Gedney, Oliver

From: Gedney, David
Sent: 15 November 2022 10:14
To: _planningadvice
Subject: FW: H23-0545-22 - Cond Comp - Scheme to deal with contamination, etc, Dwellings, Orchard Farm, Dowsdale Bank, Shepeau Stow
Attachments: 0870-1 Orchard Farm Dowsdale Bank Shepeau Stow Spalding Lincs PE12 0UA - Desk Study - November 2022-signed.pdf

Please scan email and attachment

6SUP (Geo-Environmental Desk Study)

Regards

David Gedney
Senior Planning Officer
South Holland District Council
T: 01775 764468
E: dgedney@sholland.gov.uk

Working Days: Monday, Tuesday & Thursday



Please note that any informal officer opinion expressed by this email is without prejudice and is not binding on the Council during the consideration of any formal application.

From: Sam Herring <sam@swannedwards.co.uk>
Sent: 15 November 2022 08:58
To: Gedney, David <DGedney@sholland.gov.uk>
Subject: RE: H23-0545-22 - Cond Comp - Scheme to deal with contamination, etc, Dwellings, Orchard Farm, Dowsdale Bank, Shepeau Stow

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Good morning David,

Sorry for the delay in getting back to you. Please find attached the Phase I desk study as requested.

Can you please confirm if we are up to date on all of the information required for this application?

Kind Regards

Sam Herring (He/Him)
ACIAT
Architectural Technician

Working Days: Monday – Thursday

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ARCHITECTURE

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Registered Office: Swann Edwards Architecture Limited, 22-26 King Street, King's Lynn, PE30 1HJ | Registration No: 07943586 | VAT Registration No: 121597127
Business Address: Swann Edwards Architecture Limited, Black Barn, Fen Road, Guyhirn, PE13 4AA

Please consider the environment before printing this email



From: Gedney, David <DGedney@sholland.gov.uk>
Sent: 13 October 2022 14:23
To: Sam Herring <sam@swannedwards.co.uk>
Subject: H23-0545-22 - Cond Comp - Scheme to deal with contamination, etc, Dwellings, Orchard Farm, Dowsdale Bank, Shepeau Stow

Afternoon Sam

We have now received a response from Environmental Protection (see below) concerning the condition compliance application within the subject title.

I welcome your response in due course addressing the points raised, so that we are in a position to proceed with the application.

Regards

David Gedney
Senior Planning Officer
South Holland District Council
T: 01775 764468
E: dgedney@sholland.gov.uk

Working Days: Monday, Tuesday & Thursday



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From: Armour, Susan <Susan.Armour@sholland.gov.uk>
Sent: 13 October 2022 13:58
To: Gedney, David <DGedney@sholland.gov.uk>
Subject: RE: H23-0545-22 - Cond Comp - Scheme to deal with contamination, etc, Dwellings, Orchard Farm, Dowsdale Bank, Shepeau Stow

David,

I'm so sorry, I don't know how I haven't responded to this one sooner. The report attached is for a single window sampler borehole – there isn't a phase 1 desk study? Have I missed that somewhere?
Also, there are no test results or borehole logs attached?

Sorry again,

Sue

Sue Armour
Team Leader Environmental Protection
South Holland District Council

T: 07976642144
E: susan.armour@sholland.gov.uk
www.sholland.gov.uk



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School holiday office hours - Monday & Tuesday 9.15am-5.45pm

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PROPOSED RESIDENTIAL DEVELOPMENT
ORCHARD FARM
DOWSDALE BANK
SHEPEAU STOW
SPALDING
LINCS

PROPOSED RESIDENTIAL DEVELOPMENT ORCHARD FARM DOWSDALE BANK SHEPEAU STOW SPALDING LINCS

GEOENVIRONMENTAL DESK STUDY

Report Ref.: 0870/1

Prepared by :

D Sargeant

D Sargeant
BSc FGS

Date:

November 2022

Goldfinch Environmental Limited
19 Palmer Street, Walsham Le Willows, Bury St Edmunds, Suffolk, IP31 3BZ
Tel: 01359 258681

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- Figure 1 Site Location Plan
- Figure 2 Proposed Layout Plan

APPENDICES

- Appendix 1 'Groundsure' Report

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PROPOSED RESIDENTIAL DEVELOPMENT

ORCHARD FARM

DOWSDALE BANK, SHEPEAU STOW

SPALDING

LINCS

1. INTRODUCTION.

1.1 General.

This report describes the findings of a geoenvironmental desk study undertaken by Goldfinch Environmental Limited on the instruction of Mr Dickens (the Client), via the offices of Swann Edwards Architecture Ltd, at a site off Dowsdale Bank, Shepeau Stow, slightly north of a line between Gedney Hill [to the east] and Crowland [to the west], Spalding, Lincs..

The Desk Study was required to support a planning application for the development of the site to a residential land use by establishment of new dwellings as shown in Figure 2 towards the back of this report.

A site location plan has been included as Figure 1 with the proposed layout shown in Figure 2 towards the back of this report to assist the reader.

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2. LIMITATIONS.

This report is for the sole reliance and use of the Client. Any Third Party coming into possession of this report relies on it at their risk, unless written permission is expressly sought from, and provided by, Goldfinch Environmental Limited. The author owes them no duty of care and skill. Goldfinch Environmental Ltd accepts no responsibility or liability for the consequences of this document being used for purposes other than that for which it was commissioned and the assessments provided herein should not be relied on as a legal opinion.

The findings and opinions expressed are relevant to the time of the site visit and information review and should not be relied upon to represent conditions at substantially later dates. The assessments and opinions given in this report are based upon information available at the time of the report. Where additional information comes available which may affect or identify a need to review our conclusions or assessments we request the opportunity (and reserve the right), to review the information and where warranted, modify our assessment / opinion in part or wholly, accordingly.

The purpose of this desk study report was to determine the historical use of the site and adjacent areas from searches of Public Registers and a review of available historical maps and included a site reconnaissance ('walkover') survey together with brief internet searches. The outcome of these activities is described below and this information was used to construct a conceptual model for the site from which a risk assessment was completed in the context of the proposed residential development of the site.

The risk assessment was based on the source-pathway-receptor framework, with respect to the geoenvironmental condition of the site in the context of various sensitive receptors. Goldfinch Environmental Ltd have based this desk study upon the sources given in this report, and believes them to be reliable but cannot and does not guarantee the authenticity or reliability of the data it has relied upon.

This desk study does not include any geotechnical considerations pertaining to the site as these were outside the agreed brief.

The recommendations given in this report are based on guidance and best practice in place at the time of issue of the report, the information available at the time of the investigation, the nature of the indicated proposed development and associated end user behaviour patterns. Should any of the foregoing change at any time, then this report should be reviewed in the context of proposed changes.

The absence of indicators in search data, or from on site observations does not rule out their presence in other parts of the site. This desk study report has been based on information supplied in the 'GroundSure' report and its component parts included at Appendix 1 towards the back of this report, discussions with the Client and in-house searches.

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3. LEGISLATIVE & REGULATORY SETTING.

The Environmental Protection Act of 1990 created the framework for the identification and remediation of contaminated land. The Act defines "contaminated land" as any land, which appears by the Local Authority to be "in such a condition, by reason of substances, in, on, or under the land that significant harm is being caused or there is significant possibility of such harm being caused, or, pollution of Controlled Waters is being, or is likely to be, caused".

Land potentially affected by 'contamination' is a material consideration for planning purposes together with its relationship with 'regulatory intervention' (Part IIa), and 'voluntary' investigation (which includes redevelopment of sites which may be affected by contamination). The Model Procedures (CLR-11, Environment Agency 2004), provide a generic framework indicating key technical activities applicable in each of these contexts.

The management of land contamination broadly comprises three components that are identified as 'Risk assessment', 'Options appraisal' and 'Implementation'. These, in turn, determine if any *un*acceptable risks exist, ascertain the most appropriate remediation strategy for the site and, finally, demonstrate that the strategy will be effective.

In accordance with this and other current guidance, where a 'land quality' risk assessment is required each 'Relevant Pollutant Linkage' (RPL, formerly referred to as "source-pathway-receptor" framework), is separately identified and a level of risk attached. This is documented in the form of a 'Conceptual Model'.

The outcome of the assessment of established, plausible relevant pollutant linkages is used to determine qualitatively the need for further investigation, or remediation with ensuing mitigation of the determined unacceptable risk. (In accordance with the Model Procedures and Regulatory preference, detailed remedial measures should be provided in a separate phase).

The risk assessment takes account of the local environment, end user behaviour patterns, and the nature of the development in relation to proven 'unacceptable' risk. This is the approach advocated by current guidance (CLR-11 and BS10175 etc), and therefore has been adopted in the assessment of this site.

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4. SITE LOCATION AND DESCRIPTION.

4.1 Introduction

A site visit was carried out during 12 November 2022 the purpose being to:-

I. Collect additional/relevant information about the site its environs and any site-specific potential contaminants, pathways and receptors.

II. Record any aspects of the site not revealed by documentary searches. (e.g. the presence of above- or belowground hydrocarbon storage tanks.).

III. Collect any information that will assist in the planning of any subsequent phases of field investigation where the Desk Study deems this is necessary.

Approximate Grid Reference $^{5}29464$, $^{3}311391$ refers.

The site comprised a sensibly-level, irregularly-shaped plot of land on the southern side of Dowsdale Bank, Shepeau Stow to the southeast of Spalding, Lincs..

At the time of the site walkover survey the site was almost entirely capped with hard cover of concrete except for a relatively narrow strip of exposed soils along the south/southwestern boundary extending northeastwards to the approximate midpoint of the northern site boundary of the site with all other external areas being capped with concrete as can be seen in some of the images below.

It was understood from the Client that the former barns [removed at the time of the walkover survey] had been used for grain drying and storage with the exception of the easternmost barn [still present], which comprised a small workshop. There was no evidence of the storage of potentially leachable materials in the existing workshop.

At the time of the walkover survey the buildings had been removed wit the exception of the Workshop in the east of the site and construction was underway on the new dwellings. Internal inspection of the Workshop showed the exposed concrete floor surfaces were relatively stain-free.

Searches by this Author revealed that the former buildings appeared to have been constructed mainly from brick around a steel frame with the upper elevations clad with corrugated cementised panels all over concrete floorslabs. A short ramp was noted at the front of the site, it was understood this feature was used for loading/unloading lorries with grain.

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Photograph 1: View of the Site from the Road [North] – 2021

Photograph 2: View of the Site from the Southeast

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Photograph 3: View of the Site from the Road [North] – 2021

Photograph 4: Internal View of the Existing Workshop in the East of the Site.

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The external areas of the site were noted to be stain-free and the sparse plant growth did not show any unusual discolouration.

Following visual inspection of the site there were no notable features with regard to land contamination. In addition, although the site had been subject to previous 'development' [as it had existed as part of a larger residential garden] there was no apparent evidence of:~

1. The presence of Made Ground [other than the referred inert sources].
2. The presence or storage of potentially leachable materials/chemicals.
3. Demolition or dispersal of *contaminated* rubble or other materials.
4. Importation of potentially contaminated fill onto the site.

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5. SITE HISTORY.

5.1 Historical Maps.

Where the attached maps are compiled from a composite of editions, the year of map upon which the majority of the site may be found is quoted below. These are reproduced at Appendix 1. Annotation, as it appears on the maps, is indicated by italics.

Land use in excess of 250m from the site is considered of potentially negligible to low risk to the application site and on that basis is generally excluded from the summary provided below (unless record review by this author suggests otherwise). However, should the reader require this additional detail, full disclosure records are included in Appendix 1 towards the back of this report.

(The reader should note at this point that occasionally on the older map editions the site boundaries can be slightly 'shifted' relative to more recent maps.).

1887 Edition {County Series - Scale 1:10 560}

The site was shown as an undeveloped plot of land in a rural environment with no near development.

There were no other notable features associated with the site or surrounding land use in the context of land quality within the search radius for the site.

1888 Edition {County Series - Scale 1:2 500}

There were apparent changes to the site as a structure was shown in the western corner of the site and a second structure was shown near the northwestern boundary of the site.

1904 Edition {County Series - Scale 1:2 500}

There were no apparent changes to the site or its immediate environs at this scale of mapping.

1906 Edition {County Series - Scale 1:10 560}

There were no further apparent changes to the site or its immediate environs at this scale of mapping.

1950 Edition {County Series - Scale 1:10 560}

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There were no apparent changes to the site or its immediate environs at this scale of mapping.

More distant land to the southwest of the site had undergone sparse development.

1958-9 Edition {Provisional - Scale 1:10 560}

There were no apparent changes to the site. However, this does not preclude minor development having taken place.

1975 Edition {National Grid - Scale 1:2 500}

The site had now undergone extensive redevelopment at this scale of mapping. Four structures were established at the site.

The immediate environs to the east of the site had undergone development and were annotated '*Orchard Farm*'.

1979-80 Edition {National Grid - Scale 1:10 000}

There were no apparent changes to the site at this scale of mapping.

There were no apparent changes to surrounding land at this scale of mapping. However, this does not preclude minor development having taken place.

1994 Edition {National Grid - Scale 1:2 500}

There were no apparent changes to the site at this scale of mapping.

There were no apparent changes to surrounding land at this scale of mapping except that land immediately to the southwest of the site appeared to have undergone development .

2001 Edition {National Grid - Scale 1:10 000}

There were apparent changes to the site as the former large building appeared to have been extended and other subordinate buildings had also been removed.

There were no apparent changes to the immediate environs of the site.

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2003 Edition {LandLine - Scale 1:1 250}

There were no apparent changes to the site.

There were no apparent changes to the immediate environs of the site.

2010 Edition {National Grid - Scale 1:10 000}

There were no further changes to the site.

There were no apparent changes to the surrounding environs with respect to land contamination.

2022 Edition {National Grid - Scale 1:10 000}

There were no apparent changes to the site or surrounding environs with respect to land contamination.

5.2 Public Registers.

A search of public register information has been made using an Internet-based system. A disclosure report is reproduced at Appendix 1. The following commentary is restricted to entries within a 250m search radius of the site. Appendix 1 should be referred to for details on entries beyond of this range.

5.2.1 Past Land Use

There were no entries for the referred search radius for the site within this dataset.

5.2.2 Past Land Use – Ungrouped

There were no entries for the referred search radius for the site within this dataset.

5.2.3 Waste & Landfill

There were no records for this potential source of contamination within the search radius for the site.

5.2.4 Current Industrial Land Use

5.2.4.1 Recent Industrial Land Uses

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There was one entry for the referred search radius for the site. Supplied information indicated this was located approximately 130m distant from the site and was given as; '*Poultry Houses*'.

5.2.5 Hydrogeology

5.2.5.1 Superficial Aquifer

Records were '*Identified*' within supplied search data and indicated the site was underlain by a '*Unproductive*' aquifer.

5.2.5.2 Bedrock Aquifer

Records were '*Identified*' within supplied search data and indicated the site was underlain by a '*Unproductive*' aquifer.

5.2.6 Geology

5.2.6.1 Superficial (1:50 000)

Records were '*Identified*' within supplied search data and indicated the site was underlain by Tidal Flat Deposits (Clay & Silt).

5.2.6.2 Bedrock (1:50 000)

Records were '*Identified*' within supplied search data and indicated the site was underlain by Oxford Clay Formation (Mudstone).

5.2.7 Radon

Searches indicated that the site is in an area where less than 1% of properties are above the 'Action Level' therefore radon protection measures are not necessary in extensions and new dwellings.

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6. PRELIMINARY QUALITATIVE RISK ASSESSMENT.

6.1 Introduction.

There are three factors that are taken into account whilst undertaking a qualitative risk assessment. These have been described in Section 3 of this document. At the time of this report, the site had been proposed for residential development.

6.2 Conceptual Model.

Source (s) (Potential)	Pathway	Target	Risk
Soil: The site had existed as a 'developed' plot of land since at least issue of the 1888 Edition with changes shown on the 1975 and 2001 Editions with no further changes to the present day. i.e. the time of the site walkover survey carried out during 12 November 2022 by this Author. There were no site-specific indicators of potential soil-borne contamination. Visual and olfactory indicators of potential contamination immediately nearby off site were not noted.	❖ Dermal contact, ingestion and inhalation	• Present users • End users • Construction workers • General public	• Low • Low • Low • Low
	❖ Wind erosion and atmospheric dispersion	• Adjacent properties • General public	• Low • Low • Low • n/a
	❖ Leaching	• Adjacent properties • Shallow groundwater • Services/construction materials • Plant life • Surface water	• Low • Low • Low • Low • Low • Low • Low
Shallow groundwater: The site overlies '*Unproductive*' aquifers, which were not considered to be pollution sources.	❖ Groundwater migration	• Adjacent properties • Deep groundwater • Services/construction materials • Plant life	• Low • Low • Low • n/a • Low • Low
	❖ Dermal contact, ingestion and inhalation	• Present users • End users • Construction workers • General public	• Low • Low • Low • Neg-Low
Gas: Measurable (background) concentrations of ground gas would not (reasonably) be anticipated to be present as a result of historical site use or the underlying natural geology.	❖ Direct inhalation ❖ Soil migration ❖ Services migration	• End users • Construction workers • Buildings	• Low • Low • Low • Low • Neg

Negligible Risk	Defined as the site should be considered suitable for present or future use and environmental setting. Contaminants unlikely to be present, which might have unacceptable impact on key targets.
Low Risk	Defined as the site should be considered suitable for present or future use and environmental setting. Contaminants may be present but unlikely to have unacceptable impact on key targets.
Medium Risk	Defined as the site may not be suitable for present or future use and environmental setting. Contaminants are probably present and might have unacceptable impact on key targets.
High Risk	Defined as the site is probably or certainly not suitable for present or future use and environmental setting. Contaminants probably or certainly present and likely to have an unacceptable impact on key targets.
Notes:	n/a = not applicable

The risk assessment follows below:-

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6.3 Targets.

Potential targets, in the context of the risk assessment (based on the relevant pollutant linkage), where a plausible pathway can be proven, are discussed as follows.

At the time of this report, the proposed scheme comprised residential development.

6.3.1 Human Health (Site Users & Construction Workers)

The site had a limited documented development history as described, which included its establishment but much of the site had been capped with concrete for much of its documented history, which would have afforded protection of the underlying soils from any activities carried out at the site during its agricultural history. There is little or no potential for the presence of limited thicknesses of Made Ground [other than the referred inert sources referred in Section 4 of this report.

Based upon the foregoing and the final paragraph of this report, regarding 'unanticipated contamination:-

A *Low* risk has been identified until proven otherwise.

6.3.2 Services and Construction Materials

6.3.2.1 Concrete & Potable water supplies.

Adverse effects on services and construction materials may be anticipated where soils are impacted by localised raised/lowered pH values, PAH's, TPHs and metals contamination and where these are present in Made Ground materials. However, in this instance and based on the absence of Made Ground and the foregoing:-

A *Low* risk has been identified.

6.4 Landscaping & Planting

Based on the foregoing a '*Low*' risk is presented to this receptor from the Made Ground present at the site.

6.5 Groundwater (Controlled Waters)

The site is underlain by '*Unproductive*' aquifers. However, there remains the potential for small quantities of perched groundwater in any superficial fills (or Made Ground), where these are present. However, searches indicated in this instance that the presence of

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significant thicknesses of Made Ground would not be reasonably anticipated given the documented history of the site.

A *Low* risk to deeper groundwater has been identified.

6.6 Ground Gas

Measurable concentrations of soil gases (predominantly carbon dioxide) would not be reasonably anticipated to be present as a function of any made ground present. However, where present, any granular overburden would mitigate the risk of ground gas buildup via natural ventilation of ground gas to atmosphere.

On the basis of the foregoing:~

A *Low* risk has been identified.

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7. RECOMMENDATIONS FOLLOWING PRELIMINARY RISK ASSESSMENT.

7.1 Overview.

The desk study information (including the outcome of the walkover survey), showed the site had a limited documented developmental history since its establishment.

The site walkover survey and the searches carried out as part of this Desk Study indicated that there were no readily identifiable [plausible] sources of contamination.

Made Ground [other than the inert sources referred above] was not noted to be present.

On that basis, and subject to the final paragraph in this report (in blue text), the need for a Phase 2 intrusive investigation is considered ***un***warranted.

The opinions and recommendations in this report are subject to the agreement of the Regulators.

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8. CONCLUSIONS.

This geoenvironmental desk study prepared by Goldfinch Environmental Limited was undertaken on the instruction of Mr Dickens (the Client), via the offices of Swann Edwards Architecture Ltd, at a site off Dowsdale Bank, Shepeau Stow, slightly north of a line between Gedney Hill [to the east] and Crowland [to the west], Spalding, Lincs..

The site was proposed for residential development.

There were no notable features present in the context of land contamination other than inert Made Ground as described above.

Desk Study searches have shown that the site rests on Tidal Flat Deposits (Clay and Silt) underlain by Oxford Clay Formation (Mudstone).

An *overall Low* risk is associated with the site *subject to the final paragraph in this report.*

Recommendations for the need for further work (or otherwise) have been discussed in Section 7 of this report.

Also, at all times especially once any necessary groundworks have commenced, the final paragraph below applies regarding 'unanticipated' contamination.

The reader should note that the opinions, recommendations and conclusions in this report are subject to the agreement of the Local Authority who are the final arbiters in these matters.

Based on the foregoing, a *Low* risk to construction workers and services installations has been associated with the site until proven otherwise. Site personnel, particularly groundworkers, should follow sound health and safety welfare practices that will further mitigate this level of risk.

Should unanticipated contamination be suspected, or revealed during any groundworks, then the area should be temporarily isolated and further advice sought by a suitably independent qualified person and a management strategy for these occurrences should be submitted to the Local Authority for their approval prior to proceeding, as required by Regulatory Offices.

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Tel: 01359 258681

FIGURES

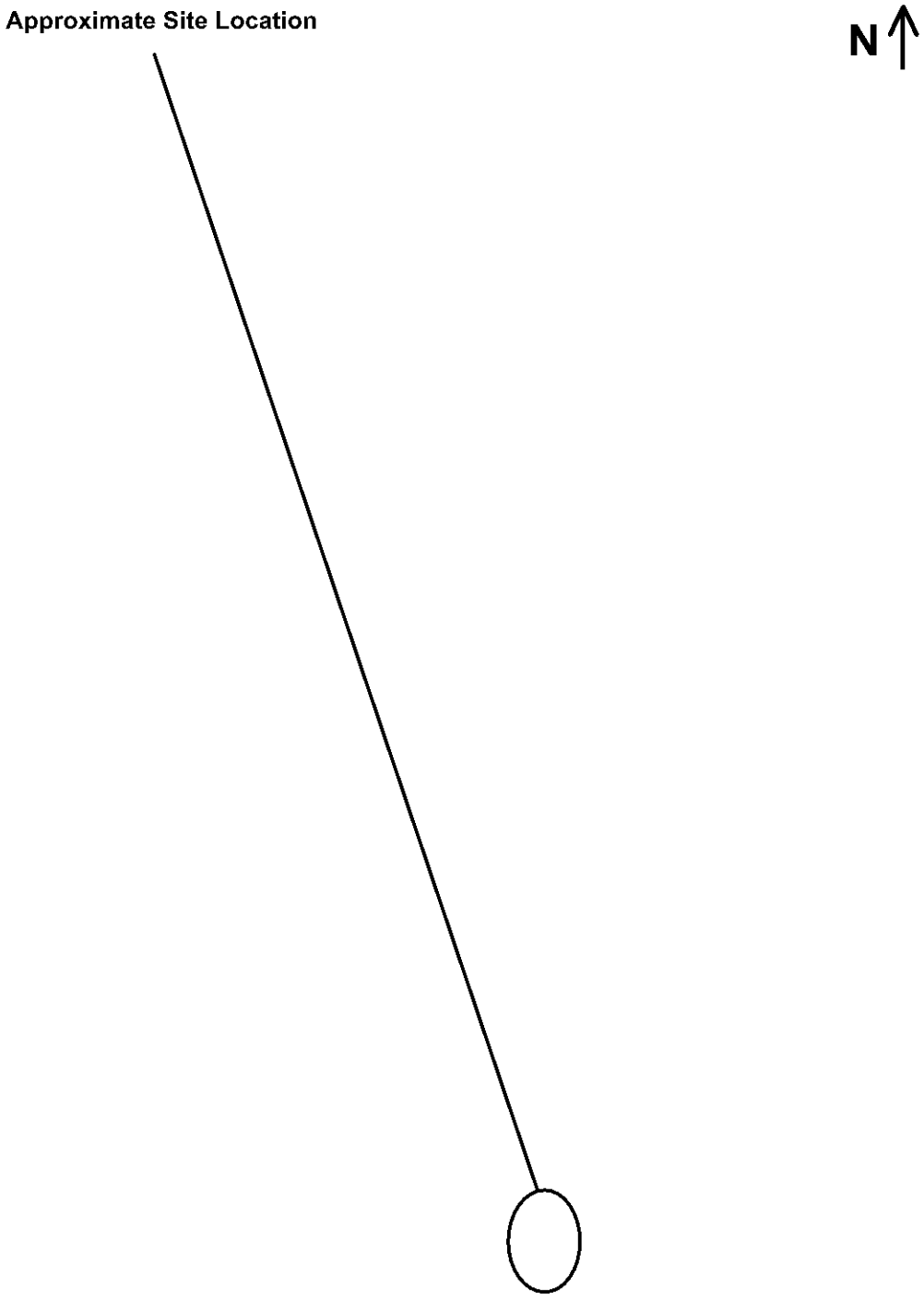


Figure 1	Site Location Plan	**Goldfinch** Environmental Ltd
Ref: 0870/1		

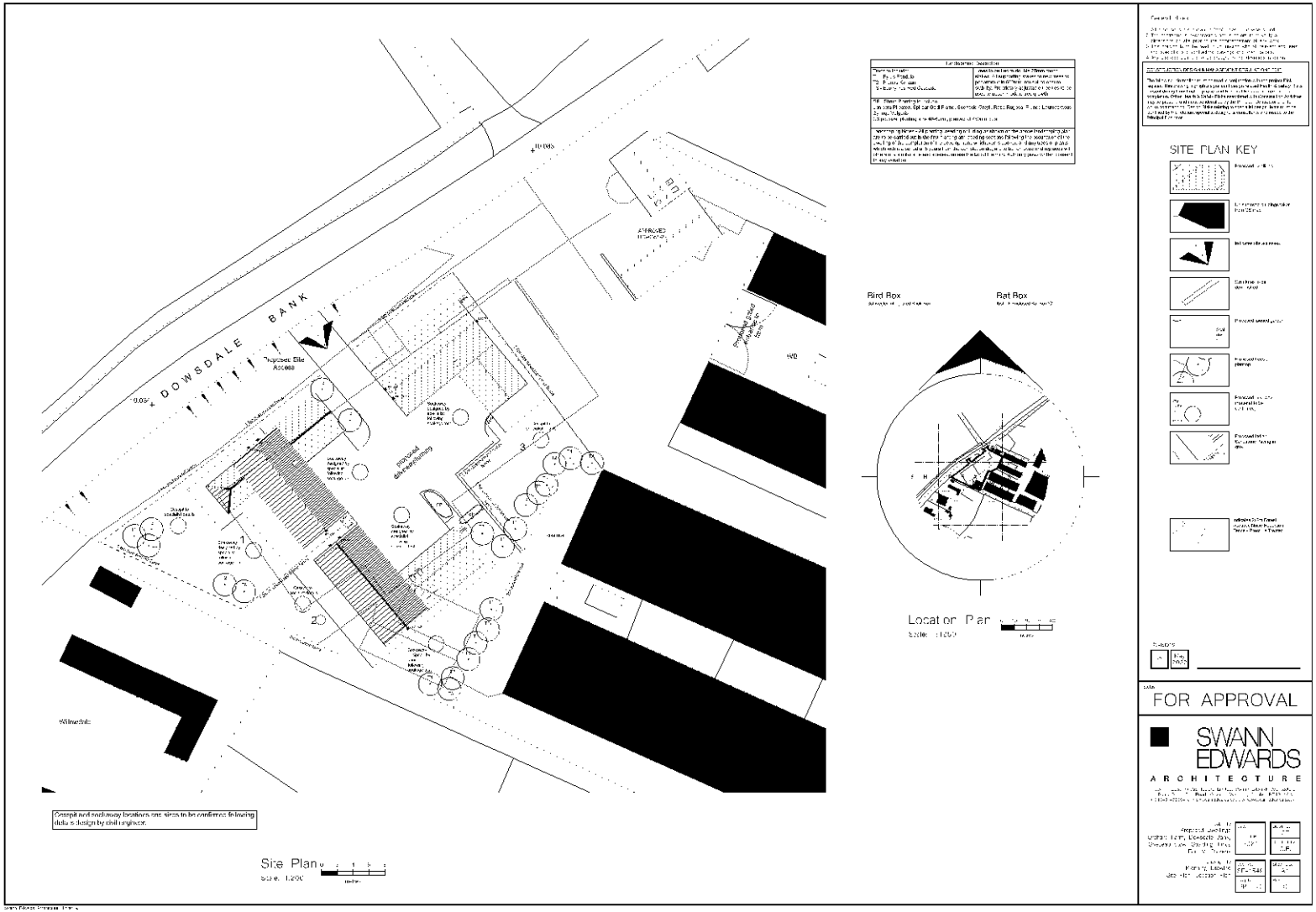


Figure 2	Proposed Layout Plan	**Goldfinch** Environmental Limited
Ref. 0870/1		

APPENDIX 1

'Groundsure' Report

Site Details:

ORCHARD FARM, DOWSDALE BANK, SHEPEAU STOW, SPALDING, PE12 0UA

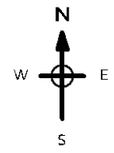
Client Ref: 0870-ds
Report Ref: GS-2391-9190150
Grid Ref: 529459, 311390

Map Name: County Series

Map date: **1886**

Scale: 1:10,560

Printed at: 1:10,560



Produced by
Groundsure Insights
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W: www.groundsure.com

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Production date: 10 November 2022

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

Site Details:

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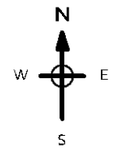
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Report Ref: GS-2391-9190150
Grid Ref: 529459, 311390

Map Name: County Series

Map date: **1887**

Scale: 1:10,560

Printed at: 1:10,560



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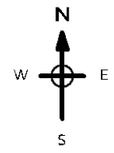
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Grid Ref: 529459, 311390

Map Name: County Series

Map date: **1888**

Scale: 1:2,500

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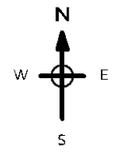
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Report Ref: GS-2391-9190150
Grid Ref: 529459, 311390

Map Name: County Series

Map date: **1904**

Scale: 1:2,500

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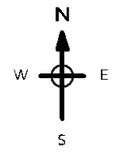
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Report Ref: GS-2391-9190150
Grid Ref: 529459, 311390

Map Name: County Series

Map date: **1906**

Scale: 1:10,560

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Client Ref: 0870-ds
Report Ref: GS-2391-9190150
Grid Ref: 529459, 311390

Map Name: County Series

Map date: **1950**

Scale: 1:10,560

Printed at: 1:10,560



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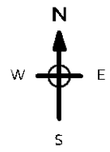
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Report Ref: GS-2391-9190150
Grid Ref: 529459, 311390

Map Name: Provisional

Map date: **1958-1959**

Scale: 1:10,560

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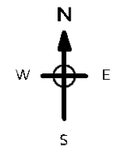
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Report Ref: GS-2391-9190150
Grid Ref: 529459, 311390

Map Name: National Grid

Map date: **1975**

Scale: 1:2,500

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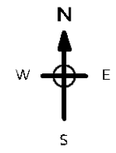
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Report Ref: GS-2391-9190150
Grid Ref: 529459, 311390

Map Name: National Grid

Map date: **1975**

Scale: 1:2,500

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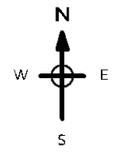
Client Ref: 0870-ds
Report Ref: GS-2391-9190150
Grid Ref: 529459, 311390

Map Name: National Grid

Map date: **1979-1980**

Scale: 1:10,000

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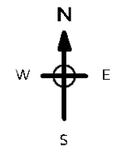
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Report Ref: GS-2391-9190150
Grid Ref: 529459, 311390

Map Name: National Grid

Map date: **1994**

Scale: 1:2,500

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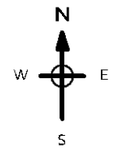
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Report Ref: GS-2391-9190150
Grid Ref: 529459, 311390

Map Name: National Grid

Map date: **2001**

Scale: 1:10,000

Printed at: 1:10,000



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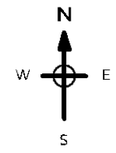
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Client Ref: 0870-ds
Report Ref: GS-2391-9190150
Grid Ref: 529459, 311390

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



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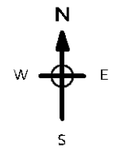
Client Ref: 0870-ds
Report Ref: GS-2391-9190150
Grid Ref: 529459, 311390

Map Name: National Grid

Map date: **2010**

Scale: 1:10,000

Printed at: 1:10,000



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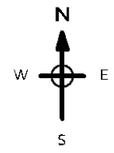
Client Ref: 0870-ds
Report Ref: GS-2391-9190150
Grid Ref: 529459, 311390

Map Name: National Grid

Map date: 2022

Scale: 1:10,000

Printed at: 1:10,000



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ORCHARD FARM, DOWSDALE BANK, SHEPEAU STOW, SPALDING, PE12 0UA

Order Details

Date: 10/11/2022

Your ref: 0870-ds

Our Ref: GS-2391-9190151

Site Details

Location: 529464 311391

Area: 0.24 ha

Authority: South Holland District Council

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Summary of findings p. 2

OS MasterMap site plan p.13

Aerial image p. 8

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Summary of findings

Page	Section	Past land use	On site	0-50m	50-250m	250-500m	500-2000m

Page	Section	Past land use - un-grouped	On site	0-50m	50-250m	250-500m	500-2000m

Page	Section	Waste and landfill	On site	0-50m	50-250m	250-500m	500-2000m

Page	Section	Current industrial land use	On site	0-50m	50-250m	250-500m	500-2000m
20	4.1	Recent industrial land uses			1		

23	**4.13**	**Licensed Discharges to controlled waters**	2

Page	Section	Hydrogeology	On site	0-50m	50-250m	250-500m	500-2000m
26	**5.1**	**Superficial aquifer**	Identified (within 500m)				
27	**5.2**	**Bedrock aquifer**	Identified (within 500m)				
28	**5.3**	**Groundwater vulnerability**	Identified (within 50m)				

31	**5.7**	**Surface water abstractions**	2

Page	Section	Hydrology	On site	0-50m	50-250m	250-500m	500-2000m
33	**6.1**	**Water Network (OS MasterMap)**		5	11		

35	6.2	Surface water features	1	2	2		
35	6.3	WFD Surface water body catchments	1				
36	6.4	WFD Surface water bodies					

Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
37	7.1	Risk of flooding from rivers and the sea	Low (within 50m)				
38	7.2	Historical Flood Events		1			

40	7.6	Flood Zone 2	Identified (within 50m)

Page	Section	Surface water flooding	
42	8.1	Surface water flooding	1 in 30 year, 0.1m - 0.3m (within 50m)
Page	Section	Groundwater flooding	
44	9.1	Groundwater flooding	Negligible (within 50m)

Page	Section	Environmental designations	On site	0-50m	50-250m	250-500m	500-2000m

48	**10.16**	**Nitrate Vulnerable Zones**	1

Page	Section	Visual and cultural designations	On site	0-50m	50-250m	250-500m	500-2000m

Page	Section	Agricultural designations	On site	0-50m	50-250m	250-500m	500-2000m
52	**12.1**	**Agricultural Land Classification**	Grade 2 (within 250m)				

54	**12.5**	**Countryside Stewardship Schemes**			2		

Page	Section	Habitat designations	On site	0-50m	50-250m	250-500m	500-2000m

Page	Section	Geology 1:10,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
56	**14.1**	**10k Availability**	Identified (within 500m)				
58	**14.3**	**Superficial geology (10k)**	1		1	1	

60	14.5	Bedrock geology (10k)	1			1	

Page	Section	Geology 1:50,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
62	15.1	50k Availability	Identified (within 500m)				
64	15.4	Superficial geology (50k)	1				
65	15.5	Superficial permeability (50k)	Identified (within 50m)				
66	15.8	Bedrock geology (50k)	1				
67	15.9	Bedrock permeability (50k)	Identified (within 50m)				

Page	Section	Boreholes	On site	0-50m	50-250m	250-500m	500-2000m

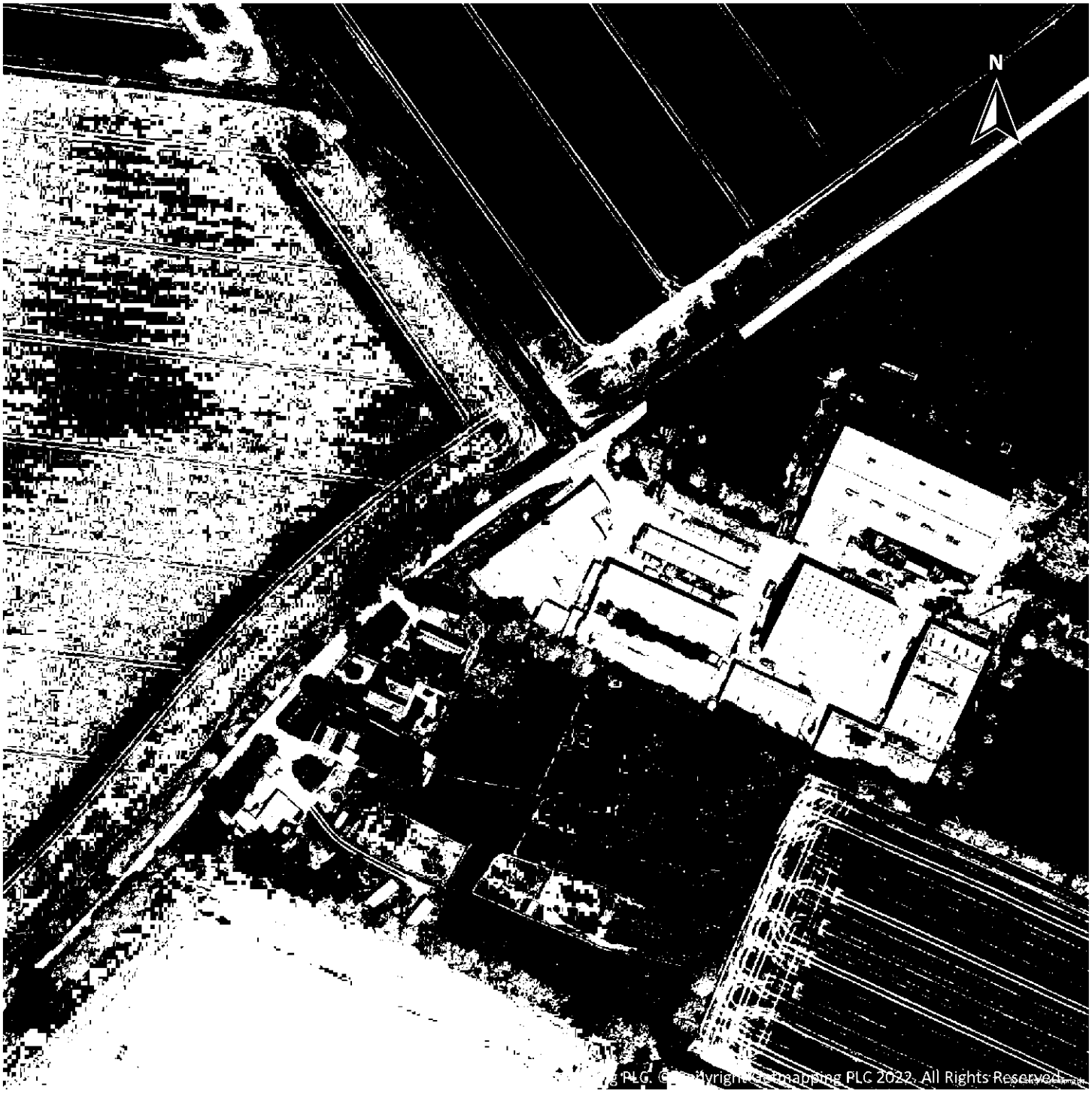
Page	Section	Natural ground subsidence	
69	17.1	Shrink swell clays	Low (within 50m)
70	17.2	Running sands	Moderate (within 50m)
71	17.3	Compressible deposits	Moderate (within 50m)
72	17.4	Collapsible deposits	Negligible (within 50m)
73	17.5	Landslides	Very low (within 50m)
74	17.6	Ground dissolution of soluble rocks	Negligible (within 50m)

Page	Section	Mining, ground workings and natural cavities	On site	0-50m	50-250m	250-500m	500-2000m

Page	Section	Radon					
78	**19.1**	**Radon**	Less than 1% (within 0m)				
Page	Section	Soil chemistry	On site	0-50m	50-250m	250-500m	500-2000m
79	**20.1**	**BGS Estimated Background Soil Chemistry**	2				

Page	Section	Railway infrastructure and projects	On site	0-50m	50-250m	250-500m	500-2000m

Recent aerial photograph



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Capture Date: 29/05/2021

Site Area: 0.24ha

Recent site history - 2018 aerial photograph



Capture Date: 20/04/2018

Site Area: 0.24ha

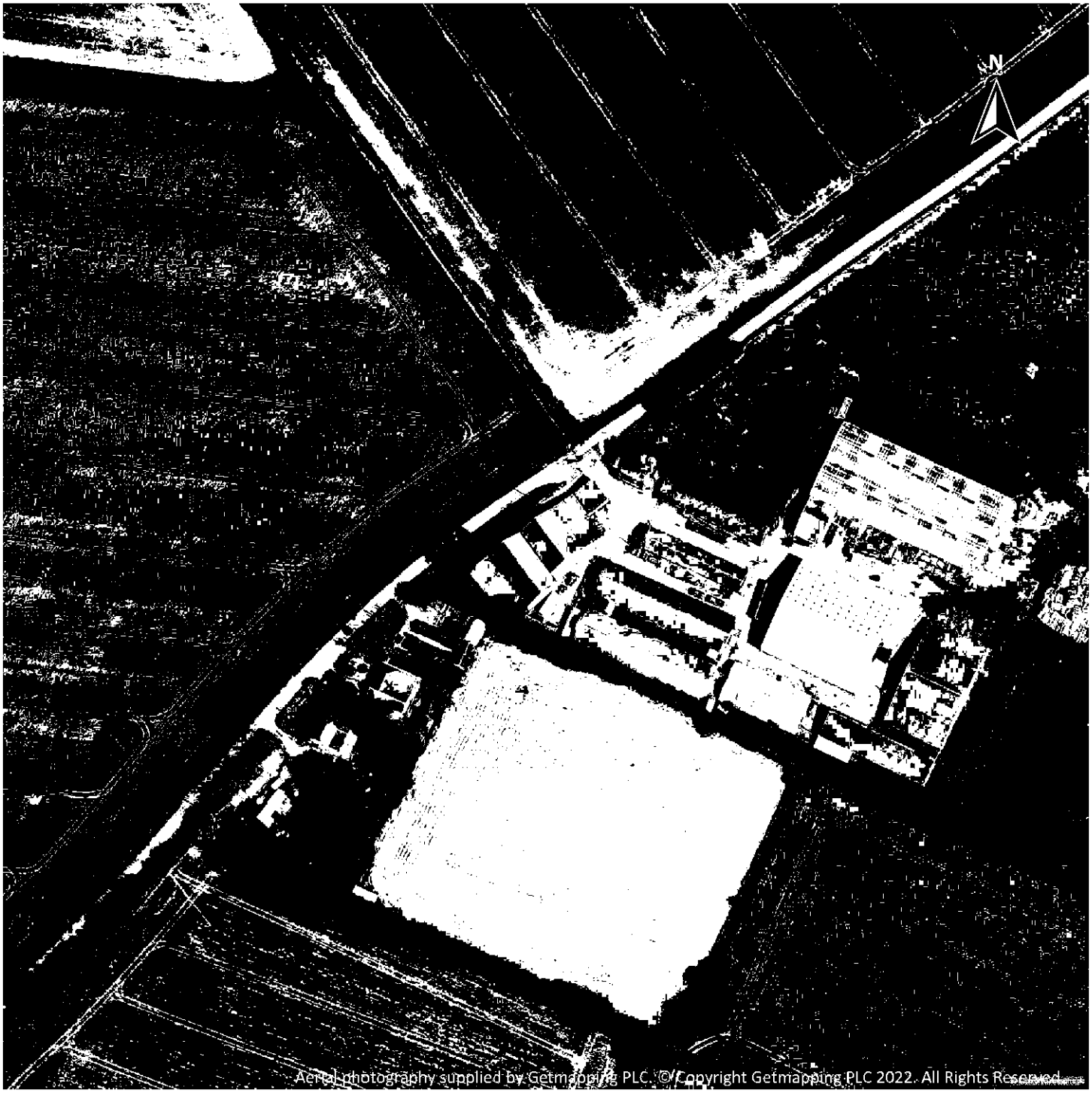
Recent site history - 2014 aerial photograph



Capture Date: 06/06/2014

Site Area: 0.24ha

Recent site history - 2012 aerial photograph



Capture Date: 23/07/2012

Site Area: 0.24ha

Recent site history - 1999 aerial photograph



Capture Date: 18/06/1999

Site Area: 0.24ha

OS MasterMap site plan

Site Area: 0.24ha

1 Past land use

1.1 Historical industrial land uses

Records within 500m **0**

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'.

1.2 Historical tanks

Records within 500m **0**

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

1.3 Historical energy features

Records within 500m **0**

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

1.4 Historical petrol stations

Records within 500m **0**

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

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 un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

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.

2 Past land use - un-grouped

2.1 Historical industrial land uses

Records within 500m	**0**

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'.

2.2 Historical tanks

Records within 500m	**0**

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'.

2.3 Historical energy features

Records within 500m	**0**

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'.

2.4 Historical petrol stations

Records within 500m	**0**

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

2.5 Historical garages

Records within 500m	**0**

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

3 Waste and landfill

3.1 Active or recent landfill

Records within 500m **0**

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

3.2 Historical landfill (BGS records)

Records within 500m **0**

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

3.3 Historical landfill (LA/mapping records)

Records within 500m **0**

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

3.4 Historical landfill (EA/NRW records)

Records within 500m **0**

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

3.5 Historical waste sites

Records within 500m **0**

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

3.6 Licensed waste sites

Records within 500m	**0**

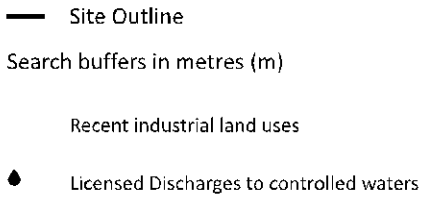
Active or recently closed waste sites under Environment Agency/Natural Resources Wales regulation.

3.7 Waste exemptions

Records within 500m	**0**

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

4 Current industrial land use



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4.1 Recent industrial land uses

Records within 250m **1**

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 20**

ID	Location	Company	Address	Activity	Category

4.2 Current or recent petrol stations

Records within 500m **0**

Open, closed, under development and obsolete petrol stations.

4.3 Electricity cables

Records within 500m **0**

High voltage underground electricity transmission cables.

4.4 Gas pipelines

Records within 500m **0**

High pressure underground gas transmission pipelines.

4.5 Sites determined as Contaminated Land

Records within 500m **0**

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

4.6 Control of Major Accident Hazards (COMAH)

Records within 500m **0**

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

4.7 Regulated explosive sites

Records within 500m **0**

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

4.8 Hazardous substance storage/usage

Records within 500m **0**

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

4.9 Historical licensed industrial activities (IPC)

Records within 500m **0**

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

4.10 Licensed industrial activities (Part A(1))

Records within 500m **0**

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

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

Records within 500m **0**

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

4.12 Radioactive Substance Authorisations

Records within 500m **0**

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

4.13 Licensed Discharges to controlled waters

Records within 500m **2**

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 20**

ID	Location	Address	Details

4.14 Pollutant release to surface waters (Red List)

Records within 500m **0**

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

4.15 Pollutant release to public sewer

Records within 500m **0**

Discharges of Special Category Effluents to the public sewer.

4.16 List 1 Dangerous Substances

Records within 500m **0**

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

4.17 List 2 Dangerous Substances

Records within 500m **0**

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

4.18 Pollution Incidents (EA/NRW)

Records within 500m **0**

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

4.19 Pollution inventory substances

Records within 500m **0**

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

4.20 Pollution inventory waste transfers

Records within 500m **0**

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

4.21 Pollution inventory radioactive waste

Records within 500m	**0**

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

5 Hydrogeology - Superficial aquifer



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5.1 Superficial aquifer

Records within 500m **2**

Aquifer status of groundwater held within superficial geology.

Features are displayed on the Hydrogeology map on **page 26**

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

Bedrock aquifer



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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 27**

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

Groundwater vulnerability



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5.3 Groundwater vulnerability

Records within 50m **1**

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

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

Features are displayed on the Groundwater vulnerability map on **page 28**

ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	**On site**	**Summary Classification: Unproductive aquifer (may have productive aquifer beneath) Combined classification: Unproductive Bedrock Aquifer, Unproductive Superficial Aquifer**	**Leaching class: High Infiltration value: >70% Dilution value: <300mm/year**	**Vulnerability: Unproductive Aquifer type: Unproductive Thickness: >10m Patchiness value: >90% Recharge potential: Low**	**Vulnerability: Unproductive Aquifer type: Unproductive Flow mechanism: Well connected fractures**

5.4 Groundwater vulnerability- soluble rock risk

Records on site **0**

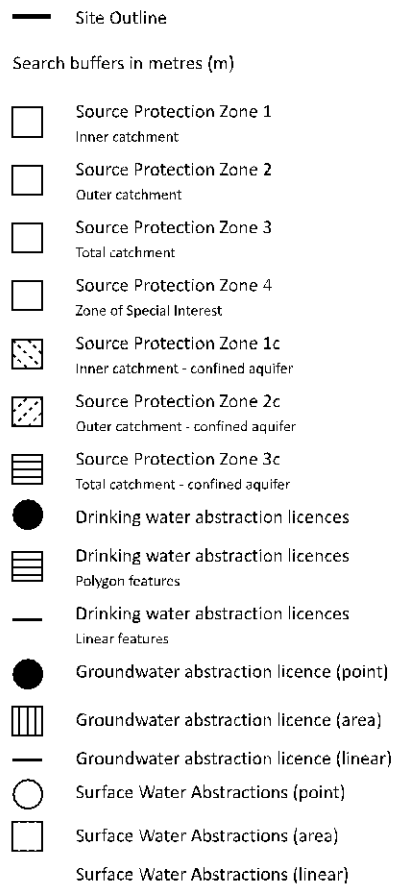
This dataset identifies areas where solution features that enable rapid movement of a pollutant may be present within a 1km grid square.

5.5 Groundwater vulnerability- local information

Records on site **0**

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

Abstractions and Source Protection Zones



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5.6 Groundwater abstractions

Records within 2000m **0**

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.

5.7 Surface water abstractions

Records within 2000m **2**

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 30**

ID	Location	Details

5.8 Potable abstractions

Records within 2000m **0**

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

5.9 Source Protection Zones

Records within 500m	**0**

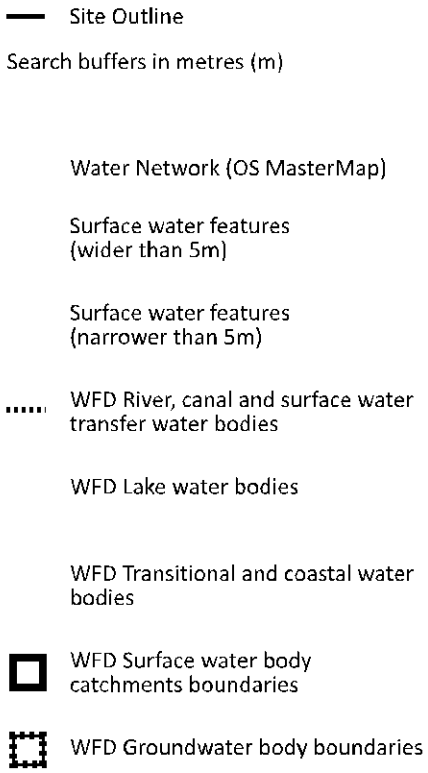
Source Protection Zones define the sensitivity of an area around a potable abstraction site to contamination.

5.10 Source Protection Zones (confined aquifer)

Records within 500m	**0**

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

6 Hydrology



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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 33**

ID	Location	Type of water feature	Ground level	Permanence	Name

ID	Location	Type of water feature	Ground level	Permanence	Name

ID	Location	Type of water feature	Ground level	Permanence	Name

6.2 Surface water features

Records within 250m **5**

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 33**

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 33**

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
1	**On site**	**River**	**South Holland Main Drain**	**GB205032050405**	**Nene Lower**	**Nene**

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 33**

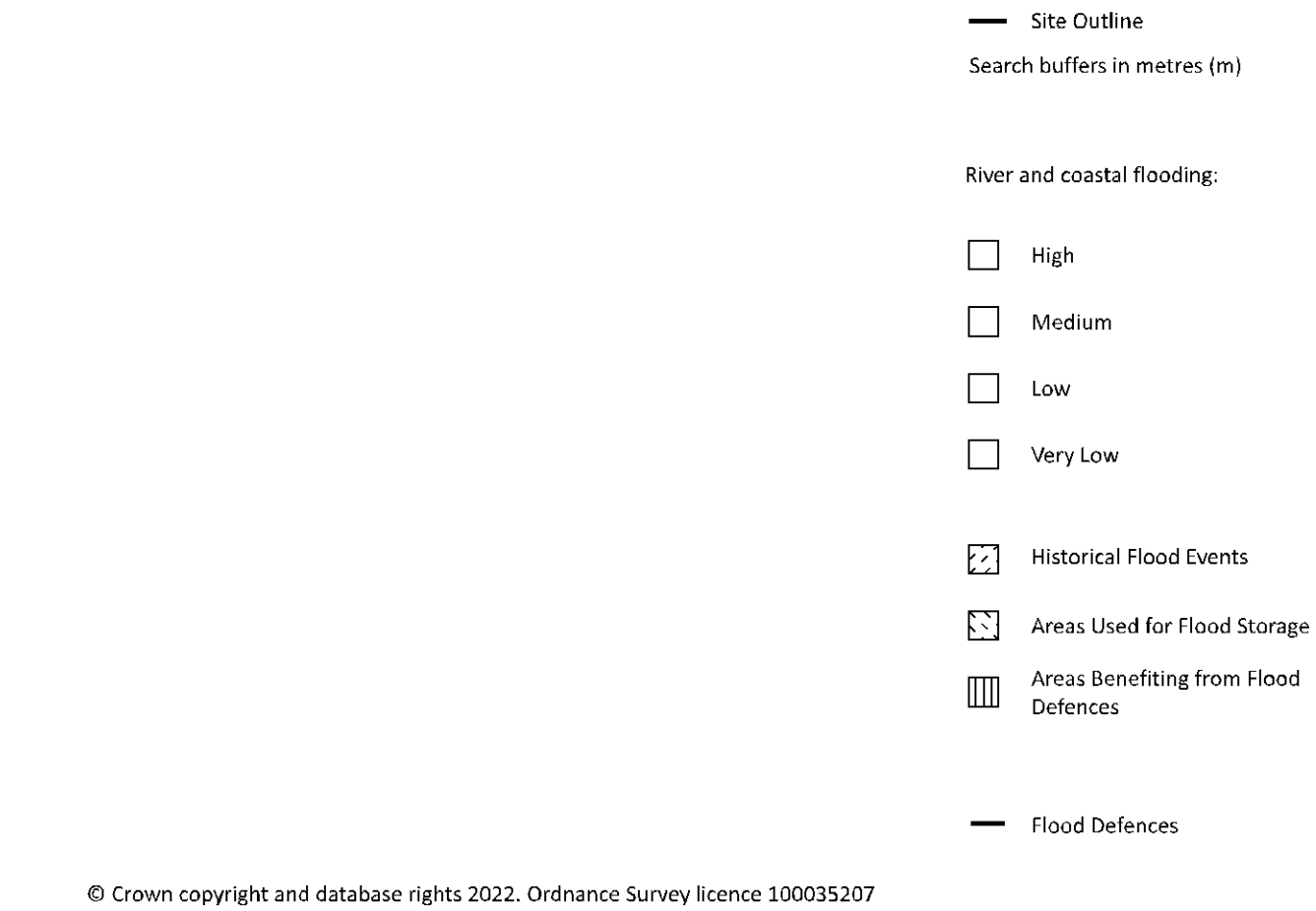
ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year

6.5 WFD Groundwater bodies

Records on site **0**

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.

7 River and coastal flooding



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7.1 Risk of flooding from rivers and the sea

Records within 50m **2**

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 37**

Distance	Flood risk category
On site	**N/A**

7.2 Historical Flood Events

Records within 250m **1**

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.

Features are displayed on the River and coastal flooding map on **page 37**

ID	Location	Event name	Date of flood	Flood source	Flood cause	Type of flood

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.

7.4 Areas Benefiting from Flood Defences

Records within 250m **0**

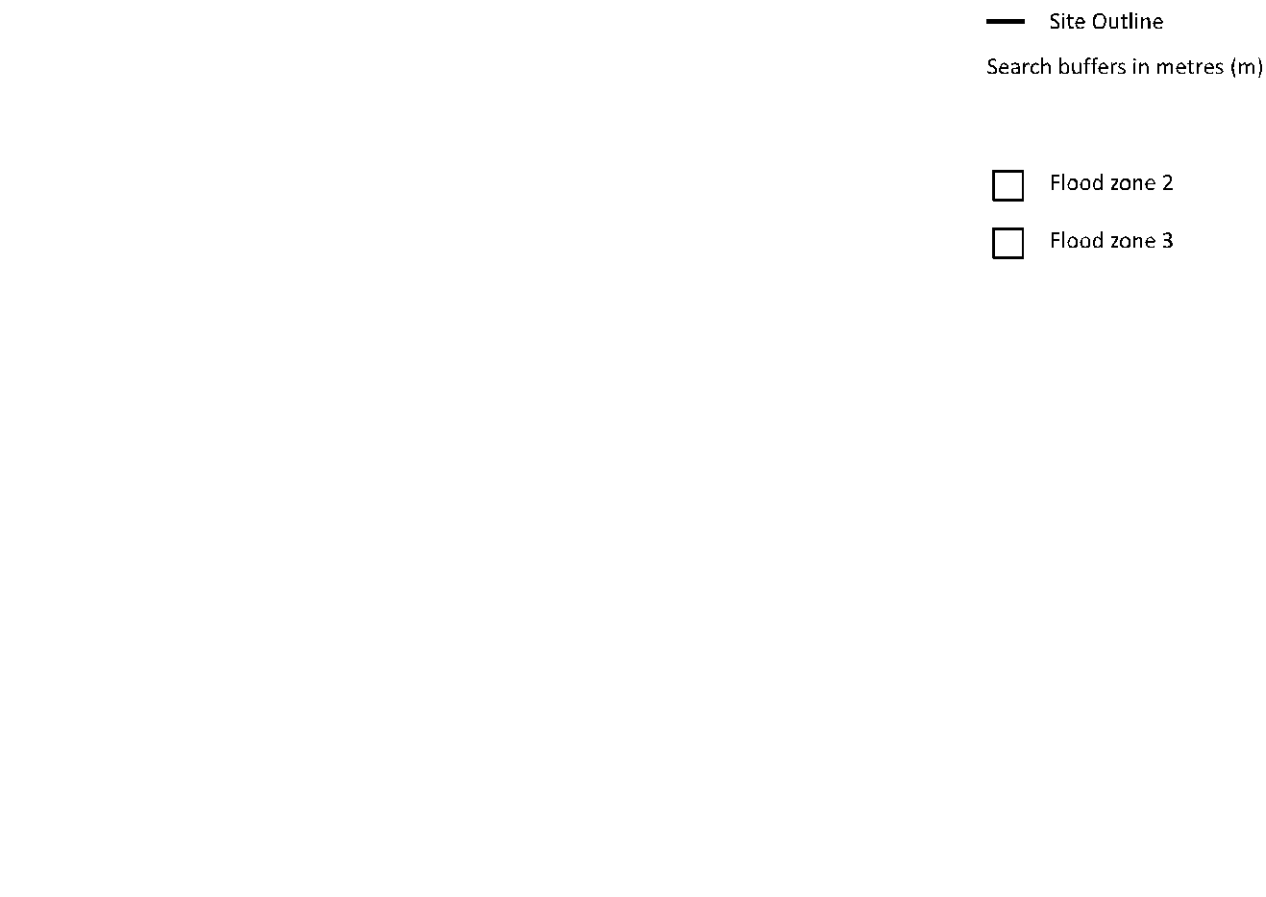
Areas that would benefit from the presence of flood defences in a 1 in 100 (1%) chance of flooding each year from rivers or 1 in 200 (0.5%) chance of flooding each year from the sea.

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.

River and coastal flooding - Flood Zones



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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 37**

Location	Type

7.7 Flood Zone 3

Records within 50m	**0**

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

8 Surface water flooding



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8.1 Surface water flooding

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

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 42**

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

9 Groundwater flooding



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9.1 Groundwater flooding

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

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

Features are displayed on the Groundwater flooding map on **page 44**

10 Environmental designations

10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m **0**

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

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.

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.

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.

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.

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.

10.7 Designated Ancient Woodland

Records within 2000m **0**

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.

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.

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.

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.

10.11 Green Belt

Records within 2000m **0**

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

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.

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.

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.

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).

10.16 Nitrate Vulnerable Zones

Records within 2000m **1**

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

SSSI Impact Zones and Units

10.17 SSSI Impact Risk Zones

Records on site **0**

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

10.18 SSSI Units

Records within 2000m **0**

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

11 Visual and cultural designations

11.1 World Heritage Sites

Records within 250m **0**

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

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.

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.

11.4 Listed Buildings

Records within 250m **0**

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

11.5 Conservation Areas

Records within 250m	**0**

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

11.6 Scheduled Ancient Monuments

Records within 250m	**0**

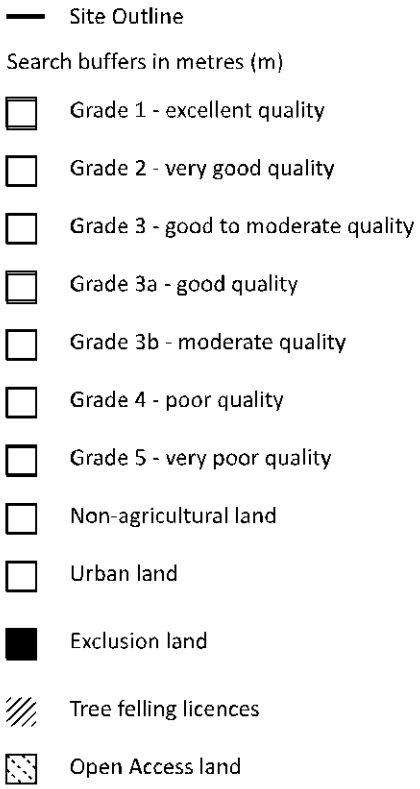
A scheduled monument is an historic building or site that is included in the Schedule of Monuments kept by the Secretary of State for Digital, Culture, Media and Sport. The regime is set out in the Ancient Monuments and Archaeological Areas Act 1979. The Schedule of Monuments has c.20,000 entries and 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.

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.

12 Agricultural designations



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12.1 Agricultural Land Classification

Records within 250m **1**

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

Features are displayed on the Agricultural designations map on **page 52**

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

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.

12.3 Tree Felling Licences

Records within 250m **0**

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

12.4 Environmental Stewardship Schemes

Records within 250m **0**

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

12.5 Countryside Stewardship Schemes

Records within 250m **2**

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

13 Habitat designations

13.1 Priority Habitat Inventory

Records within 250m **0**

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

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.

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.

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.

14 Geology 1:10,000 scale - Availability



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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 56**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	**On site**	**No coverage**	**Full**	**Full**	**No coverage**	**TF21SE**

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

14.2 Artificial and made ground (10k)

Records within 500m	**0**

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

Geology 1:10,000 scale - Superficial



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14.3 Superficial geology (10k)

Records within 500m **3**

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 58**

ID	Location	LEX Code	Description	Rock description
1	**On site**	**BYD-XCZ**	**Barroway Drove Beds - Clay And Silt**	**Clay And Silt**

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.

Geology 1:10,000 scale - Bedrock



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14.5 Bedrock geology (10k)

Records within 500m **2**

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 60**

ID	Location	LEX Code	Description	Rock age
1	**On site**	**OXC-MDST**	**Oxford Clay Formation - Mudstone**	**Oxfordian Age - Callovian Age**

14.6 Bedrock faults and other linear features (10k)

Records within 500m	**0**

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

15 Geology 1:50,000 scale - Availability



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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 62**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	**On site**	**Full**	**Full**	**Full**	**No coverage**	**EW158_peterborough_v4**

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

15.2 Artificial and made ground (50k)

Records within 500m **0**

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

15.3 Artificial ground permeability (50k)

Records within 50m **0**

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

Geology 1:50,000 scale - Superficial



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15.4 Superficial geology (50k)

Records within 500m **1**

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

Features are displayed on the Geology 1:50,000 scale - Superficial map on **page 64**

ID	Location	LEX Code	Description	Rock description
1	**On site**	**TFD1-XCZ**	**TIDAL FLAT DEPOSITS, 1**	**CLAY AND SILT**

15.5 Superficial permeability (50k)

Records within 50m **1**

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

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

15.6 Landslip (50k)

Records within 500m **0**

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

15.7 Landslip permeability (50k)

Records within 50m **0**

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

Geology 1:50,000 scale - Bedrock



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15.8 Bedrock geology (50k)

Records within 500m **1**

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

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 66**

ID	Location	LEX Code	Description	Rock age
1	**On site**	**OXC-MDST**	**OXFORD CLAY FORMATION - MUDSTONE**	**CALLOVIAN**

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**	**Low**	**Very Low**

15.10 Bedrock faults and other linear features (50k)

Records within 500m **0**

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

16 Boreholes

16.1 BGS Boreholes

Records within 250m	**0**

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

17 Natural ground subsidence - Shrink swell clays



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17.1 Shrink swell clays

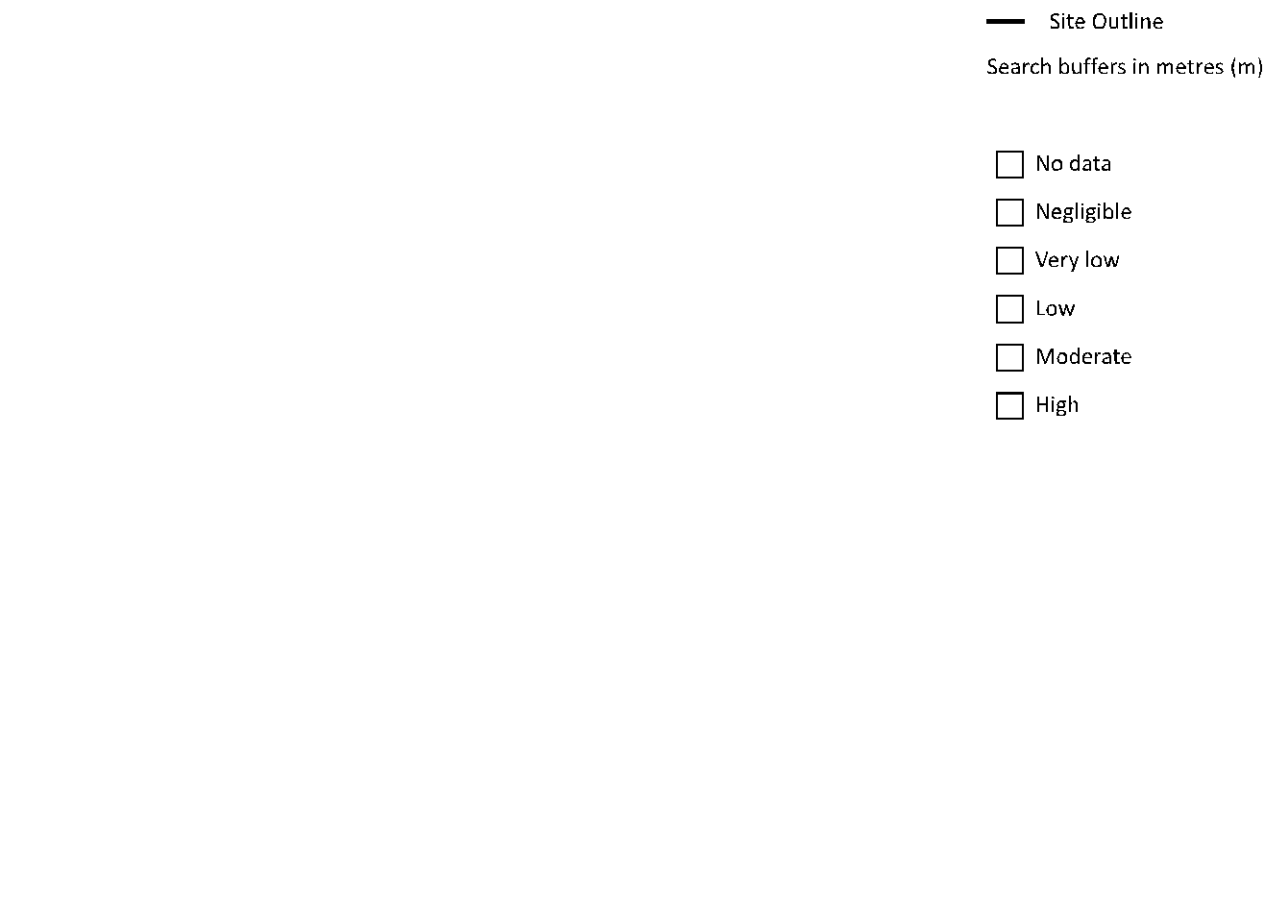
Records within 50m **1**

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

Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 69**

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

Natural ground subsidence - Running sands



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17.2 Running sands

Records within 50m **1**

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

Features are displayed on the Natural ground subsidence - Running sands map on **page 70**

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

Natural ground subsidence - Compressible deposits



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17.3 Compressible deposits

Records within 50m **1**

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

Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 71**

Location	Hazard rating	Details
On site	**Moderate**	**Compressibility and uneven settlement hazards are probably present. Land use should consider specifically the compressibility and variability of the site.**

Natural ground subsidence - Collapsible deposits



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17.4 Collapsible deposits

Records within 50m **1**

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

Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 72**

Location	Hazard rating	Details
On site	**Negligible**	**Deposits with potential to collapse when loaded and saturated are believed not to be present.**

Natural ground subsidence - Landslides



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17.5 Landslides

Records within 50m **1**

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

Features are displayed on the Natural ground subsidence - Landslides map on **page 73**

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.**

Natural ground subsidence - Ground dissolution of soluble rocks



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17.6 Ground dissolution of soluble rocks

Records within 50m **1**

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 74**

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.**

18 Mining, ground workings and natural cavities

18.1 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.

18.2 BritPits

Records within 500m **0**

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

18.3 Surface ground workings

Records within 250m **0**

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.

18.4 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.

18.5 Historical Mineral Planning Areas

Records within 500m **0**

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

18.6 Non-coal mining

Records within 1000m **0**

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).

18.7 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.

18.8 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.

18.9 Coal mining

Records on site **0**

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

18.10 Brine areas

Records on site	**0**

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

18.11 Gypsum areas

Records on site	**0**

Generalised areas that may be affected by gypsum extraction.

18.12 Tin mining

Records on site	**0**

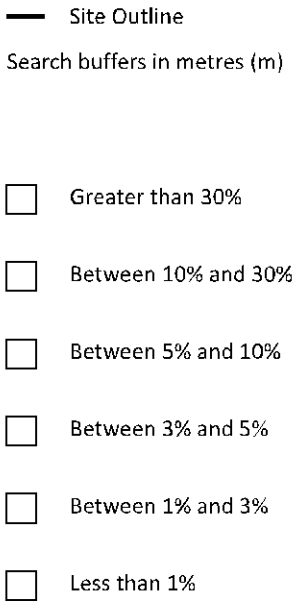
Generalised areas that may be affected by historical tin mining.

18.13 Clay mining

Records on site	**0**

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

19 Radon



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19.1 Radon

Records on site **1**

Estimated percentage of dwellings exceeding the Radon Action Level. This data is the highest resolution radon dataset available for the UK and is produced to a 75m level of accuracy to allow for geological data accuracy and a 'residential property' buffer. The findings of this section should supersede any estimations derived from the Indicative Atlas of Radon in Great Britain. The data was derived from both geological assessments and long term measurements of radon in more than 479,000 households.

Features are displayed on the Radon map on **page 78**

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

20 Soil chemistry

20.1 BGS Estimated Background Soil Chemistry

Records within 50m **2**

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

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

20.2 BGS Estimated Urban Soil Chemistry

Records within 50m **0**

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

20.3 BGS Measured Urban Soil Chemistry

Records within 50m **0**

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

21 Railway infrastructure and projects

21.1 Underground railways (London)

Records within 250m **0**

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

21.2 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.

21.3 Railway tunnels

Records within 250m **0**

Railway tunnels taken from contemporary Ordnance Survey mapping.

21.4 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.

21.5 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.

21.6 Historical railways

Records within 250m **0**

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

21.7 Railways

Records within 250m **0**

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

21.8 Crossrail 1

Records within 500m **0**

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

21.9 Crossrail 2

Records within 500m **0**

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

21.10 HS2

Records within 500m **0**

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

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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