

Phase 1 Preliminary Risk Assessment

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1. Introduction

The following document is a Phase 1 Preliminary Risk Assessment carried out by Oakshire Environmental, and includes details of the site, environmental setting, contaminant linkages and an evaluation of risk.

1.1 Project Overview

The client's proposed project involves a change of use from an agricultural building to a single dwelling and associated work at Willow Farm, Fenn Lanes, Fenny Drayton, Nuneaton, Leicestershire, CV13 6BJ. Oakshire Environmental have carried out a Phase 1 Preliminary Risk Assessment, as described below.

1.2 Purpose of Investigation

The objectives of the Phase 1 Preliminary Risk Assessment were to:

- Develop a detailed assessment of the site.
- Identify potential contamination sources, receptors and pathways at the site.
- Assess the level of potential contamination risk.
- Determine the requirement or scope of further investigations.

1.3 Scope of Work

- Brief introductory information has been noted to provide context to the report and include an Introduction, Project Overview, Scope of Work and Limitations.
- To develop a detailed assessment of the site, desk studies have been carried out to collate information obtained from sources including the British Geological Society, Environment Agency and Ordnance Survey on planning and site history, ground conditions and environmental setting.
- This information has been used to identify potential contamination sources, receptors and pathways at the site, as part of an initial Conceptual Site Model.
- To assess the level of potential contamination risk, a Conceptual Site Model has been produced to categorise the potential severity of the impact of the contaminant linkage on the receptor and the probability of the contaminant linkage being present.
- Following the assessment of contaminant linkages, an evaluation of contamination risk has been conducted to determine the requirement and scope of further investigations.
- Supporting appendix include photographs, maps, and plans of the site.

1.4 Limitations

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This report excludes consideration of potential hazards arising from any activities at the site other than normal use and occupancy for the intended land uses. Hazards associated with any other activities have not been assessed and must be subject to a specific risk assessment by the parties responsible for those activities. Oakshire Environmental does not warrant or guarantee that the site is free of hazardous or potentially hazardous materials or conditions. It should be noted that this report has been produced for environmental purposes only.

2. Site

The following section provides a description of the site, location and proposed development, in addition to, planning and site history, utilising information obtained from the client and publicly available sources.

2.1 Site Description and Location

The site is located at Willow Farm on Fenn Lanes in Fenny Drayton and is approximately 0.03ha. The site is comprised of an agricultural building constructed with metal sheeting with a corrugated sheet roof (potentially containing asbestos), a concrete base throughout and an external area of concrete hardstanding and soft landscaping. The existing building has been used for animal rearing and feed/bedding storage and is in good condition. A walkover survey of the site identified no visible or olfactory evidence of contamination at or in the vicinity of the site.

The site is bordered by a gravel yard area with various materials stored including corrugated sheeting, a stockpile of gravel and an empty oil drum to the north and an open-sided timber clad agricultural building with a corrugated sheet roof (potential containing asbestos), which is currently used for the storage of agricultural equipment and hay, to the east with paddocks beyond. There is also a large agricultural building belonging to a separate farm development and a corrugated sheet canopy (potentially containing asbestos) connecting this building to the on-site building to the west and livestock shelters to the south with a residential dwelling beyond. The surrounding area is predominantly agricultural with some isolated dwellings and commercial premises.

National Grid Reference: SP 36684 97705

2.2 Proposed Development

The proposed development involves the conversion of the agricultural building on the site to a three-bed dwelling. The building bordering the site to the east will be retained but no longer used for agricultural purposes.

2.3 Relevant Planning History

A search of Hickley and Bosworth Borough Council's planning website identified the following relevant applications at and near the site.

Table 1: Planning applications at or near the site

Application No.	Year	Address	Proposal	Decision	Details
86/01116/4	1987	White Gables Farm (70m south of the site)	Conversion of barn to dwelling	Permitted	No documents available
94/00283/GDO	1994	White Gables Farm (on-site)	Agricultural building	Prior approval not required	No contaminated land conditions applied
95/00372/FUL	1995	Willow Farm	Erection of garages	Permitted	No documents available
96/00575/FUL	1996	White Gables Farm (adjacent to the site to the west)	Erection of replacement stables	Permitted	No documents available
98/00429/FUL	1998	Willow Farm	Erection of stable block and tractor shed	Permitted	No documents available
98/00430/FUL	1998	Willow Farm (50m south of the site)	Conversion of existing storage building to additional living accommodation	Permitted	No documents available
02/01233/FUL	2002	White Gables Farm (60m south of the site)	Conversion of stable to living accommodation with extensions and alterations	Permitted	No documents available
03/00459/FUL	2003	Willow Farm (40m east of the site)	Construction of manège	Permitted	No documents available

2.4 Site History

A detailed assessment of historical Ordnance Survey maps and associated data has highlighted the below on-site and off-site, current and historical land uses.

Table 2: Description of the site and surrounding area over time, according to historical maps

Year	Site Description	Surrounding Area
1888	No development on the site	Surrounding area is predominantly agricultural fields Fenn Lane Farm with a collection of agricultural buildings 50m south Ponds 30m north and 80m north west as well as many additional ponds in surrounding fields
1903		No significant change
1929		New open-sided building at Fenn Lane Farm 40m south Additional pond developed in wooded area 130m south east Two small, attached structures 210m south west
1945		Aerial photo shows agricultural buildings and external areas of hardstanding
1961		Fenn Lane Farm to the south now labelled as White Gables Farm Sheep Wash at White Gables Farm 70m south west Small structures to the south west now labelled as Wood Hayes and Wide View (most likely dwellings)
1969		No significant change
1988		Dwellings to the south west no longer present and replaced by three separate unlabelled structures
1999	Aerial photo shows an agricultural building on the site with an area of external soft landscaping at the north	New agricultural buildings 5m west, 10m south and 15m south Enclosed external yard area 10m north west Manège 20m west Pond to the north expanded Buildings at White Gables Farm to the south removed including open-sided building
2006	Materials and equipment stored in external yard area at the north of the site and concrete hardstanding developed	Shipping containers and an external yard area bordering the site to the east Materials and equipment bordering the site to the north and south Manège and paddocks developed 10m south east New agricultural building 10m north west New pond excavated 60m north east Extension to agricultural building 60m south (planning history shows that this was also redeveloped to living accommodation)
2011		New agricultural building in yard area to the east External hardstanding 30m north west extended further north and materials and equipment stored in this area New lawn area 25m south west Pond to the north west expanded
2015		New agricultural building bordering the site to the east and 30m north west Agricultural building in yard area to the east removed and vehicles and shipping containers situated in this area Manège to the west extended further north and vehicles parked on adjacent hardstanding Pond to the north east infilled

2018	No materials and equipment at the north of the site	Yard area to the east cleared Canopy constructed between on-site building and adjacent building to the west
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3. Environmental Setting

The following section provides information on the environmental setting of the site, utilising data from the British Geological Survey (BGS), the Department for Environment, Food and Rural Affairs (DEFRA), the Coal Authority and Public Health England (PHE).

Table 3: Summary of the site's environmental setting

Environmental Factor		Details	
Hydrogeology	Aquifer Designation	Superficial	No superficial aquifer underlying the site
		Bedrock	Secondary B
	Groundwater Vulnerability	Superficial	N/A
		Bedrock	Low
	Source Protection Zones and Abstractions		Site does not lie within a Source Protection Zone, Drinking Water Protected Area or Drinking Water Safeguard Zone
Hydrology	Water Network		Ponds 30m north and 60m north west No watercourses within 250m of the site
Geology	Artificial Ground		None within 500m of the site
	Superficial Deposits		No superficial deposits underlying the site
	Bedrock Geology		Gunthorpe Member - red-brown mudstone with subordinate dolomitic siltstone and fine-grained sandstone, greenish grey, common gypsum veins and nodules Map shows that the site is underlain by dolomitic siltstone
	Superficial Permeability		N/A
	Bedrock Permeability		Low
	Borehole Records		No borehole records within 500m of the site
Workings	Mining and Ground Workings		No coal mining activity within 500m of the site Ponds to the north and north west expanded New pond excavated 60m north east of the site between 1999 and 2006 and infilled between 2011 and 2015
Radon	PHE UKradon		<1% probability of being above action level
Waste and Landfill	Historical Landfill		None within 1km of the site
	Permitted Waste Sites		None within 1km of the site

4. Initial Conceptual Site Model

The following section outlines potential contamination sources, pathways and receptors, utilising information gathered in the previous sections, to develop an initial conceptual site model.

4.1 Potential Contamination Sources

Information collated through detailed desk studies has identified the following potential sources of contamination.

Agricultural Activity

The site has been used for animal rearing and feed/bedding storage since around 1994 and the land to the south of the site has been used for agricultural purposes since at least 1888. There is no visible or olfactory evidence of contamination on the site and the existing building has a concrete base and is in good condition suggesting that contamination from activities on the site itself are unlikely to have caused significant contamination.

Localised spillages and leakages from agricultural machinery and equipment stored at the site may have impacted shallow soils at the north of the site and in the yard areas to the north and east, however, these are not likely to be significant given the site's use as a livestock farm.

The agricultural buildings on and in the vicinity of the site are built with potentially asbestos containing materials in the roofs. These can pose a risk to human health and may impact shallow soils when loose fibres are released through damage. There is no evidence of damage to these materials and the buildings are in good condition suggesting that the release of asbestos fibres is unlikely.

Given the low permeability of the underlying soil, groundwater is not likely to be impacted by localised contamination in shallow soil.

Infilled Pond

Aerial photos show that a new pond was excavated 60m north east of the site between 1999 and 2006 and was later infilled between 2011 and 2015. This pond appears to have been relatively shallow and is likely to have been infilled with adjacent natural soil and/or the arisings from the original excavation, therefore, the risk to the site from the leaching of contaminants from infill material is low and the risk of ground gas production from the degradation of putrescible material is very low.

4.2 Potential Contamination Receptors

Given the proposed use of the site, the following receptors are considered:

- Residential end users
- Controlled waters

4.3 Potential Contamination Pathways

Based on the expected on-site receptors, relevant pathways for the above receptors include:

- Ingestion/inhalation of contaminated soil dust
- Dermal contact with contaminated soil
- Inhalation of soil vapours
- Ingestion of homegrown produce
- Permeation into drinking water pipes
- Ground gas permeation into the building
- Leaching through soil
- Surface runoff

Pathways between off-site sources and off-site receptors is beyond the scope of this assessment.

4.4 Risk Assessment Methodology

The potential level of risk posed by a particular source is determined by assessing the potential severity of the impact of the contaminant linkage on the receptor, if it is assumed to be present, and the probability of the contaminant linkage being present.

Severities are categorised from Minor to Severe and probabilities are categorised from Unlikely to High Likelihood to give a potential level of risk output.

Table 4: Risk Matrix

Probability	Severity of Consequence			
	Severe	Medium	Mild	Minor
High Likelihood	Very High Risk	High Risk	Moderate Risk	Low / Moderate Risk
Likely	High Risk	Moderate Risk	Low / Moderate Risk	Low Risk
Low Likelihood	Moderate Risk	Low / Moderate Risk	Low Risk	Very Low Risk
Unlikely	Low / Moderate Risk	Low Risk	Very Low Risk	Very Low Risk

Very High Risk

There is a high probability that severe harm could arise to a designated receptor from an identified source; or there is evidence that severe harm to a designated receptor is currently happening.

High Risk

Harm is likely to arise to a designated receptor from an identified source.

Moderate Risk

It is possible that harm could arise to a designated receptor from an identified source. It is relatively unlikely that any such harm would be severe or if any harm were to occur it is more likely that the harm would be relatively mild.

Low Risk

It is possible that harm could arise to a designated receptor from an identified source, however, it is likely that this harm, if realised, would normally be mild.

Very Low Risk

There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.

4.5 Conceptual Site Model

The information in this section has been compiled to produce an initial conceptual site model outlining the potential sources, pathways and receptors to consider at the site. The level of risk was categorised by considering the severity and probability, as outlined in the previous section.

Table 5: Conceptual site model

Sources	Pathways	Receptors	Severity	Probability	Potential Level of Risk
Agricultural Activity	Ingestion/inhalation of contaminated soil dust Dermal contact with contaminated soil Inhalation of soil vapours Ingestion of homegrown produce Permeation into drinking water pipes	Residential end users	Mild	Low Likelihood	There is no visible or olfactory evidence of contamination on the site and the existing building has a concrete base and is in good condition suggesting that contamination from activities on the site itself are unlikely to have caused significant contamination. Localised spillages and leakages from agricultural machinery and equipment stored at the site may have impacted shallow soils at the north of the site and in the yard areas to the north and east, however, these are not likely to be significant given the site's use as a livestock farm. There is no evidence of damage to the potentially asbestos containing materials on and in the vicinity of the site and the buildings are in good condition suggesting that the release of asbestos fibres is unlikely.
	Leaching through soil Surface runoff	Controlled waters	Mild	Low Likelihood	Given the low permeability of the underlying soil, groundwater is not likely to be impacted by localised contamination in shallow soil. The concrete base of the existing building will also further mitigate the impact on underlying groundwater. Surface runoff from the site may have impacted the ponds to the north and north west, however, these are not considered to be vulnerable to contamination given that they are not abstracted for drinking water or irrigation.
Infilled Pond	Ingestion/inhalation of contaminated soil dust Dermal contact with contaminated soil Inhalation of soil vapours Ingestion of homegrown produce Permeation into drinking water pipes Ground gas permeation into the building	Residential end users	Mild	Low Likelihood	The pond to the north east of the site appears to have been relatively shallow and is likely to have been infilled with adjacent natural soil and/or the arisings from the original excavation, therefore, the risk to the site from the leaching of contaminants from infill material is low and the risk of ground gas production from the degradation of putrescible material is very low.

5. Conclusions

5.1 Risk Evaluation

The initial conceptual site model identified the following potential contaminant linkages present at the site and the following conclusions have been drawn:

- There is a **low risk** to residential end users from the ingestion/inhalation of contaminated soil dust, dermal contact with contaminated soil, inhalation of soil vapours, ingestion of homegrown produce and permeation into drinking water pipes from agricultural activity on and in the vicinity of the site.
- There is a **low risk** to controlled waters from the leaching and surface runoff of contaminants from agricultural activity on and in the vicinity of the site.
- There is a **low risk** to residential end users from the ingestion/inhalation of contaminated soil dust, dermal contact with contaminated soil, inhalation of soil vapours, ingestion of homegrown produce, permeation into drinking water pipes and ground gas permeation into the building from the infilled pond to the north east of the site.

Based on the findings of this Phase 1 Preliminary Risk Assessment, the risk to residential end users and controlled waters is considered to be low.

5.2 Further Investigation

Based on the above conclusions, further investigation or remediation is not considered necessary. It is important to note that this conclusion is based on the proposed development plan.

If visible or olfactory evidence of contamination is identified during excavations at the site, work should cease in order to allow further investigation to be carried out. In addition, to ensure regulatory compliance, Waste Classification & Waste Acceptance Criteria (WAC) testing of excavated material from the site may be required prior to off-site disposal.

6. References

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Landmark Information Group.

Ordnance Survey. [online] Available at: <ordnancesurvey.co.uk>.

Oakshire Environmental. Available at: <oakshireenvironmental.co.uk>.



Appendix - Site Maps & Plans

Description

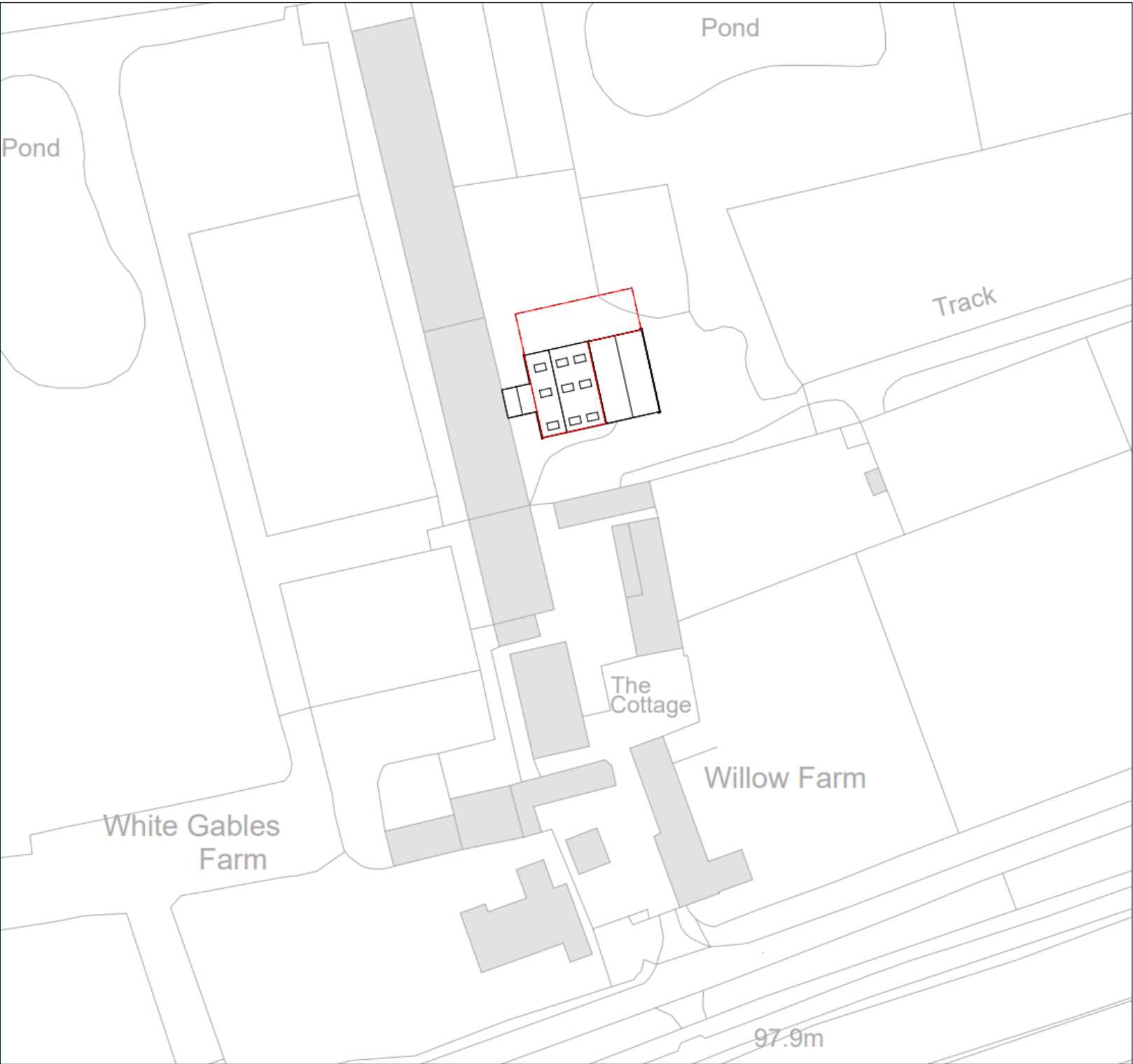
Site location plan

Sources

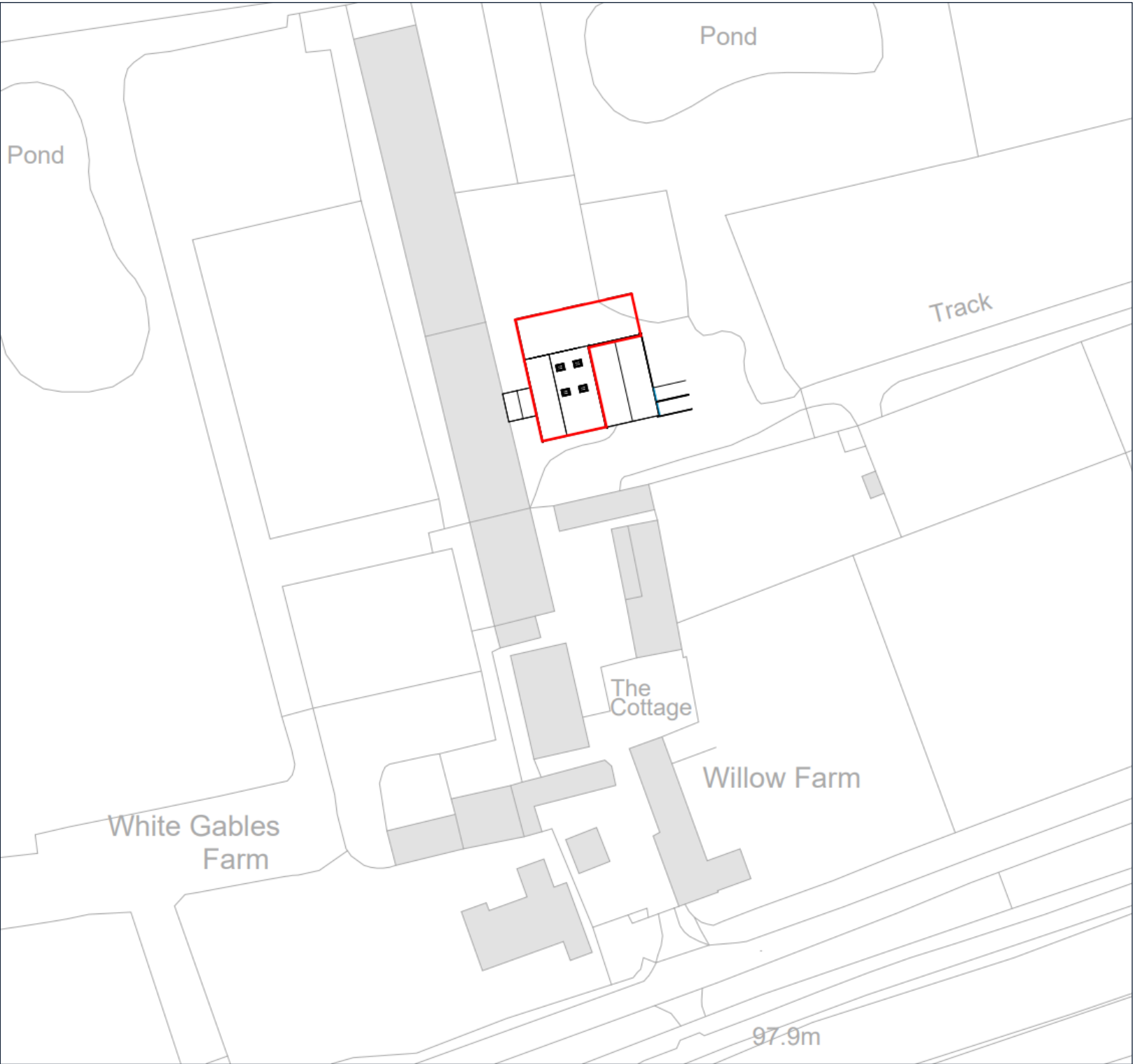
Contains OS data © Crown copyright and database rights

Key

	Site boundary
▲	North



Appendix - Site Maps & Plans	
Description	
Existing site plan	
Sources	
Class Q Ltd	
Key	
	Site boundary
▲	North



Appendix - Site Maps & Plans	
Description	
Proposed site plan	
Sources	
Class Q Ltd	
Key	
	Site boundary
▲	North



Appendix - Site Photos

Description

Photo of existing building and concrete hardstanding and soft landscaping at the north, facing south east

Sources

Oakshire Environmental



Appendix - Site Photos

Description

Photo of interior of existing building

Sources

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Appendix - Site Photos

Description

Photo of interior of existing building

Sources

Oakshire Environmental



Appendix - Site Photos

Description

Photo of interior of existing building

Sources

Oakshire Environmental



Appendix - Site Photos

Description

Photo of interior of existing building

Sources

Oakshire Environmental



Appendix - Site Photos

Description

Photo of yard area to the north of the site, facing north west

Sources

Oakshire Environmental



Appendix - Site Photos

Description

Photo of yard area to the north of the site, facing south east

Sources

Oakshire Environmental



Appendix - Site Photos

Description

Photo of interior of agricultural building bordering the site to the east, facing south west

Sources

Oakshire Environmental



Appendix - Site Photos

Description

Photo of livestock shelter and concrete courtyard area to the south of the site, facing north

Sources

Oakshire Environmental



Appendix - Site Photos

Description

Photo of pond to the north of the site, facing west

Sources

Oakshire Environmental



Appendix – Historical Maps

Description

Historical map dated 1888

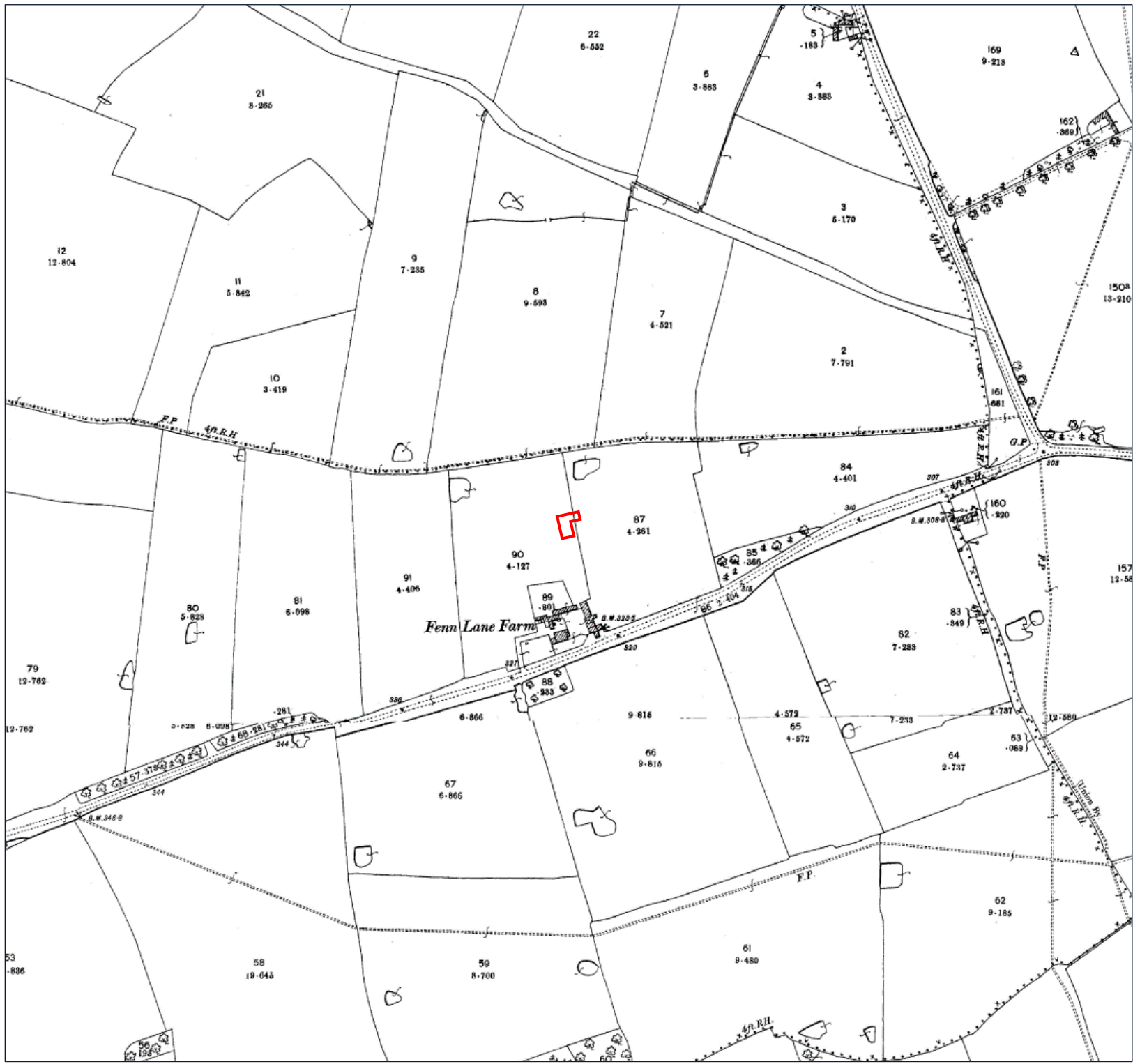
Scale: 1:2,500

Sources

Landmark Information Group

Key

	Site boundary
▲	North



Appendix – Historical Maps

Description

Historical map dated 1903

Scale: 1:2,500

Sources

Landmark Information Group

Key

Site boundary

North



Appendix – Historical Maps

Description

Aerial photograph dated 1945

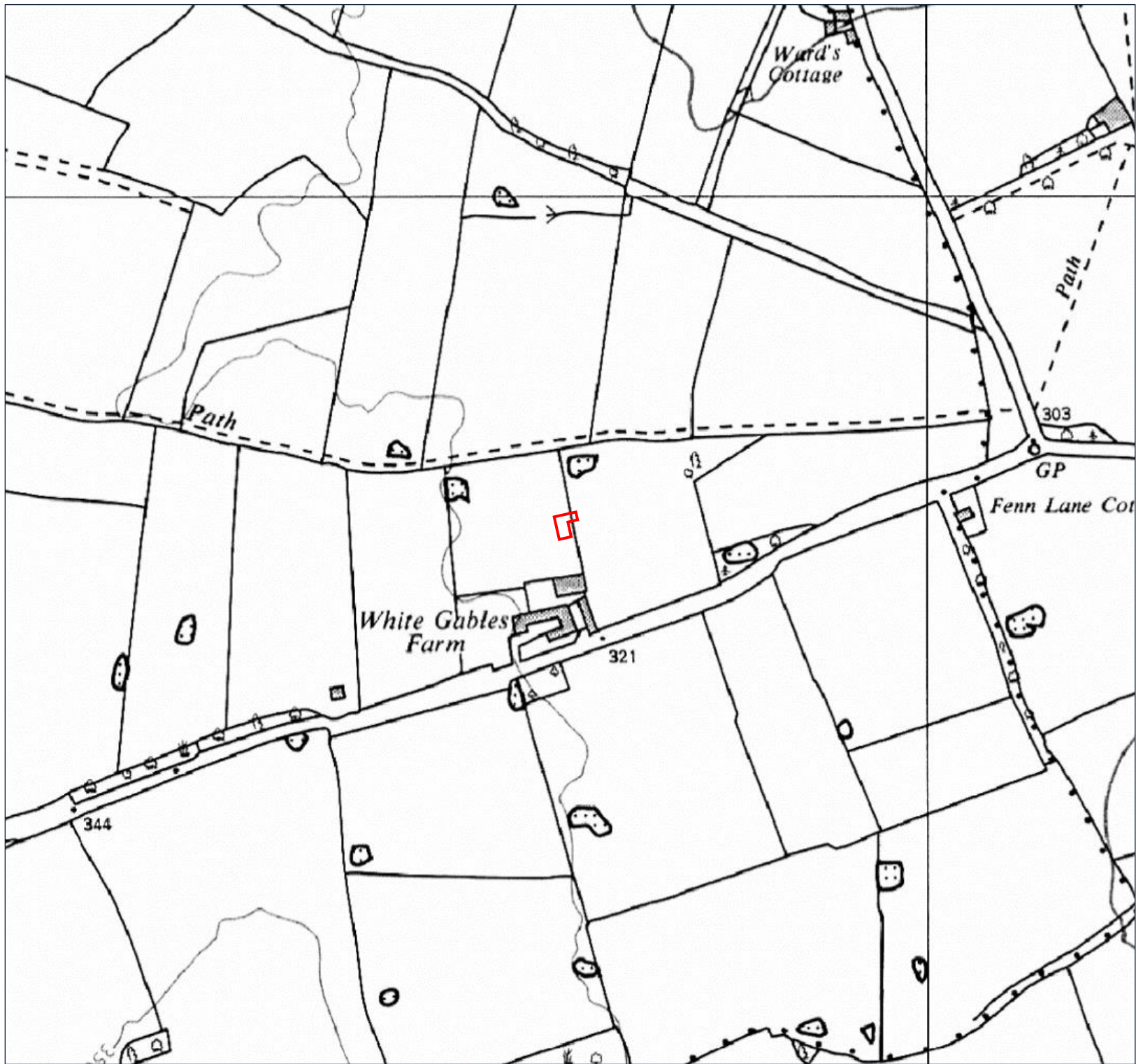
Sources

The GeoInformation Group

Key

Site boundary

North



Appendix – Historical Maps

Description

Historical map dated 1968

Scale: 1:10,000

Sources

Landmark Information Group

Key

	Site boundary
▲	North



Appendix – Historical Maps	
Description	
Historical map dated 1989	
Scale: 1:10,000	
Sources	
Landmark Information Group	
Key	
	Site boundary
	North



Appendix – Historical Maps

Description

Aerial photograph dated 1999

Sources

Infoterra Ltd & Bluesky

Key

Site boundary

▲ North



Appendix – Historical Maps

Description

Aerial photograph dated 2006

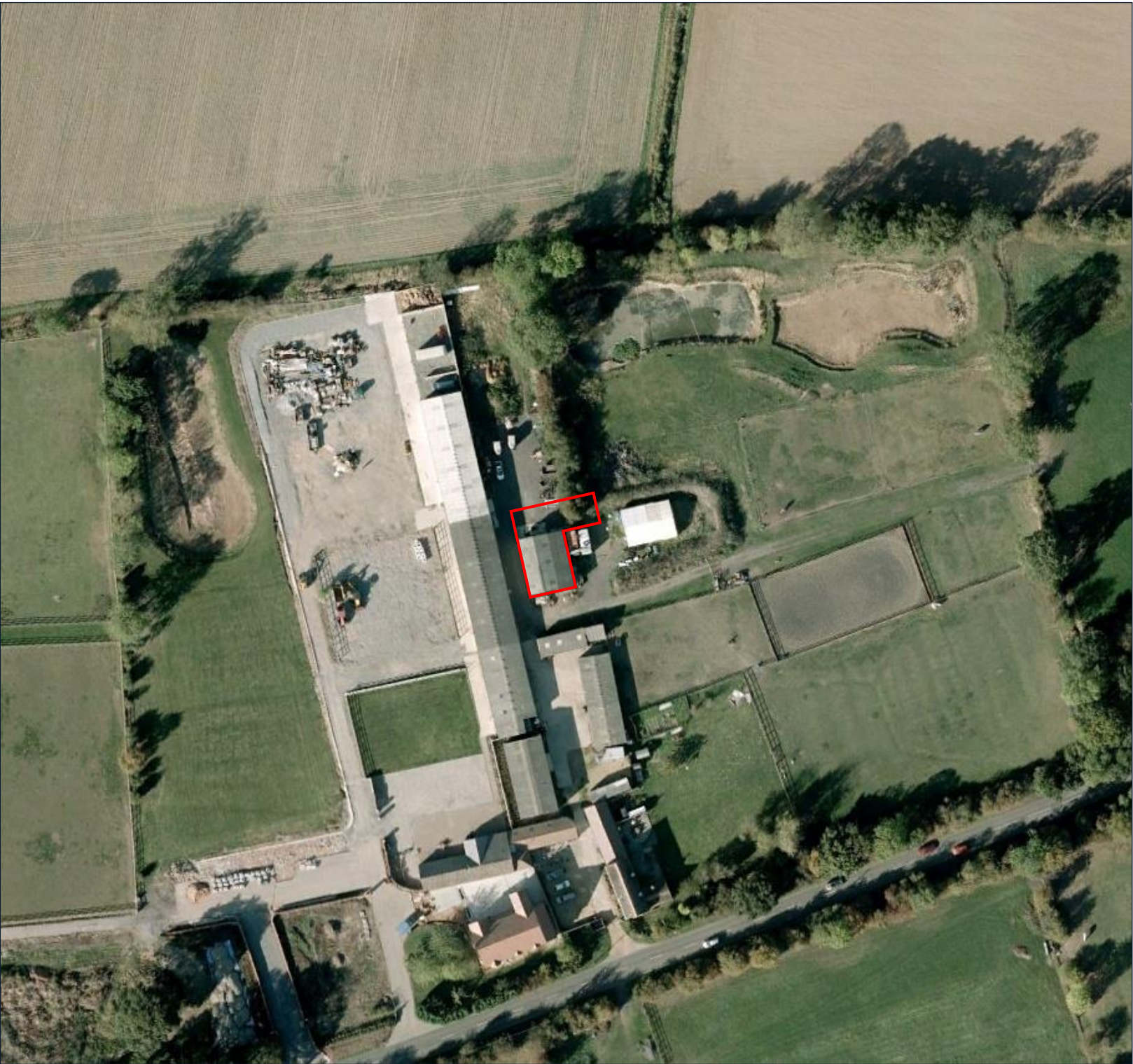
Sources

Infoterra Ltd & Bluesky

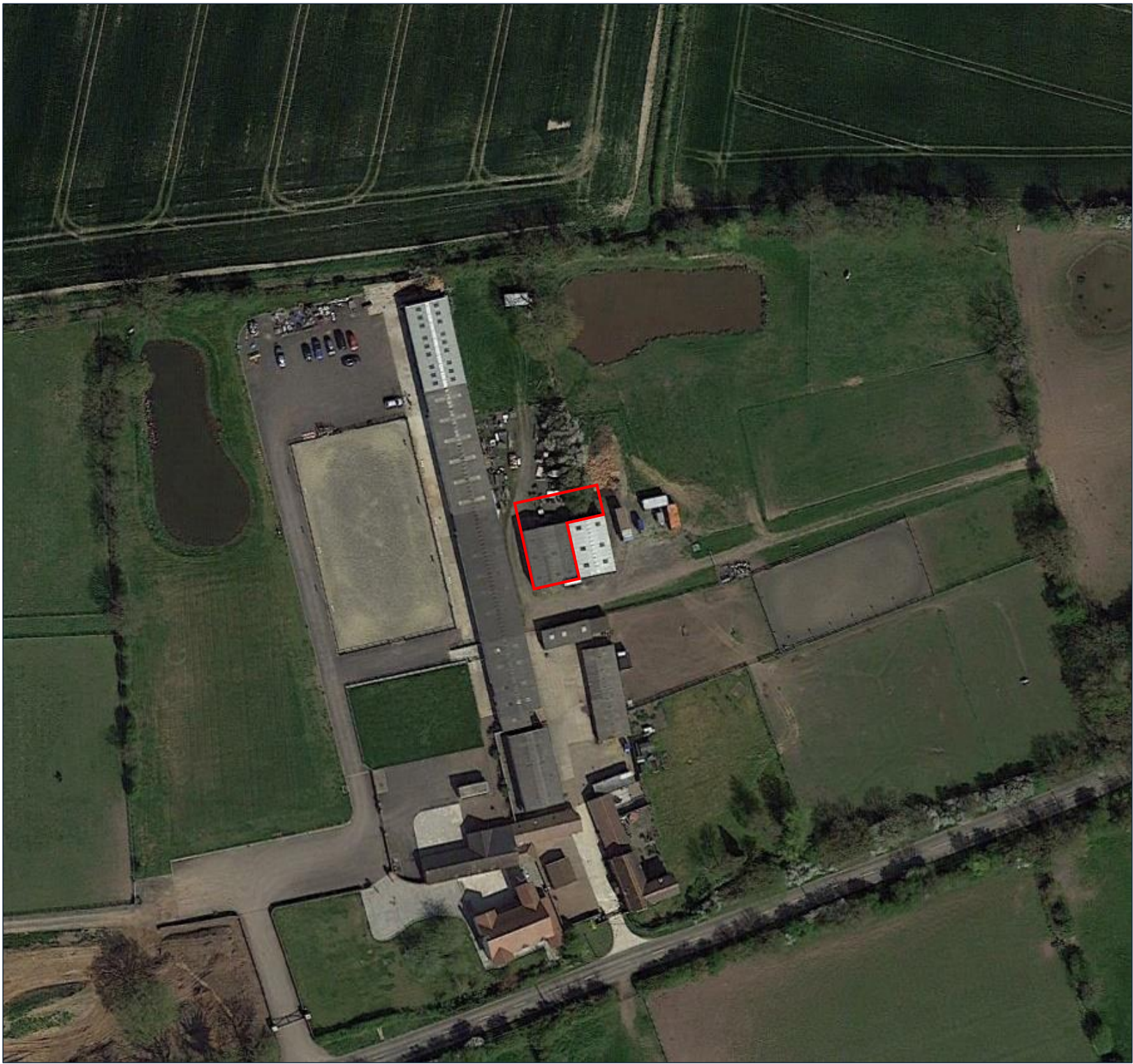
Key

Site boundary

▲ North



Appendix – Historical Maps	
Description	
Aerial photograph dated 2011	
Sources	
Bluesky	
Key	
	Site boundary
	North



Appendix – Historical Maps

Description

Aerial photograph dated 2015

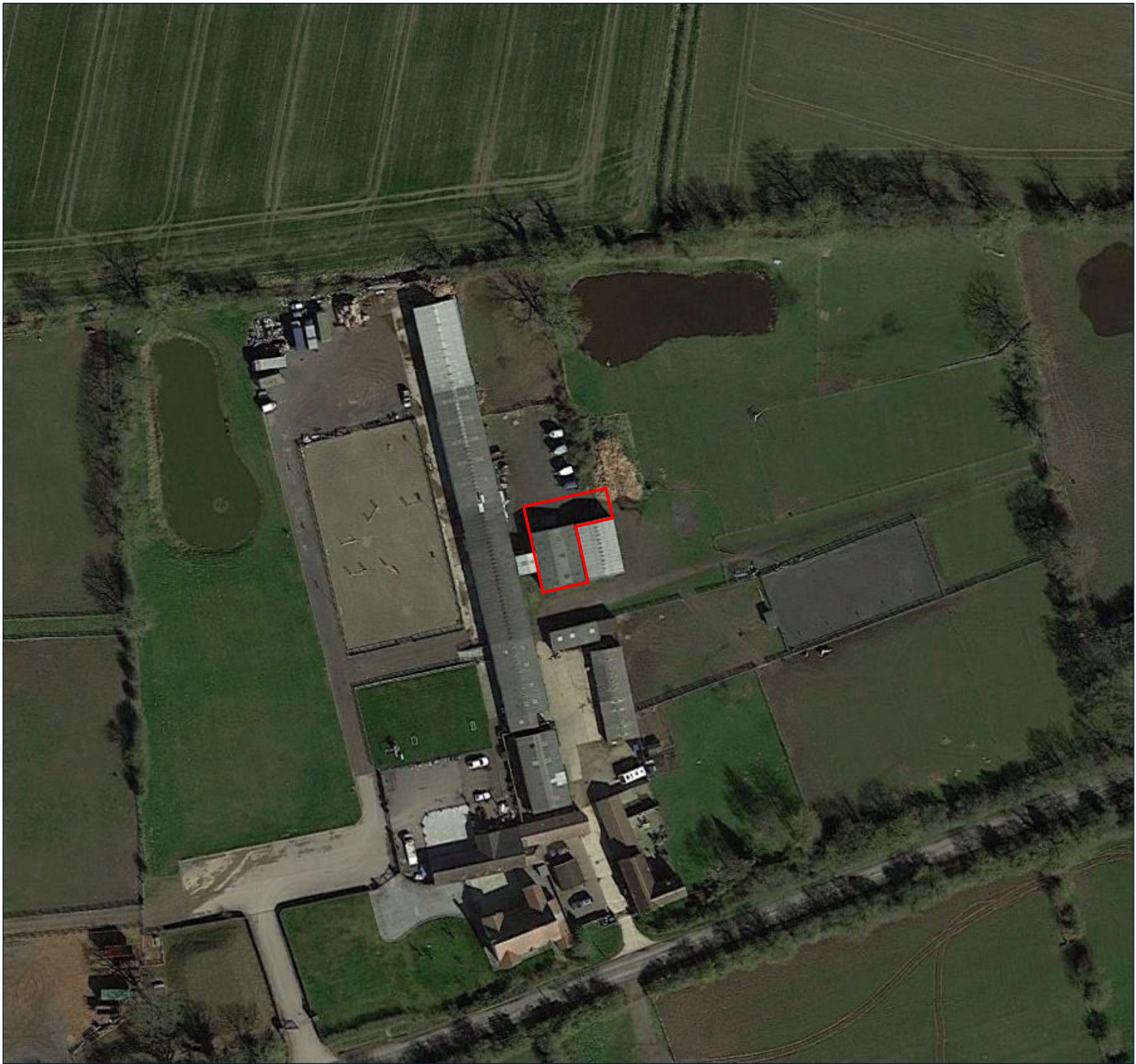
Sources

Google Earth

Key

Site boundary

North



Appendix – Historical Maps

Description

Aerial photograph dated 2018

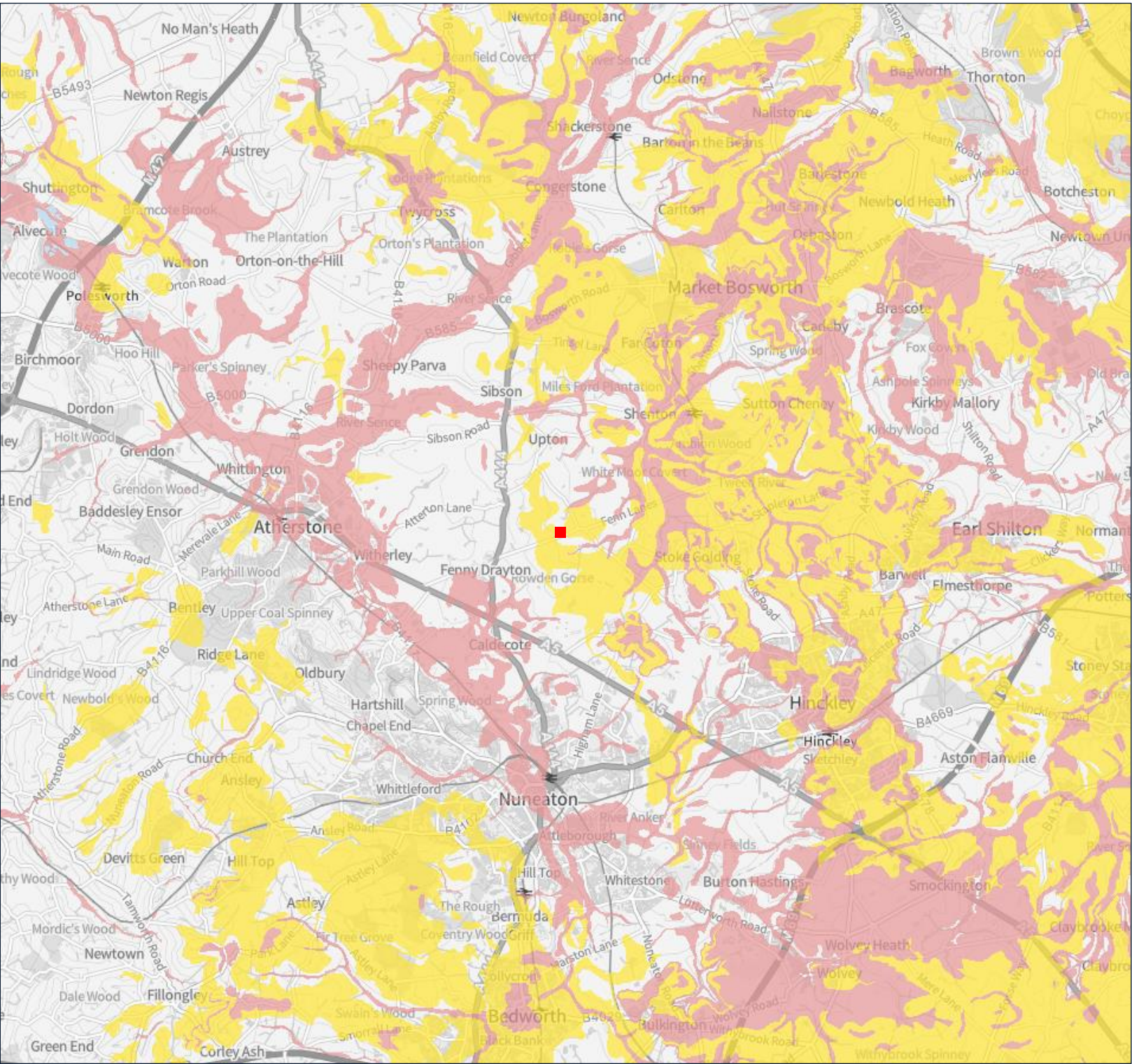
Sources

Google Earth

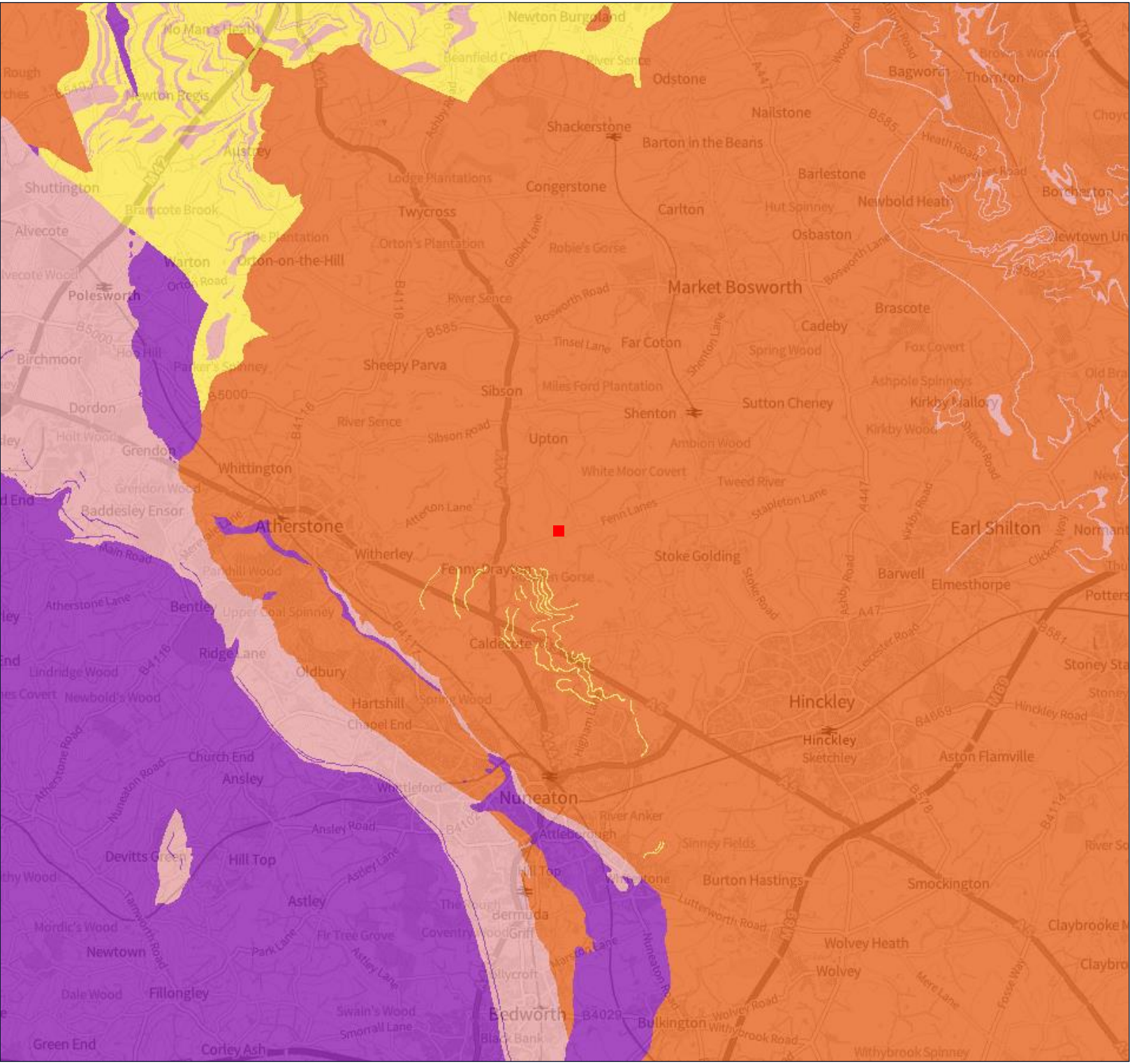
Key

Site boundary

▲ North



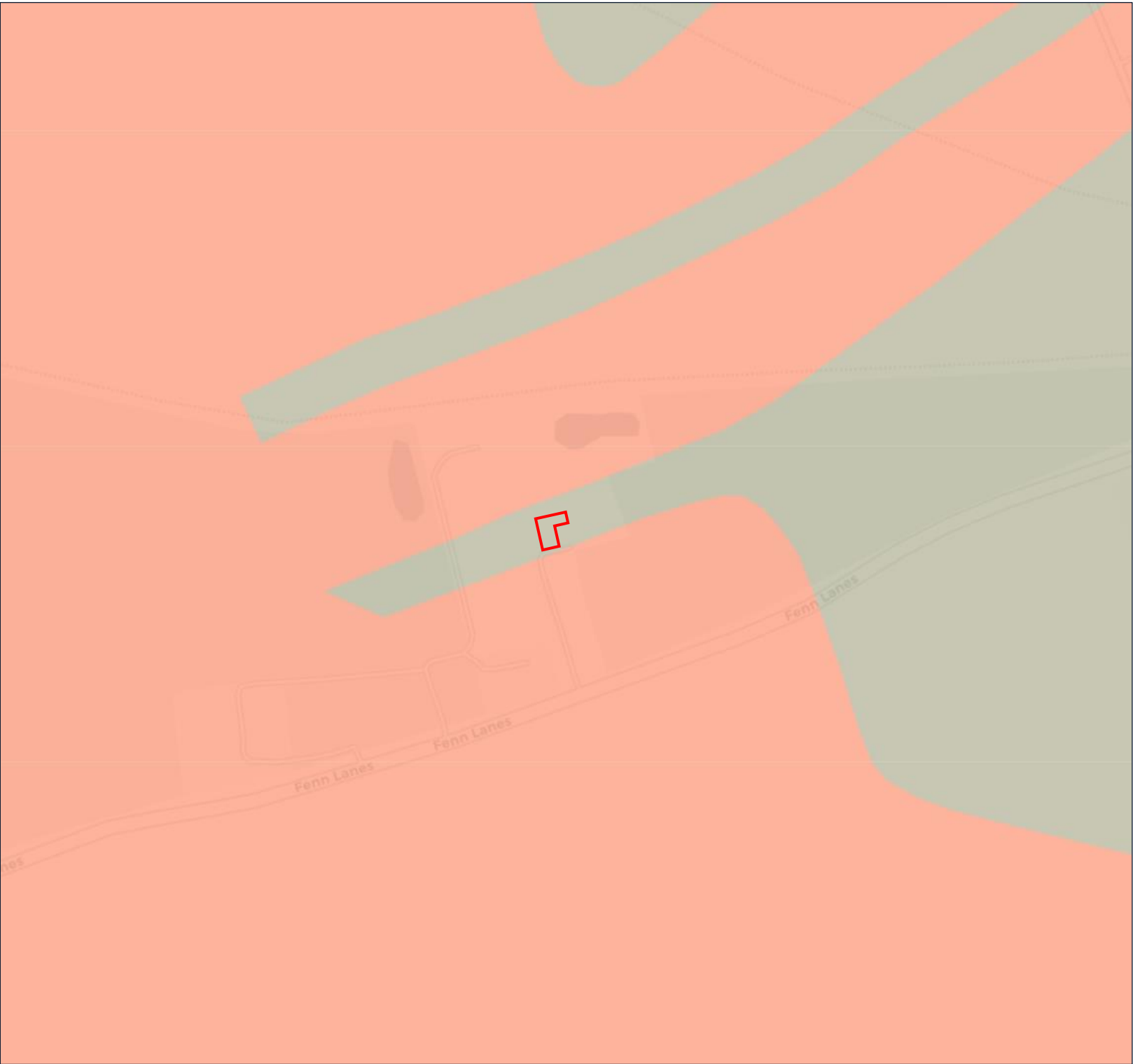
Appendix - Geological Maps	
Description	
BGS map showing superficial hydrogeology on site	
Sources	
DEFRA Magic Map British Geological Survey	
Key	
	Site location
	Principal
	Secondary A
	Secondary B
	Secondary (undifferentiated)
	Unproductive
	North



Appendix - Geological Maps	
Description	
BGS map showing bedrock hydrogeology on site	
Sources	
DEFRA Magic Map British Geological Survey	
Key	
	Site location
	Principal
	Secondary A
	Secondary B
	Secondary (undifferentiated)
	Unproductive
	North



Appendix - Geological Maps	
Description	
BGS map showing superficial deposits on site	
Sources	
British Geological Survey	
Key	
	Site boundary
	Thrussington Member – Diamicton
	North



Appendix - Geological Maps

Description

BGS map showing bedrock geology on site

Sources

British Geological Survey

Key

	Site boundary
	Gunthorpe Member – Dolomitic Siltstone
	Gunthorpe Member – Mudstone
	North