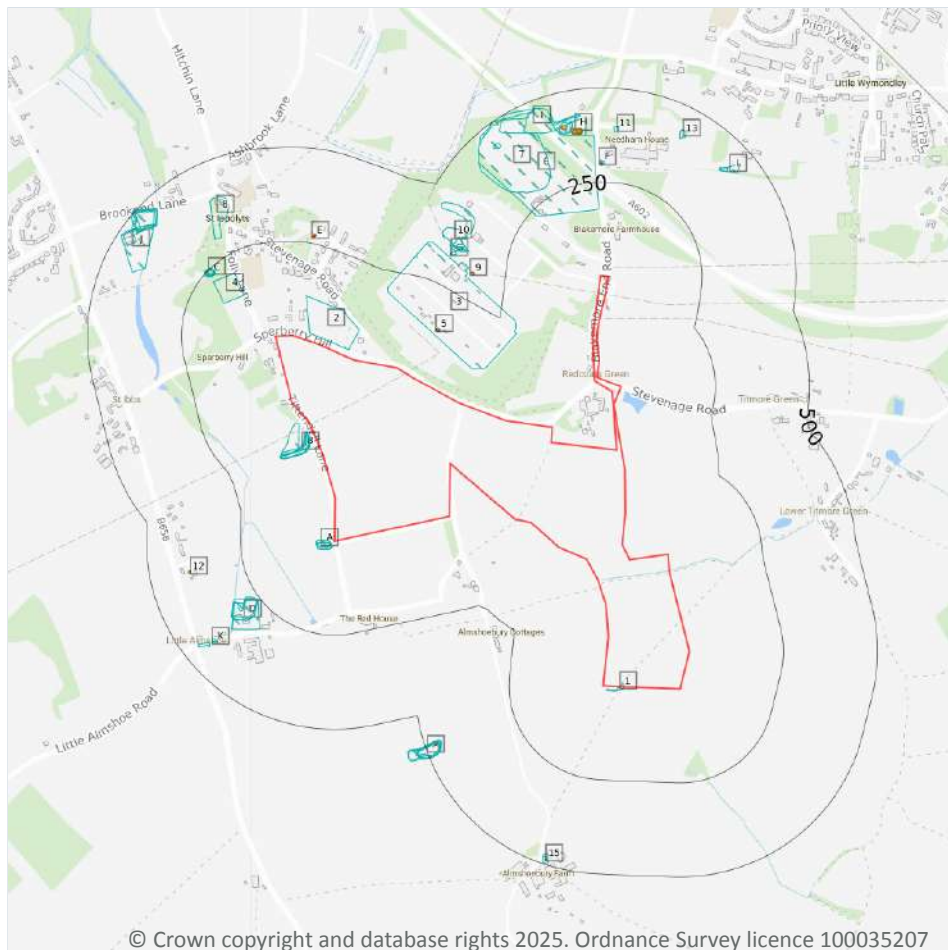


Capture Date: 27/05/1999

Site Area: 35.59ha



1 Past land use



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

1.1 Historical industrial land uses

Records within 500m

60

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 14 >](#)

ID	Location	Land use	Dates present	Group ID
1	On site	Unspecified Pit	1884	2087507



ID	Location	Land use	Dates present	Group ID
A	11m SW	Unspecified Pit	1976	2144623
A	12m SW	Unspecified Pit	1922 - 1947	2155210
A	14m SW	Old Gravel Pit	1897	2072198
A	14m SW	Unspecified Pit	1884	2101829
A	14m SW	Unspecified Pit	1949	2110679
A	14m SW	Unspecified Pit	1922	2151974
B	15m SW	Unspecified Ground Workings	1947	2138567
B	16m SW	Unspecified Ground Workings	1897 - 1922	2099383
B	16m SW	Unspecified Ground Workings	1884	2117524
B	16m SW	Unspecified Ground Workings	1949	2147508
B	16m SW	Unspecified Ground Workings	1922	2102359
2	18m NE	Nursery	1980	2084886
B	24m SW	Refuse Heap	1980 - 1991	2139719
3	96m NE	Transformer Station	1980	2073969
4	137m NW	Cemetery	1980 - 1991	2111581
6	176m N	Disused Gravel Pit	1980	2074765
C	230m NW	Unspecified Pit	1959	2118176
C	232m NW	Gravel Pit	1897	2095041
C	232m NW	Unspecified Pit	1922 - 1946	2135839
C	233m NW	Unspecified Pit	1946	2125571
C	236m NW	Unspecified Disused Pit	1980 - 1991	2099433
D	255m SW	Gravel Pit	1949	2134795
D	258m SW	Gravel Pit	1922	2129266
D	259m SW	Gravel Pit	1922	2112601
D	260m SW	Gravel Pit	1947	2133352
7	277m NW	Gravel Pit	1976	2145255
8	299m NW	Grave Yard	1884	2077150
F	299m N	Electric Substation	1980	2085820



ID	Location	Land use	Dates present	Group ID
G	332m NE	Gravel Pit	1884	2095040
G	347m NE	Gravel Pit	1897	2112064
G	353m NE	Gravel Pit	1884	2123347
G	354m NE	Unspecified Pit	1922 - 1946	2132709
10	357m NE	Gravel Pit	1976	2111457
H	376m N	Oil Depot	1980	2093315
11	386m N	Gravel Pit	1884	2095038
I	389m N	Unspecified Ground Workings	1922 - 1946	2132844
J	391m NW	Iron Foundry	1897	2104137
H	392m N	Unspecified Pit	1976	2087721
K	409m SW	Smithy	1897	2089381
L	410m NE	Pumping House	1946	2103450
L	411m NE	Pumping House	1922 - 1946	2117468
13	413m NE	Gravel Pit	1884	2095039
H	420m N	Unspecified Ground Workings	1976	2113990
K	428m SW	Smithy	1884	2089382
J	432m NW	Unspecified Works	1980 - 1991	2140111
J	432m NW	Unspecified Works	1959	2153206
J	433m NW	Iron Foundry	1946	2135977
14	433m NW	Gravel Pit	1884	2107882
J	434m NW	Iron Foundry	1884	2130577
J	434m NW	Iron Foundry	1922 - 1946	2148065
J	446m NW	Unspecified Foundry	1980 - 1991	2156285
M	455m W	Gravel Pit	1947	2117382
M	456m W	Gravel Pit	1884	2112357
M	456m W	Gravel Pit	1949	2136001
M	456m W	Gravel Pit	1976	2118321
M	457m W	Gravel Pit	1922	2097644



ID	Location	Land use	Dates present	Group ID
M	457m W	Gravel Pit	1897 - 1922	2105626
I	461m NW	Unspecified Ground Workings	1976	2097774
15	472m S	Unspecified Pit	1884	2087514

This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m

9

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original 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 14 >](#)

ID	Location	Land use	Dates present	Group ID
5	140m NE	Unspecified Tank	1986 - 1993	373120
9	315m NE	Unspecified Tank	1986 - 1993	366324
H	380m N	Tanks	1993	371722
H	383m N	Tanks	1971	370997
H	383m N	Tanks	1986 - 1992	374657
12	391m W	Unspecified Tank	1981 - 1992	373744
H	399m N	Tanks	1971 - 1986	372343
J	448m NW	Unspecified Tank	1981	365172
J	457m NW	Unspecified Tank	1981	365173

This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m

4

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 14 >](#)

ID	Location	Land use	Dates present	Group ID
E	268m N	Electricity Substation	1986 - 1993	258876
E	269m N	Electricity Substation	1971	252045
F	295m N	Electricity Substation	1993	264470
F	299m N	Electricity Substation	1986 - 1992	261255

This data is sourced from Ordnance Survey / Groundsure.

1.4 Historical petrol stations

Records within 500m

0

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

This data is sourced from Ordnance Survey / Groundsure.

1.5 Historical garages

Records within 500m

0

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

This data is sourced from Ordnance Survey / Groundsure.

1.6 Historical military land

Records within 500m

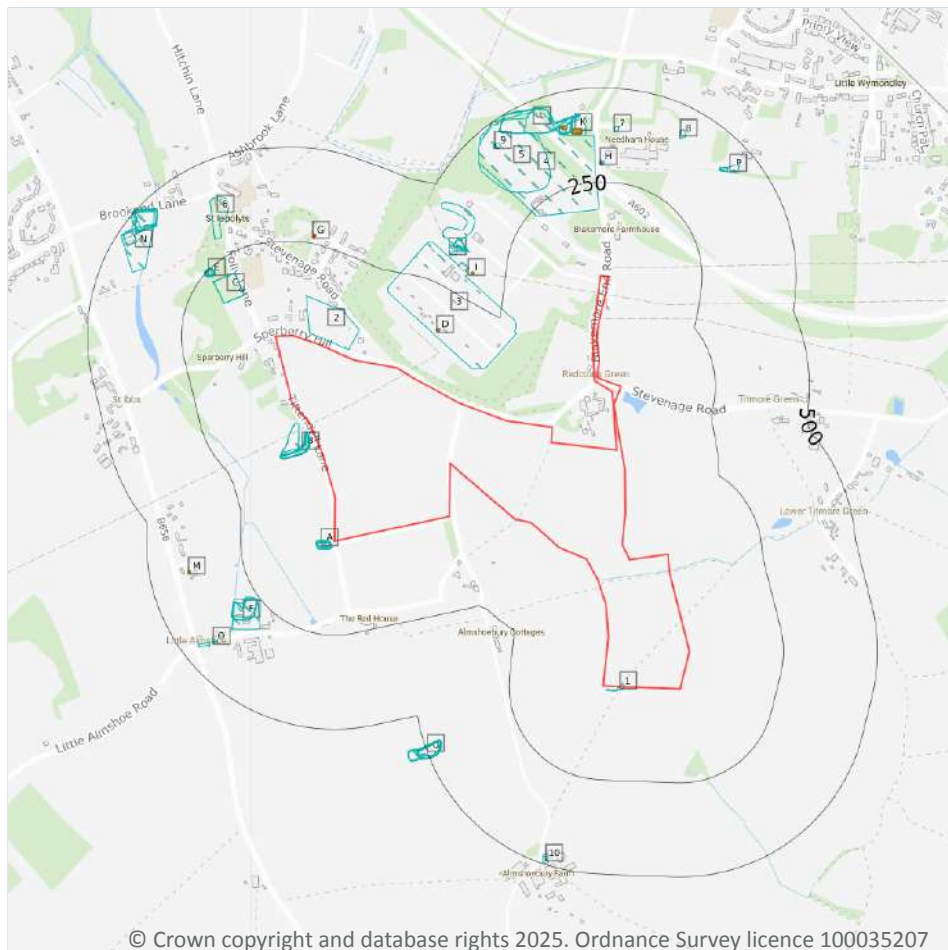
0

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

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



2 Past land use - un-grouped



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

2.1 Historical industrial land uses

Records within 500m

82

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

Features are displayed on the Past land use - un-grouped map on [page 19](#) >

ID	Location	Land Use	Date	Group ID
1	On site	Unspecified Pit	1884	2087507
A	11m SW	Unspecified Pit	1976	2144623
A	12m SW	Unspecified Pit	1947	2155210



ID	Location	Land Use	Date	Group ID
A	12m SW	Unspecified Pit	1922	2155210
A	12m SW	Unspecified Pit	1922	2155210
A	14m SW	Unspecified Pit	1949	2110679
A	14m SW	Unspecified Pit	1922	2151974
A	14m SW	Unspecified Pit	1884	2101829
A	14m SW	Old Gravel Pit	1897	2072198
B	15m SW	Unspecified Ground Workings	1947	2138567
B	16m SW	Unspecified Ground Workings	1949	2147508
B	16m SW	Unspecified Ground Workings	1922	2099383
B	16m SW	Unspecified Ground Workings	1897	2099383
B	16m SW	Unspecified Ground Workings	1884	2117524
B	16m SW	Unspecified Ground Workings	1922	2102359
B	16m SW	Unspecified Ground Workings	1922	2102359
2	18m NE	Nursery	1980	2084886
B	24m SW	Refuse Heap	1991	2139719
B	24m SW	Refuse Heap	1980	2139719
3	96m NE	Transformer Station	1980	2073969
C	137m NW	Cemetery	1991	2111581
C	137m NW	Cemetery	1980	2111581
4	176m N	Disused Gravel Pit	1980	2074765
E	230m NW	Unspecified Pit	1959	2118176
E	232m NW	Unspecified Pit	1946	2135839
E	232m NW	Unspecified Pit	1922	2135839
E	232m NW	Gravel Pit	1897	2095041
E	233m NW	Unspecified Pit	1946	2125571
E	233m NW	Unspecified Pit	1946	2125571
E	236m NW	Unspecified Disused Pit	1991	2099433
E	236m NW	Unspecified Disused Pit	1980	2099433



ID	Location	Land Use	Date	Group ID
F	255m SW	Gravel Pit	1949	2134795
F	258m SW	Gravel Pit	1922	2129266
F	259m SW	Gravel Pit	1922	2112601
F	259m SW	Gravel Pit	1922	2112601
F	260m SW	Gravel Pit	1947	2133352
5	277m NW	Gravel Pit	1976	2145255
6	299m NW	Grave Yard	1884	2077150
H	299m N	Electric Substation	1980	2085820
J	332m NE	Gravel Pit	1884	2095040
J	347m NE	Gravel Pit	1897	2112064
J	353m NE	Gravel Pit	1884	2123347
J	354m NE	Unspecified Pit	1946	2132709
J	354m NE	Unspecified Pit	1946	2132709
J	357m NE	Gravel Pit	1976	2111457
J	357m NE	Unspecified Pit	1946	2132709
J	357m NE	Unspecified Pit	1922	2132709
K	376m N	Oil Depot	1980	2093315
7	386m N	Gravel Pit	1884	2095038
L	389m N	Unspecified Ground Workings	1946	2132844
L	389m N	Unspecified Ground Workings	1922	2132844
L	389m N	Unspecified Ground Workings	1946	2132844
L	389m N	Unspecified Ground Workings	1946	2132844
N	391m NW	Iron Foundry	1897	2104137
K	392m N	Unspecified Pit	1976	2087721
O	409m SW	Smithy	1897	2089381
P	410m NE	Pumping House	1946	2103450
P	411m NE	Pumping House	1946	2117468
P	411m NE	Pumping House	1922	2117468



ID	Location	Land Use	Date	Group ID
8	413m NE	Gravel Pit	1884	2095039
K	420m N	Unspecified Ground Workings	1976	2113990
O	428m SW	Smithy	1884	2089382
N	432m NW	Unspecified Works	1991	2140111
N	432m NW	Unspecified Works	1980	2140111
N	432m NW	Unspecified Works	1959	2153206
N	433m NW	Iron Foundry	1946	2135977
9	433m NW	Gravel Pit	1884	2107882
N	434m NW	Iron Foundry	1884	2130577
N	434m NW	Iron Foundry	1946	2148065
N	434m NW	Iron Foundry	1922	2148065
N	446m NW	Unspecified Foundry	1991	2156285
N	446m NW	Unspecified Foundry	1980	2156285
Q	455m W	Gravel Pit	1947	2117382
Q	456m W	Gravel Pit	1884	2112357
Q	456m W	Gravel Pit	1949	2136001
Q	456m W	Gravel Pit	1976	2118321
Q	457m W	Gravel Pit	1922	2097644
Q	457m W	Gravel Pit	1922	2097644
Q	457m W	Gravel Pit	1922	2105626
Q	457m W	Gravel Pit	1897	2105626
L	461m NW	Unspecified Ground Workings	1976	2097774
10	472m S	Unspecified Pit	1884	2087514

This data is sourced from Ordnance Survey / Groundsure.



2.2 Historical tanks

Records within 500m

14

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

Features are displayed on the Past land use - un-grouped map on [page 19](#) >

ID	Location	Land Use	Date	Group ID
D	140m NE	Unspecified Tank	1993	373120
D	141m NE	Unspecified Tank	1986	373120
I	315m NE	Unspecified Tank	1986	366324
I	316m NE	Unspecified Tank	1993	366324
K	380m N	Tanks	1993	371722
K	383m N	Tanks	1971	370997
K	383m N	Tanks	1986	374657
K	383m N	Tanks	1992	374657
M	391m W	Unspecified Tank	1981	373744
M	391m W	Unspecified Tank	1992	373744
K	399m N	Tanks	1986	372343
K	401m N	Tanks	1971	372343
N	448m NW	Unspecified Tank	1981	365172
N	457m NW	Unspecified Tank	1981	365173

This data is sourced from Ordnance Survey / Groundsure.

2.3 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. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on [page 19](#) >



ID	Location	Land Use	Date	Group ID
G	268m N	Electricity Substation	1993	258876
G	268m N	Electricity Substation	1986	258876
G	268m N	Electricity Substation	1992	258876
G	269m N	Electricity Substation	1971	252045
H	295m N	Electricity Substation	1993	264470
H	299m N	Electricity Substation	1986	261255
H	299m N	Electricity Substation	1992	261255

This data is sourced from Ordnance Survey / Groundsure.

2.4 Historical petrol stations

Records within 500m	0
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Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

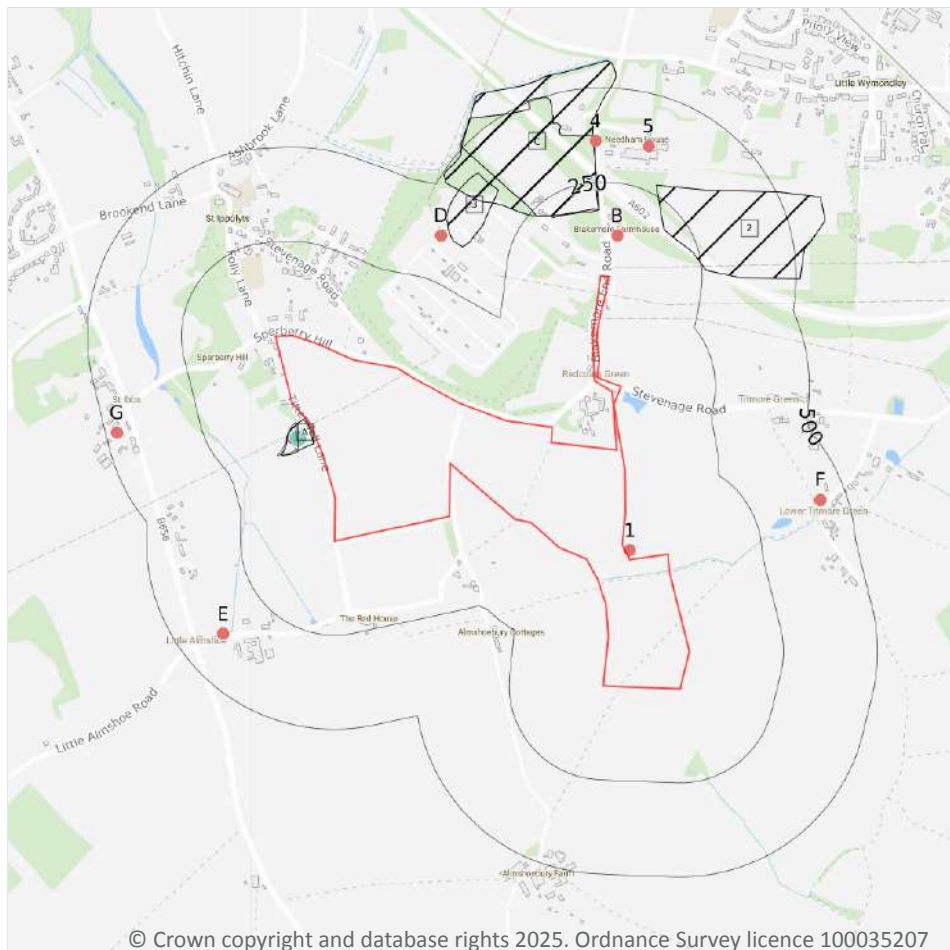
2.5 Historical garages

Records within 500m	0
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Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

3 Waste and landfill



- Site Outline
- Search buffers in metres (m)
- Historical landfill (EA/NRW)
- Historical landfill (BGS)
- Historical landfill (LA/OS)
- Waste exemptions

3.1 Active or recent landfill

Records within 500m

0

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

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

3.2 Historical landfill (BGS records)

Records within 500m

1

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.

Features are displayed on the Waste and landfill map on [page 25 >](#)



ID	Location	Address	BGS Number	Risk	Waste Type
A	44m SW	Tittendell Pit, ST Ippollitts, Hitchin	1550	Risk to major aquifer	N/A

This data is sourced from the British Geological Survey.

3.3 Historical landfill (LA/mapping records)

Records within 500m	1
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Landfill sites identified from Local Authority records and high detail historical mapping.

Features are displayed on the Waste and landfill map on [page 25 >](#)

ID	Location	Site address	Source	Data type
A	25m SW	Refuse Tip	1979 mapping	Polygon

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

3.4 Historical landfill (EA/NRW records)

Records within 500m	5
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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.

Features are displayed on the Waste and landfill map on [page 25 >](#)

ID	Location	Details		
A	4m SW	Site Address: Tittendell, Tittendell Street, St Ippollitts, Hertfordshire Licence Holder Address: -	Waste Licence: - Site Reference: HCC/138 Waste Type: Inert, Industrial, Commercial, Household Environmental Permitting Regulations (Waste) Reference: - Licence Issue: - Licence Surrender: -	Operator: Thomas Brothers Licence Holder: R P L McMurtrie Esq First Recorded 10/09/1964 Last Recorded: 31/12/1975
C	173m N	Site Address: Little Wymondley Gravel Pit, Little Wymondley, Near Hitchin, Hertfordshire Licence Holder Address: -	Waste Licence: - Site Reference: HCC082, LS82, HCC120, 0500/5097 Waste Type: - Environmental Permitting Regulations (Waste) Reference: - Licence Issue: - Licence Surrender: -	Operator: - Licence Holder: - First Recorded - Last Recorded: -



ID	Location	Details		
C	177m N	Site Address: Little Wymondley Quarry, Little Wymondley, Near Hitchen, Hertfordshire Licence Holder Address: 27a Essex Road, Stevenage, Hertfordshire	Waste Licence: Yes Site Reference: 83/157, 78/0085, 78/55, 1900/5342 Waste Type: Inert, Industrial, Commercial Environmental Permitting Regulations (Waste) Reference: - Licence Issue: - Licence Surrender: 30/04/1994	Operator: - Licence Holder: J W Stutley First Recorded - Last Recorded: 31/05/1983
2	194m NE	Site Address: Wymondleybury, Little Wymondley Licence Holder Address: -	Waste Licence: Yes Site Reference: 91/262 Waste Type: Inert Environmental Permitting Regulations (Waste) Reference: - Licence Issue: 20/08/1991 Licence Surrender: 27/01/1993	Operator: - Licence Holder: C J Pryor Earth Moving Contractors Limited First Recorded 20/08/1991 Last Recorded: 27/01/1993
3	340m NW	Site Address: Titmore Green Road, Little Wymondley, Near Hitchen, Hertfordshire Licence Holder Address: Elms Yard, Little Wymondley, Hitchin, Hertfordshire	Waste Licence: - Site Reference: HCC/120 Waste Type: Inert, Industrial, Commercial, Household, Special Environmental Permitting Regulations (Waste) Reference: - Licence Issue: - Licence Surrender: -	Operator: - Licence Holder: Stutley Brothers Limited First Recorded 10/04/1963 Last Recorded: 31/12/1970

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

3.5 Historical waste sites

Records within 500m	0
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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

33

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

Features are displayed on the Waste and landfill map on [page 25 >](#)

ID	Location	Site	Reference	Category	Sub-Category	Description
1	10m NE	-	WEX357243	Disposing of waste exemption	On a farm	Burning waste in the open
B	109m N	-	WEX410259	Using waste exemption	Not on a farm	Use of waste in construction
B	109m N	-	WEX410259	Storing waste exemption	Not on a farm	Storage of waste in secure containers
B	109m N	-	WEX410259	Storing waste exemption	Not on a farm	Storage of waste in a secure place
B	109m N	Ukpn Wymondley Grid, Blakemore End Road, Hitchin, Sg4 7jj	WEX182710	Storing waste exemption	Not on a farm	Storage of waste in a secure place
4	358m N	Waterloo Farm Huntingdon Cambridgeshire Pe28 4hq	EPR/WH0379V C/A001	Disposing of waste exemption	Agricultural waste only	Burning waste in the open
5	361m N	-	WEX316124	Storing waste exemption	Not on a farm	Storage of waste in a secure place
D	369m N	Park Farm Huntingdon Cambridgeshire Pe28 4rn	EPR/JH0974SJ/A001	Disposing of waste exemption	Both agricultural and non-agricultural waste	Burning waste in the open
D	369m N	Park Farm Huntingdon Cambridgeshire Pe28 4rn	EPR/JH0974SJ/A001	Using waste exemption	Both agricultural and non-agricultural waste	Spreading waste on agricultural land to confer benefit
D	369m N	Park Farm Huntingdon Cambridgeshire Pe28 4rn	EPR/JH0974SJ/A001	Using waste exemption	Both agricultural and non-agricultural waste	Use of mulch
D	369m N	Park Farm Huntingdon Cambridgeshire Pe28 4rn	EPR/JH0974SJ/A001	Disposing of waste exemption	Both agricultural and non-agricultural waste	Deposit of waste from dredging of inland waters



ID	Location	Site	Reference	Category	Sub-Category	Description
D	369m N	Park Farm Huntingdon Cambridgeshire Pe28 4rn	EPR/JH0974SJ/ A001	Storing waste exemption	Both agricultural and non-agricultural waste	Storage of waste in a secure place
D	369m N	Park Farm Huntingdon Cambridgeshire Pe28 4rn	EPR/JH0974SJ/ A001	Treating waste exemption	Both agricultural and non-agricultural waste	Cleaning, washing, spraying or coating relevant waste
D	369m N	Park Farm Huntingdon Cambridgeshire Pe28 4rn	EPR/JH0974SJ/ A001	Treating waste exemption	Both agricultural and non-agricultural waste	Preparatory treatments (baling, sorting, shredding etc)
D	369m N	Park Farm Huntingdon Cambridgeshire Pe28 4rn	EPR/JH0974SJ/ A001	Using waste exemption	Both agricultural and non-agricultural waste	Use of waste in construction
D	369m N	Park Farm Huntingdon Cambridgeshire Pe28 4rn	EPR/JH0974SJ/ A001	Using waste exemption	Both agricultural and non-agricultural waste	Spreading of plant matter to confer benefit
E	387m SW	Vicars Grove Pit, Little Almshoe Lane, St Ippolyts, Hitchin, Sg4 7np	WEX248373	Using waste exemption	Not on a farm	Use of waste in construction
E	387m SW	Vicars Grove Pit, Little Almshoe Lane, St Ippolyts, Hitchin, Sg4 7np	WEX248373	Storing waste exemption	Not on a farm	Storage of waste in secure containers
E	387m SW	Vicars Grove Pit, Little Almshoe Lane, St Ippolyts, Hitchin, Sg4 7np	WEX248373	Storing waste exemption	Not on a farm	Storage of waste in a secure place
E	387m SW	Vicars Grove Pit, Little Almshoe Lane, St Ippolyts, Hitchin, Sg4 7np	WEX248373	Treating waste exemption	Not on a farm	Screening and blending of waste
E	387m SW	Vicars Grove Pit, Little Almshoe Lane, St Ippolyts, Hitchin, Sg4 7np	WEX248373	Treating waste exemption	Not on a farm	Sorting mixed waste
E	387m SW	Vicars Grove Pit, Little Almshoe Lane, St Ippolyts, Hitchin, Sg4 7np	WEX248373	Treating waste exemption	Not on a farm	Manual treatment of waste
F	430m E	Green Gates, Lower Titmore Lane, Little Wymondley, Sg47jt	WEX088850	Storing waste exemption	Not on a farm	Storage of waste in a secure place

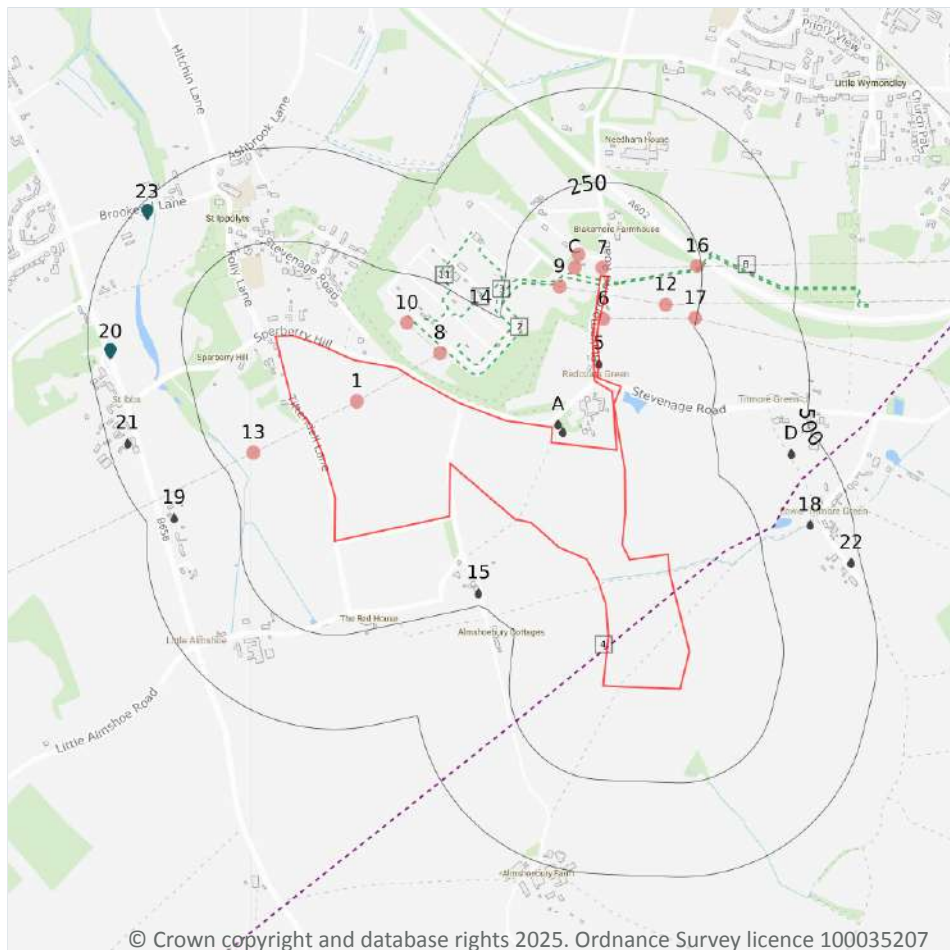


ID	Location	Site	Reference	Category	Sub-Category	Description
F	430m E	Greengates, Lower Titmore Lane, Hitchin, Sg4 7jt	WEX016764	Disposing of waste exemption	On a farm	Deposit of agricultural waste consisting of plant tissue under a Plant Health notice
F	430m E	Greengates, Lower Titmore Lane, Hitchin, Sg4 7jt	WEX016764	Disposing of waste exemption	On a farm	Depositing samples of waste for the purposes of testing or analysing them
F	430m E	Greengates, Lower Titmore Lane, Hitchin, Sg4 7jt	WEX016764	Disposing of waste exemption	On a farm	Disposal by incineration
F	430m E	Greengates, Lower Titmore Lane, Hitchin, Sg4 7jt	WEX016764	Disposing of waste exemption	On a farm	Burning waste in the open
F	430m E	Greengates, Lower Titmore Lane, Hitchin, Sg4 7jt	WEX016764	Disposing of waste exemption	On a farm	Burning waste at a port under a Plant Health notice
F	430m E	Greengates, Lower Titmore Lane, Hitchin, Sg4 7jt	WEX016764	Disposing of waste exemption	On a farm	Deposit of waste from dredging of inland waters
F	430m E	Greengates, Lower Titmore Lane, Hitchin, Sg4 7jt	WEX016764	Disposing of waste exemption	On a farm	Deposit of waste from a railway sanitary convenience
F	430m E	Greengates, Lower Titmore Lane, Hitchin, Sg4 7jt	WEX016764	Disposing of waste exemption	On a farm	Deposit of waste from a portable sanitary convenience
G	472m W	St. Ibbs Farm, London Road, St. Ippolyts, Hitchin, Sg4 7nl	WEX374383	Using waste exemption	Not on a farm	Use of waste in construction
G	472m W	St. Ibbs Farm, London Road, St. Ippolyts, Hitchin, Sg4 7nl	WEX374383	Storing waste exemption	Not on a farm	Storage of waste in a secure place

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
- Electricity cables
- Gas pipelines
- Licensed pollutant release (Part A(2)/B)
- Licensed Discharges to controlled waters

4.1 Recent industrial land uses

Records within 250m

12

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on [page 31](#) >

ID	Location	Company	Address	Activity	Category
1	On site	Pylon	Hertfordshire, SG4	Electrical Features	Infrastructure and Facilities
6	10m E	Pylon	Hertfordshire, SG4	Electrical Features	Infrastructure and Facilities
7	22m N	Pylon	Hertfordshire, SG4	Electrical Features	Infrastructure and Facilities



ID	Location	Company	Address	Activity	Category
C	73m W	Mast (Telecommu nication)	Hertfordshire, SG4	Telecommunications Features	Infrastructure and Facilities
C	81m NW	Pylon	Hertfordshire, SG4	Electrical Features	Infrastructure and Facilities
8	92m NE	Pylon	Hertfordshire, SG4	Electrical Features	Infrastructure and Facilities
9	104m W	Pylon	Hertfordshire, SG4	Electrical Features	Infrastructure and Facilities
10	122m N	Pylon	Hertfordshire, SG4	Electrical Features	Infrastructure and Facilities
12	162m E	Pylon	Hertfordshire, SG4	Electrical Features	Infrastructure and Facilities
13	165m SW	Pylon	Hertfordshire, SG4	Electrical Features	Infrastructure and Facilities
16	238m E	Pylon	Hertfordshire, SG4	Electrical Features	Infrastructure and Facilities
17	247m E	Pylon	Hertfordshire, SG4	Electrical Features	Infrastructure and Facilities

This data is sourced from Ordnance Survey.

4.2 National Geographic Database (NGD) - Current or recent tanks

Records within 250m

0

Current or recent tanks identified from the Ordnance Survey NGD.

This data is sourced from Ordnance Survey.

4.3 Current or recent petrol stations

Records within 500m

0

Open, closed, under development and obsolete petrol stations.

This data is sourced from Experian.



4.4 Electricity cables

Records within 500m

6

High voltage underground electricity transmission cables.

Features are displayed on the Current industrial land use map on [page 31 >](#)

ID	Location	Cable Set	Cable Route	Details	
2	On site	COREYS MILL - WYMONDLEY 3 SECTION 1	COREYS MILL - WYMONDLEY 3	Cable Make: PIRELLI 25KV (Cable Type: A/C Operating Voltage (kV): 33	Year of installation: 2002 Cable in tunnel? Not specified
3	On site	COREYS MILL - WYMONDLEY 4 SECTION 1	COREYS MILL - WYMONDLEY 4	Cable Make: PIRELLI 25KV (Cable Type: A/C Operating Voltage (kV): 33	Year of installation: 2002 Cable in tunnel? Not specified
B	29m E	COREYS MILL - WYMONDLEY 4 SECTION 2	COREYS MILL - WYMONDLEY 4	Cable Make: PIRELLI 25KV (Cable Type: A/C Operating Voltage (kV): 33	Year of installation: 2002 Cable in tunnel? Not specified
B	31m E	COREYS MILL - WYMONDLEY 3 SECTION 2	COREYS MILL - WYMONDLEY 3	Cable Make: PIRELLI 25KV (Cable Type: A/C Operating Voltage (kV): 33	Year of installation: 2002 Cable in tunnel? Not specified
11	149m NE	SGT1 132KV CABLE	WYMONDLEY 400KV S/S	Cable Make: ABB XLPE CWS&P Cable Type: A/C Operating Voltage (kV): 132	Year of installation: 2011 Cable in tunnel? Not specified
14	194m NE	SGT2 132KV CABLE	WYMONDLEY 400KV S/S	Cable Make: ABB XLPE CWS&P Cable Type: A/C Operating Voltage (kV): 132	Year of installation: 2011 Cable in tunnel? Not specified

This data is sourced from National Grid.

4.5 Gas pipelines

Records within 500m

1

High pressure underground gas transmission pipelines.

Features are displayed on the Current industrial land use map on [page 31 >](#)

ID	Location	Pipe Name	Details	
4	On site	GREAT WILBRAHAM TO WHITWELL	Pipe Number: - Pipeline Safety Regulations Number: - Ownership: National Grid Maximum Operating Pressure (Bar): -	Pipeline Diameter (mm): 900 Wall Thickness (mm): - Year of commission: Not specified Abandonment Status: Not abandoned

This data is sourced from National Grid.



4.6 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.

4.7 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.

4.8 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.

4.9 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.

4.10 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.

4.11 Licensed industrial activities (Part A(1))

Records within 500m

0

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

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

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

Records within 500m

2

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.

Features are displayed on the Current industrial land use map on [page 31 >](#)

ID	Location	Address	Details	
20	442m W	National Grid Site, Nr Whitwell, Hitchin, SG4 0SL	Process: Gas Processes Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of enforcement: No Enforcements Notified Comment: No Enforcements Notified
23	475m NW	Henry Isaacs, The Foundry, St Ippolit, Hichin, SG4 7NX	Process: Non-ferrous Metal Foundry Processes Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of enforcement: No Enforcements Notified Comment: No Enforcements Notified

This data is sourced from Local Authority records.

4.13 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.

4.14 Licensed Discharges to controlled waters

Records within 500m

12

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

Features are displayed on the Current industrial land use map on [page 31 >](#)



ID	Location	Address	Details	
5	On site	REDCOATS FARMHOUSE HOTEL, REDCOATS FARMHOUSE HOTEL, REDCOATS GREEN, NR HITCHIN, HERTFORDSHIRE, SG4 7JR	Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: PRCLF00160 Permit Version: 1 Receiving Water: land	Status: PRE NRA LEGISLATION WHERE ISSUE DATE 01-SEP-89 (HISTORIC ONLY) Issue date: 02/12/1988 Effective Date: 02/12/1988 Revocation Date: 20/11/2012
A	18m NE	REDCOATS FARMHOUSE HOTEL, REDCOATS FARMHOUSE HOTEL, REDCOATS GREEN, NR HITCHIN, HERTFORDSHIRE, SG4 7JR	Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: PRCLF00160 Permit Version: 2 Receiving Water: land	Status: VARIED UNDER EPR 2010 Issue date: 21/11/2012 Effective Date: 21/11/2012 Revocation Date: 29/11/2017
A	28m E	REDCOATS FARMHOUSE HOTEL, REDCOATS FARMHOUSE HOTEL, REDCOATS GREEN, NR HITCHIN, HERTFORDSHIRE, SG4 7JR	Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: PRCLF00160 Permit Version: 3 Receiving Water: GROUNDWATER VIA INFILT SYS	Status: VARIED UNDER EPR 2010 Issue date: 30/11/2017 Effective Date: 30/11/2017 Revocation Date: -
15	217m S	1-6 ALMSHOEBURY COTTAGES, ST IPPOLLITTS, HERTS, SG4 7NS	Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: PRCNF05039 Permit Version: 1 Receiving Water: Trib Ippollitt's Brook	Status: POST NRA LEGISLATION WHERE ISSUE DATE > 31-AUG-89 (HISTORIC ONLY) Issue date: 28/04/1992 Effective Date: 28/04/1992 Revocation Date: 07/01/1997
18	385m E	HERMIT OF REDCOATS PUBLIC HOUSE, & TITMORE GREEN FARM, TITMORE GREEN, WYMONDLEY, HERTS, SG4 7JT	Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: PRCNF05686 Permit Version: 1 Receiving Water: Ashbrook	Status: REVOKED (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 01/08/1996 Effective Date: 01/08/1996 Revocation Date: 05/10/2003
D	423m NE	HERMIT OF REDCOATS PUBLIC HOUSE, & TITMORE GREEN FARM, TITMORE GREEN, WYMONDLEY, HERTS, SG4 7JT	Effluent Type: SEWAGE & TRADE COMBINED - UNSPECIFIED Permit Number: PRCLF14943 Permit Version: 1 Receiving Water: Ashbrook	Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 06/10/2003 Effective Date: 06/10/2003 Revocation Date: 13/12/2011
D	423m NE	HERMIT OF REDCOATS PUBLIC HOUSE, & TITMORE GREEN FARM, TITMORE GREEN, WYMONDLEY, HERTS, SG4 7JT	Effluent Type: SEWAGE & TRADE COMBINED - UNSPECIFIED Permit Number: PRCLF14943 Permit Version: 1 Receiving Water: Ashbrook	Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 06/10/2003 Effective Date: 06/10/2003 Revocation Date: 13/12/2011



ID	Location	Address	Details	
D	423m NE	HERMIT OF REDCOATS PUBLIC HOUSE, & TITMORE GREEN FARM, TITMORE GREEN, WYMONDLEY, HERTS, SG4 7JT	Effluent Type: SEWAGE & TRADE COMBINED - UNSPECIFIED Permit Number: PRCLF14943 Permit Version: 2 Receiving Water: Ashbrook	Status: VARIED UNDER EPR 2010 Issue date: 14/12/2011 Effective Date: 14/12/2011 Revocation Date: -
D	423m NE	HERMIT OF REDCOATS PUBLIC HOUSE, & TITMORE GREEN FARM, TITMORE GREEN, WYMONDLEY, HERTS, SG4 7JT	Effluent Type: SEWAGE & TRADE COMBINED - UNSPECIFIED Permit Number: PRCLF14943 Permit Version: 2 Receiving Water: Ashbrook	Status: VARIED UNDER EPR 2010 Issue date: 14/12/2011 Effective Date: 14/12/2011 Revocation Date: -
19	427m W	HOBBS HALL, LONDON ROAD, STIPPOLYTS, HITCHIN, HERTS	Effluent Type: UNSPECIFIED Permit Number: PRCLF03890 Permit Version: 1 Receiving Water: -	Status: POST NRA LEGISLATION WHERE ISSUE DATE > 31-AUG-89 (HISTORIC ONLY) Issue date: 05/11/1990 Effective Date: 05/11/1990 Revocation Date: 01/10/1996
21	451m W	4 PROPERTIES AT FORMER DRAGON INN, LONDON ROAD, ST IPPOLYTS, HITCHIN, SG4 7NL	Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: EPRQB3191VL Permit Version: 1 Receiving Water: GROUNDWATER	Status: NEW ISSUED UNDER EPR 2010 Issue date: 01/04/2020 Effective Date: 01/04/2020 Revocation Date: -
22	474m E	TITMORE GREEN COTTAGES, LOWER TITMORE GREEN, NR STEVENAGE, HERTS, SG4 7JT	Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: PRCNF01053 Permit Version: 1 Receiving Water: Trib River Purwell	Status: POST NRA LEGISLATION WHERE ISSUE DATE > 31-AUG-89 (HISTORIC ONLY) Issue date: 08/06/1989 Effective Date: 08/06/1989 Revocation Date: 09/01/1992

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

4.15 Pollutant release to surface waters (Red List)

Records within 500m	0
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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.



4.16 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.

4.17 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.

4.18 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.

4.19 Pollution Incidents (EA/NRW)

Records within 500m**0**

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

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

4.20 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.



4.21 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.

4.22 Pollution inventory radioactive waste

Records within 500m

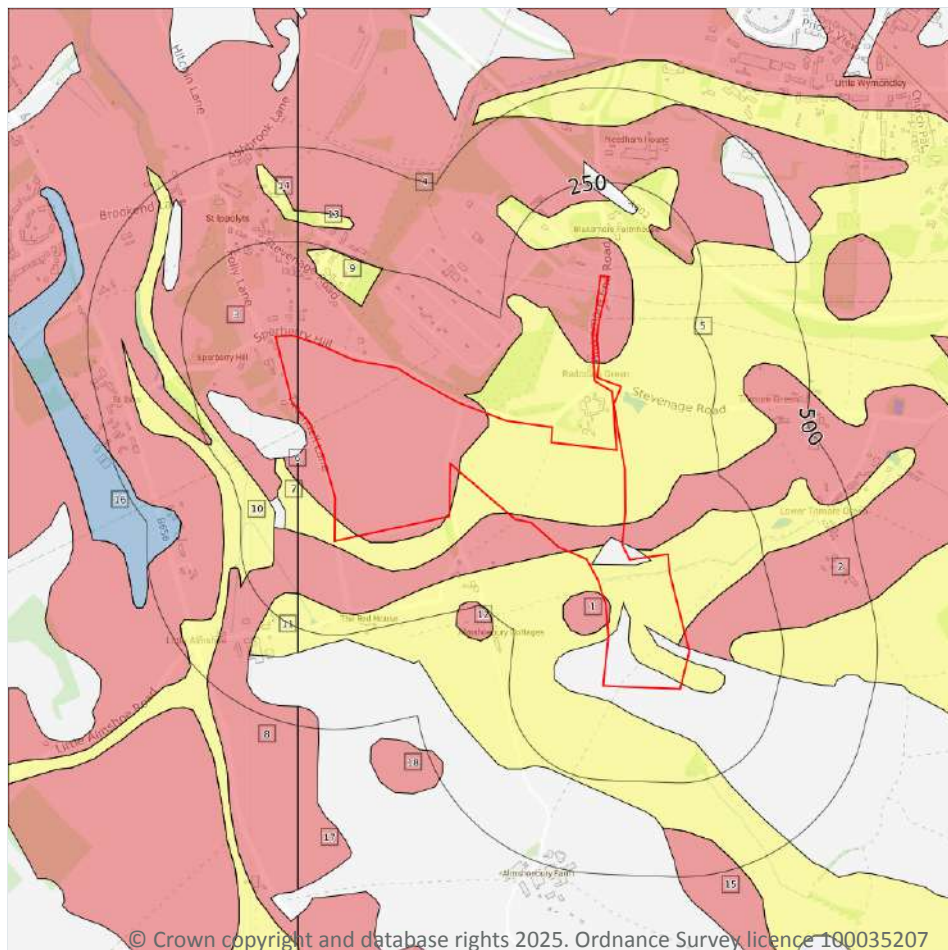
0

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

18

Aquifer status of groundwater held within superficial geology.

Features are displayed on the Hydrogeology map on [page 40 >](#)

ID	Location	Designation	Description
1	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
2	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers



ID	Location	Designation	Description
3	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
4	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
5	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
6	61m SW	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
7	84m W	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
8	98m W	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
9	138m NE	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
10	158m W	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
11	170m SW	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
12	233m S	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
13	295m N	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
14	302m N	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
15	370m S	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
16	408m W	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow

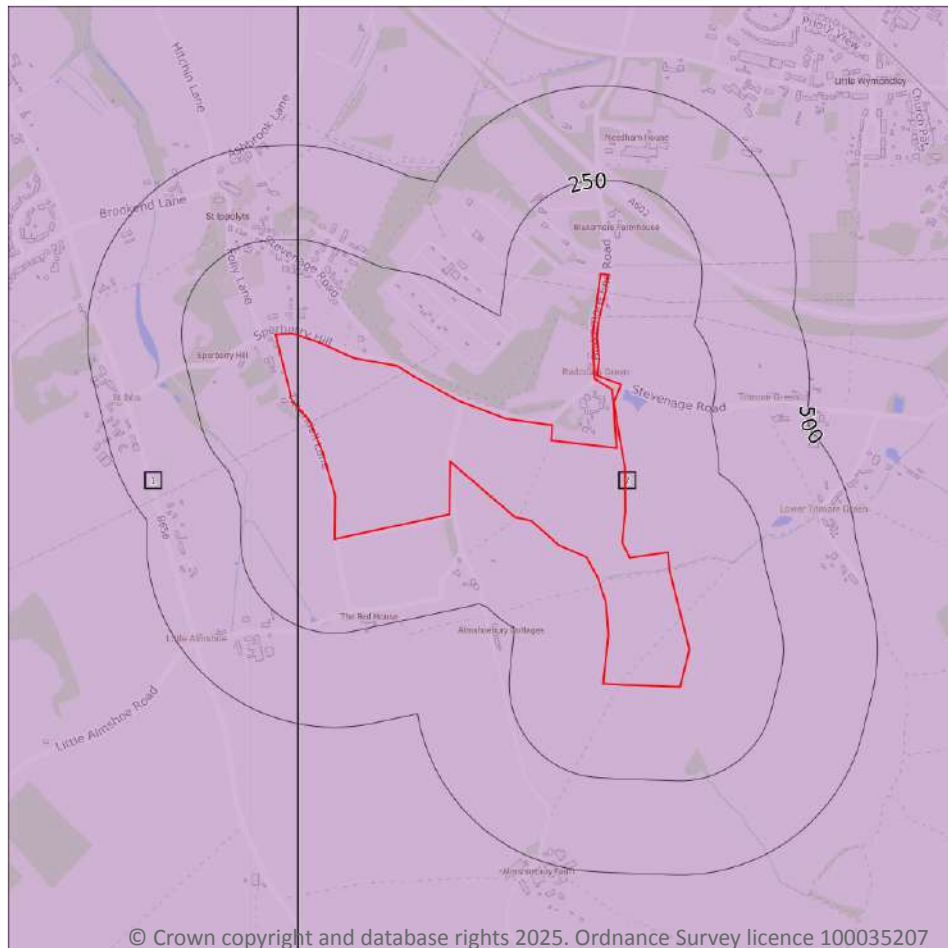


ID	Location	Designation	Description
17	449m S	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
18	472m SW	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

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



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 43](#) >

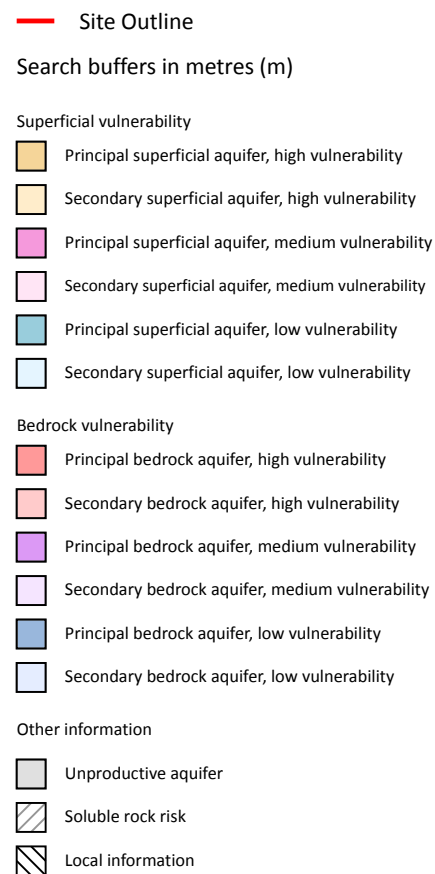
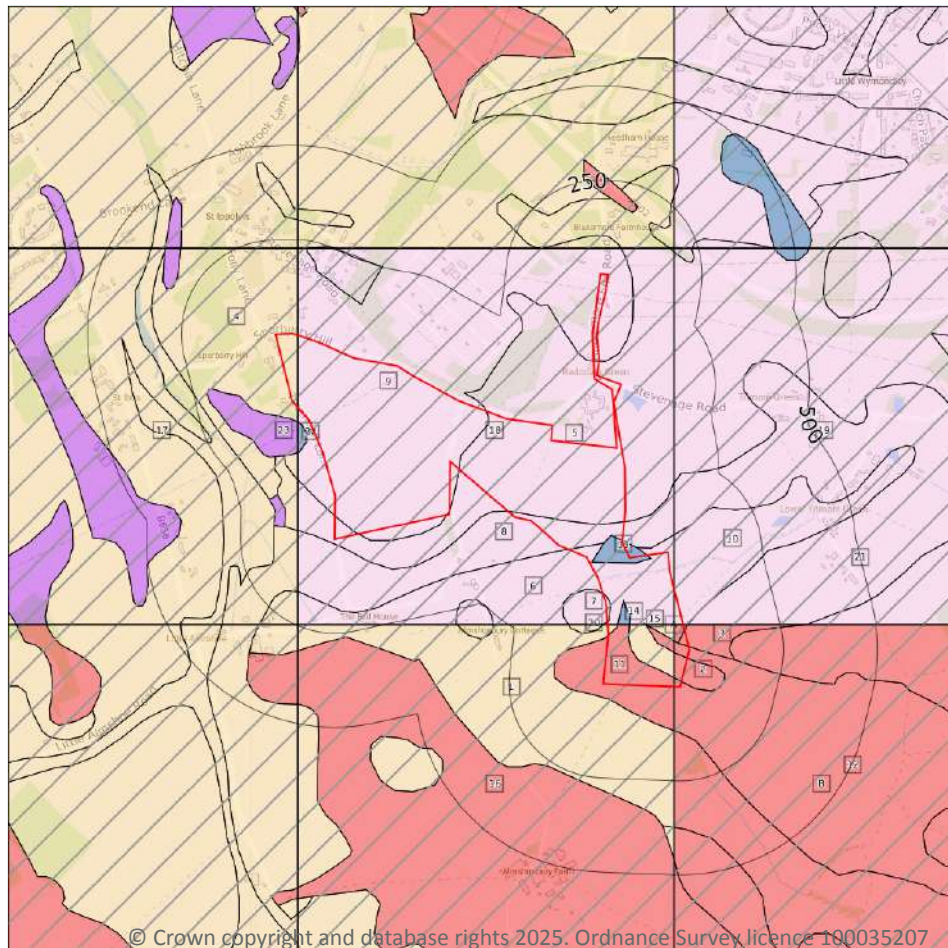
ID	Location	Designation	Description
1	On site	Principal	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers
2	On site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



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



Groundwater vulnerability



5.3 Groundwater vulnerability

Records within 50m

23

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 45](#) >



ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	On site	Summary Classification: Secondary superficial aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: <300mm/year	Vulnerability: High Aquifer type: Secondary Thickness: <3m Patchiness value: <90% Recharge potential: No Data	Vulnerability: High Aquifer type: Principal Flow mechanism: Well connected fractures
2	On site	Summary Classification: Principal bedrock aquifer - High 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: No Data	Vulnerability: High Aquifer type: Principal Flow mechanism: Well connected fractures
3	On site	Summary Classification: Principal bedrock aquifer - High 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: No Data	Vulnerability: High Aquifer type: Principal Flow mechanism: Well connected fractures
4	On site	Summary Classification: Secondary superficial aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: <300mm/year	Vulnerability: High Aquifer type: Secondary Thickness: >10m Patchiness value: >90% Recharge potential: High	Vulnerability: Medium Aquifer type: Principal Flow mechanism: Well connected fractures
5	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: 3-10m Patchiness value: >90% Recharge potential: High	Vulnerability: Low Aquifer type: Principal Flow mechanism: Well connected fractures
6	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: 3-10m Patchiness value: >90% Recharge potential: High	Vulnerability: Low Aquifer type: Principal Flow mechanism: Well connected fractures



ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
7	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: 3-10m Patchiness value: >90% Recharge potential: High	Vulnerability: Low Aquifer type: Principal Flow mechanism: Well connected fractures
8	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: 3-10m Patchiness value: >90% Recharge potential: High	Vulnerability: Low Aquifer type: Principal Flow mechanism: Well connected fractures
9	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: 3-10m Patchiness value: >90% Recharge potential: High	Vulnerability: Low Aquifer type: Principal Flow mechanism: Well connected fractures
10	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: >10m Patchiness value: >90% Recharge potential: High	Vulnerability: Low Aquifer type: Principal Flow mechanism: Well connected fractures
11	On site	Summary Classification: Principal bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: <300mm/year	Vulnerability: - Aquifer type: - Thickness: <3m Patchiness value: <90% Recharge potential: No Data	Vulnerability: High Aquifer type: Principal Flow mechanism: Well connected fractures
12	On site	Summary Classification: Principal bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: Intermediate Infiltration value: 40-70% Dilution value: <300mm/year	Vulnerability: - Aquifer type: - Thickness: <3m Patchiness value: <90% Recharge potential: No Data	Vulnerability: High Aquifer type: Principal Flow mechanism: Well connected fractures



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



ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
20	11m W	Summary Classification: Secondary superficial aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: <300mm/year	Vulnerability: High Aquifer type: Secondary Thickness: <3m Patchiness value: <90% Recharge potential: No Data	Vulnerability: High Aquifer type: Principal Flow mechanism: Well connected fractures
21	12m E	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: >10m Patchiness value: >90% Recharge potential: High	Vulnerability: Low Aquifer type: Principal Flow mechanism: Well connected fractures
22	19m SW	Summary Classification: Principal bedrock aquifer - Low Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: Intermediate Infiltration value: 40- 70% Dilution value: <300mm/year	Vulnerability: - Aquifer type: - Thickness: 3-10m Patchiness value: >90% Recharge potential: High	Vulnerability: Low Aquifer type: Principal Flow mechanism: Well connected fractures
23	25m SW	Summary Classification: Principal bedrock aquifer - Medium Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: <300mm/year	Vulnerability: - Aquifer type: - Thickness: >10m Patchiness value: >90% Recharge potential: High	Vulnerability: Medium Aquifer type: Principal Flow mechanism: Well connected fractures

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

5.4 Groundwater vulnerability- soluble rock risk

Records on site	5
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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
16	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.	0.0%
17	Significant soluble rocks are likely to be present. Problems unlikely except with considerable surface or subsurface water flow.	78.0%



ID	Maximum soluble risk category	Percentage of grid square covered by maximum risk
18	Significant soluble rocks are likely to be present. Problems unlikely except with considerable surface or subsurface water flow.	79.0%
19	Significant soluble rocks are likely to be present. Problems unlikely except with considerable surface or subsurface water flow.	55.00000000000001%
B	Very significant soluble rocks are likely to be present with a moderate possibility of localised natural subsidence or dissolution-related degradation of bedrock, especially in adverse conditions such as concentrated surface or subsurface water flow.	2.0%

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

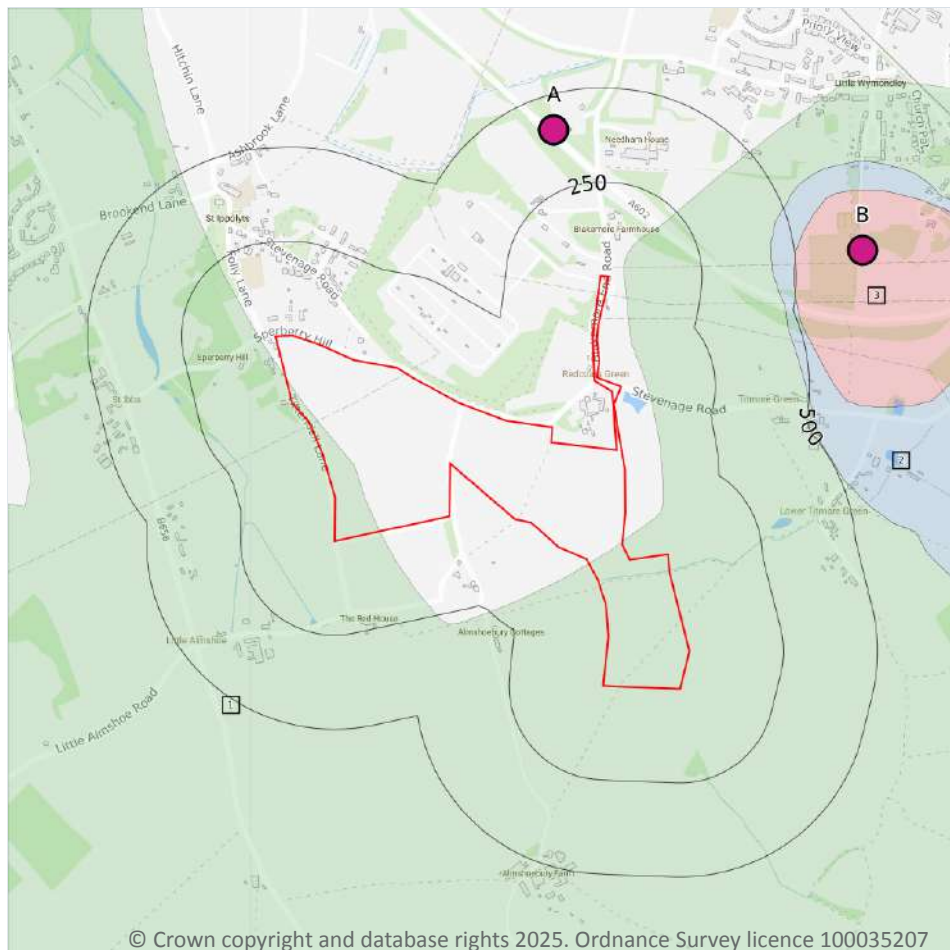
5.5 Groundwater vulnerability- local information

Records on site	0
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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
Point features
- 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

10

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 51](#) >

ID	Location	Details	
A	408m N	Status: Historical Licence No: 6/33/13/*G/0086 Details: General Farming & Domestic Direct Source: GROUND WATER SOURCE OF SUPPLY Point: BOREHOLE W OF LITTLE WYMONDLEY Data Type: Point Name: HERTFORDSHIRE & BEDFORDSHIRE PETROLEUM Easting: 520680 Northing: 227320	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 01/04/1985 Expiry Date: - Issue No: 100 Version Start Date: 01/04/1988 Version End Date: -
A	408m N	Status: Historical Licence No: 6/33/13/*G/0086 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: GROUND WATER SOURCE OF SUPPLY Point: BOREHOLE W OF LITTLE WYMONDLEY Data Type: Point Name: HERTFORDSHIRE & BEDFORDSHIRE PETROLEUM Easting: 520680 Northing: 227320	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 01/04/1985 Expiry Date: - Issue No: 100 Version Start Date: 01/04/1988 Version End Date: -
B	679m E	Status: Active Licence No: 6/33/13/*G/0007 Details: Potable Water Supply - Direct Direct Source: GROUND WATER SOURCE OF SUPPLY Point: BOREHOLE - LITTLE WYMONDLEY Data Type: Point Name: Affinity Water Limited Easting: 521500 Northing: 227000	Annual Volume (m ³): 414831 Max Daily Volume (m ³): 1528 Original Application No: NPS/WR/034570 Original Start Date: 01/11/1966 Expiry Date: - Issue No: 105 Version Start Date: 17/09/2020 Version End Date: -
-	1175m E	Status: Active Licence No: 6/33/13/*G/0097 Details: Spray Irrigation - Direct Direct Source: GROUND WATER SOURCE OF SUPPLY Point: BOREHOLE AT TODDS GREEN Data Type: Point Name: F T GEARING LANDSCAPE Easting: 522030 Northing: 226730	Annual Volume (m ³): 9100 Max Daily Volume (m ³): 45 Original Application No: - Original Start Date: 01/05/1996 Expiry Date: - Issue No: 100 Version Start Date: 01/05/1996 Version End Date: -
-	1485m SW	Status: Historical Licence No: 6/33/13/*G/0053 Details: Spray Irrigation - Direct Direct Source: GROUND WATER SOURCE OF SUPPLY Point: BOREHOLE E OF POYNDERS END Data Type: Point Name: FAWCETT Easting: 520000 Northing: 224600	Annual Volume (m ³): 882 Max Daily Volume (m ³): 27.28 Original Application No: - Original Start Date: 01/05/1968 Expiry Date: - Issue No: 100 Version Start Date: 01/04/1995 Version End Date: -



ID	Location	Details	
-	1485m SW	Status: Historical Licence No: 6/33/13/*G/0053 Details: General Farming & Domestic Direct Source: GROUND WATER SOURCE OF SUPPLY Point: BOREHOLE E OF POYNDERS END Data Type: Point Name: FAWCETT Easting: 520000 Northing: 224600	Annual Volume (m ³): 882 Max Daily Volume (m ³): 27.28 Original Application No: - Original Start Date: 01/05/1968 Expiry Date: - Issue No: 100 Version Start Date: 01/04/1995 Version End Date: -
-	1941m SW	Status: Historical Licence No: 6/33/13/*G/0095 Details: General Farming & Domestic Direct Source: GROUND WATER SOURCE OF SUPPLY Point: BOREHOLE AT POYNDERS END Data Type: Point Name: KEAN Easting: 518900 Northing: 224700	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 01/04/1995 Expiry Date: - Issue No: 100 Version Start Date: 01/10/1996 Version End Date: -
-	1941m SW	Status: Historical Licence No: 6/33/13/*G/0095 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Household Direct Source: GROUND WATER SOURCE OF SUPPLY Point: BOREHOLE AT POYNDERS END Data Type: Point Name: KEAN Easting: 518900 Northing: 224700	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 01/04/1995 Expiry Date: - Issue No: 100 Version Start Date: 01/10/1996 Version End Date: -
-	1976m W	Status: Historical Licence No: 6/33/13/*G/0046 Details: General Farming & Domestic Direct Source: GROUND WATER SOURCE OF SUPPLY Point: BOREHOLE AT TATMORE PLACE Data Type: Point Name: DERMAL LABORATORIES LTD Easting: 518100 Northing: 226000	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 01/12/1967 Expiry Date: - Issue No: 100 Version Start Date: 01/02/1972 Version End Date: -
-	1992m N	Status: Historical Licence No: 6/33/13/*G/0043 Details: General Farming & Domestic Direct Source: GROUND WATER SOURCE OF SUPPLY Point: FOUR BOREHOLES AT NINE SPRINGS Data Type: Point Name: BURDETT-COUTTS Easting: 520500 Northing: 228900	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 01/02/1969 Expiry Date: - Issue No: 100 Version Start Date: 01/09/1990 Version End Date: -

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



5.7 Surface water abstractions

Records within 2000m

1

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

Features are displayed on the Abstractions and Source Protection Zones map on [page 51 >](#)

ID	Location	Details	
-	1926m N	Status: Historical Licence No: 6/33/13/*S/0034 Details: Spray Irrigation - Direct Direct Source: SURFACE WATER SOURCE OF SUPPLY Point: WATERCOURSE N OF GT WYMONDLEY Data Type: Line Name: LETCHWORTH GARDEN CITY HERITAGE FOUNDATION Easting: 520630 Northing: 228850	Annual Volume (m ³): 22300 Max Daily Volume (m ³): 727 Original Application No: - Original Start Date: 01/11/1967 Expiry Date: - Issue No: 100 Version Start Date: 01/03/1999 Version End Date: -

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

5.8 Potable abstractions

Records within 2000m

3

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

Features are displayed on the Abstractions and Source Protection Zones map on [page 51 >](#)

ID	Location	Details	
A	408m N	Status: Historical Licence No: 6/33/13/*G/0086 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: GROUND WATER SOURCE OF SUPPLY Point: BOREHOLE W OF LITTLE WYMONDLEY Data Type: Point Name: HERTFORDSHIRE & BEDFORDSHIRE PETROLEUM Easting: 520680 Northing: 227320	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 01/04/1985 Expiry Date: - Issue No: 100 Version Start Date: 01/04/1988 Version End Date: -



ID	Location	Details	
B	679m E	Status: Active Licence No: 6/33/13/*G/0007 Details: Potable Water Supply - Direct Direct Source: GROUND WATER SOURCE OF SUPPLY Point: BOREHOLE - LITTLE WYMONDLEY Data Type: Point Name: Affinity Water Limited Easting: 521500 Northing: 227000	Annual Volume (m ³): 414831 Max Daily Volume (m ³): 1528 Original Application No: NPS/WR/034570 Original Start Date: 01/11/1966 Expiry Date: - Issue No: 105 Version Start Date: 17/09/2020 Version End Date: -
-	1941m SW	Status: Historical Licence No: 6/33/13/*G/0095 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Household Direct Source: GROUND WATER SOURCE OF SUPPLY Point: BOREHOLE AT POYNDRS END Data Type: Point Name: KEAN Easting: 518900 Northing: 224700	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 01/04/1995 Expiry Date: - Issue No: 100 Version Start Date: 01/10/1996 Version End Date: -

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

5.9 Source Protection Zones

Records within 500m	3
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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 51](#) >

ID	Location	Type	Description
1	On site	3	Total catchment
2	436m E	2	Outer catchment
3	494m E	1	Inner catchment

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

5.10 Source Protection Zones (confined aquifer)

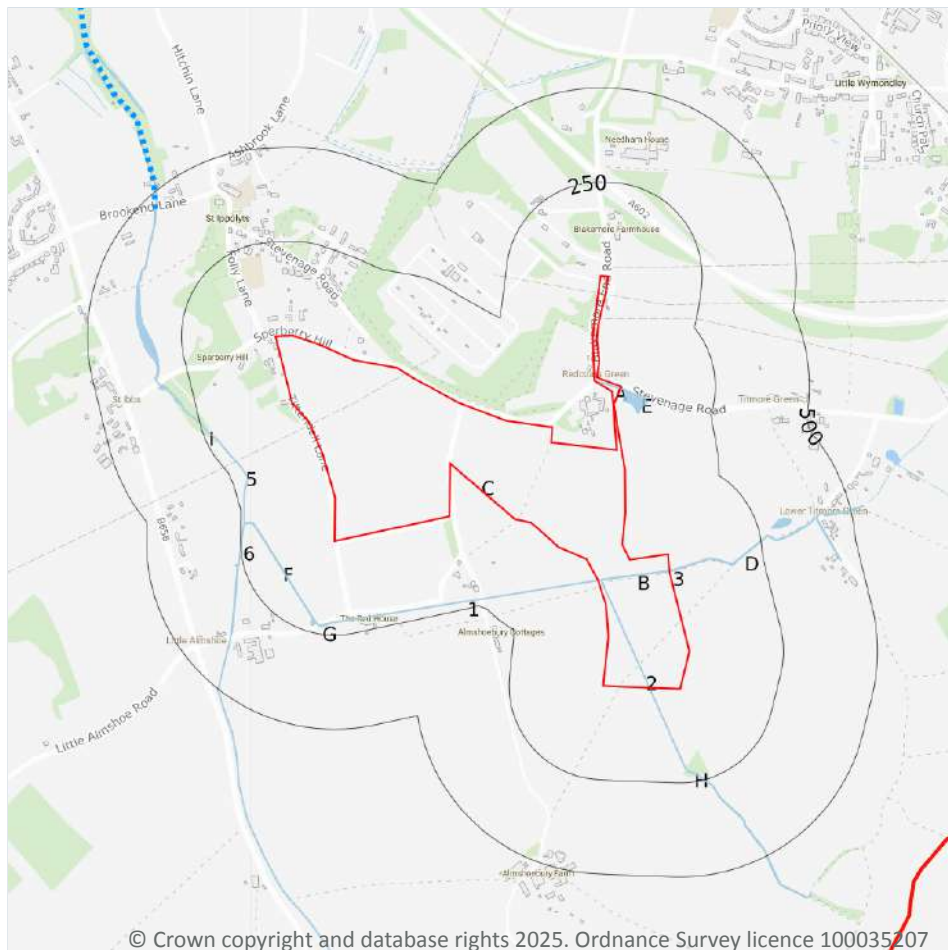
Records within 500m	0
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Source Protection Zones in the confined aquifer define the sensitivity around a deep groundwater abstraction to contamination. A confined aquifer would normally be protected from contamination by overlying geology and is only 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

16

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 56 >](#)

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



ID	Location	Type of water feature	Ground level	Permanence	Name
2	On site	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
A	On site	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
B	On site	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
3	1m E	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	-
D	7m E	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
E	16m SE	Lake, loch or reservoir.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
F	157m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
5	208m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Ippollitts Brook
G	215m S	Lake, loch or reservoir.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
H	220m S	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
H	233m S	Lake, loch or reservoir.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
I	238m W	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Ippollitts Brook
I	239m W	Marsh. An area that is predominantly waterlogged by freshwater.	On ground surface	Watercourse contains water year round (in normal circumstances)	Ippollitts Brook



ID	Location	Type of water feature	Ground level	Permanence	Name
6	240m W	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Langley Brook
I	247m W	Marsh. An area that is predominantly waterlogged by freshwater.	On ground surface	Watercourse contains water year round (in normal circumstances)	Ippollitts Brook

This data is sourced from the Ordnance Survey.

6.2 Surface water features

Records within 250m

8

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 56 >](#)

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 56 >](#)

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
C	On site	River	Purwell	GB105033037690	Ivel	Ouse Upper and Bedford

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 56 >](#)

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
9	465m NW	River	Purwell	GB105033037690 ↗	Moderate	Fail	Moderate	2019

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

6.5 WFD Groundwater bodies

Records on site

1

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

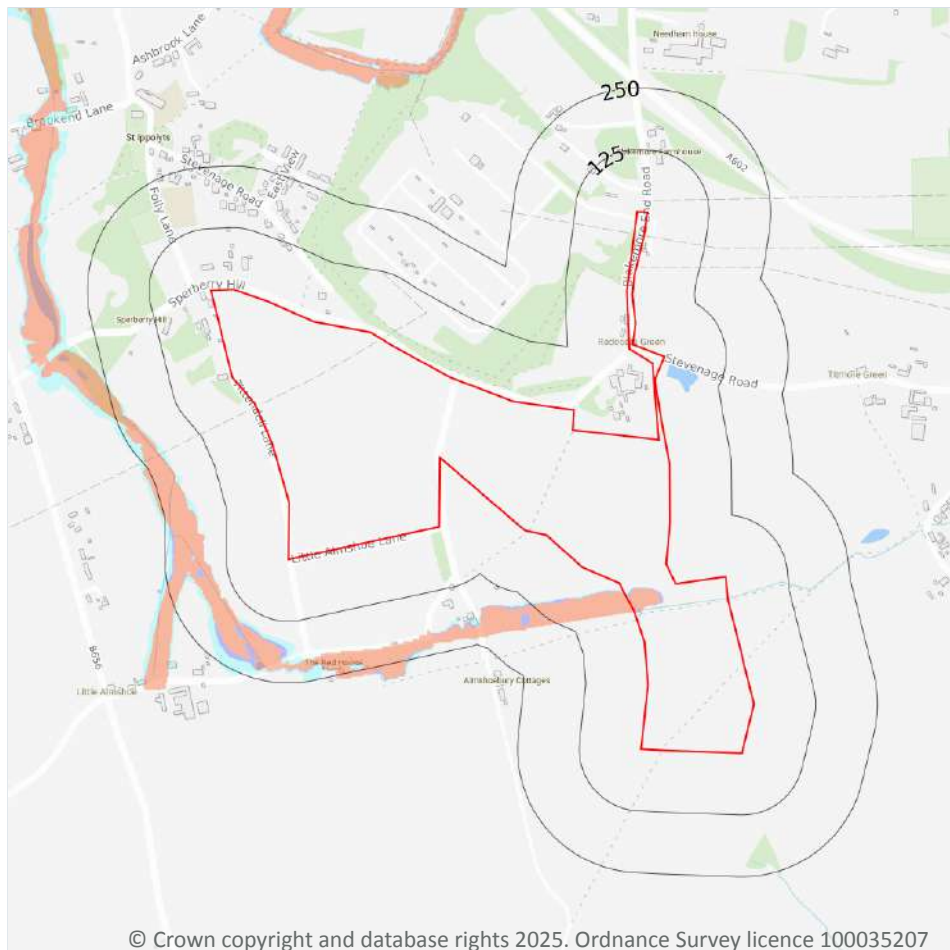
Features are displayed on the Hydrology map on [page 56 >](#)

ID	Location	Name	Water body ID	Overall rating	Chemical rating	Quantitative	Year
C	On site	Upper Bedford Ouse Chalk	GB40601G603000 ↗	Poor	Poor	Poor	2019

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



7 River and coastal flooding



- Site Outline
- Search buffers in metres (m)
- 250
- 125
- River and coastal flooding:
- High
- Medium
- Low
- Very Low
- Historical Flood Events
- Areas Used for Flood Storage
- Areas Benefiting from Flood Defences
- Flood Defences

7.1 Risk of flooding from rivers and the sea

Records within 50m

3

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).

Features are displayed on the River and coastal flooding map on [page 60 >](#)



Distance	Flood risk category
On site	High
0 - 50m	High

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



- Site Outline
- Search buffers in metres (m)
- Flood zone 2
- Flood zone 3

7.6 Flood Zone 2

Records within 50m

1

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.

Features are displayed on the River and coastal flooding map on [page 60](#) >

Location	Type
On site	Zone 2 - (Fluvial /Tidal Models)

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



7.7 Flood Zone 3

Records within 50m

1

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.

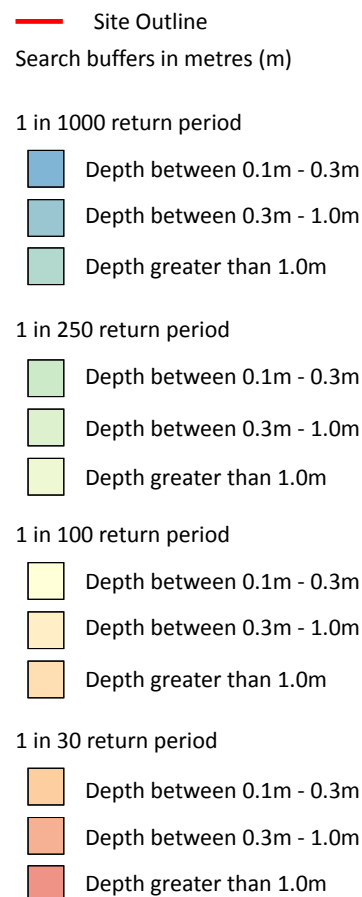
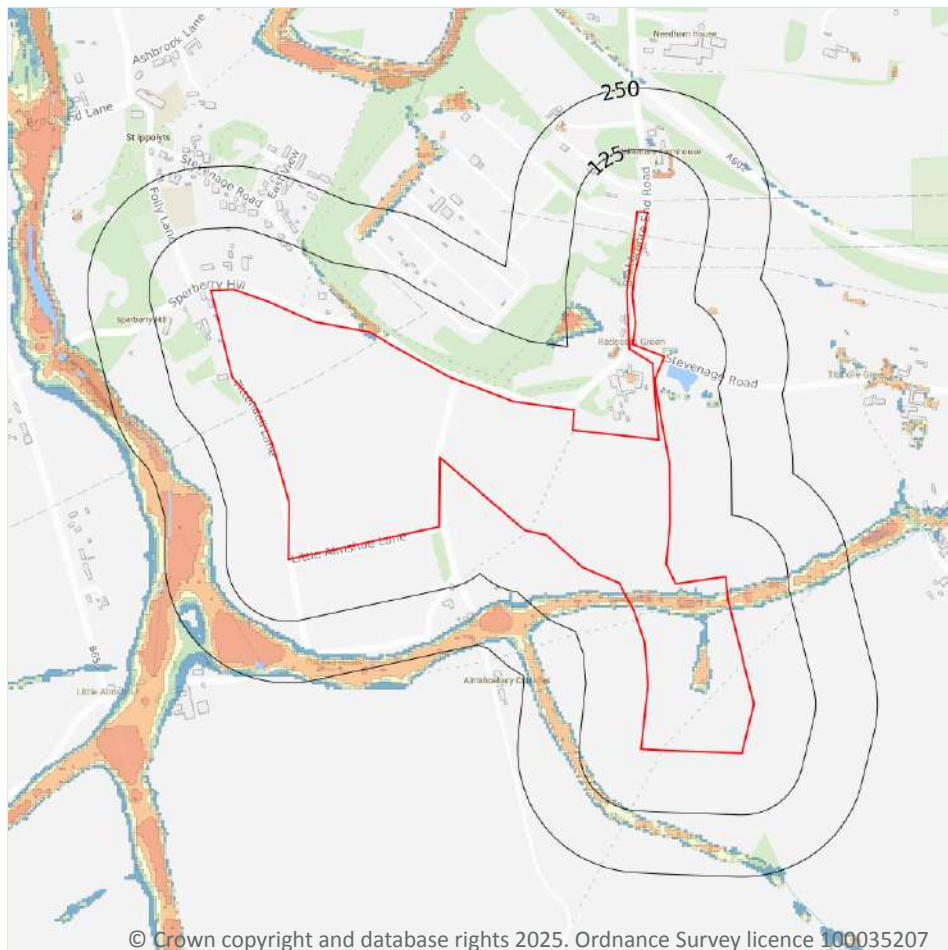
Features are displayed on the River and coastal flooding map on [page 60](#) >

Location	Type
On site	Zone 3 - (Fluvial /Tidal Models)

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, Greater than 1.0m

Highest risk within 50m

1 in 30 year, Greater than 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 64 >](#)

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.

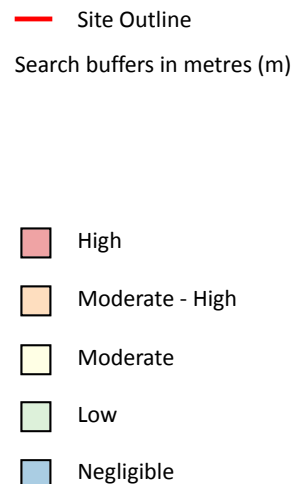
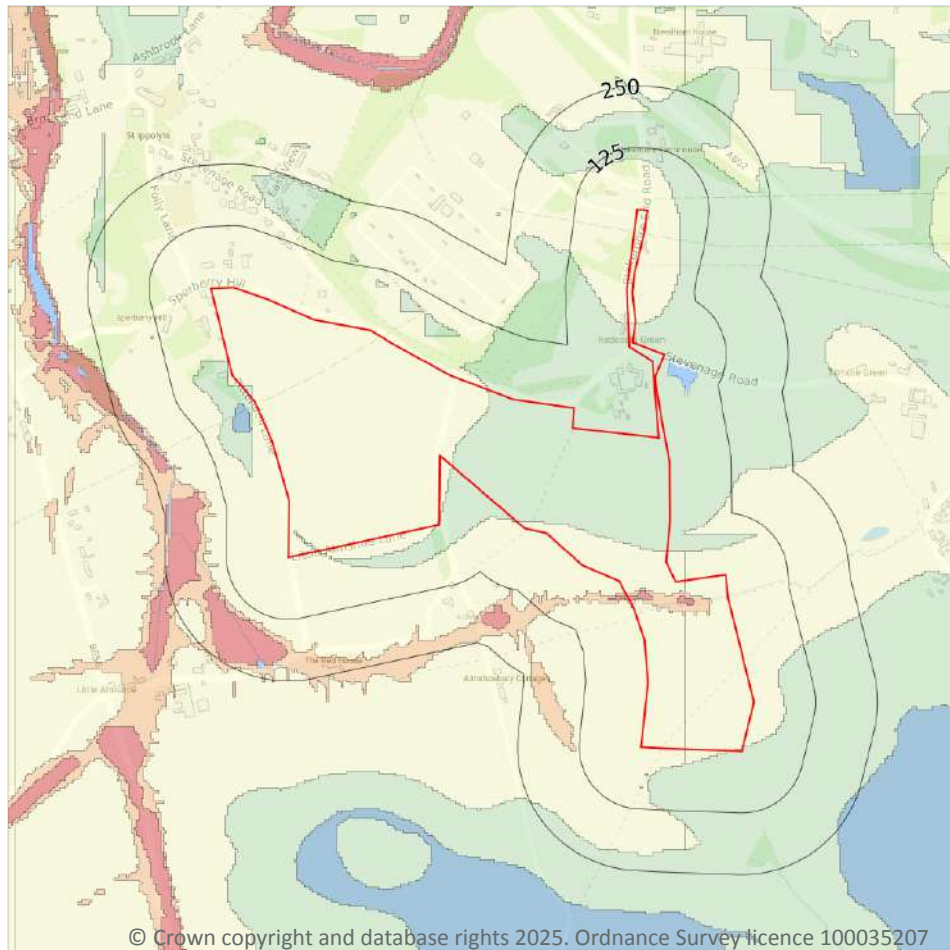
The table below shows the maximum flood depths for a range of return periods for the site.

Return period	Maximum modelled depth
1 in 1000 year	Greater than 1.0m
1 in 250 year	Greater than 1.0m
1 in 100 year	Greater than 1.0m
1 in 30 year	Greater than 1.0m

This data is sourced from Ambiantal Risk Analytics.



9 Groundwater flooding



9.1 Groundwater flooding

Highest risk on site

High

Highest risk within 50m

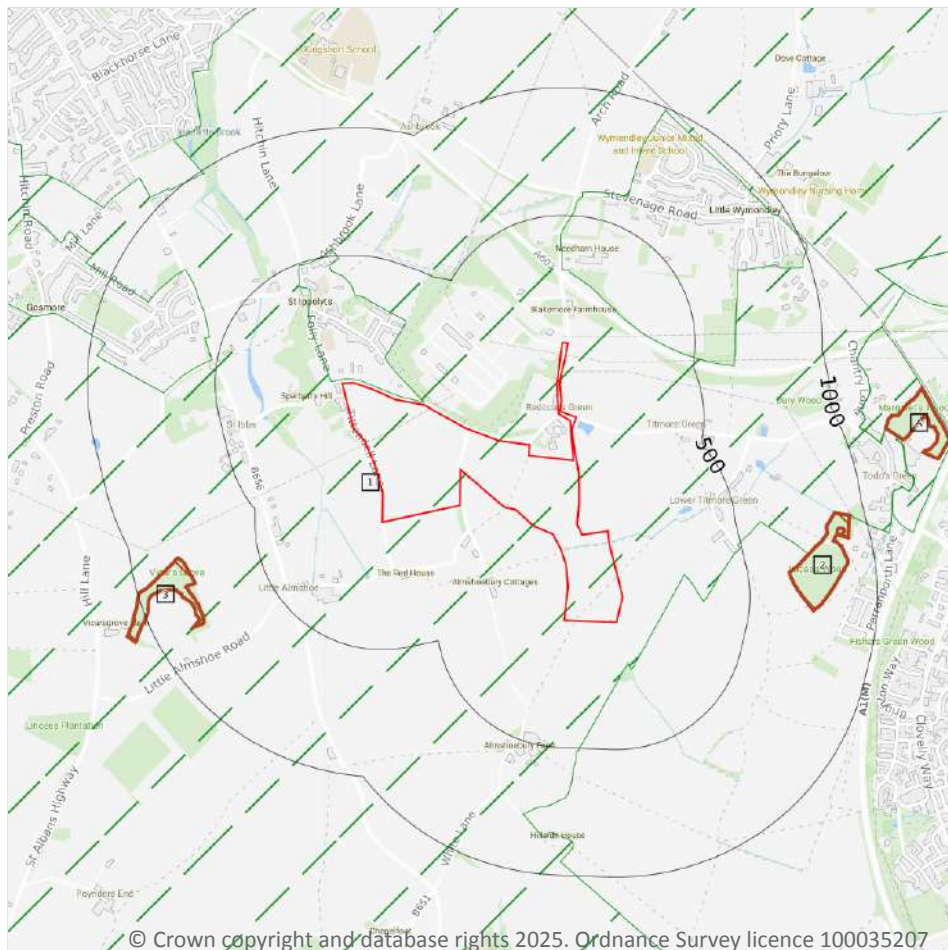
High

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 66](#) >

This data is sourced from Ambiantal Risk Analytics.

10 Environmental designations



- Site Outline
- Search buffers in metres (m)
- Sites of Special Scientific Interest (SSSI)
- Designated Ancient Woodland
- Green Belt

10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m

2

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.

Features are displayed on the Environmental designations map on [page 67](#) >

ID	Location	Name	Data source
-	1882m W	Wain Wood SSSI	Natural England



ID	Location	Name	Data source
-	1959m W	Wain Wood SSSI	Natural England

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

6

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 67 >](#)

ID	Location	Name	Woodland Type
2	661m E	Unknown	Ancient & Semi-Natural Woodland
3	773m W	Vicars Grove	Ancient & Semi-Natural Woodland
A	1162m E	Unknown	Ancient & Semi-Natural Woodland
-	1882m W	Unknown	Ancient & Semi-Natural Woodland
-	1975m SW	Unknown	Ancient Replanted Woodland
-	1994m SW	Unknown	Ancient Replanted Woodland

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

10.8 Biosphere Reserves

Records within 2000m

0

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

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



10.9 Forest Parks

Records within 2000m**0**

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

This data is sourced from the Forestry Commission.

10.10 Marine Conservation Zones

Records within 2000m**0**

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

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

10.11 Green Belt

Records within 2000m**3**

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

Features are displayed on the Environmental designations map on [page 67 >](#)

ID	Location	Name	Local Authority name
1	On site	London Green Belt	North Hertfordshire
A	1066m E	London Green Belt	Stevenage
4	1243m E	London Green Belt	Stevenage

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

5

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	Great Ouse NVZ	Surface Water	391	Existing

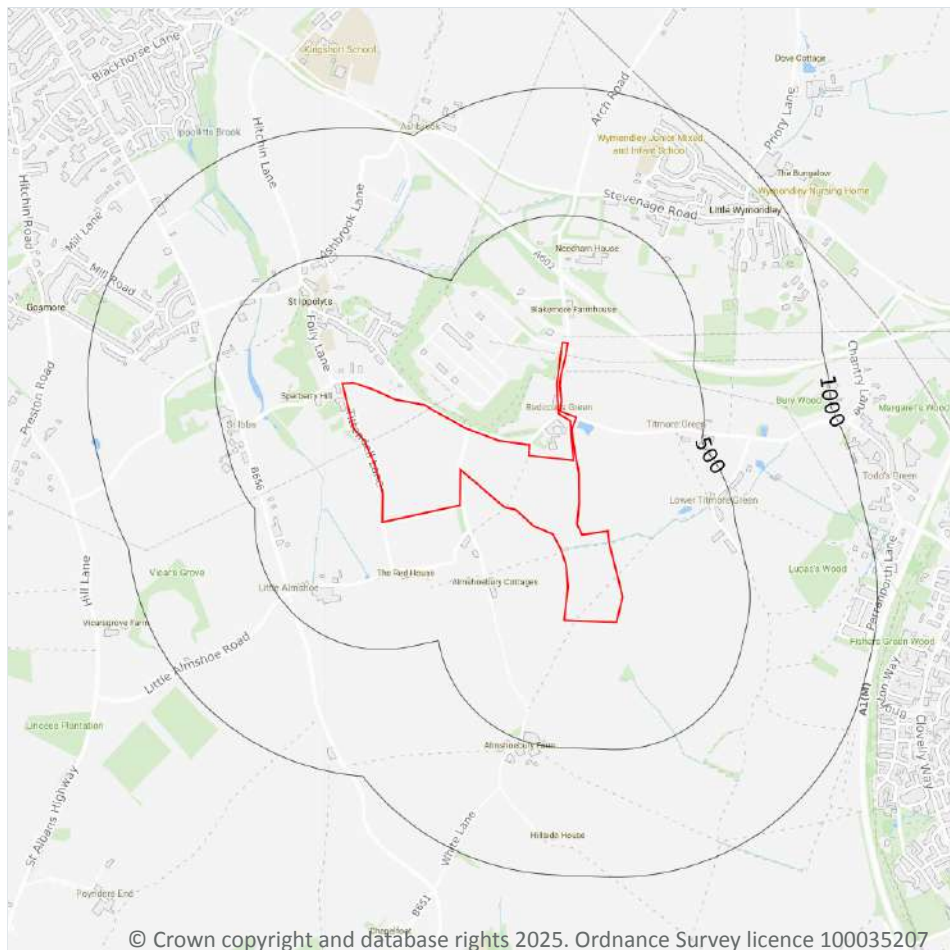


Location	Name	Type	NVZ ID	Status
On site	Great Ouse NVZ	Surface Water	391	Existing
On site	Anglian Chalk	Groundwater	71	Existing
On site	Anglian Chalk	Groundwater	71	Existing
785m SE	LEE NVZ	Surface Water	443	Existing

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

0

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

This data is sourced from Natural England.

10.18 SSSI Units

Records within 2000m

2

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.

Features are displayed on the SSSI Impact Zones and Units map on [page 73 >](#)

ID: -
 Location: 1882m W
 SSSI name: Wain Wood
 Unit name: Wains Wood
 Broad habitat: Broadleaved, Mixed And Yew Woodland - Lowland
 Condition: Unfavourable - Recovering
 Reportable features:

Feature name	Feature condition	Date of assessment
Lowland mixed deciduous woodland	Unfavourable - Recovering	20/05/2009

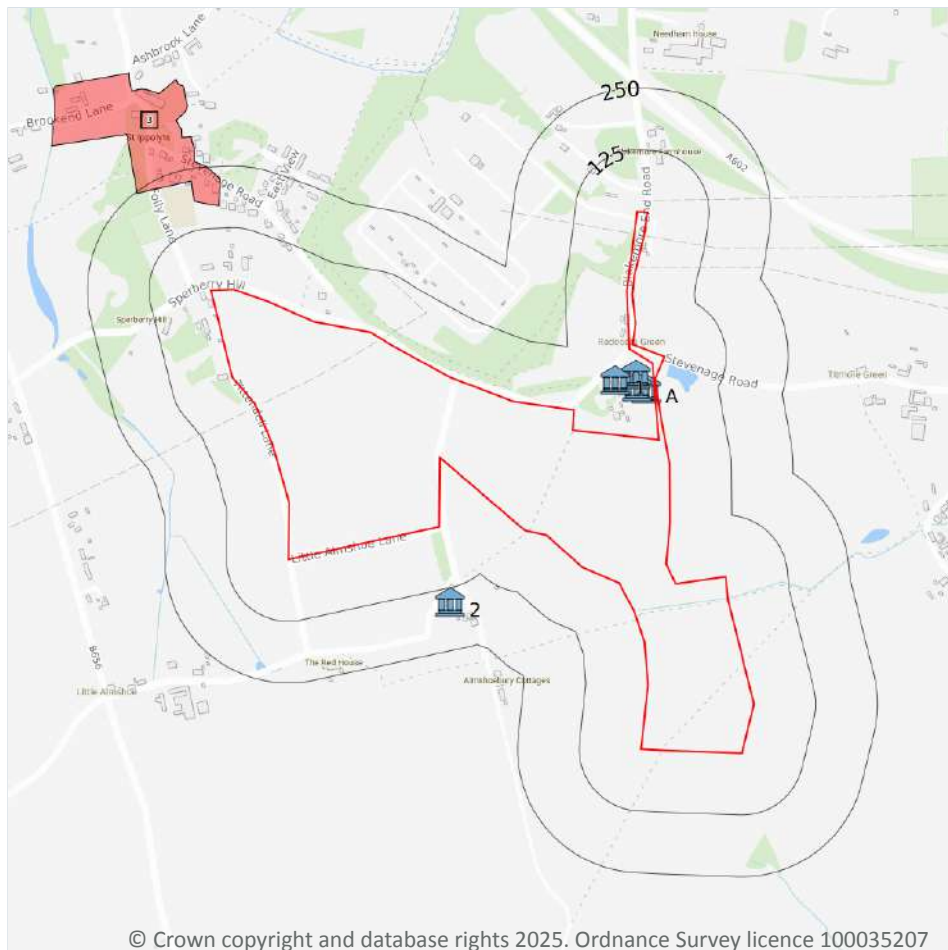
ID: -
 Location: 1959m W
 SSSI name: Wain Wood
 Unit name: Wains Wood
 Broad habitat: Broadleaved, Mixed And Yew Woodland - Lowland
 Condition: Unfavourable - Recovering
 Reportable features:

Feature name	Feature condition	Date of assessment
Lowland mixed deciduous woodland	Unfavourable - Recovering	20/05/2009

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

5

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 75 >](#)

ID	Location	Name	Grade	Reference Number	Listed date
A	17m W	Granary At Redcoat Farm, 20 Metres To East Of Farm Building Courtyard	II	1102465	28/05/1987
A	34m W	Small Barn At Redcoats Farm, On East Side Of Farmyard	II	1102464	28/05/1987
A	36m W	L-Shaped Barn Range At Redcoats Farm At North East Of Farmyard	II	1102463	28/05/1987
1	68m SW	Redcoats Farmhouse Hotel	II*	1102462	27/05/1968
2	154m S	The Wyck	II	1175127	09/06/1952



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 75 >](#)

ID	Location	Name	District	Date of designation
3	171m N	St Ippolyts	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

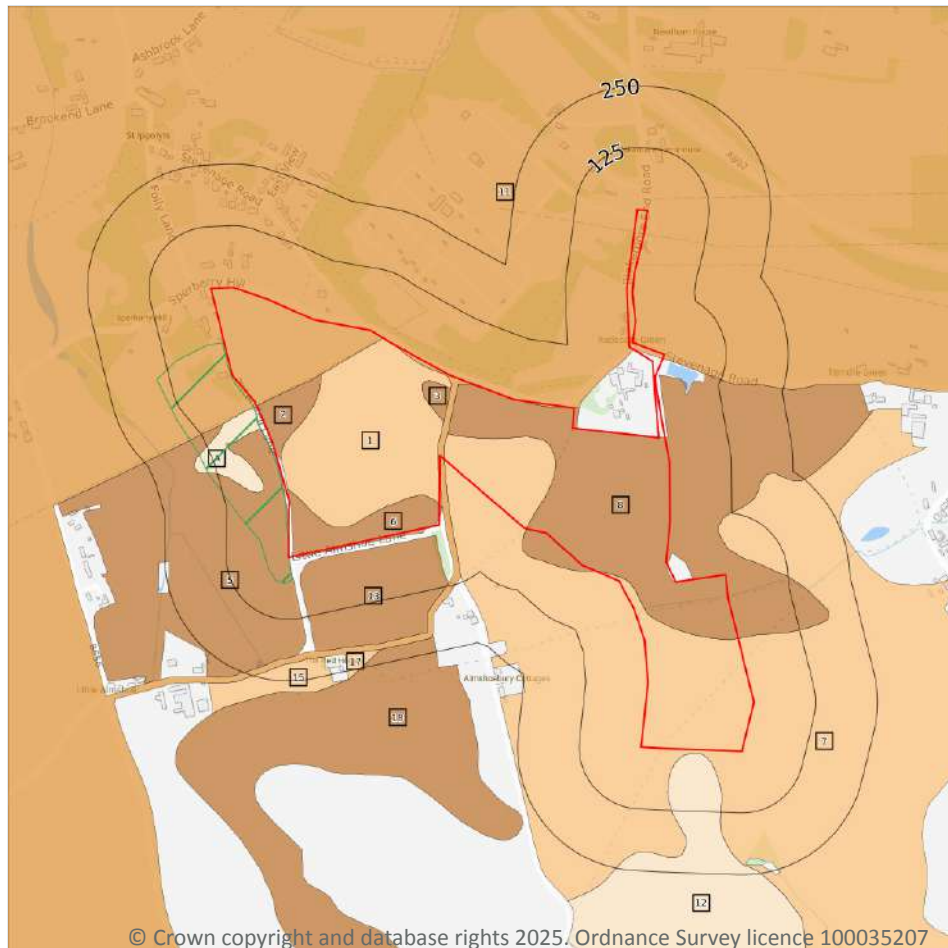
0

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

14

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 78](#) >

ID	Location	Classification	Description
1	On site	Grade 3a	Good quality agricultural land. Land capable of consistently producing moderate to high yields of a narrow range of arable crops, especially cereals, or moderate yields of a wide range of crops including cereals, grass, oilseed rape, potatoes, sugar beet and the less demanding horticultural crops.



ID	Location	Classification	Description
2	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.
3	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.
5	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.
6	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.
7	On site	Grade 3a	Good quality agricultural land. Land capable of consistently producing moderate to high yields of a narrow range of arable crops, especially cereals, or moderate yields of a wide range of crops including cereals, grass, oilseed rape, potatoes, sugar beet and the less demanding horticultural crops.
8	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.
11	On site	Grade 3	Good to moderate quality agricultural land. Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where more demanding crops are grown yields are generally lower or more variable than on land in Grades 1 and 2.
A	4m SW	Grade 3b	Moderate quality agricultural land. Land capable of producing moderate yields of a narrow range of crops, principally cereals and grass or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year.
12	7m S	Grade 3b	Moderate quality agricultural land. Land capable of producing moderate yields of a narrow range of crops, principally cereals and grass or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year.



ID	Location	Classification	Description
13	14m S	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.
15	209m S	Grade 3a	Good quality agricultural land. Land capable of consistently producing moderate to high yields of a narrow range of arable crops, especially cereals, or moderate yields of a wide range of crops including cereals, grass, oilseed rape, potatoes, sugar beet and the less demanding horticultural crops.
17	215m S	Grade 3a	Good quality agricultural land. Land capable of consistently producing moderate to high yields of a narrow range of arable crops, especially cereals, or moderate yields of a wide range of crops including cereals, grass, oilseed rape, potatoes, sugar beet and the less demanding horticultural crops.
18	216m S	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

1

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.

Features are displayed on the Agricultural designations map on [page 78 >](#)



ID	Location	Description	Reference	Application date
A	On site	Selective Fell/Thin (Conditional)	017/130/05-06	26/09/2005

This data is sourced from the Forestry Commission.

12.4 Environmental Stewardship Schemes

Records within 250m	2
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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.

Location	Reference	Scheme	Start Date	End date
On site	AG00383695	Entry Level plus Higher Level Stewardship	01/10/2011	30/09/2021
90m W	AG00449774	Entry Level plus Higher Level Stewardship	01/07/2013	30/06/2023

This data is sourced from Natural England.

12.5 Countryside Stewardship Schemes

Records within 250m	9
----------------------------	----------

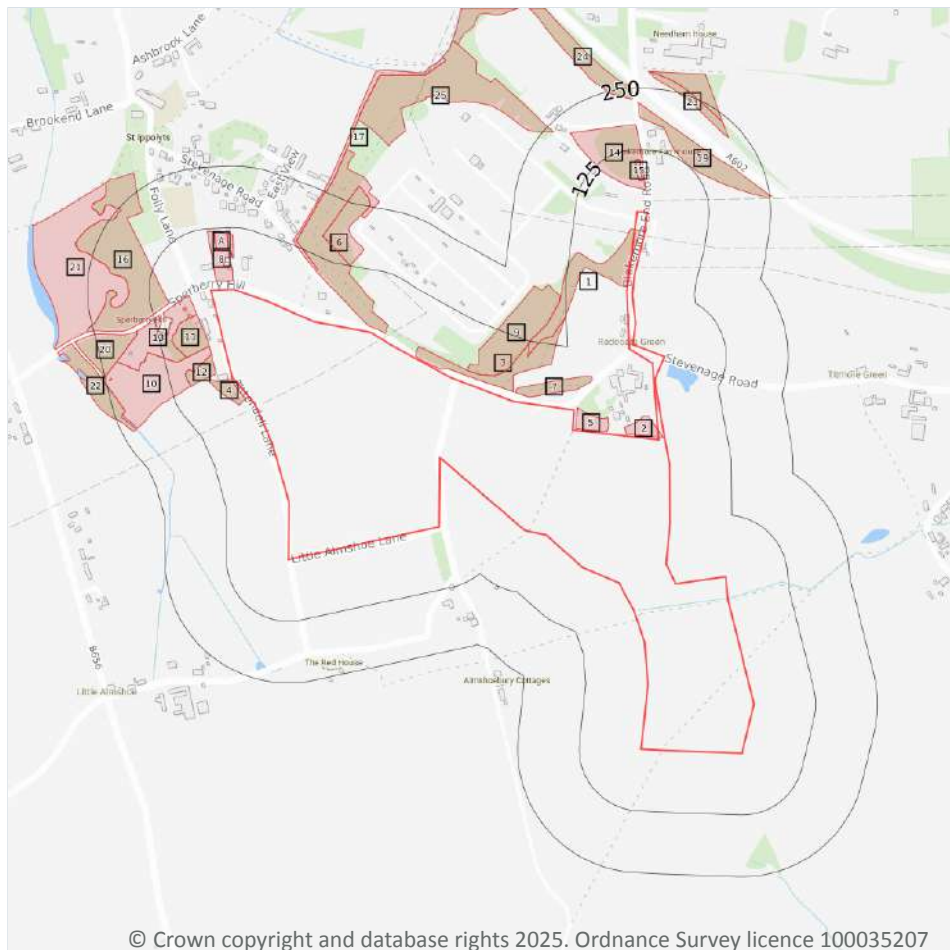
Countryside Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. Main objectives are to improve the farmed environment for wildlife and to reduce diffuse water pollution.

Location	Reference	Scheme	Start Date	End Date
On site	828403	Countryside Stewardship (Middle Tier)	01/01/2020	31/12/2024
On site	1058195	Countryside Stewardship (Middle Tier)	01/01/2021	31/12/2025
On site	1234258	Countryside Stewardship (Higher Tier)	01/01/2022	31/12/2031
On site	1234258	Countryside Stewardship (Higher Tier)	01/01/2022	31/12/2031
1m W	1058195	Countryside Stewardship (Middle Tier)	01/01/2021	31/12/2025
47m W	1270257	Countryside Stewardship (Middle Tier)	01/01/2022	31/12/2026
201m NW	1270257	Countryside Stewardship (Middle Tier)	01/01/2022	31/12/2026
207m SW	1057745	Countryside Stewardship (Middle Tier)	01/01/2021	31/12/2025
223m NE	828403	Countryside Stewardship (Middle Tier)	01/01/2020	31/12/2024

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

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13.1 Priority Habitat Inventory

Records within 250m

28

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 82](#) >

ID	Location	Main Habitat	Other habitats
1	On site	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
2	On site	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
3	3m NE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
4	3m SW	Deciduous woodland	Main habitat: DWOOD (INV > 50%)



ID	Location	Main Habitat	Other habitats
5	3m N	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
6	11m N	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
7	13m N	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
8	17m N	No main habitat but additional habitats present	Additional: TORCH (INV 50%)
9	25m N	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
10	30m W	Good quality semi-improved grassland	Main habitat: GQSIG (INV > 50%)
11	30m W	No main habitat but additional habitats present	Main habitat: DWOOD (INV > 50%)
12	30m W	Deciduous woodland	Main habitat: DWOOD (INV > 50%); GQSIG (INV > 50%)
13	39m W	No main habitat but additional habitats present	Additional: DWOOD (INV 50%)
14	46m N	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
15	63m N	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
A	81m N	Traditional orchard	Overruled by Traditional Orchards HAP Inventory dataset
16	88m W	Deciduous woodland	Main habitat: DWOOD (INV > 50%); Additional: GQSIG (FEP 50%)
17	96m NE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
A	114m N	Traditional orchard	Overruled by Traditional Orchards HAP Inventory dataset
18	126m N	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
19	127m NE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
20	165m W	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
21	166m W	No main habitat but additional habitats present	Additional: DWOOD (INV 50%); GQSIG (FEP 50%)
22	221m SW	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
23	221m NE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
24	228m N	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
25	234m NW	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
26	238m NE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)

This data is sourced from Natural England.



13.2 Habitat Networks

Records within 250m

0

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

This data is sourced from Natural England.

13.3 Open Mosaic Habitat

Records within 250m

0

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

This data is sourced from Natural England.

13.4 Limestone Pavement Orders

Records within 250m

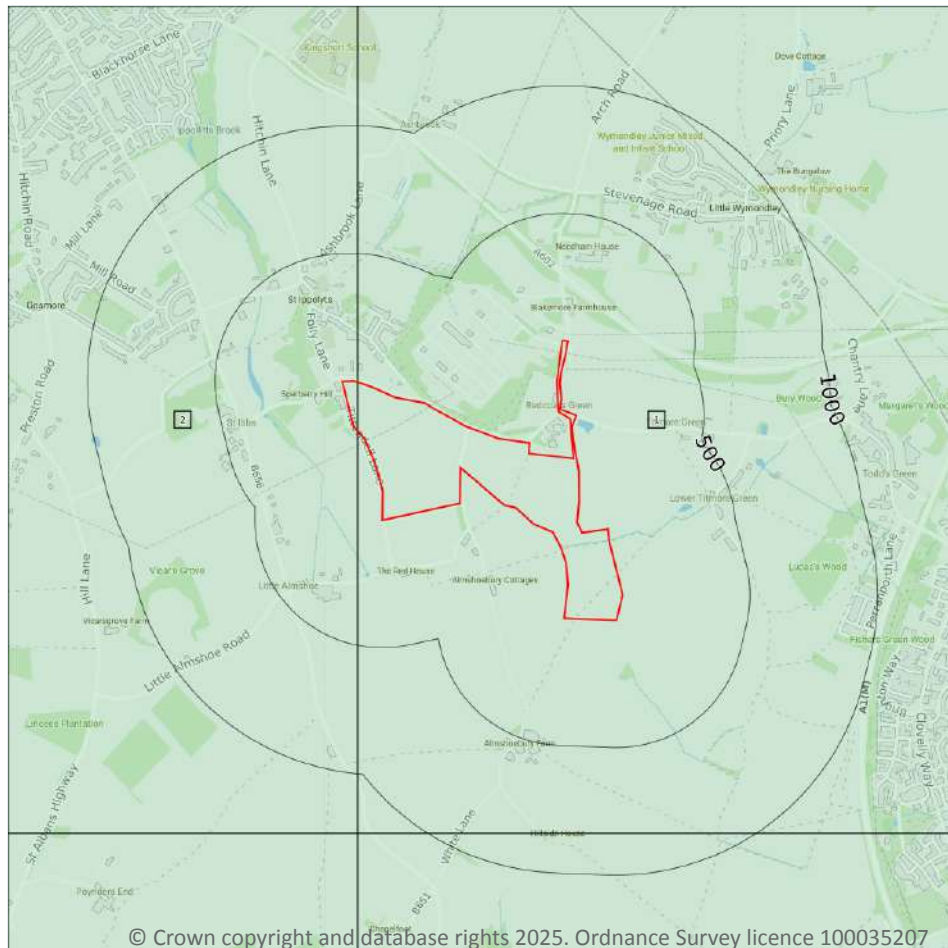
0

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

This data is sourced from Natural England.



14 Geology 1:10,000 scale - Availability



— Site Outline
Search buffers in metres (m)

- Full coverage
- Partial coverage
- No coverage

14.1 10k Availability

Records within 500m

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.

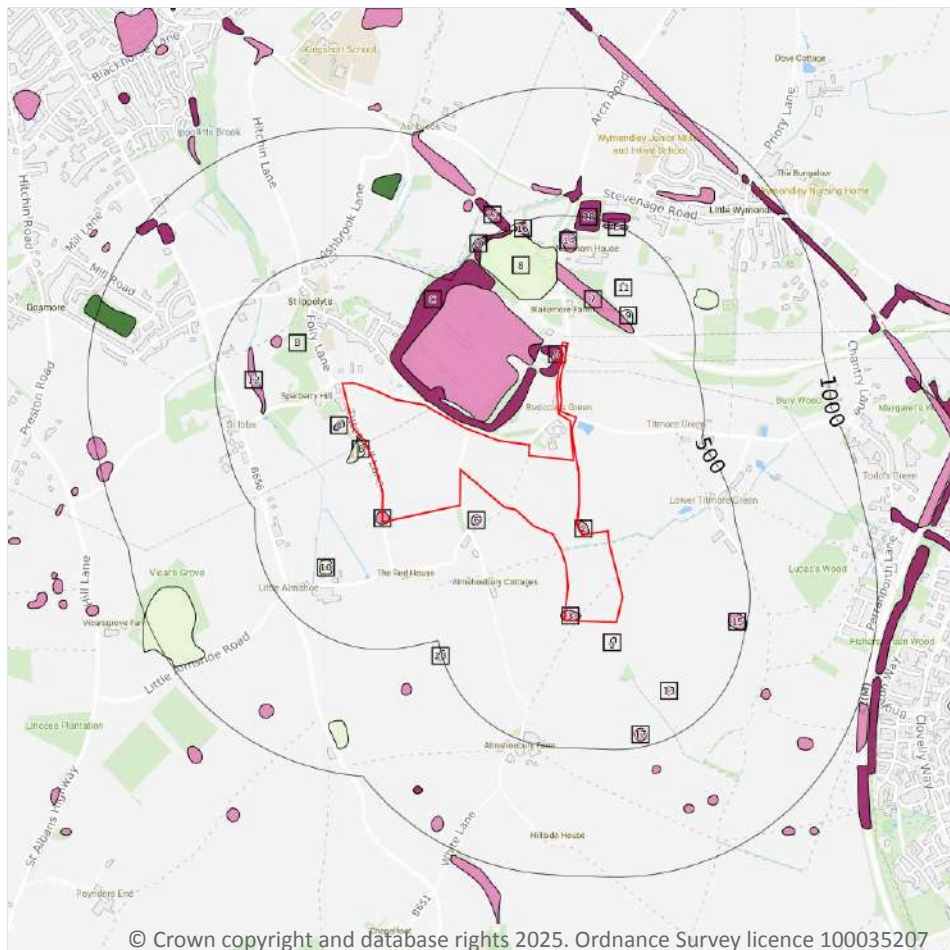
Features are displayed on the Geology 1:10,000 scale - Availability map on [page 85](#) >

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	Full	Full	Full	No coverage	TL22NW
2	On site	Full	Full	Full	No coverage	TL12NE

This data is sourced from the British Geological Survey.



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



- Site Outline**
- Search buffers in metres (m)
- Reclaimed ground
 - Made ground
 - Worked ground
 - Infilled ground
 - Disturbed ground
 - Landscaped ground

14.2 Artificial and made ground (10k)

Records within 500m

31

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.

Features are displayed on the Geology 1:10,000 scale - Artificial and made ground map on [page 86](#) >

ID	Location	LEX Code	Description	Rock description
1	On site	WGR-VOID	Worked Ground (Undivided)	Void
2	On site	WGR-VOID	Worked Ground (Undivided)	Void
3	On site	WGR-VOID	Worked Ground (Undivided)	Void
A	On site	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit

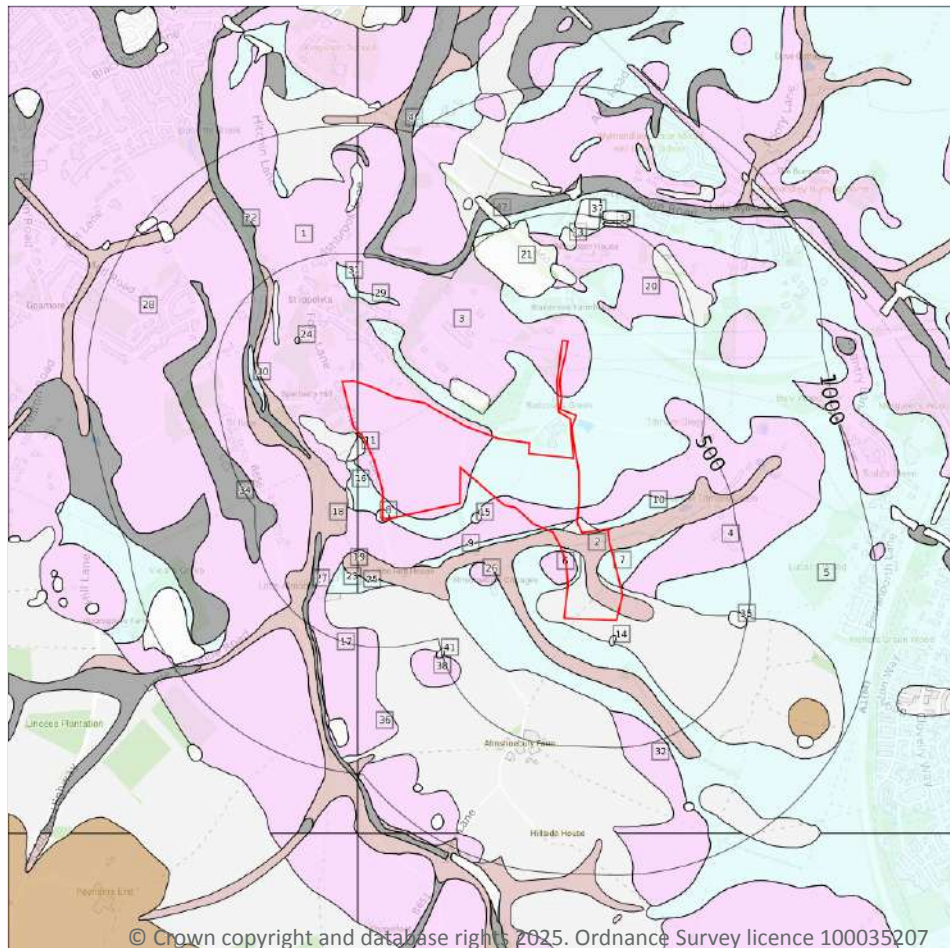


ID	Location	LEX Code	Description	Rock description
B	9m SW	WMGR-ARTDP	Infilled Ground	Artificial Deposit
B	10m SW	WMGR-ARTDP	Infilled Ground	Artificial Deposit
C	11m NE	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
4	29m W	WGR-VOID	Worked Ground (Undivided)	Void
C	44m N	WGR-VOID	Worked Ground (Undivided)	Void
5	59m S	WGR-VOID	Worked Ground (Undivided)	Void
6	67m SE	WGR-VOID	Worked Ground (Undivided)	Void
A	80m W	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
7	167m NE	WGR-VOID	Worked Ground (Undivided)	Void
8	192m NW	WMGR-ARTDP	Infilled Ground	Artificial Deposit
D	227m NW	WGR-VOID	Worked Ground (Undivided)	Void
9	236m NE	WMGR-ARTDP	Infilled Ground	Artificial Deposit
10	254m SW	WMGR-ARTDP	Infilled Ground	Artificial Deposit
D	285m NW	WGR-VOID	Worked Ground (Undivided)	Void
11	295m NE	WMGR-ARTDP	Infilled Ground	Artificial Deposit
12	311m W	WGR-VOID	Worked Ground (Undivided)	Void
13	324m SE	WGR-VOID	Worked Ground (Undivided)	Void
14	358m N	WGR-VOID	Worked Ground (Undivided)	Void
15	425m E	WGR-VOID	Worked Ground (Undivided)	Void
16	426m N	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
17	426m S	WGR-VOID	Worked Ground (Undivided)	Void
18	445m N	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
19	448m NW	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
E	475m N	WGR-VOID	Worked Ground (Undivided)	Void
20	486m W	WGR-VOID	Worked Ground (Undivided)	Void
21	487m NW	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
E	497m N	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit

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

44

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 88](#) >

ID	Location	LEX Code	Description	Rock description
1	On site	GFDMP-XSV	Glaciofluvial Deposits, Mid Pleistocene - Sand And Gravel	Sand And Gravel
2	On site	HEAD-XCZSV	Head - Clay, Silt, Sand And Gravel	Clay, Silt, Sand And Gravel
3	On site	GFDMP-XSV	Glaciofluvial Deposits, Mid Pleistocene - Sand And Gravel	Sand And Gravel



ID	Location	LEX Code	Description	Rock description
4	On site	GFDMP-XSV	Glaciofluvial Deposits, Mid Pleistocene - Sand And Gravel	Sand And Gravel
5	On site	LOFT-DMTN	Lowestoft Formation - Diamicton	Diamicton
6	On site	GFDMP-XSV	Glaciofluvial Deposits, Mid Pleistocene - Sand And Gravel	Sand And Gravel
7	On site	LOFT-DMTN	Lowestoft Formation - Diamicton	Diamicton
8	On site	SUPNM-UNKNOWN	Superficial Theme Not Mapped [for Digital Map Use Only] - Unknown/unclassified Entry	Unknown/unclassified Entry
9	On site	LOFT-DMTN	Lowestoft Formation - Diamicton	Diamicton
10	On site	LOFT-DMTN	Lowestoft Formation - Diamicton	Diamicton
11	9m SW	SUPNM-UNKNOWN	Superficial Theme Not Mapped [for Digital Map Use Only] - Unknown/unclassified Entry	Unknown/unclassified Entry
12	10m SW	SUPNM-UNKNOWN	Superficial Theme Not Mapped [for Digital Map Use Only] - Unknown/unclassified Entry	Unknown/unclassified Entry
13	55m SW	GFDMP-XSV	Glaciofluvial Deposits, Mid Pleistocene - Sand And Gravel	Sand And Gravel
14	59m S	SUPNM-UNKNOWN	Superficial Theme Not Mapped [for Digital Map Use Only] - Unknown/unclassified Entry	Unknown/unclassified Entry
15	67m SE	SUPNM-UNKNOWN	Superficial Theme Not Mapped [for Digital Map Use Only] - Unknown/unclassified Entry	Unknown/unclassified Entry
16	68m SW	LOFT-DMTN	Lowestoft Formation - Diamicton	Diamicton
17	98m W	GFDMP-XSV	Glaciofluvial Deposits, Mid Pleistocene - Sand And Gravel	Sand And Gravel
18	135m W	HEAD-XCZSV	Head - Clay, Silt, Sand And Gravel	Clay, Silt, Sand And Gravel
19	153m SW	HEAD-XCZSV	Head - Clay, Silt, Sand And Gravel	Clay, Silt, Sand And Gravel
20	182m NE	GFDMP-XSV	Glaciofluvial Deposits, Mid Pleistocene - Sand And Gravel	Sand And Gravel
21	198m NW	SUPNM-UNKNOWN	Superficial Theme Not Mapped [for Digital Map Use Only] - Unknown/unclassified Entry	Unknown/unclassified Entry
22	206m SW	ALV-CZ	Alluvium - Silty Clay	Clay, Silty
23	222m SW	LOFT-DMTN	Lowestoft Formation - Diamicton	Diamicton
24	227m NW	SUPNM-UNKNOWN	Superficial Theme Not Mapped [for Digital Map Use Only] - Unknown/unclassified Entry	Unknown/unclassified Entry
25	234m S	LOFT-DMTN	Lowestoft Formation - Diamicton	Diamicton
26	237m SW	GFDMP-XSV	Glaciofluvial Deposits, Mid Pleistocene - Sand And Gravel	Sand And Gravel



ID	Location	LEX Code	Description	Rock description
27	247m W	ALV-CZ	Alluvium - Silty Clay	Clay, Silty
28	248m SW	GFDMP-XSV	Glaciofluvial Deposits, Mid Pleistocene - Sand And Gravel	Sand And Gravel
29	310m N	LOFT-DMTN	Lowestoft Formation - Diamicton	Diamicton
30	311m W	SUPNM-UNKNOWN	Superficial Theme Not Mapped [for Digital Map Use Only] - Unknown/unclassified Entry	Unknown/unclassified Entry
31	325m N	LOFT-DMTN	Lowestoft Formation - Diamicton	Diamicton
32	353m S	GFDMP-XSV	Glaciofluvial Deposits, Mid Pleistocene - Sand And Gravel	Sand And Gravel
33	358m N	SUPNM-UNKNOWN	Superficial Theme Not Mapped [for Digital Map Use Only] - Unknown/unclassified Entry	Unknown/unclassified Entry
34	413m W	GLLMP-CZ	Glaciolacustrine Deposits, Mid Pleistocene - Clay, Silty (unlithified Deposits Coding Scheme)	Clay, Silty
35	425m E	SUPNM-UNKNOWN	Superficial Theme Not Mapped [for Digital Map Use Only] - Unknown/unclassified Entry	Unknown/unclassified Entry
36	427m S	GFDMP-XSV	Glaciofluvial Deposits, Mid Pleistocene - Sand And Gravel	Sand And Gravel
37	445m N	SUPNM-UNKNOWN	Superficial Theme Not Mapped [for Digital Map Use Only] - Unknown/unclassified Entry	Unknown/unclassified Entry
38	450m SW	GFDMP-XSV	Glaciofluvial Deposits, Mid Pleistocene - Sand And Gravel	Sand And Gravel
39	475m N	SUPNM-UNKNOWN	Superficial Theme Not Mapped [for Digital Map Use Only] - Unknown/unclassified Entry	Unknown/unclassified Entry
40	486m N	ALV-CZ	Alluvium - Silty Clay	Clay, Silty
41	486m W	SUPNM-UNKNOWN	Superficial Theme Not Mapped [for Digital Map Use Only] - Unknown/unclassified Entry	Unknown/unclassified Entry
42	487m NW	SUPNM-UNKNOWN	Superficial Theme Not Mapped [for Digital Map Use Only] - Unknown/unclassified Entry	Unknown/unclassified Entry
43	488m NW	LOFT-DMTN	Lowestoft Formation - Diamicton	Diamicton
44	497m N	SUPNM-UNKNOWN	Superficial Theme Not Mapped [for Digital Map Use Only] - Unknown/unclassified Entry	Unknown/unclassified Entry

This data is sourced from the British Geological Survey.



14.4 Landslip (10k)

Records within 500m

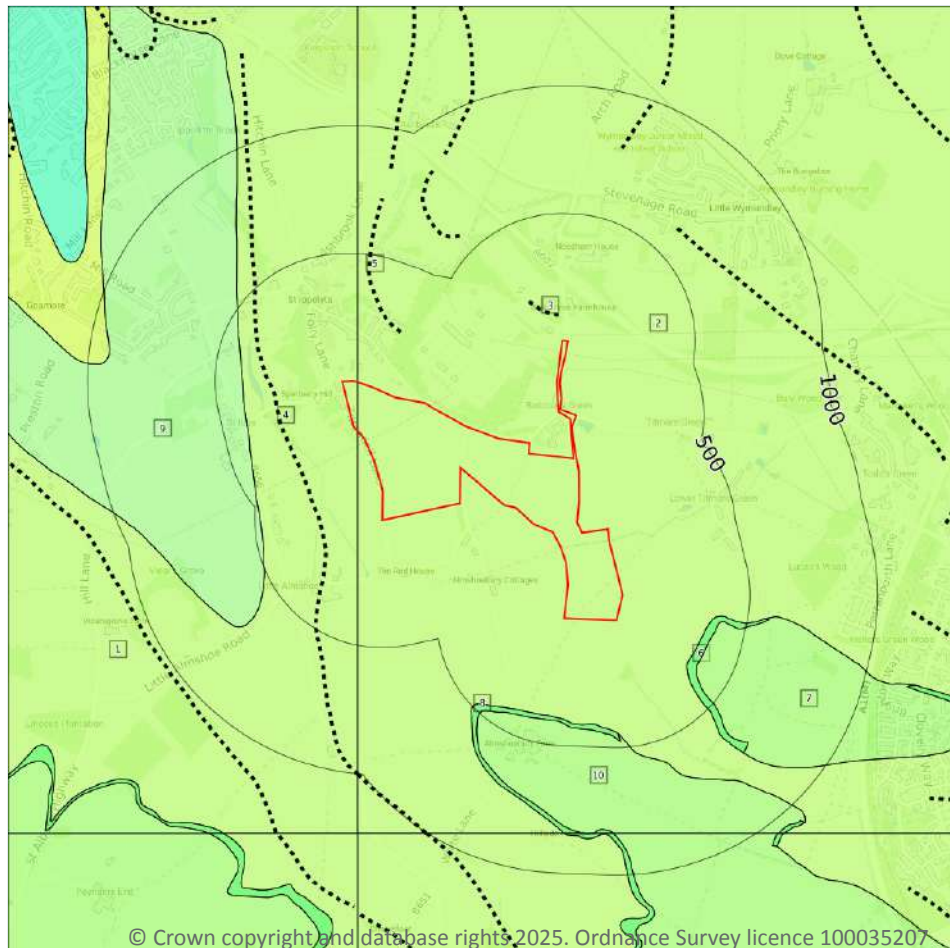
0

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

7

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 92 >](#)

ID	Location	LEX Code	Description	Rock age
1	On site	HNCK-CHLK	Holywell Nodular Chalk Formation And New Pit Chalk Formation (undifferentiated) - Chalk	Turonian Age - Cenomanian Age
2	On site	HNCK-CHLK	Holywell Nodular Chalk Formation And New Pit Chalk Formation (undifferentiated) - Chalk	Turonian Age - Cenomanian Age
6	325m SE	CKR-CHLK	Chalk Rock Member - Chalk	Turonian Age



ID	Location	LEX Code	Description	Rock age
7	363m SE	LESE-CHLK	Lewes Nodular Chalk Formation And Seaford Chalk Formation (undifferentiated) - Chalk	Santonian Age - Turonian Age
8	387m S	CKR-CHLK	Chalk Rock Member - Chalk	Turonian Age
9	390m W	ZZCH-CHLK	Zig Zag Chalk Formation - Chalk	Cenomanian Age
10	405m 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

3

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.

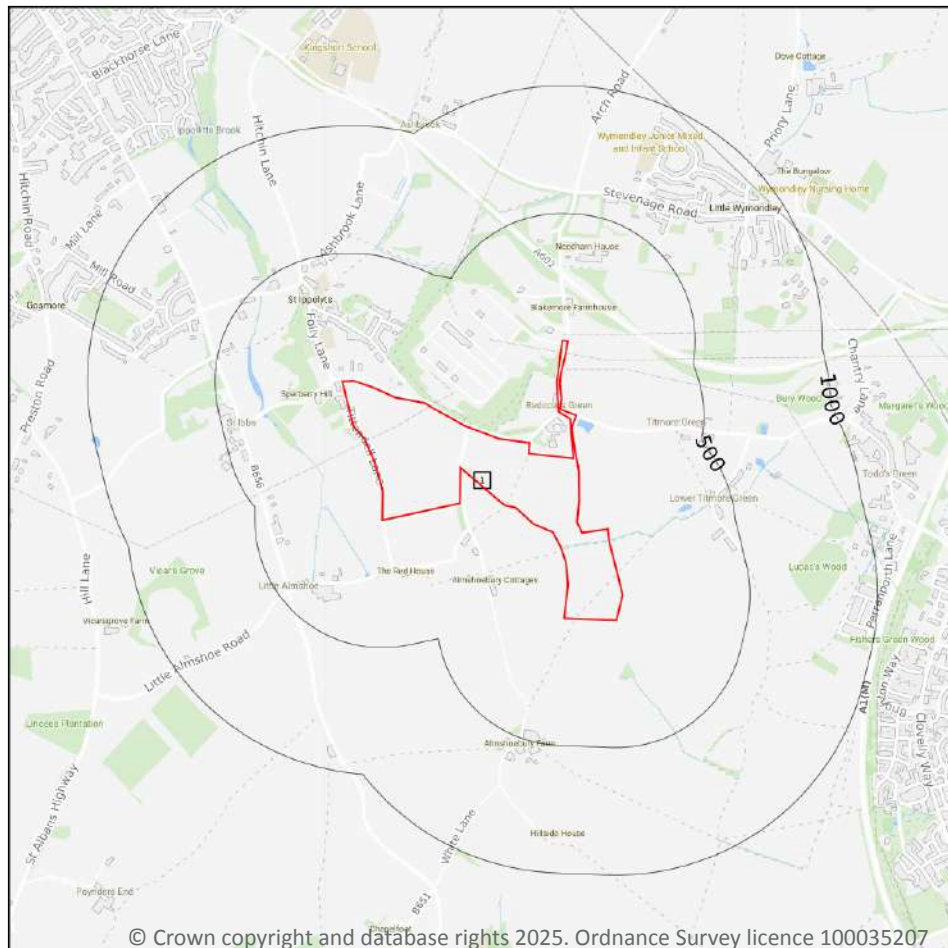
Features are displayed on the Geology 1:10,000 scale - Bedrock map on [page 92 >](#)

ID	Location	Category	Description
3	97m N	LANDFORM	Buried channel or valley margin
4	239m W	LANDFORM	Buried channel or valley margin
5	244m NE	LANDFORM	Buried channel or valley margin

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.

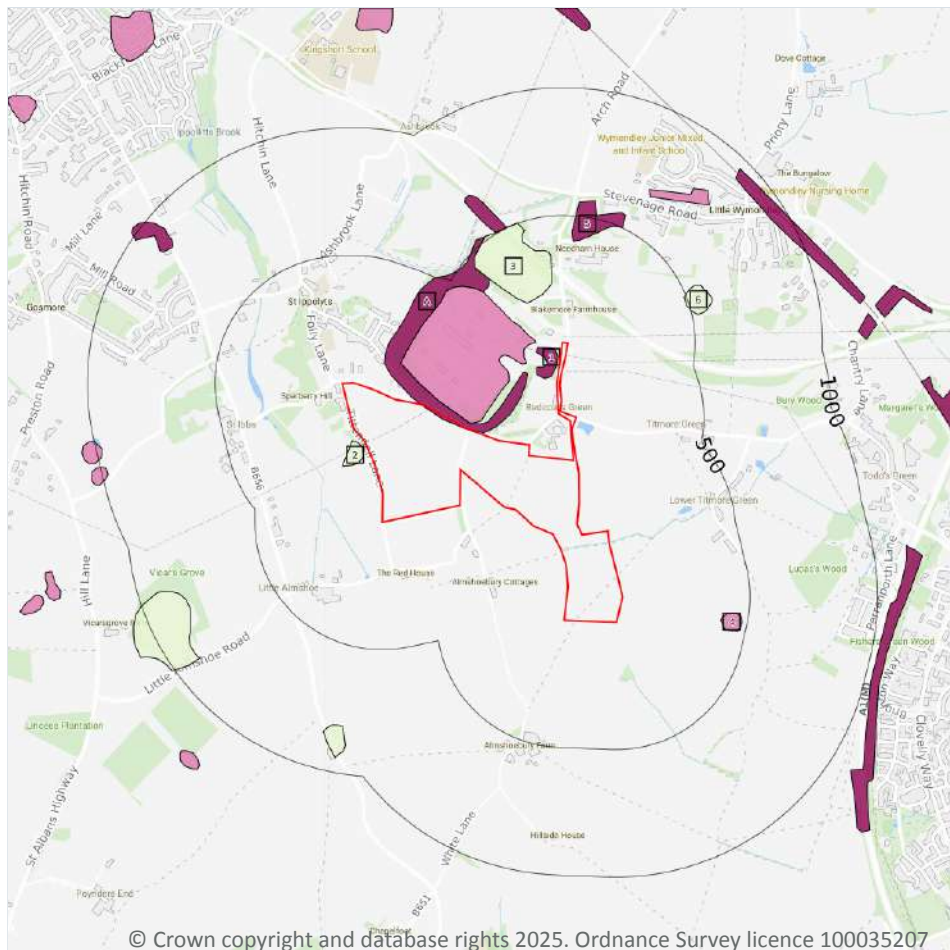
Features are displayed on the Geology 1:50,000 scale - Availability map on [page 94](#) >

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



- Site Outline**
- Search buffers in metres (m)
- Made ground
 - Worked ground
 - Infilled ground
 - Disturbed ground
 - Landscaped ground

15.2 Artificial and made ground (50k)

Records within 500m

8

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.

Features are displayed on the Geology 1:50,000 scale - Artificial and made ground map on [page 95](#) >

ID	Location	LEX Code	Description	Rock description
A	On site	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT
1	11m W	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT
2	19m SW	WMGR-ARTDP	INFILLED GROUND	ARTIFICIAL DEPOSIT
A	24m N	WGR-VOID	WORKED GROUND (UNDIVIDED)	VOID



ID	Location	LEX Code	Description	Rock description
3	202m NW	WMGR-ARTDP	INFILLED GROUND	ARTIFICIAL DEPOSIT
4	396m E	WGR-VOID	WORKED GROUND (UNDIVIDED)	VOID
5	400m N	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT
6	489m E	WMGR-ARTDP	INFILLED GROUND	ARTIFICIAL DEPOSIT

This data is sourced from the British Geological Survey.

15.3 Artificial ground permeability (50k)

Records within 50m	4
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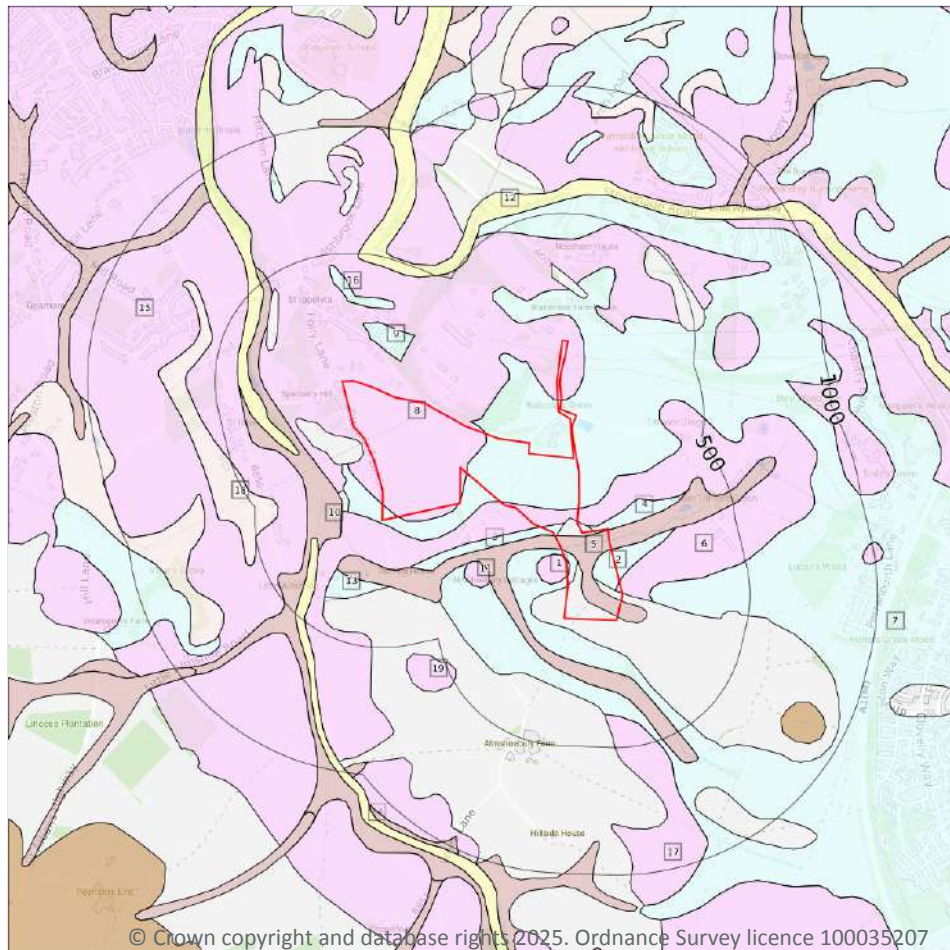
A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any artificial deposits (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	Mixed	Very High	Low
10m W	Mixed	Very High	Low
19m SW	Mixed	Very High	Low
25m SW	Mixed	Very High	Low

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

19

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 97](#) >

ID	Location	LEX Code	Description	Rock description
1	On site	GFDMP-XSV	GLACIOFLUVIAL DEPOSITS, MID PLEISTOCENE	SAND AND GRAVEL
2	On site	LOFT-DMTN	LOWESTOFT FORMATION	DIAMICTON
3	On site	LOFT-DMTN	LOWESTOFT FORMATION	DIAMICTON
4	On site	LOFT-DMTN	LOWESTOFT FORMATION	DIAMICTON



ID	Location	LEX Code	Description	Rock description
5	On site	HEAD-XCZSV	HEAD	CLAY, SILT, SAND AND GRAVEL
6	On site	GFDMP-XSV	GLACIOFLUVIAL DEPOSITS, MID PLEISTOCENE	SAND AND GRAVEL
7	On site	LOFT-DMTN	LOWESTOFT FORMATION	DIAMICTON
8	On site	GFDMP-XSV	GLACIOFLUVIAL DEPOSITS, MID PLEISTOCENE	SAND AND GRAVEL
9	138m NE	LOFT-DMTN	LOWESTOFT FORMATION	DIAMICTON
10	158m W	HEAD-XCZSV	HEAD	CLAY, SILT, SAND AND GRAVEL
11	233m S	GFDMP-XSV	GLACIOFLUVIAL DEPOSITS, MID PLEISTOCENE	SAND AND GRAVEL
12	237m SW	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL
13	248m S	LOFT-DMTN	LOWESTOFT FORMATION	DIAMICTON
14	266m W	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL
15	281m SW	GFDMP-XSV	GLACIOFLUVIAL DEPOSITS, MID PLEISTOCENE	SAND AND GRAVEL
16	295m N	LOFT-DMTN	LOWESTOFT FORMATION	DIAMICTON
17	370m S	GFDMP-XSV	GLACIOFLUVIAL DEPOSITS, MID PLEISTOCENE	SAND AND GRAVEL
18	408m W	GLLMP-XCZ	GLACIOLACUSTRINE DEPOSITS, MID PLEISTOCENE	CLAY AND SILT
19	472m SW	GFDMP-XSV	GLACIOFLUVIAL DEPOSITS, MID PLEISTOCENE	SAND AND GRAVEL

This data is sourced from the British Geological Survey.

15.5 Superficial permeability (50k)

Records within 50m

6

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	Intergranular	Very High	High
On site	Intergranular	Very High	High
On site	Intergranular	Very High	High
On site	Mixed	High	Very Low
On site	Mixed	Moderate	Low



Location	Flow type	Maximum permeability	Minimum permeability
On site	Mixed	Moderate	Low

This data is sourced from the British Geological Survey.

15.6 Landslip (50k)

Records within 500m	0
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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.

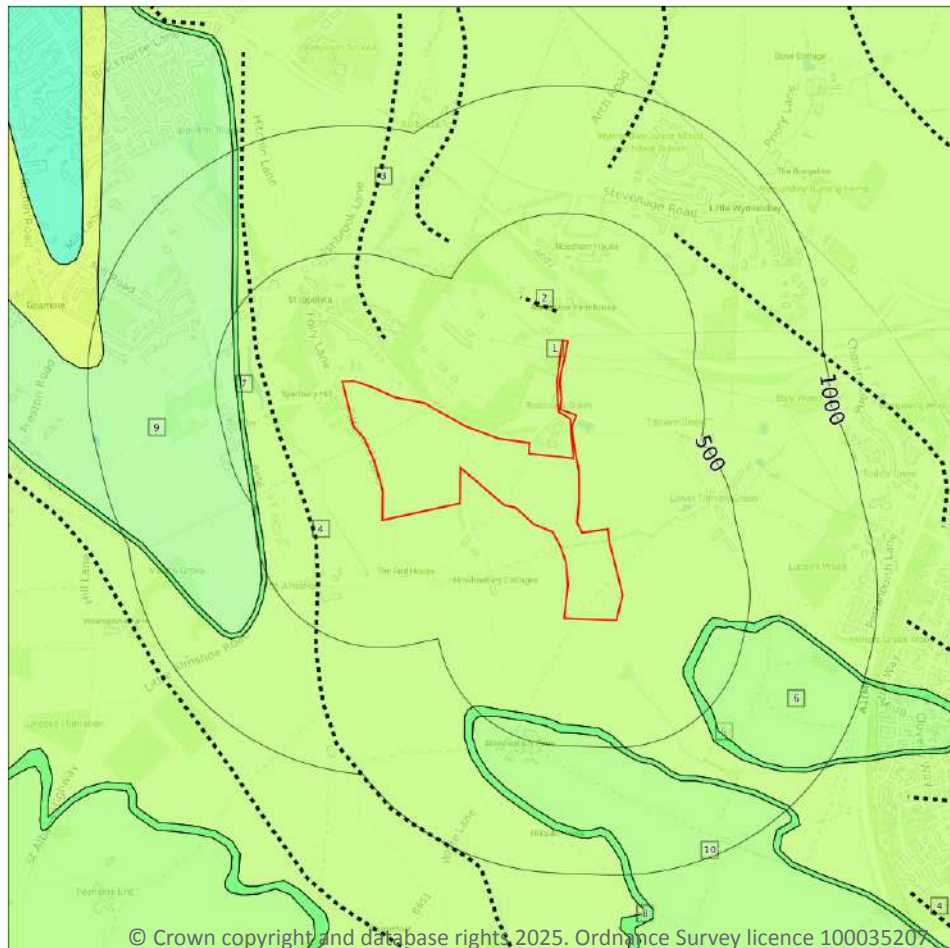
15.7 Landslip permeability (50k)

Records within 50m	0
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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

7

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 100](#) >

ID	Location	LEX Code	Description	Rock age
1	On site	HNCK-CHLK	HOLYWELL NODULAR CHALK FORMATION AND NEW PIT CHALK FORMATION (UNDIFFERENTIATED) - CHALK	CENOMANIAN
5	319m SE	CKR-CHLK	CHALK ROCK MEMBER - CHALK	TURONIAN
6	357m SE	LESE-CHLK	LEWES NODULAR CHALK FORMATION AND SEAFORD CHALK FORMATION (UNDIFFERENTIATED) - CHALK	TURONIAN



ID	Location	LEX Code	Description	Rock age
7	398m W	MR-CHLK	MELBOURN ROCK MEMBER - CHALK	CENOMANIAN
8	399m S	CKR-CHLK	CHALK ROCK MEMBER - CHALK	TURONIAN
9	417m W	ZZCH-CHLK	ZIG ZAG CHALK FORMATION - CHALK	CENOMANIAN
10	429m S	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	3
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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.

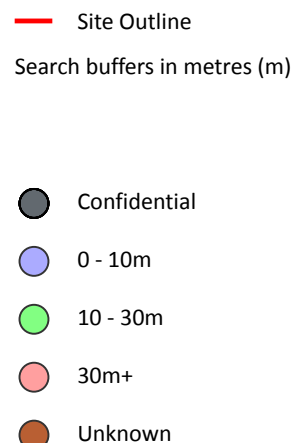
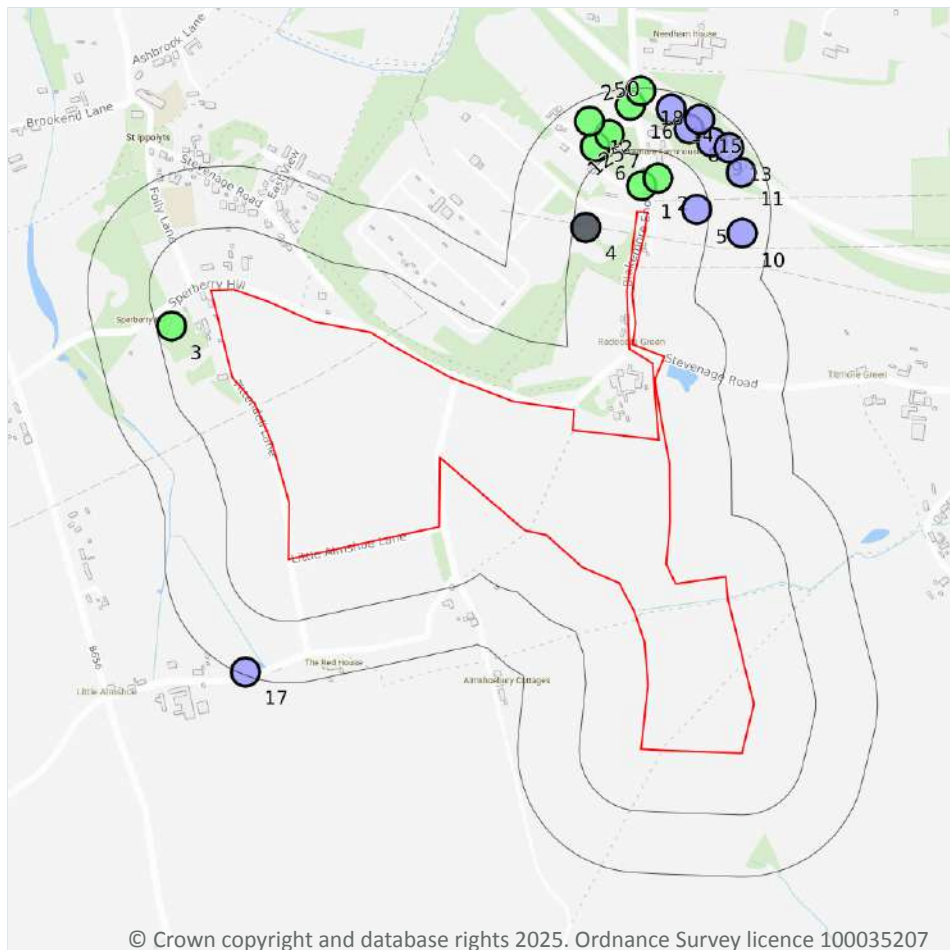
Features are displayed on the Geology 1:50,000 scale - Bedrock map on [page 100 >](#)

ID	Location	Category	Description
2	119m N	LANDFORM	Approximate margin of buried (superficial deposit-filled) channel or valley
3	185m N	LANDFORM	Approximate margin of buried (superficial deposit-filled) channel or valley
4	270m W	LANDFORM	Approximate margin of buried (superficial deposit-filled) channel or valley

This data is sourced from the British Geological Survey.



16 Boreholes



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16.1 BGS Boreholes

Records within 250m

18

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 102](#) >

ID	Location	Grid reference	Name	Length	Confidential	Web link
1	53m N	520812 226984	PROP.BYPASS AT LITTLE A602 WYMONOLEY 17	20.0	N	533549 ↗
2	73m N	520845 227000	PROP.BYPASS AT LITTLE A602 WYMONOLEY 18	20.0	N	533551 ↗
3	96m W	519860 226700	IPPOLITTS VICARRAGE	24.0	N	528272 ↗

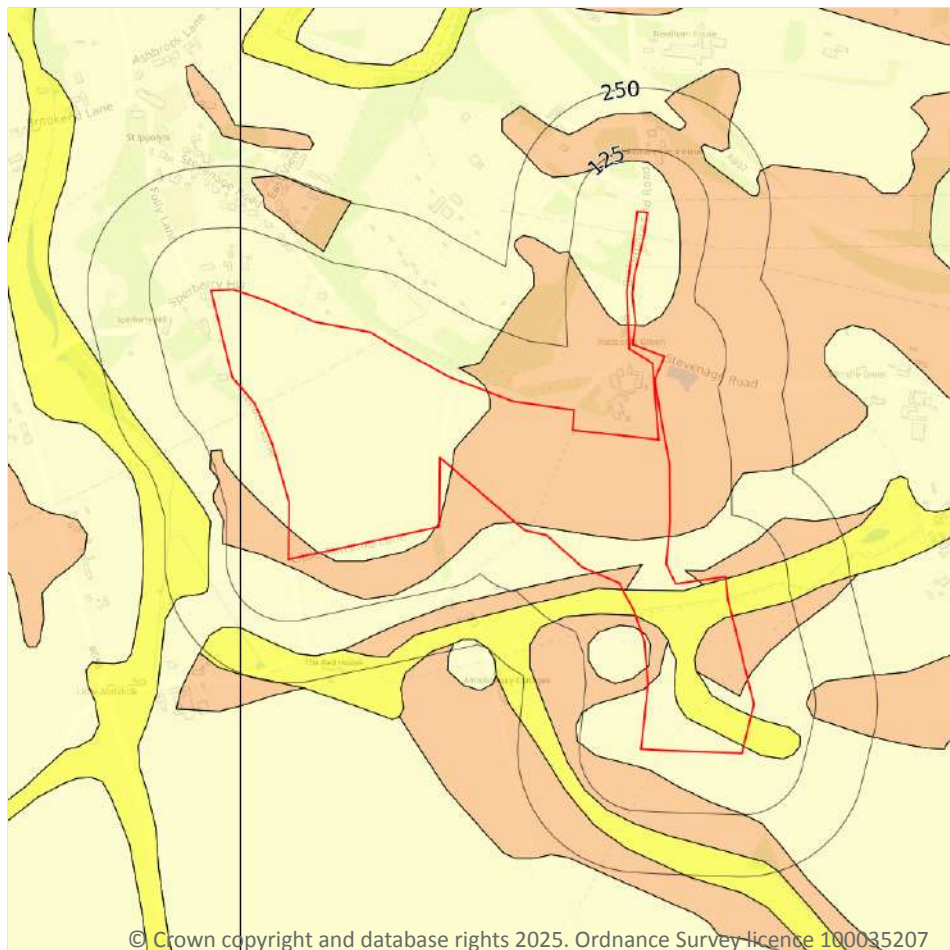


ID	Location	Grid reference	Name	Length	Confidential	Web link
4	99m W	520700 226900	LITTLE WYMONDLEY RADIO STATION 1	-	Y	N/A
5	100m E	520924 226935	PROP.BYPASS LITTLE A602 WYMONOLEY TP 19	4.5	N	533553 ↗
6	156m NW	520719 227063	PROP.BYPASS AT LITTLE A602 WYMONOLEY 16	15.0	N	533547 ↗
7	166m N	520747 227087	PROP.BYPASS AT LITTLE A602 WYMONOLEY 15	15.0	N	533545 ↗
8	189m NE	520908 227100	PROP.BYPASS AT LITTLE A602 WYMONOLEY 18A	6.0	N	533552 ↗
9	193m NE	520955 227072	A602 LITTLE WYMONDLEY BYPASS TP 123	8.0	N	533618 ↗
10	196m E	521016 226887	PROP.BYPASS LITTLE A602 WYMONOLEY 20	8.0	N	533555 ↗
11	206m NE	521014 227010	A602 LITTLE WYMONDLEY BYPASS TP 124	4.0	N	533619 ↗
12	206m NW	520708 227114	PROP.BYPASS AT LITTLE A602 WYMONOLEY B14	25.0	N	533543 ↗
13	211m NE	520990 227061	PROP.BYPASS LITTLE A602 WYMONOLEY TP 19A	4.5	N	533554 ↗
14	214m N	520872 227139	A602 LITTLE WYMONDLEY BYPASS 121	9.0	N	533616 ↗
15	215m NE	520929 227118	A602 LITTLE WYMONDLEY BYPASS TP 122	4.0	N	533617 ↗
16	216m N	520790 227147	PROP.BYPASS AT LITTLE A602 WYMONOLEY 16A	20.0	N	533548 ↗
17	244m S	520010 226000	OLE NO.IP1 - INVESTIGATION	3.0	N	12958127 ↗
18	244m N	520811 227175	PROP.BYPASS AT LITTLE A602 WYMONOLEY 17A	20.0	N	533550 ↗

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

17.1 Shrink swell clays

Records within 50m

3

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 104 >](#)

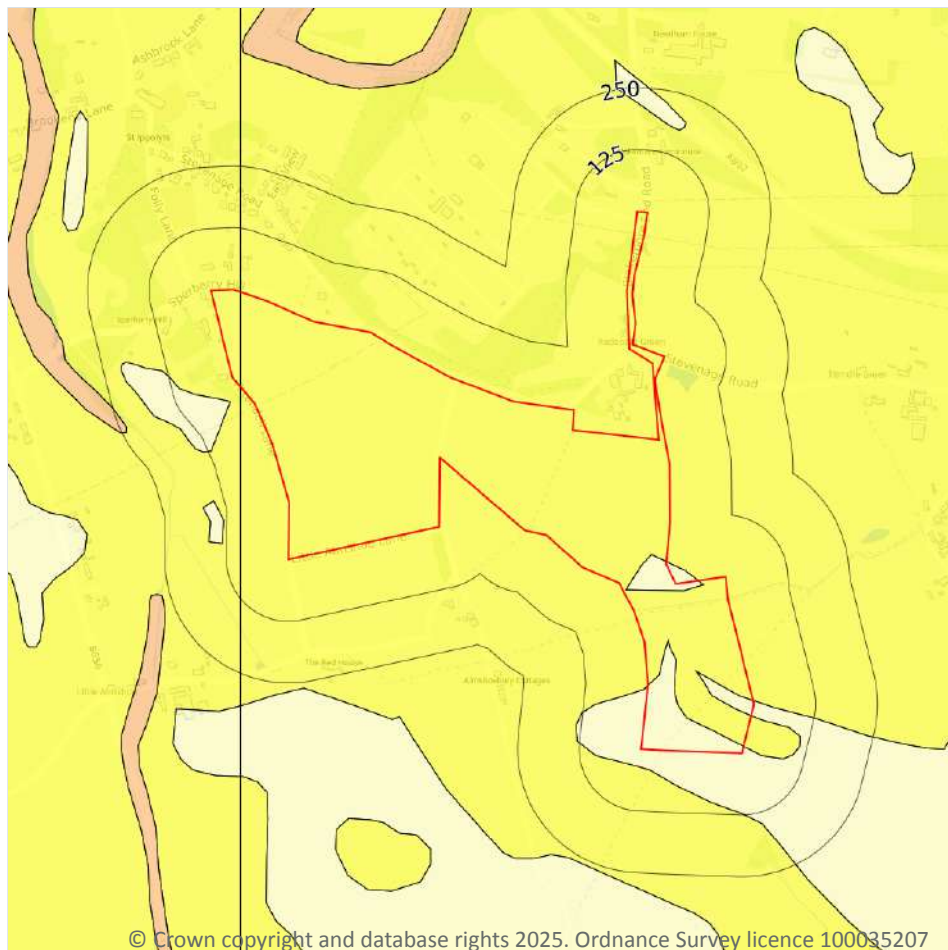
Location	Hazard rating	Details
On site	Negligible	Ground conditions predominantly non-plastic.
On site	Very low	Ground conditions predominantly low plasticity.
On site	Low	Ground conditions predominantly medium plasticity.



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

17.2 Running sands

Records within 50m

3

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 106](#) >

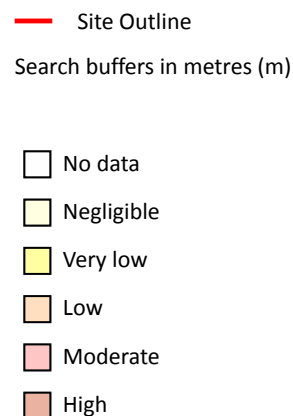
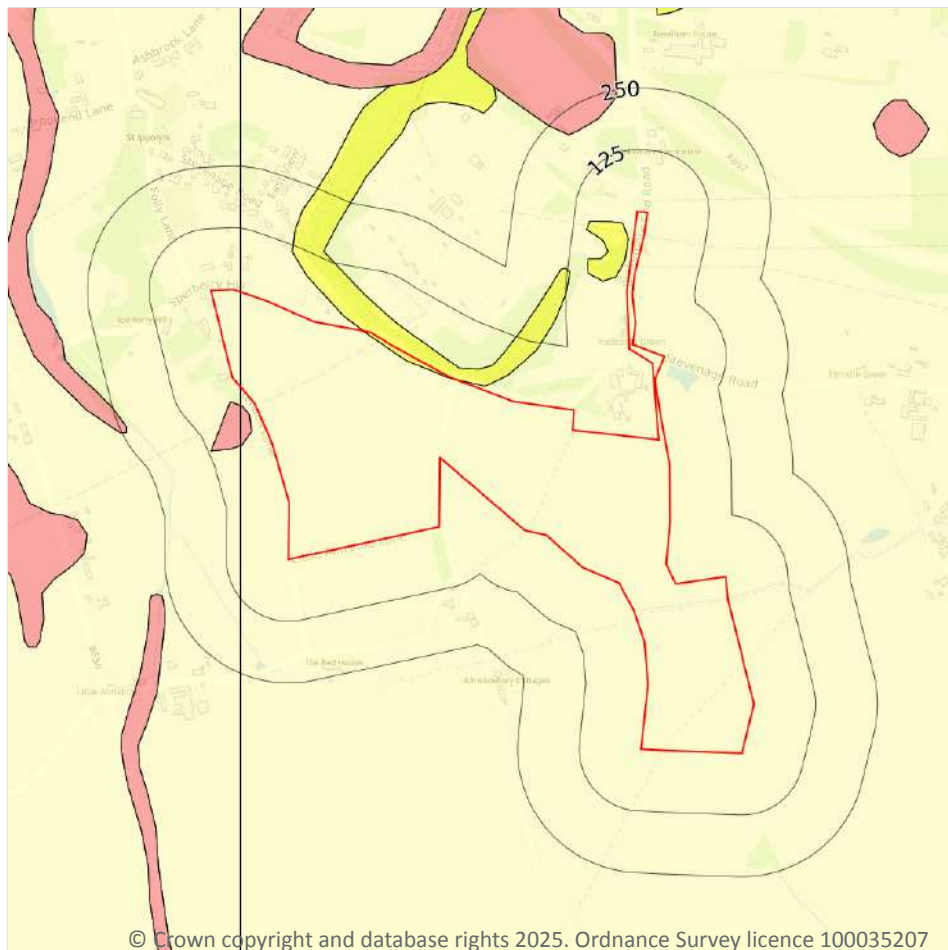
Location	Hazard rating	Details
On site	Negligible	Running sand conditions are not thought to occur whatever the position of the water table. No identified constraints on lands use due to running conditions.

Location	Hazard rating	Details
On site	Very low	Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly.
35m SW	Negligible	Running sand conditions are not thought to occur whatever the position of the water table. No identified constraints on lands use due to running conditions.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Compressible deposits



17.3 Compressible deposits

Records within 50m

5

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 108](#) >

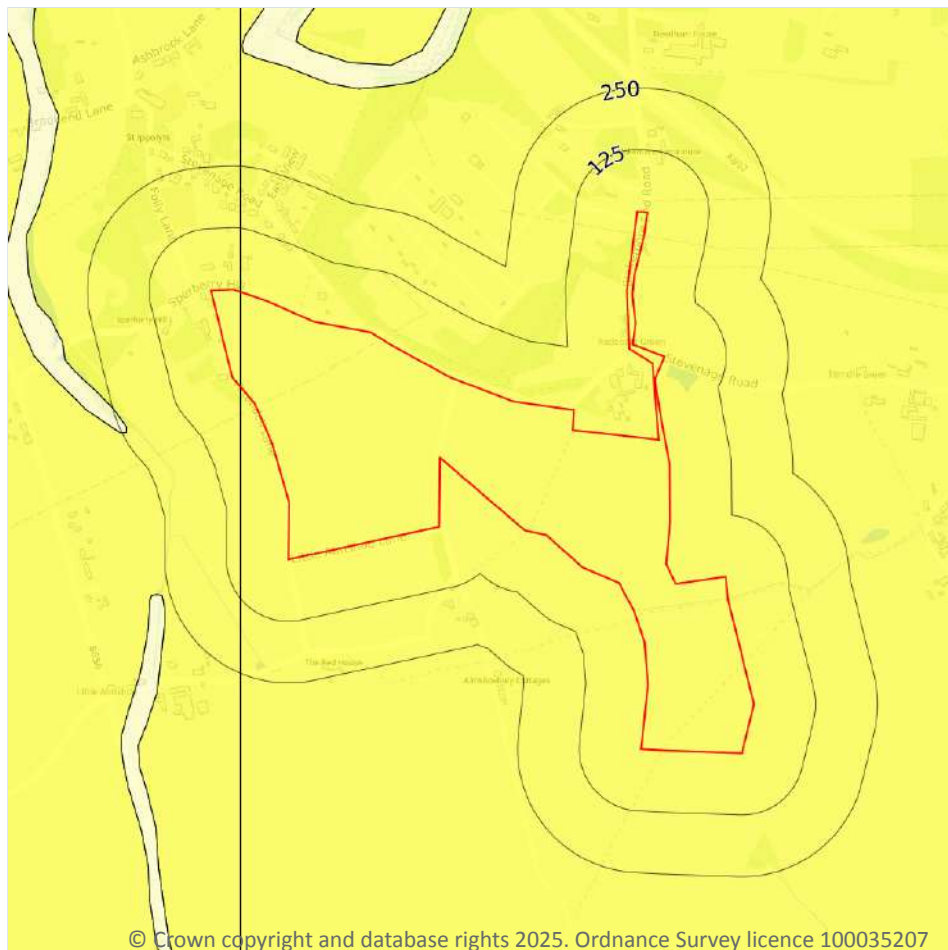
Location	Hazard rating	Details
On site	Negligible	Compressible strata are not thought to occur.
On site	Very low	Compressibility and uneven settlement problems are not likely to be significant on the site for most land uses.

Location	Hazard rating	Details
11m W	Very low	Compressibility and uneven settlement problems are not likely to be significant on the site for most land uses.
19m SW	Moderate	Compressibility and uneven settlement hazards are probably present. Land use should consider specifically the compressibility and variability of the site.
25m SW	Moderate	Compressibility and uneven settlement hazards are probably present. Land use should consider specifically the compressibility and variability of the site.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Collapsible deposits



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

17.4 Collapsible deposits

Records within 50m

1

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

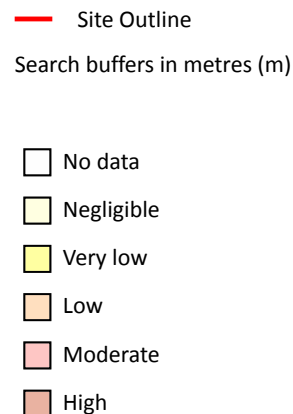
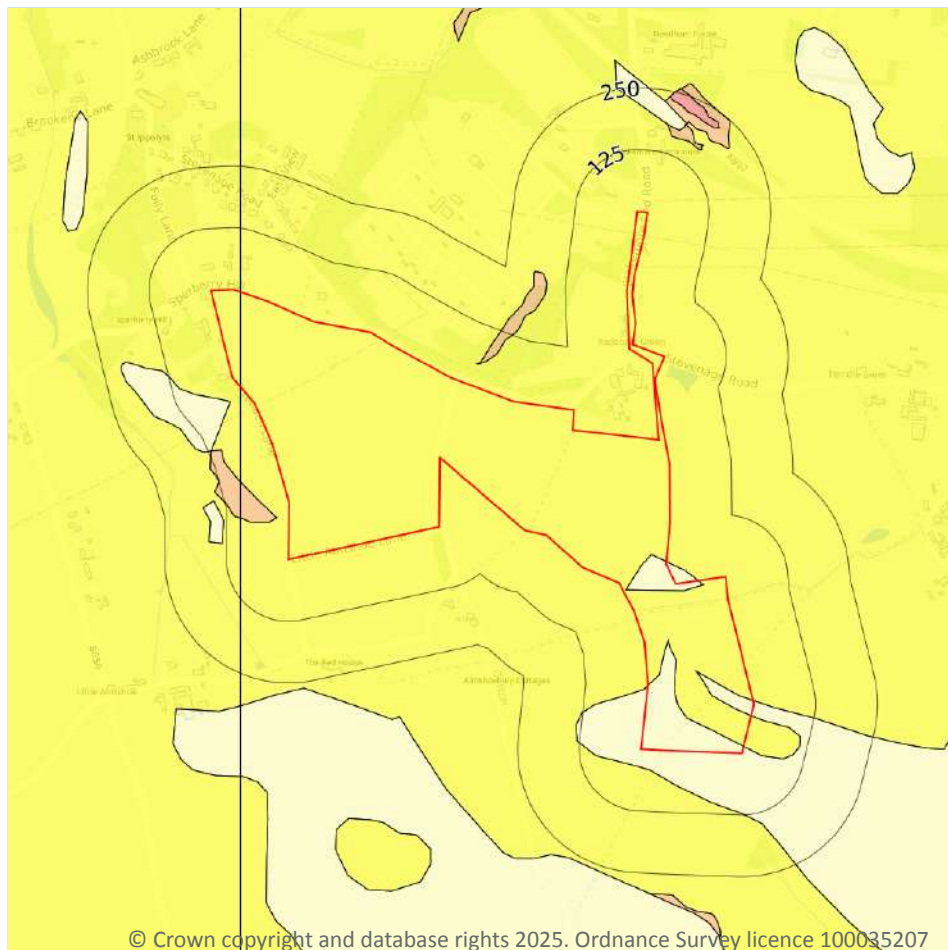
Features are displayed on the Natural ground subsidence - Collapsible deposits map on [page 110 >](#)

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



17.5 Landslides

Records within 50m

5

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 111](#) >

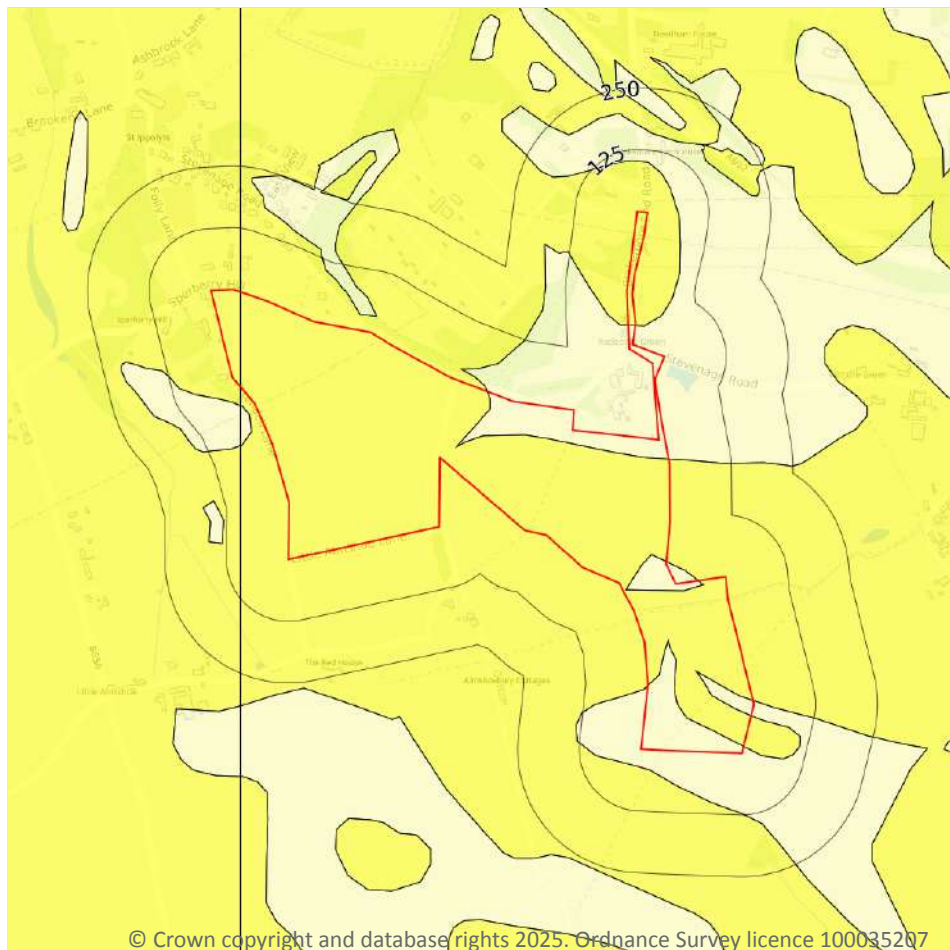
Location	Hazard rating	Details
On site	Negligible	Slope instability problems are not thought to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered.

Location	Hazard rating	Details
On site	Very low	Slope instability problems are not likely to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered.
24m W	Low	Slope instability problems may be present or anticipated. Site investigation should consider specifically the slope stability of the site.
35m SW	Negligible	Slope instability problems are not thought to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered.
46m N	Low	Slope instability problems may be present or anticipated. Site investigation should consider specifically the slope stability of the site.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Ground dissolution of soluble rocks



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

17.6 Ground dissolution of soluble rocks

Records within 50m

5

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 113](#) >

Location	Hazard rating	Details
On site	Negligible	Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present.

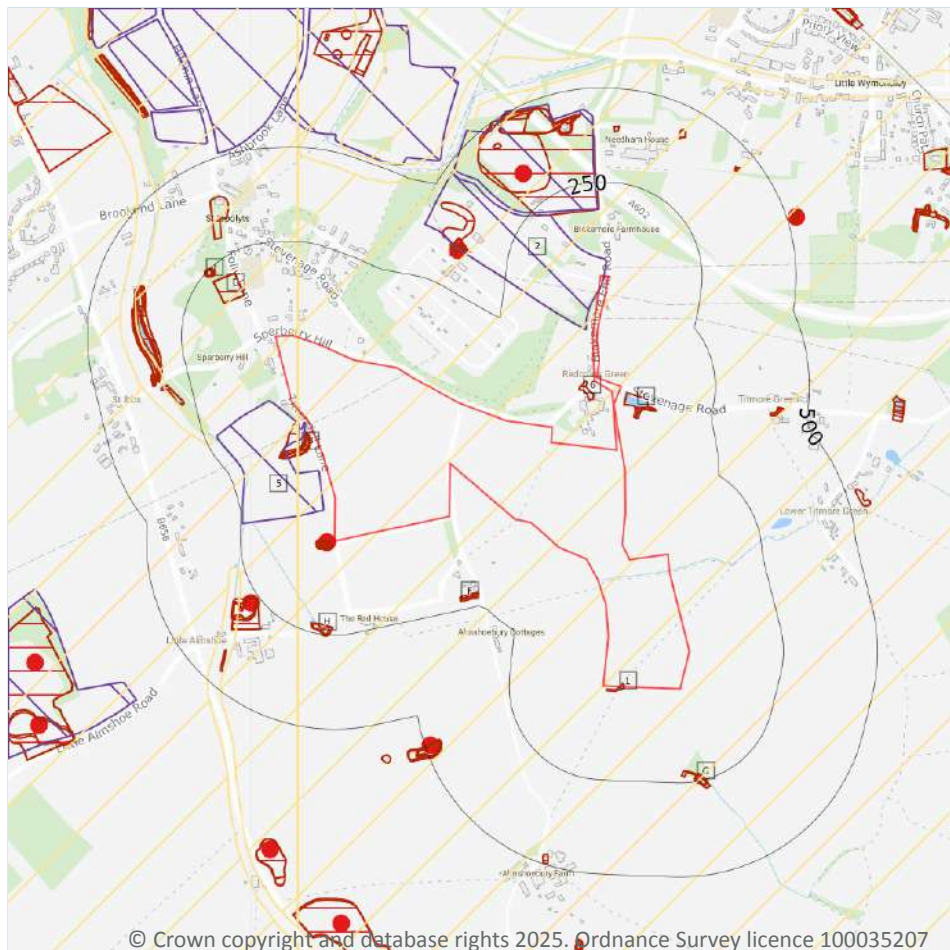


Location	Hazard rating	Details
On site	Very low	Soluble rocks are present within the ground. Few dissolution features are likely to be present. Potential for difficult ground conditions or localised subsidence are at a level where they need not be considered.
19m SW	Negligible	Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present.
25m SW	Negligible	Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present.
32m N	Negligible	Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present.

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

5

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

Features are displayed on the Mining and ground workings map on [page 115](#) >

ID	Location	Details	Description
A	20m W	Name: Little Almshoe Gravel Pit Address: St Ippolytts, HITCHIN, Hertfordshire Commodity: Sand & Gravel Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Delf, Delph, Gravel Pit, Sand Pit, Sand and Gravel Pit, Clay Pit, Pit, Opencast Coal Site or Surface Mine. It may be mapped as Worked Ground or Worked and Made Ground on BGS mapping. Status description: Site which has ceased to extract minerals. May be considered as 'Closed' by operator. May be considered to have 'Active', 'Dormant' or 'Expired' planning permissions by the Mineral Planning Authority.
J	276m SW	Name: Little Almshoe Gravel Pit Address: St Ippolytts, HITCHIN, Hertfordshire Commodity: Sand & Gravel Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Delf, Delph, Gravel Pit, Sand Pit, Sand and Gravel Pit, Clay Pit, Pit, Opencast Coal Site or Surface Mine. It may be mapped as Worked Ground or Worked and Made Ground on BGS mapping. Status description: Site which has ceased to extract minerals. May be considered as 'Closed' by operator. May be considered to have 'Active', 'Dormant' or 'Expired' planning permissions by the Mineral Planning Authority.
E	341m NW	Name: Wymondley Gravel Pit Address: Little Wymondley, HITCHIN, Hertfordshire Commodity: Sand & Gravel Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Delf, Delph, Gravel Pit, Sand Pit, Sand and Gravel Pit, Clay Pit, Pit, Opencast Coal Site or Surface Mine. It may be mapped as Worked Ground or Worked and Made Ground on BGS mapping. Status description: Site which has ceased to extract minerals. May be considered as 'Closed' by operator. May be considered to have 'Active', 'Dormant' or 'Expired' planning permissions by the Mineral Planning Authority.
M	351m NE	Name: Little Wymondley Gravel Pit Address: Wymondley, HITCHIN, Hertfordshire Commodity: Sand & Gravel Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Delf, Delph, Gravel Pit, Sand Pit, Sand and Gravel Pit, Clay Pit, Pit, Opencast Coal Site or Surface Mine. It may be mapped as Worked Ground or Worked and Made Ground on BGS mapping. Status description: Site which has ceased to extract minerals. May be considered as 'Closed' by operator. May be considered to have 'Active', 'Dormant' or 'Expired' planning permissions by the Mineral Planning Authority.



ID	Location	Details	Description
S	486m W	Name: Mill Hill Gravel Pit Address: St Ippollytts, HITCHIN, Hertfordshire Commodity: Sand & Gravel Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Delf, Delph, Gravel Pit, Sand Pit, Sand and Gravel Pit, Clay Pit, Pit, Opencast Coal Site or Surface Mine. It may be mapped as Worked Ground or Worked and Made Ground on BGS mapping. Status description: Site which has ceased to extract minerals. May be considered as 'Closed' by operator. May be considered to have 'Active', 'Dormant' or 'Expired' planning permissions by the Mineral Planning Authority.

This data is sourced from the British Geological Survey.

18.2 Surface ground workings

Records within 250m	39
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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 115 >](#)

ID	Location	Land Use	Year of mapping	Mapping scale
1	On site	Unspecified Pit	1884	1:10560
A	11m SW	Unspecified Pit	1976	1:10560
A	12m SW	Unspecified Pit	1947	1:10560
A	12m SW	Unspecified Pit	1922	1:10560
A	12m SW	Unspecified Pit	1922	1:10560
A	14m SW	Unspecified Pit	1949	1:10560
A	14m SW	Unspecified Pit	1922	1:10560
A	14m SW	Old Gravel Pit	1897	1:10560
A	14m SW	Unspecified Pit	1884	1:10560
B	15m SW	Unspecified Ground Workings	1947	1:10560
B	16m SW	Unspecified Ground Workings	1949	1:10560
B	16m SW	Unspecified Ground Workings	1922	1:10560
B	16m SW	Unspecified Ground Workings	1897	1:10560
B	16m SW	Unspecified Ground Workings	1884	1:10560



ID	Location	Land Use	Year of mapping	Mapping scale
B	16m SW	Unspecified Ground Workings	1922	1:10560
B	16m SW	Unspecified Ground Workings	1922	1:10560
6	19m W	Ponds	1884	1:10560
C	21m SE	Ponds	1884	1:10560
B	24m SW	Refuse Heap	1991	1:10000
B	24m SW	Refuse Heap	1980	1:10000
C	48m E	Ponds	1976	1:10560
D	137m NW	Cemetery	1991	1:10000
D	137m NW	Cemetery	1980	1:10000
E	176m N	Disused Gravel Pit	1980	1:10000
F	214m S	Pond	1976	1:10560
G	219m S	Pond	1976	1:10560
F	222m S	Pond	1922	1:10560
H	224m S	Ponds	1897	1:10560
H	225m S	Ponds	1884	1:10560
I	230m NW	Unspecified Pit	1959	1:10560
I	232m NW	Unspecified Pit	1946	1:10560
I	232m NW	Unspecified Pit	1922	1:10560
I	232m NW	Gravel Pit	1897	1:10560
I	233m NW	Unspecified Pit	1946	1:10560
I	233m NW	Unspecified Pit	1946	1:10560
G	235m S	Pond	1949	1:10560
I	236m NW	Unspecified Disused Pit	1991	1:10000
I	236m NW	Unspecified Disused Pit	1980	1:10000
G	240m S	Pond	1884	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 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**3**

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.

Features are displayed on the Mining and ground workings map on [page 115](#) >

ID	Location	Site Name	Mineral	Type	Planning Status	Planning Status Date
2	On site	Ash Brook	Sand and gravel	Surface mineral working	Valid	26/04/48
5	10m SW	St. Ippollitts	Sand and gravel	Surface mineral working	Refused	23/08/62
E	179m N	Wymondley	Sand and gravel	Surface mineral working	Valid	09/12/49

This data is sourced from the British Geological Survey.



18.6 Non-coal mining

Records within 1000m

4

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 115](#) >

ID	Location	Name	Commodity	Class	Likelihood
3	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.
4	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.
14	509m N	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.
-	835m 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.

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
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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
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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.

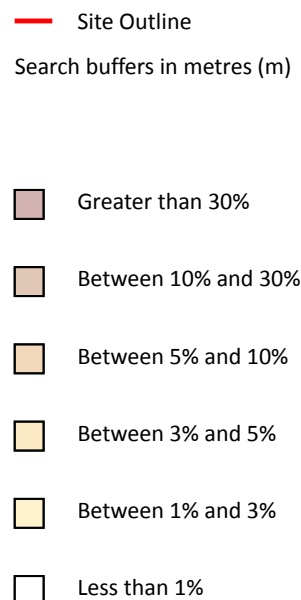
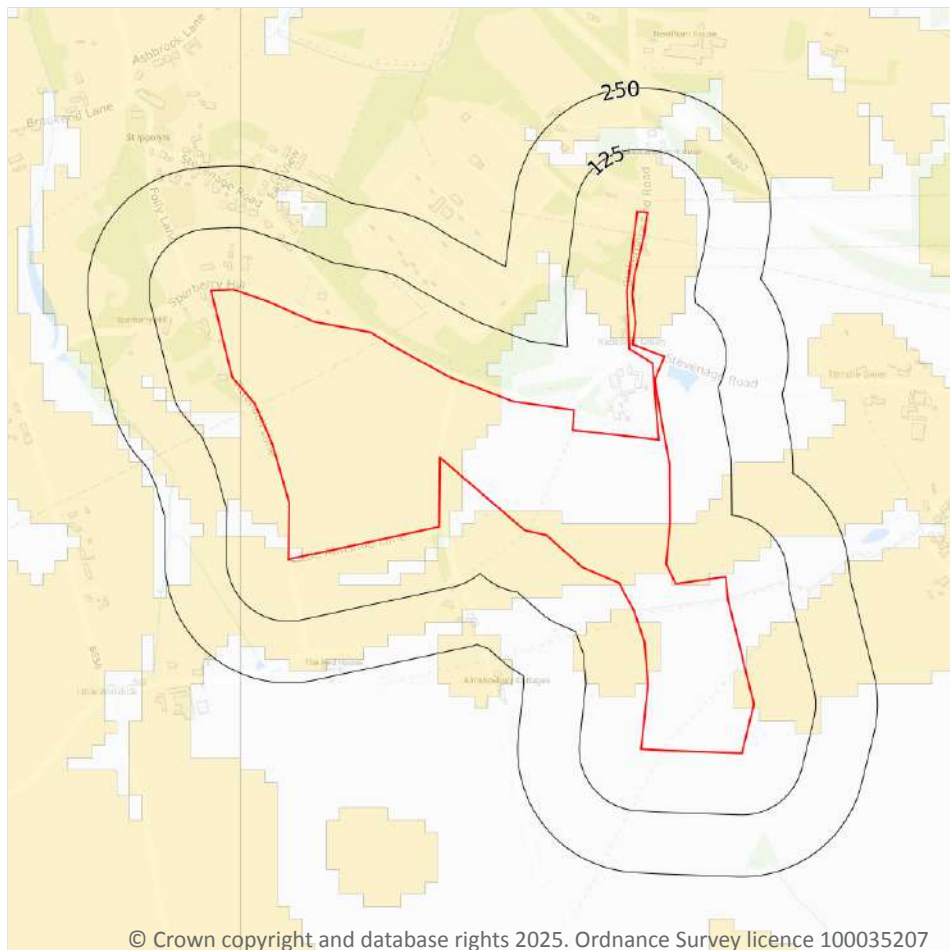
Not all 'holes' noted on Ordnance Survey mapping will necessarily be present within this dataset.



This data is sourced from Groundsure.



20 Radon



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20.1 Radon

Records on site

2

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

Features are displayed on the Radon map on [page 125 >](#)

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



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

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



21 Soil chemistry

21.1 BGS Estimated Background Soil Chemistry

Records within 50m

47

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	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
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 - 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 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg



Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
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 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
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 - 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 - 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 - 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 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg



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 - 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 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
1m 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
4m E	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg
4m E	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg
11m W	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
12m SW	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
12m E	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
17m E	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
17m E	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
19m SW	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
25m SW	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
25m SW	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
44m SW	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
50m N	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
50m N	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg

This data is sourced from the British Geological Survey.



21.2 BGS Estimated Urban Soil Chemistry

Records within 50m

0

Estimated topsoil chemistry of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc and bioaccessible Arsenic and Lead in 23 urban centres across Great Britain. These estimates are derived from interpolation of the measured urban topsoil data referred to above and provide information across each city between the measured sample locations (4 per 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
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HS2 is a proposed high speed rail network running from London to Manchester and Leeds via Birmingham. Main civils construction on Phase 1 (London to Birmingham) of the project began in 2019, and it is currently anticipated that this phase will be fully operational by 2026. Construction on Phase 2a (Birmingham to Crewe) is anticipated to commence in 2021, with the service fully operational by 2027. Construction on Phase 2b (Crewe to Manchester and Birmingham to Leeds) is scheduled to begin in 2023 and be operational by 2033.

This data is sourced from HS2 Ltd.



Data providers

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

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