



**EARTH ENVIRONMENTAL
& GEOTECHNICAL**
A Technics Group Company



Phase 1 GeoEnvironmental Desk Study

Stid Fold Barn

Wardle Rochdale

February 2026

On behalf of

Adam Smith



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1.0 INTRODUCTION

Appointment

- 1.1 Adam Smith has commissioned Earth Environmental & Geotechnical Ltd to undertake a Phase I Environmental Desk Study for a change of use on developed land at Barn Field Lane, Wardle, Rochdale.
- 1.2 It is understood that the client intends to convert an old barn to a residential dwelling with an associated car park.
- 1.3 A proposed development plan is presented in Figure 1, overleaf.

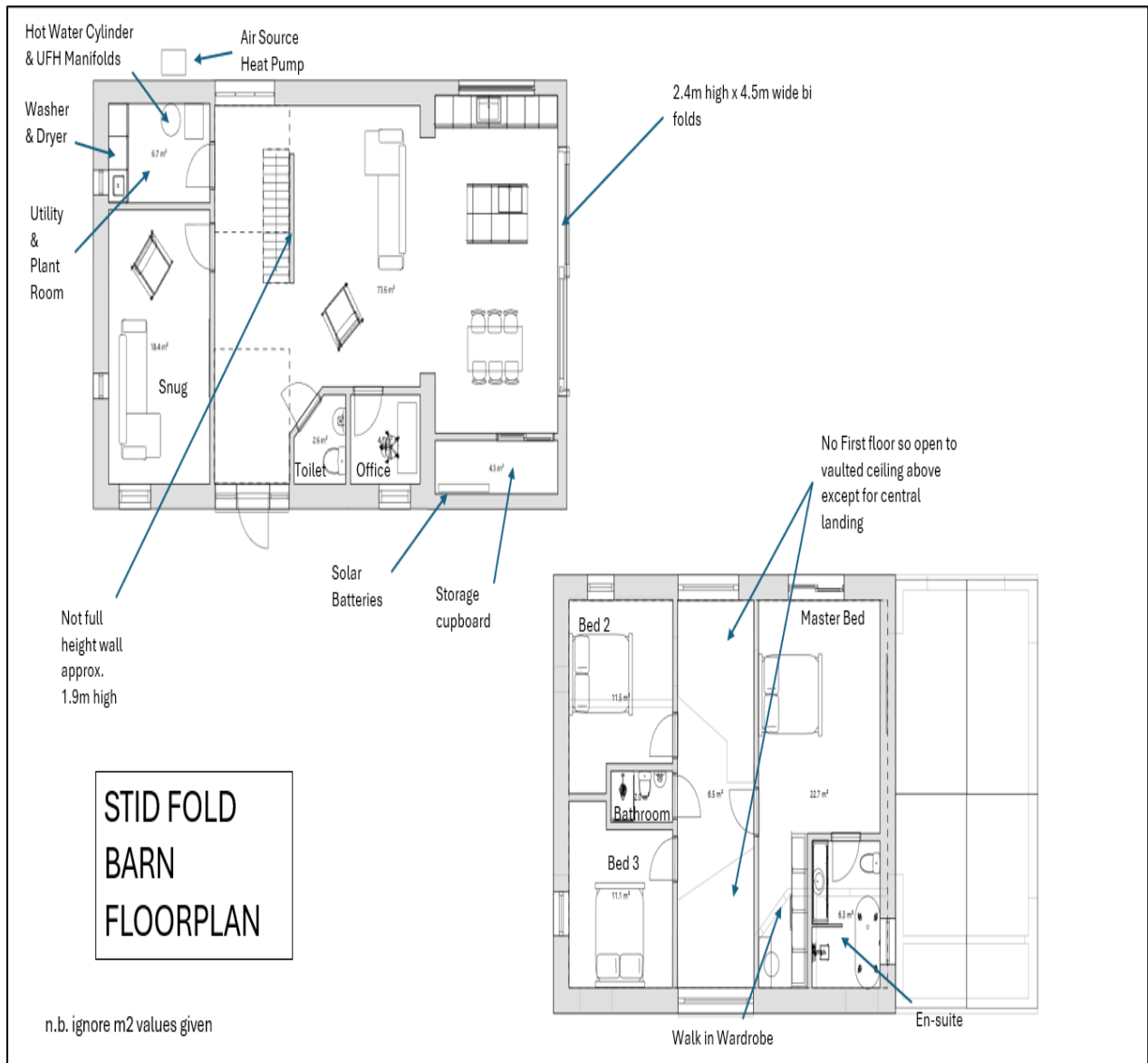
Objective

- 1.4 The purpose of the Desk Study is to collate available geological and environmental data for the site (and its environment) and provide a preliminary geotechnical and geo-environmental appraisal, with a site-specific conceptual model. This enables a preliminary assessment of geo-environmental risks and, if necessary, provides information for designing a Phase 2 Ground Investigation.

Scope

- 1.5 The Phase I Environmental Desk Study comprises a site reconnaissance visit and a review of the following information sources, some of which were provided by the client.
- British Geological Survey online maps.
 - Google Earth imagery.
 - Environment Agency online mapping data.
 - Historical Ordnance Survey maps.
 - The site and surrounding areas' environmental, geological, and mining data are presented in the site-specific GroundSure Reports (Appendix 1).
 - Coal Authority Interactive Viewer.
 - Zetica UXO Online Interactive Viewer
 - Rochdale Metropolitan Borough Council planning portal.

Figure 1: Proposed Development Plan



2.0 SITE LOCATION AND DESCRIPTION

- 2.1 The site (0.09 hectares) comprises a barn and is located at Barn Field Lane, Wardle, Rochdale, approximately 3.28km northwest of Smithy Bridge train stop.
- 2.2 The approximate National Grid Reference for the centre of the site is SD 90127 17387 (X: 390127, Y: 417387) and postcode OL12 9PN.
- 2.3 The surface topography of the site is generally level.
- 2.4 The site is located within a rural upland landscape between Rochdale and Whitworth, characterised by rolling hills and nearby reservoirs.
- 2.5 The site is situated within a predominantly residential and farmed area. It is currently unoccupied and contains a barn and a structure in disrepair in the northern and eastern areas of the site.
- 2.6 There are residential farmhouses to the west and south of the site. Stid Fold Brook is approximately 614m east of the site. Bushes and trees are not on site, but a tree is approximately 2m from the southwestern boundary.
- 2.7 Access to the site is gained from Barn Field Lane, off Slack Gate Road. There is a farm-style gate at the south of the site.
- 2.8 A stone wall encloses the site; however, this wall functions as a formal boundary only along the eastern and southern edges. An old storage building is located immediately south of the site, while a large open field adjoins it to the east and northwest. Additional parcels of land bound the site to the west and northeast.

Figure 2: Site Location Plan



Figure 3: Site Photograph



3.0 ENVIRONMENTAL SETTING

- 3.1 The geology of the site is covered by British Geological Survey (BGS) online data and the site-specific GroundSure Enviro+Geo Insight report (Appendix 1).
- 3.2 Environmental conditions are covered by the Environment Agency (EA) and British Geological Survey (BGS) online data, and the site-specific GroundSure Enviro+Geo Insight report (Appendix 1).

Geology

- 3.3 The BGS records indicate that artificial deposits do not underlie the site.
- 3.4 The BGS records indicate that any superficial deposits do not underlie the site.
- 3.5 The bedrock geology beneath the site is shown to be of the Woodhead Hill Rock-Sandstone.
- 3.6 There are 11 no. records of linear features within 500m of the site boundary. The closest record refers to a fault, inferred with unknown displacement, located 61m west of the site.
- 3.7 There are no records of landslips within 500m of the site.
- 3.8 There are no borehole records identified within 250m of the site.
- 3.9 The following hazard ratings apply to the site and land within 50m and are presented in the Enviro + Geo Insight Report
- | | |
|--|------------|
| • Shrink / swell clays: | Negligible |
| • Running sands: | Negligible |
| • Compressible deposits: | Negligible |
| • Collapsible deposits: | Very Low |
| • Landslides: | Very Low |
| • Ground dissolution of soluble rocks: | Negligible |

Hydrogeology and Hydrology

- 3.10 The Woodhead Hill Rock-Sandstone is classified by the Environment Agency (EA) as a Secondary 'A' Aquifer with a fracture flow type and high to moderate permeability. The BGS states the following:

Secondary A *'Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers.'*

- 3.11 The groundwater vulnerability of the site has been classified as high for the bedrock aquifer. The site's soil leaching potential is classified as high. The BGS states:

'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.*

- 3.12 The site is not located within an area vulnerable to soluble rock.

- 3.13 There are 20no. groundwater abstraction license records within 2km of the site. The closest record refers to a historical license dated 1966, located 583m east of the site.
- 3.14 There are 18no. surface water abstraction license records within 2km of the site. The closest record refers to a historical license dated 1994, located 103m north of the site.
- 3.15 There are 19no. potable water abstraction license records within 2km of the site. The closest record refers to a historical license dated 1994, located 103m north of the site.
- 3.16 The site is not located within a Source Protection Zone.
- 3.17 The site is not located within 500m of a Source Protection Zone within a confined aquifer.
- 3.18 There are 24no. records of water network entries within 250m of the site. The closest record refers to an Inland River not influenced by normal tidal action located 25m west of the site.
- 3.19 There are 13no. surface water features records identified within 250m of the site.
- 3.20 There is 1no. record of a Water Framework Directive (WFD) surface water body located onsite. The record refers to the Roch (Source to Spodden) River, which is within the Irwell management catchment and the Rock Irk Medlock operational catchment. The EA assigned a 'fail' chemical and a moderate ecological rating in 2019.
- 3.21 There is 1no. record of a Water Framework Directive (WFD) groundwater body located on-site. The record refers to the Northern Manchester Carboniferous Aquifers, which had a poor chemical rating in 2019.

Ground Workings, Mining and Other Underground Workings

- 3.22 There are 17no. records of historical surface ground working features, identified within 250m of the site boundary. The closest record refers to an unspecified pit mapped in 1967, located 210m west of the site. The remaining records are for the refuse heap and the unspecified old quarry.
- 3.23 According to the BGS, there are 5no. records of a British Pit within 500m of the site. The closest record, referring to the Alder Bank-Sandstone, whose workings have ceased, is located 361m northeast of the site.

Mining and Other Underground Workings

- 3.24 The site is within the Coal Mining Reported Area; however, it is not within a Coal Authority Development High Risk Area.
- 3.25 There are no records of historical mineral planning areas within 500m of the site.
- 3.26 There are 42no. records for historical underground working features identified within 1km of the site. The closest record refers to an unspecified old level mapped in 1938, located 430m south of the site. The remaining records are for unspecified disused shafts, collieries, air shafts, and old coal shafts.
- 3.27 There is no record of a non-coal mining area located within 1km of the site.
- 3.28 There are no records of brine areas, gypsum extraction, tin mining, or clay mining on the site.

- 3.29 There are no records of natural cavities within 500m of the site.
- 3.30 There are no records for mining cavities identified within 1km of the site.

Radon Potential

- 3.31 The site is in a Radon Affected Area, where less than 1% of properties are above the Action Level. Therefore, no radon protection measures are required in any new structures.

Landfill & Waste Management Activity

- 3.32 There are no records for the current Environment Agency landfill records within 500m of the site.
- 3.33 There are no records of BGS/DoE non-operational landfill sites within 500m of the site.
- 3.34 There are 3no. records of a historical landfill from the Local Authority and Historical Mapping records within 500m of the site. The closest record refers to a refuse tip mapped in 1962, located 237m southwest of the site.
- 3.35 There are no records of historic Environment Agency landfill sites within 500m of the site.
- 3.36 There are no records of historical waste sites within 500m of the site.
- 3.37 There are no records of the current Environment Agency licensed waste sites within 500m of the site.
- 3.38 There are no records of a waste treatment, transfer, or disposal site within 500m of the site.

Industrial Land Use Information

- 3.39 There are 70no. records of potentially contaminative historical land uses identified within 500m of the site. The closest record refers to an Unspecified Pit dated 1967 located 210m west of the site. The remaining records refuse heaps, unspecified old quarries, unspecified ground workings, gravel pits, unspecified mills, unspecified old levels, sandstone quarries, fishery depots and coal pits.
- 3.40 There are no records of a historical tank identified within 500m of the site.
- 3.41 There are no records of historical energy features identified within 500m of the site.
- 3.42 There are no records of historical petrol stations within 500m of the site.
- 3.43 There are no records for current petrol or fuel sites within 500m of the site.
- 3.44 There are no records of historical garage and motor vehicle repair sites identified within 500m of the site.
- 3.45 There are no records of recent industrial land uses within 250m of the site.
- 3.46 There are no records for current or recent tanks within 250m of the site.
- 3.47 There are no historical military land use records within 500m of the site.

- 3.48 There are no National Grid high voltage underground electricity transmission cables within 500m of the site.
- 3.49 There are no National Grid high-pressure gas transmission pipelines within 500m of the site.
- 3.50 There are no historical railway and tunnel features identified within 250m of the site.
- 3.51 There are no records for historical railway lines identified within 250m of the site.
- 3.52 There are no current active railway line records identified within 250m of the site.
- 3.53 There are no underground railway lines or tunnels identified within 250m of the site.
- 3.54 The site is not within 500m of the route of the High Speed 2 rail project.

Environmental Permits, Incidents, and Registers

- 3.55 The Groundsure Report includes records of environmental permits, incidents, and registers within 500m of the site, which are summarised in Table 1 below.

Table 1: Environmental Permits, Incidents, and Registers within 500m of the Site

Permit/Incident/Register	Number
Sites Determined as Contaminated Land under Part 2a EPA 1990	0
Dangerous or Hazardous (COMAH and NIHHS) Sites	0
Regulated Explosive Sites	0
Hazardous Substance Storage/Usage	0
Historical Licensed Industrial Activities (IPC)	0
Part A (1) and IPPC Authorised Activities	0
Part A (2) and Part B Activities and Enforcements	0
Category 3 or 4 Radioactive Substance Authorisations	0
Licensed Discharge Consents to Controlled Waters	0
Pollutant Release to Surface Waters (Red List)	0
Pollutant Release to Public Sewer	0
List 1 Dangerous Substances Inventory Sites	0
List 2 Dangerous Substances Inventory Sites	0
Substantiated Pollution Incidents	0
Pollution Inventory Substances	0
Pollution Inventory Waste Transfer	0
Pollution Radioactive Wastes	0

Environmentally Sensitive Sites

- 3.56 There are no records for a Site of Specific Scientific Interest (SSSI) located within 2km.

- 3.57 There are no records of Conserved wetland sites (Ramsar Sites) within 2km of the site.
- 3.58 There are no records of Special Areas of Conservation (SAC) and Special Protection Areas (SPA) within 2km of the site.
- 3.59 There are no records of National Nature Reserves (NNR) or Local Natural Reserves within 2km of the site.
- 3.60 There are 7no. records of a Designated Ancient Woodland within 2km of the site. The closest record refers to the Hey Wood located 1523m south of the site.
- 3.61 There are no records of Biosphere Reserves, Forest Parks, or Marine Conservation Zones within 2km of the site.
- 3.62 The site is within the Merseyside and Greater Manchester green belt.
- 3.63 The site is not within a Nitrate Sensitive Area.
- 3.64 The site is not within a Nitrate Vulnerable Zone.
- 3.65 The site is located within an SSI impact Risk Zone.

Ecology

- 3.66 An ecological assessment of the site falls outside the brief of this report. Where necessary, advice should be sought from an ecological specialist.
- 3.67 The land on the site is classified as Grade 4, poor-quality agricultural land.
- 3.68 There is 1no. record of Countryside Stewardship Schemes within 250m of the site. The record refers to the Countryside Stewardship (Middle Tier) dated 2023, located 124m north of the site.
- 3.69 There is 1no. record of Habitat Networks within 250m of the site. The record refers to the Network Enhancement Zone 1, located 60m northeast of the site.
- 3.70 There are no further records for agricultural or habitat designation on the site.

Archaeology

- 3.71 An archaeological assessment falls outside the scope of this report. Where considered necessary, advice should be sought from an archaeological specialist in this respect.
- 3.72 There are 3no. records for Listed Buildings within 250m of the site. The closest record refers to the Grade II Stid Fold Farmhouse, listed in 1985, located 37m to the southwest of the site.
- 3.73 There are no world heritage sites, areas of outstanding natural beauty, conservation areas, schedule of ancient monuments, national parks, or registered parks and gardens within 250m of the site.

Potential Flood Risks

- 3.74 Detailed assessment of flood risks is outside the scope of this report. However, the site does not lie within an Environment Agency Zone 2 or Zone 3 floodplain.
- 3.75 There are no records of risk of flooding from rivers and sea (RoFRaS) within 50m of the site.
- 3.76 There are no records of a historical flood event within 250m of the site.
- 3.77 There are no records of flood defences within 250m of the site.
- 3.78 There are no records for areas benefitting from flood defences within 250m of the site.
- 3.79 There are no flood storage areas within 250m of the site.
- 3.80 The highest risk of surface water flooding onsite is negligible.
- 3.81 The highest risk of groundwater flooding occurring onsite is negligible.

Unexploded Ordnance

- 3.82 The online Zetica UXO map shows the site within a low-risk zone.

4.0 SITE HISTORY

- 4.1 Reference historical plans and Google Earth imagery have determined the historical development of the site. Information in the historical mapping study has been predominantly limited to the site or to areas within 100m of the site to focus on the most directly relevant information. Beyond this radius, only information deemed appropriate will be referenced. Each map or photograph represents a snapshot of the site and its environment as of the survey date. Any changes that occur at other times may not have been recorded on the maps and could represent an unidentified hazard to the site.
- 4.2 Only selected maps with a clear view of the site and surrounding area have been used; the information reported might not represent all pertinent information that could be obtained. The interpretation of the maps and/or other data commented on in this report is subjective.
- 4.3 The earliest available historical mapping covering the site dates back to 1851. The site history is summarised in Tables 2 and 3, below, followed by selected extracts from maps and aerial photographs in Figures 4 to 6.

Table 2: Summary of Site History

Date	Scale	On-Site History	Surrounding Land Use History
1851	1:10,560	Three structures are on the site at the west, north and east corners. The area is indicated as Stid Fold	A building is at the immediate southern boundary. Buildings are approximately 50m west and south of the site. The area to the immediate north and east of the site is undeveloped land. Sandstone quarries, gravel pits and coal pits are approximately 450m west and east of the site. A footpath is immediately northeast of the site.
1890-1891	1:2,500	There are two buildings on the site, at the northwest and east.	Stid Brook is approximately 100m south. Barn Field Lane is approximately 50m to the south.
1905-1909	1:10,560	There is no significant change compared to the previous map.	Fishery and Mills are approximately 450m southwest of the site. Quarries approximately 450m northeast of the site.
1910	1:2,500	There is no significant change compared to the previous map.	There is no significant change compared to the previous map.
1928-1931	1:10,560	Building at the east had an extension to the left.	Old levels are approximately 450m south. Alder Bank Farm is approximately 450m northeast. A pit is approximately 250m west. Waterfall head is indicated at the western site's boundary.
1937	1:2,500	There is no significant change compared to the previous map.	There is no significant change compared to the previous map.
1938	1:10,560	There is no significant change compared to the previous map.	There is no significant change compared to the previous map.
1949	1:10,560	There is no significant change compared to the previous map.	Watergrove Reservoir is approximately 500m northeast of the site.

Date	Scale	On-Site History	Surrounding Land Use History
1963-1964	1:2,500	The building on the east has been demolished.	A trough approximately 50m south. Refuse tips and ponds are approximately 250m west of the site.
1967-1968	1:10,560	There is no significant change compared to the previous map.	There is no significant change compared to the previous map.
1976-1979	1:10,000	There is no significant change compared to the previous map.	There is no significant change compared to the previous map.
1988-1992	1:2,500	There is no significant change compared to the previous map.	There is no significant change compared to the previous map.
2001	1:10,000	There is no significant change compared to the previous map.	Stid Slack Farm, Nick Road, Benthead Farm, Springside Far and Moor Side Fishery are approximately 450m west, south and east of the site.
2003	1:1,250	There is no significant change compared to the previous map.	Refuse tips and ponds have been infilled. Buildings occupied the area.
2010	1:10,000	There is no significant change compared to the previous map.	There is no significant change compared to the previous map.
2015	1:10,000	There is no significant change compared to the previous map.	There is no significant change compared to the previous map.
2025	1:10,000	There is no significant change compared to the previous map.	There is no significant change compared to the previous map.

Table 3: Summary of Site History from Aerial Photographs

Date	On-Site History	Surrounding Land Use History
1999	A building is at the northwest corner of the site.	A building is at the immediate southern boundary. Buildings are approximately 25m west and south of the site. To the immediate north of the site, structures are indicated on the map. The area to the east and far north is undeveloped land covered in grass.
2000	There is no significant change compared to the previous photograph	There is no significant change compared to the previous photograph
2012	There is no significant change compared to the previous photograph.	New developments have been constructed approximately 25m south of the site.
2019	There is no significant change compared to the previous photograph.	There is no significant change compared to the previous picture.
2023	There is no significant change compared to the previous photograph.	The structures indicated to the immediate north of the site have probably been cleared.

- 4.4 The earliest available mapping, 1851, shows three structures located at the western, eastern, and northern corners of the site. Buildings were also present along the western and southern boundaries, while the northern and eastern boundaries remained undeveloped.
- 4.5 By 1890–1891, one of the on-site structures had been demolished, and a further demolition occurred between 1963 and 1964, leaving a single remaining structure in the northwest corner.
- 4.6 Presently, the site comprises a barn situated in the northwest corner, with the remainder of the site unoccupied. A structure is at the immediate southern boundary of the site. Barn Field Lane is located approximately 50m to the south, while several residential properties are approximately 25m to the west and south of the site.
- 4.7 The areas to the north and east of the site's boundaries remain as undeveloped grassland.



Figure 4 OS Map Extract 1890-1891

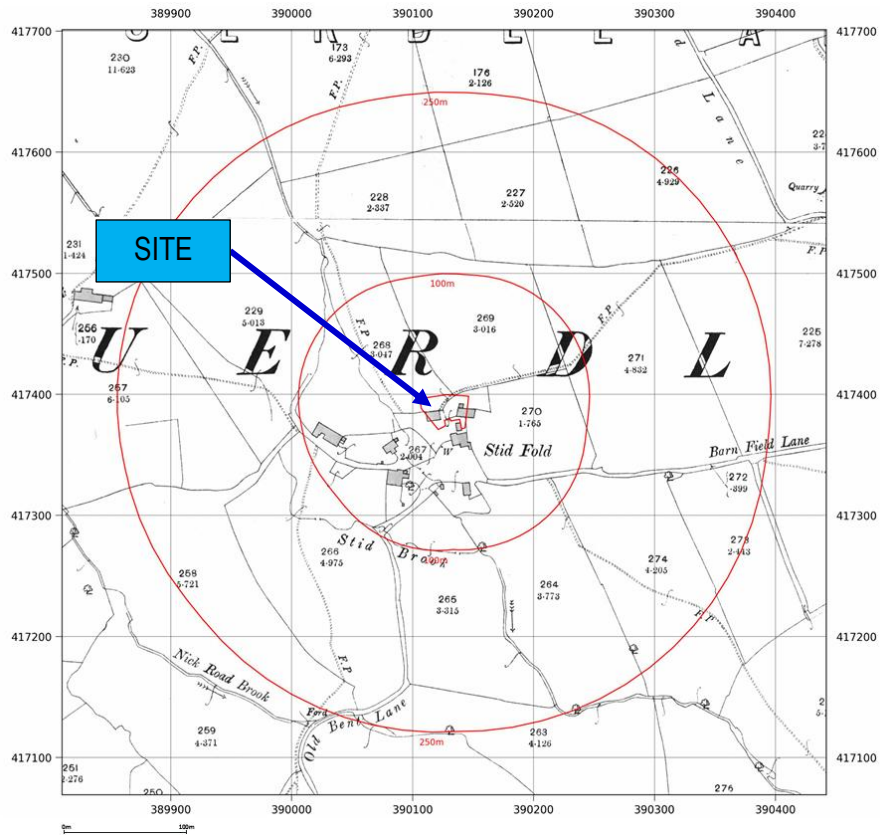


Figure 5 OS Map Extract 1988-1992

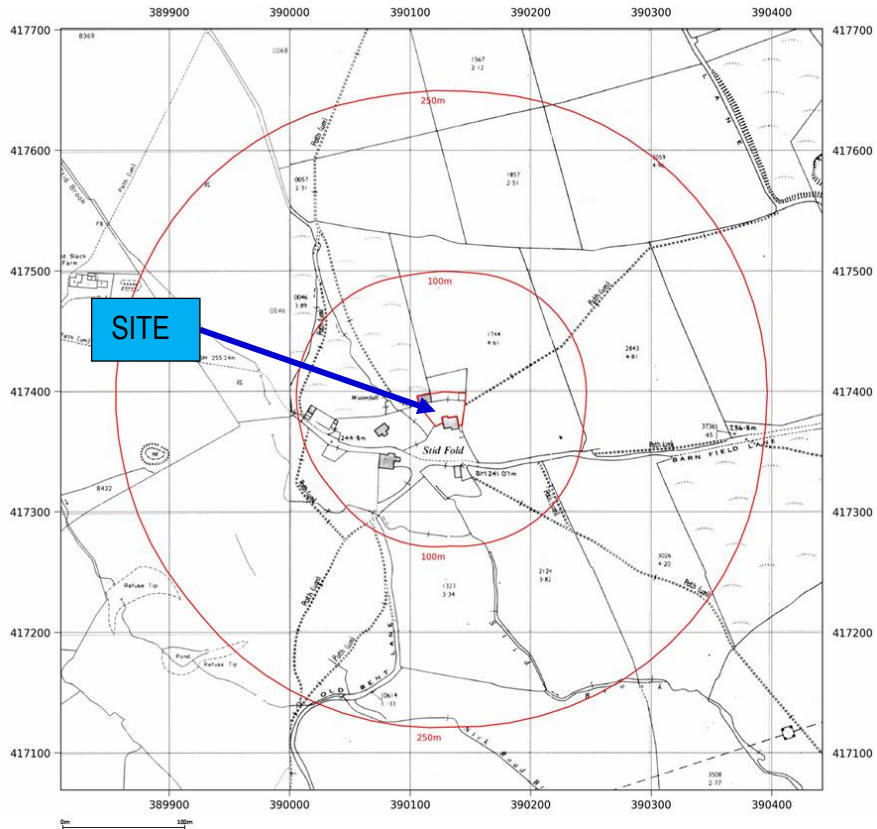


Figure 6 OS Map Extract 2003

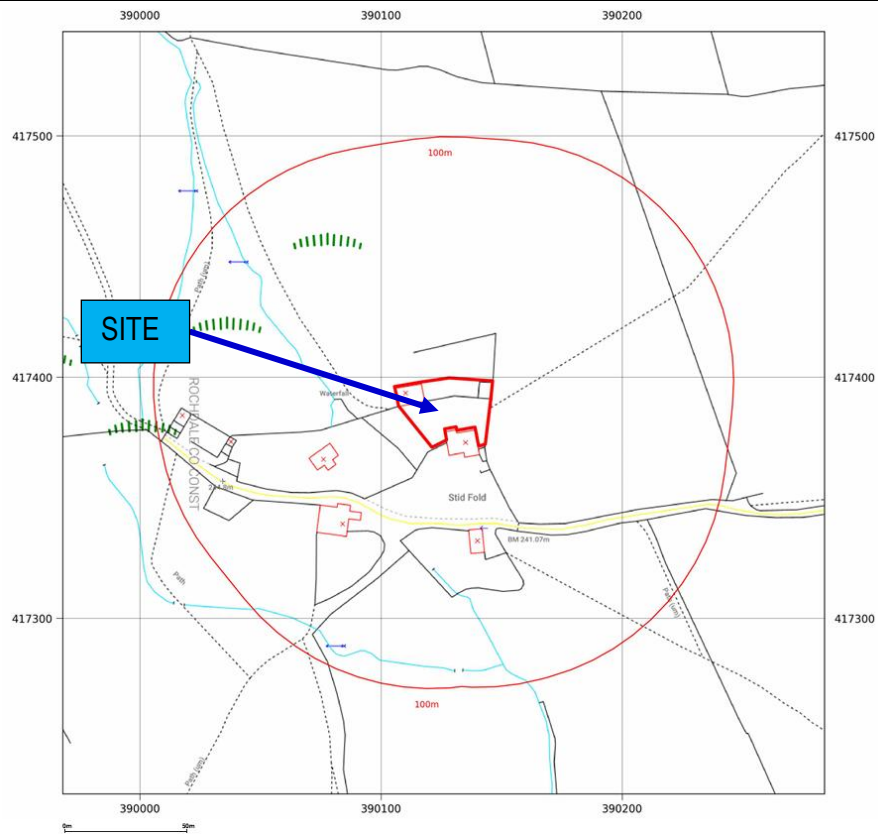
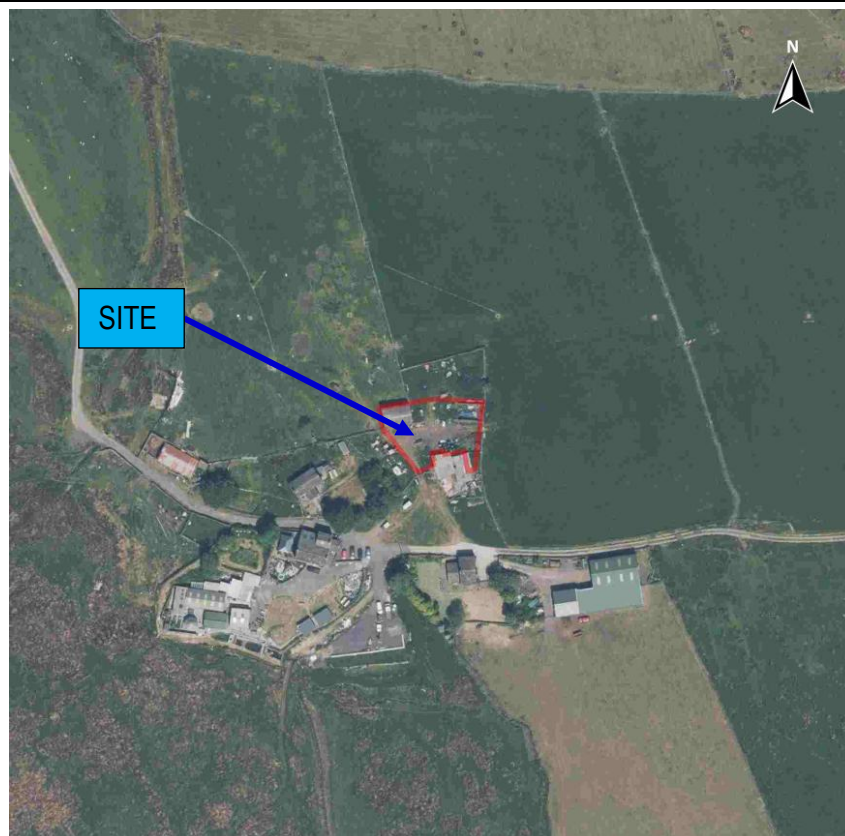


Figure 7 Aerial Photograph 2023



5.0 SITE WALKOVER SURVEY

- 5.1 A walkover survey was completed on the 5th February 2026.
- 5.2 The photographs and notes from this survey are appended to this report as Appendix 2 and Appendix 3, respectively. The site is understood to comprise the area of the proposed development, which is located within a farm development area.
- 5.3 A plan of key features is shown in Figure 8.
- 5.4 The surface topography of the site is generally level; however, the site is slightly undulating. The surrounding area is typically level, though undulating in other parts. The site is located within a rural upland landscape between Rochdale and Whitworth, characterised by rolling hills and nearby reservoirs.
- 5.5 The site is situated within a predominantly residential and farmed area. It is currently unoccupied and contains a barn and a structure in disrepair in the northern and eastern areas of the site.
- 5.6 There are residential farmhouses to the west and south of the site. Stid Fold Brook is approximately 614m east of the site. Bushes and trees are not on site, but a tree is approximately 2m from the southwestern boundary.
- 5.7 Access to the site is gained from Barn Field Lane, off Slack Gate Road. There is a farm-style gate at the south of the site.
- 5.8 A stone wall encloses the site; however, this wall functions as a formal boundary only along the eastern and southern edges. An old storage building is located immediately south of the site, while a large open field adjoins it to the east and northwest. Additional parcels of land bound the site to the west and northeast.

Figure 8 Site Features Plan



6.0 PRELIMINARY CONTAMINATION RISK ASSESSMENT

Introduction

- 6.1 The following paragraphs outline a Preliminary Risk Assessment (PRA) for the site based on the above desk study information as defined by the Land Contamination Risk Management Environment Agency, July 2023.
- 6.2 Table 6 provides a Preliminary Conceptual Model (PCM) which considers the source-pathway-receptor linkages present alongside the likelihood, severity, and risk level as defined within Table 4 and Table 5 below. The assessment of probability, the modified risk table, and the specific consequence definitions are based on CIRIA C552 and the Land Contamination Risk Management Environment Agency's July 2023 guidance.
- 6.3 Table 6 considers whether a pollution linkage is potentially present and provides a preliminary qualitative assessment of risk based on the information currently available. Where a possible linkage is identified, it does not necessarily indicate a significant risk; instead, it suggests that further information, through appropriate site investigation, is required to substantiate the conceptual model.
- 6.4 The PCM/PRA is based on a residential end use.

Table 4: Consequence, Probability and Risk

Probability	Consequence,	Risk
High Likelihood- There is a pollution linkage, and an event either appears very likely in the short term and almost inevitable over the long term, or there is evidence at the receptor of harm or pollution	Very High – acute risk to human health, likely to result in significant harm. Risk of severe or irreversible effects on ground/surface water quality. Catastrophic damage to buildings/property.	Very High – there is a high likelihood that the source-pathway-receptor scenarios may cause harm to human health or the environment, and remedial action is likely to be required.
Likely – there is a pollution linkage, and all the elements are present, which means that it is probable that an event will occur. Circumstances are such that an event is possible in the short term and likely over the long term.	High – Severe or irreversible effect on human health. Temporary severe or irreversible effect on ground/surface water quality. Reduction of water quality rendering groundwater or surface water unfit to drink and/or a substantial adverse impact on groundwater-dependent environmental receptors.	High – it is likely that source-pathway-receptor scenarios may affect human health or the environment, requiring remediation and/or control measures to mitigate risks.
Low likelihood– there is a pollutant linkage, and circumstances are possible for an event to occur. However, it is by no means certain that such an event would occur over a longer period; it is less likely in the short term.	Moderate – Long term or short-term moderate effect on human health. Moderate impact on ground/surface water quality, reversible with time. Reduced reliability of a supply at a groundwater or surface water abstraction source	Moderate – it is possible that source-pathway-receptor scenarios may affect human health or the environment; however, it is either relatively unlikely that such consequences would be severe, or, if any harm were to occur, it is more likely to be mild.
Unlikely – there is a pollution linkage, but circumstances are such that it is doubtful that an event would occur even in the very long term.	Low – non-permanent health effects to human health (easily prevented by means such as personal protective clothing, etc.) Slight impact on ground/surface water quality, reversible with time. Marginal reduced reliability of a supply at a groundwater or surface water abstraction source.	Low – it is possible that harm could arise at the source; however, likely, this would at worst be mild.
		Very Low – It is unlikely that the source-pathway-receptor scenarios will affect human health or the environment.

Table 5: Estimation of the Level of Risk by Comparison of Consequence and Probability

		Consequence			
		High	Moderate	Low	Very low
Probability	High Likelihood	Very High	High risk	Moderate risk	Moderate to low risk
	Likely	High risk	Moderate risk	Moderate to low risk	Low risk
	Low Likelihood	Moderate risk	Moderate to low risk	Low risk	Very low risk
	Unlikely	Moderate to low risk	Low risk	Very low risk	Very low risk

Potential Sources

- 6.5 There are no potential sources of contamination on the site or in the local area.

Potential Receptors

- 6.6 The following receptors have been considered for the construction and operational stages of the proposed redevelopment.
- Current site users;
 - Adjacent land users;
 - Future land users;
 - Construction workers during site development works;
 - Surface water features (Stid Brook)

Potential Pathways

- 6.7 The following pathways have been considered for the construction and operational stages of the proposed redevelopment.
- Dermal contact, ingestion, and inhalation pathways of potentially contaminated soils.
 - Downward vertical migration of leachate to shallow groundwater.
 - Vertical or lateral migration of ground gas.

Table 6: Preliminary Conceptual Model

Source	Pathway	Receptor	Probability	Consequence	Risk	Comment
Made Ground (Heavy Metals, PAH, TPH, BTEX)	Dermal contact, ingestion, and inhalation of soil dust	Current Site Users	Unlikely	Moderate	Very Low	The site is currently unoccupied. Therefore, there is limited potential for direct contact between contaminated soils and receptors. The risk is consequently considered VERY LOW .
		Adjacent land users	Low Likelihood	Moderate	Low	There is a limited potential for contamination on the site. The risk to off-site land users is considered LOW . Usual dust control measures should be implemented as part of good site working practices during construction to reduce dust generation.
		Future land users	Low Likelihood	Moderate	Low	Given that the proposed site is a residential development, there is potential for direct contact between contaminated soils and receptors. The risk to future site users from direct exposure is considered LOW .
		Construction Workers	Low Likelihood	Moderate	Low	Construction workers may be exposed to potentially contaminated materials during construction; however, exposure will be short-term. The risk to construction workers is considered LOW . Assuming appropriate health and safety measures are adopted (in accordance with CDM and other relevant guidance), a LOW risk to construction workers is anticipated.
	Downward vertical migration of leachate to shallow groundwater	Groundwater within the Underlying Aquifer	Unlikely	Moderate	Low	The groundwater vulnerability is high. There are no nearby groundwater abstraction licenses. The risk to groundwater is therefore considered LOW .
	Lateral migration in surface waters	Nearby Surface water features	Low Likelihood	Moderate	Low	There are nearby surface water features, and there is limited potential for contamination. Therefore, the risk to surface waters is considered LOW .
	Vertical or lateral migration of ground gas	Current Site Users	Unlikely	Moderate	Low	The site is currently unoccupied. There is no potential for ground gas. The risk to current site users from ground gas is therefore considered to be LOW .
		Adjacent land users	Unlikely	Moderate	Low	There is limited potential for deep-made ground gas, as the site is not a significant source of ground gas. Therefore, the risk to adjacent site users from ground gas is considered LOW .
		Future land users	Unlikely	Moderate	Low	There is no potential for ground gas. Therefore, the risk posed by ground gas to future site users is considered LOW .
		Construction Workers	Unlikely	Moderate	Low	Given the site's history, there is no potential for deep-made ground. It is unlikely that construction workers will be exposed to ground gas / depleted oxygen conditions in excavations. The risk to

Source	Pathway	Receptor	Probability	Consequence	Risk	Comment
						construction workers from ground gas is considered LOW .
Asbestos Containing Material (ACM)		Current Site Users	Unlikely	Moderate	Low	Given the site history, there is minimal potential for asbestos in the site soils. Asbestos is only harmful when disturbed. The risk to current site users is LOW .
		Adjacent land users	Low Likelihood	Moderate	Low	The risk to adjacent land users is considered LOW .
		Future land users	Low Likelihood	Moderate	Low	The risk to future land users is considered LOW .
		Construction Workers	Low Likelihood	Moderate	Moderate to Low	Asbestos is only harmful when disturbed. However, given the age of the existing barn, there is a possibility that asbestos may be present in the structure. Therefore, construction workers are likely to be exposed to asbestos during the refurbishment. The risk is considered MODERATE to LOW . However, the risk could be reduced to LOW following the completion of an asbestos survey.

7.0 GEOTECHNICAL HAZARDS ASSOCIATED WITH THE DEVELOPMENT

- 7.1 In addition to the environmental hazards, there are also geotechnical hazards associated with the stability of the ground, including load bearing capacity, slope stability and effects of ground mining activities. Local Authorities follow the NPPF (2021), which requires that a site be suitable for its new use, taking into account ground conditions and land instability, including from natural hazards and from former activities such as mining. A summary of the geotechnical hazards and geotechnical considerations is provided below in Tables 7 and 8, respectively.

Table 7: Summary of Geotechnical Hazards

Geohazards:	
Highly Compressible Ground	Negligible
Collapsible Soils	Very Low
Swelling Clay	Negligible
Running Sand	Negligible
Ground Dissolution	Negligible
Landslip	Very low
Mining & Quarrying	The site does not lie within a Coal Authority Development High Risk Area.

Table 8: Summary of Geotechnical Considerations

Geotechnical Design Considerations	
Site Clearance	Site clearance will be required.
Trees	There are no mature trees within the site boundary.
Existing Buildings/Obstructions	An old barn is on the site in the north. A structure in disrepair is to the east of the site.
Foundations	The depth and type of proposed foundations would depend on the ground conditions present on site. There are no artificial or superficial deposits in the proposed development area. The Woodhead Hill Rock underlies the proposed development. Shallow foundations are likely possible.
Floor Slabs	A ground-bearing floor slab is anticipated to be suitable at the prepared formation level. However, verification of the ground would be required.
Groundwater	Groundwater conditions are not known at this stage. For a more detailed understanding of the groundwater regime, an intrusive geotechnical investigation would be required. However, the site is underlain by [Secondary A aquifer]. The highest risk of groundwater flooding on the site is recorded as negligible.
Soakaways	Soakaways may be feasible on the site.
Earthworks	Earthworks are likely to be required to form a foundation platform.
Slopes	The site is slightly undulating.
Retaining Walls	It is unlikely that retaining walls will be required.

Geotechnical Design Considerations

Chemically aggressive ground conditions

Chemically aggressive ground conditions are not expected at this site. However, an intrusive geotechnical investigation would be necessary to confirm this at the specified development location.

8.0 CONCLUSIONS AND RECOMMENDATIONS

Conclusions

- 8.1 The earliest available mapping, 1851, shows three structures located at the western, eastern, and northern corners of the site. Buildings were also present along the western and southern boundaries, while the northern and eastern boundaries remained undeveloped. By 1890–1891, one of the on-site structures had been demolished, and a further demolition occurred between 1963 and 1964, leaving a single structure remaining in the northwest corner.
- 8.2 The bedrock geology beneath the site is shown to be of the Woodhead Hill Rock (Secondary 'A' Aquifer).
- 8.3 The overall risk from soil contamination to residential end users is concluded to be **LOW**, and to construction workers is concluded to be **LOW**.
- 8.4 The risk from asbestos-containing materials to residential users and construction workers is considered to be **LOW**; however, this can be reduced to **VERY LOW** following an asbestos survey of the old barn.
- 8.5 The risk to controlled waters is concluded to be **LOW**.
- 8.6 There are no significant sources of ground gas within 250m of the site; therefore, the risk from ground gas to end users is supposed to be **LOW**.
- 8.7 The site does not lie within a radon-affected area, and therefore radon protection measures are not required for any new structures.
- 8.8 The site does not lie within a flood plain.
- 8.9 The site lies within an area of **LOW RISK** of UXOs.

Recommendations

- 8.10 The barn should be surveyed for potential asbestos materials within the building fabric and infrastructure.

APPENDIX 1
GROUNDSURE REPORTS

APPENDIX 2
SITE PHOTOGRAPHS

Earth Environmental & Geotechnical Ltd

Tel: 0161 975 6088
Email: info@earthenvironmental.co.uk
Web: www.earthenvironmental.co.uk

SITE PHOTOGRAPHS



Job No.: A7573

Site: Stid Fold Farm, Wardle

Plate 1 View facing southwest showing site access route



Plate 2 View facing south showing the site access



Date: 5th February 2026

Date: 5th February 2026

Plate 3 View facing north showing into the site.



Plate 4 View facing east showing into the site.



Date: 5th February 2026

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SITE PHOTOGRAPHS



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Site: Stid Fold Farm, Wardle

Plate 5 View showing the eastern site boundary



Plate 6 View showing the western site boundary



Date: 5th February 2026

Date: 5th February 2026

Plate 7 View showing the southern boundary.



Plate 8 View showing the northern boundary.



Date: 5th February 2026

Date: 5th February 2026

Earth Environmental & Geotechnical Ltd Tel: 0161 975 6088 Email: info@earthenvironmental.co.uk Web: www.earthenvironmental.co.uk	SITE PHOTOGRAPHS 
Job No.: A7573	Site: Stid Fold Farm, Wardle
Plate 9 View facing northwest showing the barn on the site	Plate 10 View facing southwest showing littered piles at the immediate boundary of the site.
	
Date: 5th February 2026	Date: 5th February 2026
Plate 11 View facing northeast showing the disrepair of the structure on the site	Plate 12 View facing southeast showing soil stockpile on the site and old storage building at the southern boundary
	
Date: 5th February 2026	Date: 5th February 2026

Figure 9: Site Walkover Photograph Locations



APPENDIX 3

SITE WALKOVER NOTES

WALK OVER SURVEY REPORT

Site: Stid Fold Farm, Wardle

Date: 5th February 2026

Job No: A7573

Undertaken By: Rose Sarnoe

Purpose of Site Walkover:

- 1) Provide further information for the Desk Study Report.
- 2) Identify potential contamination sources, pathways, and receptors;
- 3) Identify geotechnical features and potential geohazards;
- 4) Determine locations for exploratory boreholes.

Desk Study features checked during site visit.	Feature and Information required	Present	Description / Comments
Site Setting	Description required for: Town/Country/Suburb Setting Industrial/Residential/Retail Usage Current Site use (if undertaking security and access to the site)		The site is situated within a predominantly residential and farmed area. It is currently unoccupied and contains a barn and an older structure located toward the northern and eastern parts of the site.
Evidence of Past Activities	Are there: Are there any relevant street names in the area? Features or relics which indicate past history?	Yes Yes	Barn Field Lane lies approximately 36m to the south. The presence of the existing barn indicates historical agricultural use, likely associated with cattle farming.
Geographic Setting	Description required for: Low-lying flood plain/dry valley/rolling hills, etc.		The site is located within a rural upland landscape between Rochdale and Whitworth, characterised by rolling hills and nearby reservoirs.
Ground Conditions	Is there any evidence of: Mining, Mine entries Subsidence Landslip/slope erosion Former investigation works	No No No	

Desk Study features checked during site visit.	Feature and Information required	Present	Description / Comments
Topography	Description required for: Are there any apparent differences between the site and the surrounding area? (If yes, describe the presence of retaining walls and slopes.) Is there evidence of Made Ground / Fill on site?	No Yes	The site is slightly undulating. Given the site's history and usage, ground conditions are expected.
Site Boundaries and Neighbours	Description required for: Type of boundary demarcation (if any) on each side of the site, usage of adjacent land and name of industrial/commercial occupiers. Note any adjacent features such as water course and other potentially environmentally sensitive uses (residential, school, infirmary, SSSI, etc.)		The site is surrounded by a stone wall. However, the stone wall serves as a formal boundary only to the east and south. An old storage building borders the site to the south, and a large open field borders the site to the east and northwest. A parcel of land borders the site to the west and northeast. There are residential farmhouses to the west and south of the site. Stid Fold Brook is approximately 614m east of the site.
Vegetation	Are there any vegetation/trees on or close to the site (if yes, describe locations, type, maturity, etc) Is there any evidence of poor health/distress?	Yes No	No trees on the site; trees are approximately 2m west of the site.
Ground Surface	Are there areas of hardstanding, and what is the estimated split between hard and soft cover? (If yes, describe locations, types, and conditions. Is there any evidence of any spillages or staining?	No No	The site is predominantly covered in soft cover; however, there is gravel surfacing.

Desk Study features checked during site visit.	Feature and Information required	Present	Description / Comments
Site Drainage	Are there any drain covers/soakaways (if yes, describe locations) Are there any outfalls/water courses on site (note the condition of water courses in open water courses. discolouration, odour, eutrophication, oily sheen, gas bubbling in water, clear or cloudy) Where a watercourse runs alongside or crosses a site, are there any differences in visible water quality upstream and downstream of the site?	No No No	
Electrical Equipment	Are there any electricity substations on or adjacent to the site? Are there any electrical transformers, capacitors, pylons, or similar equipment on site?	No	
Buildings	Is there any evidence of asbestos-containing construction materials, e.g., roofing and insulation? Do any buildings have basements? Do any buildings have a boiler room (if yes, describe fuel type and storage arrangements)?	No No No	No ACM observed.

Desk Study features checked during site visit.	Feature and Information required	Present	Description / Comments
Landfilling	Is there any evidence of gas protection measures (gas membrane, gravel-filled trenches, venting pipes, etc)?	No	
Process Air Emissions	Point Source: Are there any stacks/vents / cooling towers/abatement equipment? Fugitive Source: Is there any stockpiled material / windblown dust/vapour process?	No No	
Storage of fuels & Chemicals	Are there any drums/containers (if so, describe the quantity, full/empty, stored on hardstanding/soft landscaping, and bunding)? Are there any above-ground fuel tanks (if yes, describe locations, volumes, how many, bunding, used / disused, condition) Is there any evidence of underground fuel tanks (fuel pumps, covers, vent pipes, how many and how significant, fill point, used / disused, and condition)?	No No No	
Accidents	In the event of a large spillage, would runoff affect any vulnerable watercourse/culverts? Are emergency procedures/equipment in place?	No No	

Desk Study features checked during site visit.	Feature and Information required	Present	Description / Comments
Waste	Are there any waste skips present on site? Are waste storage facilities adequate? Is there any litter or fly-tipped material?	No No Yes	There are littered old tyres, gas cylinders, car parts and household materials.
Atmospheric	Are there any fumes or odours originating from the site or affecting the site from neighbouring sites?	No	N/A
Access / Further Investigations	If a Phase 2 Investigation is likely to be required, describe any access problems, including headroom where relevant, services, overhead cables, restricted access areas, confined spaces, trafficked areas, etc., that are likely to affect the investigation scope/techniques. Identify possible site office and storage locations. Identify possible water supply.		The site can be accessed through a large farm-style gate off Barn Field Lane to the south, which leads off from Stid Fold Farm gate approximately 73m west of the site. The site office can be located anywhere on the site. A pond is to the west of the site.
Site Environs	Are there any local features that could have a harmful influence, e.g., landfill, industrial processes, or railway land? Are there any sensitive water features/courses near the site?	No Yes	Stid Fold Brook is approximately 614m east of the site.
Local Knowledge / Anecdotal Evidence			N/A

APPENDIX 5

REPORT LIMITATIONS

LIMITATIONS

This contract was completed by Earth Environmental & Geotechnical Ltd based on a defined programme, scope of works, and terms and conditions agreed with the client. This report was compiled with due care and skill, taking into account the project objectives, the agreed scope of works, the prevailing site conditions, the budget, and the staff resources allocated to the project.

Other than that, expressly contained in the above paragraph, Earth Environmental & Geotechnical Ltd provides no other representation or warranty, whether express or implied, in relation to the services. Unless otherwise agreed, this report has been prepared exclusively for the use and reliance of the client in accordance with generally accepted consulting practices and for the intended purposes as stated in the agreement under which this work was completed. This report may not be relied upon, or transferred to, by any other party without the written agreement of a Director of Earth Environmental & Geotechnical Ltd.

If a third party relies on this report, it does so wholly at its own and sole risk and Earth Environmental & Geotechnical Ltd disclaims any liability to such parties.

It is Earth Environmental & Geotechnical Ltd's understanding that this report is to be used for the purpose described in the introduction to the report. That purpose was an important factor in determining the scope and level of the services. Should the purpose for which the report is used, or the proposed use of the site change, this report will no longer be valid, and any further use of, or reliance upon the report in those circumstances by the client without Earth Environmental & Geotechnical Ltd review and advice shall be at the client's sole and own risk.

The report was written in 2026 and should be read in light of any subsequent changes in legislation, statutory requirements, and industry best practices. Ground conditions can also change over time, and further investigations or assessments should be made if there is any significant delay in acting on the findings of this report. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of Earth Environmental & Geotechnical Ltd. In the absence of such written advice from Earth Environmental & Geotechnical Ltd, reliance on the report in the future shall be at the client's own and sole risk. Should Earth Environmental & Geotechnical Ltd be requested to review the report in the future, Earth Environmental & Geotechnical Ltd shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between Earth Environmental & Geotechnical Ltd and the client.

The observations and conclusions described in this report are based solely upon the services that were provided pursuant to the agreement between the client and Earth Environmental & Geotechnical Ltd. Earth Environmental & Geotechnical Ltd has not performed any observations, investigations, studies or testing not explicitly set out or mentioned within this report.

Earth Environmental & Geotechnical Ltd is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this report, Earth Environmental & Geotechnical Ltd did not seek to evaluate the presence on or off the site of electromagnetic fields, lead paint, radon gas or other radioactive materials.

The services are based on Earth Environmental & Geotechnical Ltd's observations of existing physical conditions at the site, derived from a walkover survey, together with Earth Environmental & Geotechnical Ltd's interpretation of information, including documentation obtained from third parties and from the client, on the site's history and usage. The findings and recommendations contained in this report are based in part upon information provided by third parties, and whilst Earth Environmental & Geotechnical Ltd have no reason to doubt the accuracy of that information, which has been provided in full from those it was requested from, the items relied on have not been verified.

No responsibility can be accepted for errors within third-party items presented in this report. Further Earth Environmental & Geotechnical Ltd was not authorised and did not independently verify the accuracy or completeness of information, documentation, or materials received from the client or third parties, including laboratories and information services, during the performance of the services. Earth Environmental & Geotechnical Ltd is not liable for any inaccurate information, misrepresentation of data or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to Earth Environmental & Geotechnical Ltd and including the doing of any independent investigation of the information provided to Earth Environmental & Geotechnical Ltd save as otherwise provided in the terms of the contract between the client and Earth Environmental & Geotechnical Ltd.

Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work. Ground conditions can also be variable, and investigation excavations permit examination of the ground only at discrete locations. The potential exists for ground conditions to be encountered that differ from those considered in this report. The extent of the limited area depends on soil and groundwater conditions, the positions of any existing structures and underground facilities, and natural and other on-site activities. In addition, chemical analysis was carried out for a limited set of parameters [as stipulated in the contract between the client and Earth Environmental & Geotechnical Ltd], based on the available operational and historical information; it should not be inferred that other chemical species are absent.

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

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