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CONSULTING

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GEO-ENVIRONMENTAL PHASE 1 DESK STUDY

LAND ADJACENT TO 55 BRADLEY FOLD ROAD

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BURY
BL2 5QR**

On behalf of:

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1.0 INTRODUCTION

1.1 Background & Objectives

Adeptus was appointed by Neil Pike Architects to undertake a Geo-Environmental Phase 1 Desk Study in support of a planning application for development at the site known as Land Adjacent to 55 Bradley Fold Road. The report is required to assess the potential for significant contamination affecting the site and ensure suitability for the proposed use.

The objectives of the desk study are to:

- Summarise historical land use on and in the vicinity of the site
- Assess the likelihood of contamination, as well as its potential nature and extent
- Evaluate the geological and environmental setting of the site and its surrounds
- Develop an initial conceptual site model
- Identify potentially significant contaminant linkages
- Undertake a preliminary risk assessment in line with LCRM guidance
- Determine whether further investigation is required

1.2 Regulatory Framework

Land contamination is a material consideration under the National Planning Policy Framework (2012). This means that local authorities must take the potential or actual presence of contamination into account when considering planning applications.

“Contamination” is defined in BS 10175:2011 as:

presence of a substance or agent, as a result of human activity, in, on or under land, which has the potential to cause harm or to cause pollution.

1.3 Previous Reports & Supporting Information

At the time of writing, no previous reports have been made available to Adeptus.

A site plan is included as Appendix A.

Other sources of information utilised in producing this report are listed as Appendix B.

2.0 SITE DETAILS & PROPOSALS

This section provides a review of the land use on and in the vicinity of the Site, with the purpose of identifying potentially significant current features and environmental constraints.

2.1 Location and Description

Table 2-1: Site Summary

Location	The site is situated southwest Bradley Fold Road in a predominantly rural area circa 0.5km south of Ainsworth.
Grid Reference	376341 409596 (centred on, approx.)
Area & Shape	0.06 ha – roughly rectangular.
Development Proposals	Conversion of agricultural building to dwelling with gardens.



Figure 2-1: Site Location

2.2 Site Reconnaissance

A site walkover carried out and the findings are noted in Table 2-2, below.

Table 2-2: Site Walkover Observations

Date: 04/11/2021	Notes
Current/Recent Land Use	On-site: Steel portal framed agricultural barn yard space to its north, west and south. A small area of lawn also falls within the curtilage at the north of the site.
	North: Existing farmhouse at distance, with driveway and garden closer.
	East: Open farmland.
	South: Detached dwelling with gardens.
	West: Open farmland beyond Bradley Fold Road.
Retaining Structures	None evident during site walkover.
Topography	Generally flat and level.
Ground Cover Proportions On-site	Buildings: 25%
	Hardstanding: 65%
	Soft Landscaping: 10%
Drainage/Buried Services	
Fuel and/or Chemical Storage	None evident during site walkover. However it is noted that use of such substances is common within agricultural premises and may have occurred in the past.
Off Site Potential Contaminant Sources	None evident during site walkover.
Visual or olfactory evidence of contamination	None evident during site walkover.
Asbestos Containing Material (ACM)	Corrugated sheet cladding to the roof and sides of the building are likely to be ACM, and it is possible that the building fabric contain ACM also. However, this will require management in line with the Control of Asbestos Regulations, 2012, and is therefore not expected to impact ground conditions. A small mound of builder's waste was noted south of the entrance consisting of concrete blocks from a wall or similar. Further blocks and bricks were stacked north of the entrance also.
Vegetation & Potential Invasive Flora	No signs of vegetation stress were noted. No invasive species were evident during the site walkover.
General Comments	

3 HISTORICAL LAND USE

3.1 Historical Development

Historical Ordnance (OS) Survey map extracts have been examined to provide a summary of significant land use on and in proximity to the site, including industrial features within 100m and potential landfills within 250m.

Where available, more recent aerial photographs have also been reviewed for evidence of relevant land use.

Potentially significant features are noted in the table below. Where more than one instance of the same use occurs in the same direction, only the closest has been described. Hyphens (-) connote no significant change.

Table 3-1: Summary of Historical Features

Date(s)	On-Site	Off-Site
1850	The east and west boundaries of the application are defined, but extend further north and south forming a longer strip of land between adjacent buildings/dwellings.	Titus House – 20m N. This appears to be the original farmhouse remaining in place today. Titus's – 15m S. The feature appears to be a terrace of dwellings with an additional detached one to the east. However it is not clear whether it could also be a stone barn or similar. Lower Green Farm – 90m N Kiln Clough (house/farm) – 80m NE Plane Trees (farm) – 70m SW
1890	-	-
1910	-	-
1930	-	Unspecified structure – 8m S. A small building or similar is located beyond the southern boundary of the application site. Titus Cottage – the terrace ca. 15m S is labelled as a dwelling.
1939	-	
1955	Unspecified structure. The structure sitting at the east boundary is shown divided into three small square and considered likely to be stables or similar. The remainder of the site is labelled as an orchard.	The terrace to the north of Titus Cottage has been partially demolished.
1975	Barn. The current barn appears at the south of the site, replaces the above stables and remaining within the curtilage of Titus House to the north.	-
1986	-	-

1992	-	-
2000*		Three small structures appear beyond the south boundary.
2003	-	-
2011	-	The field to the east appears to be used as a horse paddock.
2019*	A large red shipping container is situated immediately west of the barn.	-

Notes: * Aerial photograph | - No significant change

3.2 Landfill & Waste Sites

Landfills and other potentially significant waste sites identified within 250m of the site are reviewed in table below.

Table 3-2: Data on Landfill & Waste Sites

Records	Details & Significance
- Active or recently closed landfills: 0 - BGS/DOE historical landfills: 0 - Local Authority(OS) historical landfill: 0 - EA/NRW historical landfills: 0 - EA/NRW current/recent landfills: 0 - Historical permissioned waste sites: 0 - Active or recently waste sites: 0 - Waste exemptions: 12	<u>Waste Exemptions</u> The exemptions are for small scale waste storage and not considered significant.

3.3 Industrial Features, Authorisations & Incidents

Industrial features indicating an increased likelihood of the presence of contamination, pollution incidents, and sites determined as contaminated land by a statutory authority, within 100m, are reviewed in table below.

Table 3-3: Industrial Data

Records	Details & Significance
- Current industrial sites: 0 - Current or recent petrol stations: 0 - Electricity cables: 0 - Gas pipelines: 0	There are no significant features within the search distance.

- Sites determined as Contaminated Land: 0
- COMAH Sites: 0
- Regulated explosive sites: 0
- Hazardous substance storage: 0
- Integrated Pollution Control (IPC) records: 0
- Part A(1) permitted installations: 0
- Licensed pollutant releases (Part A(2)/B): 0
- Radioactive substance authorisations: 0
- Licensed discharges to controlled waters: 0
- Pollutant discharge to surface waters: 0
- Pollutant release to public sewer: 0
- List 1/2 dangerous substances discharge: 0
- Pollution incidents: 0
- Pollution inventory reporting: 0

4 ENVIRONMENTAL SETTING

The site's environmental and geological setting are reviewed characterise probable pathways and receptors, as well as identify relevant contaminant sources.

4.1 Geology & Geohazards

4.1.1 Anticipated Geology

Data held by the British Geological Survey (BGS) indicate the site is underlain by the geological sequence summarised in the table below.

Table 4-1: Summary of Published Geology

Geological Unit	Description	Composition	Location
• Superficial/Drift:	Till, Devensian	Diamicton	113m NE
• Bedrock/Solid:	Cannel Rock (south Lancashire)	Sandstone	On site

4.1.2 Relevant 'Geohazards'

Potential health and environmental hazards relating to recorded or unrecorded mine workings, artificial ground and permanent gases are reviewed in the table below.

Table 4-2: Environmental Geohazards

Potential Geohazard	Details & Significance
Coal Mining Legacy	The site is located within the Development Low Risk Area, as defined by the Coal Authority. No further action in respect of coal mining is generally required in the low-risk area.
Infilled or Made Ground	No evidence of significant ground workings or infilled voids has been identified.
Ground Gas Potential	The natural geological strata identified above not considered a significant source of permanent ground gases such as methane or carbon dioxide.

4.2 Controlled Waters

4.2.1 Groundwater

Designated groundwater aquifers underlying the site are reviewed in the table below, along with any licenced abstractions and source protection zones.

Table 4-3: Aquifers, Abstractions & Protection Zones

Records		Details & Significance
Superficial Aquifer:	N/A	No superficial deposits are mapped.
Bedrock Aquifer:	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.
- Groundwater Abstractions Licenses: 0 - Surface Water Abstractions Licenses: 0 - Potable Water Abstractions Licenses: 0 - The site <i>is not</i> within a SPZ		-

4.2.2 Surface Waters

Local surface water features and flood risk zones are reviewed in the table below.

Table 4-4: Surface Waters & Flood Risk Zones

Surface Waters	Details & Significance
Closest Watercourse	Ditch/drain - 136m NE. Local topography declines to the E/SE and the watercourse is presumed to drain in this direction.
Site Catchment	Croal Irwell.

Flood Zone 1	Very low risk of flooding, with an annual probability according to the EA/NRW of less than 0.1%.
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4.3 Designated Environmentally Sensitive Sites

4.3.1 Designated Environmental & Heritage Sites

Statutory protected environmental and heritage sites within 250m are reviewed in the table below.

Table 4-5: Statutory Protected Sites

Feature	Details & Significance
- Ramsar sites: 0 - Special Areas of Conservation (SAC): 0 - Special Protection Areas (SPA): 0 - National Nature Reserves (NNR): 0 - Local Nature Reserves (LNR): 0 - Designated Ancient Woodland: 0 - World Heritage Sites: 0 - Listed Buildings: 0	There are no significant features within the search distance.

4.4 Summary Environmental Sensitivity

Table 4-6: Site Sensitivity Assessment

Aspect	Environmental Sensitivity
Hydrogeology	<u>Moderate</u> . Secondary A bedrock strata with no superficial deposits. No aquifers or abstractions.
Hydrology	<u>Moderate</u> . Mapped surface waters are at some distance.
Environmental Designations	<u>Low</u> . None within 250m.
Local Land Use	<u>Moderate</u> . The wider area is generally agricultural with some low density residential.
Proposed Use	<u>High</u> . Residential with garden.
Overall Environmental Sensitivity:	Moderate to High

5 INITIAL CONCEPTUAL SITE MODEL

For a conceptual risk of harm to human health or the environment to exist within the context of LCRM, all of the following elements must be present:

- a source – i.e., a substance (contaminant(s)) that is capable of causing pollution or adverse health effects;
- a receptor - i.e., something which could be adversely affected by the source; and
- a pathway – i.e., a route by which the contaminant could come into contact with, or affect, the receptor.

Information on these three elements is used to form an initial conceptual site model (CSM) and identify potentially significant contaminant linkages.

5.1 Pollutant Linkage Assessment

Based on the information presented in sections 2 and 3, the following potential sources, receptors and relevant pathways for exposure are identified in relation to the development.

5.1.1 On-Site Potential Sources of Contamination

- None identified

5.1.2 Potential Receptors

Potential receptors relevant to the documented history, potential sources, site-setting and proposed use include:

- **Human Health:** future site residents; site users; nearby land users; construction workers
- **Controlled Waters:** watercourse; underlying aquifer
- **Property** in the form of buildings and structures
- **Flora** within future gardens/landscaping

5.1.3 Potential Pathways

The primary pathways relevant to the identified potential sources and receptors are:

- **Ingestion**
- **Dermal contact**
- **Inhalation**

- **Surface water run-off:** leaching/dissolution
- **Surface water infiltration:** leaching/dissolution

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5.2 Preliminary Risk Assessment

Qualitative assessment of the risks posed by the potentially significant pollutant linkages identified in Section 5.1 is summarised in the table below. Risk classification is a function of the severity of a potential environmental or health effect, and the likelihood or frequency of its occurrence.

Table 5-3. Preliminary Risk Assessment

Source	Pathway	Receptor	Consequence	Likelihood	Classification*	Rationale
Organic and inorganic contaminants potentially present in soils and/or made ground	Dermal contact, ingestion, particulate inhalation	Nearby site occupants & users	Medium	Unlikely	Low Risk	Given the distance to adjacent dwellings, there is unlikely to be an elevated short-term risk to off-site receptors, from particulates liberated during excavation/construction. Development of the site for residential dwellings introduces the possibility of sensitive receptors such as young children being exposed to contaminants in near surface soils should they be present. Similarly, the growing of produce in contaminated media is possible and may lead to ingestion. Flora may be affected by contaminants such as phytotoxic metals. No suspected sources of volatile contaminants, such as tanks, have been directly identified in proximity to the site. The nature of the building and established use also suggest a source is unlikely. It is also likely that any historical near surface sources would have been significantly attenuated by natural processes over time, including volatilisation and microbial degradation. Water supply pipes are unlikely to be sited in media containing contaminants capable of permeating standard polyethylene pipes.
		Future site occupants & users	Medium	Likely	Moderate Risk	
	Consumption of home grown produce		Medium	Low Likelihood	Moderate/ Low Risk	
	Uptake from root zone	Flora within future gardens/	Minor	Low Likelihood	Low Risk	
	Migration of vapours via strata, structures or services; subsequent inhalation	Future site occupants & users (indoors)	Medium	Unlikely	Low Risk	
	Diffusion through plastic water supply pipes	Water supply pipes	Medium	Low Likelihood	Moderate/ Low Risk	

*in the absence of mitigation or remedial measures

Source	Pathway	Receptor	Consequence	Likelihood	Classification*	Rationale
Cont'd	Leaching/dissolution into shallow groundwater; subsurface migration.	Groundwater	Medium	Low Likelihood	Moderate/ Low Risk	Bedrock underlying the site is designated a Secondary A Aquifer. The lack of mapped superficial deposits suggests potential for direct infiltration of surface water to the aquifer.
	Leaching/dissolution and migration via Site drainage	Surface waters	Medium	Unlikely	Low Risk	However, there are no abstractions within 500m and the site is not in an SPZ. Mapped surface water features are at some distance.
	Flooding	Ground/surface waters	Medium	Unlikely	Low Risk	Any Made Ground is likely to be the main source of leachable contaminants, subject to its nature and thickness. However, where this remains under impervious hardstandings infiltration will be very limited. In the soft landscaped areas, all Made Ground will be excavated and replaced with soil.
Aggressive ground (e.g. sulphate; pH)	Direct contact/chemical attack	Buildings/services	Mild	Low Likelihood	Low Risk	If present, Made Ground and/or demolition fill may present a source of aggressive contaminants.
Potential asbestos containing materials in soils	Release of asbestos fibres; subsequent inhalation	Site occupants & users	Medium	Low Likelihood	Moderate/ Low Risk	The likelihood of ACM contamination will largely depend on the nature of any of Made Ground material present beneath hardstandings.
		Construction workers	Medium	Low Likelihood	Moderate/ Low Risk	If ACM is present, construction plant/activities are likely to liberate/damage these and increase fibre release. Any such material remaining in the garden areas could result in a significant contaminant linkage. Construction works are subject to separate regulation requiring safe systems of work, with any risk e.g., to site operatives mitigated through the use of PPE.

*in the absence of mitigation or remedial measures

6 CONCLUSIONS

6.1 Risk Assessment Summary

Adeptus was appointed by Neil Pike Architects to undertake a Geo-Environmental Phase 1 Desk Study in support of a planning application for development at the site known as Land Adjacent to 55 Bradley Fold Road.

On the basis of the available information, a number of potentially significant pollutant linkages have been identified. However, it is considered that relatively simple mitigation measures should be feasible based on the outcome of subsequent quantitative assessment.

The application site remained undeveloped until construction of a small stable block between 1939 and 1955, which was further replaced by the current building before 1975.

The principal source of potential contamination is considered to be Made Ground emanating from demolition of previous structures on and adjacent the site, and possibly imported for use as subbase beneath hardstandings.

An asbestos survey (as defined by the Control of Asbestos Regulations, 2012) is beyond the scope of this report, and any potential asbestos containing materials identified during the walkover have been noted for information only. Contaminated land risk assessment is undertaken on the basis that asbestos present within the fabric of buildings will be managed in accordance with prevailing regulation, and therefore not allowed to contaminate soils.

N.B.: This summary forms part of the overall risk assessment and should not be viewed or used as an independent report.

6.2 Recommendations

It is recommended that further assessment of the potentially significant contaminant linkages highlighted in Section 5.2 is undertaken in order to further characterise the potential risks identified.

This should be achieved by intrusive investigation to address the potentially significant source areas summarised Section 5.1 and described throughout this report, to enable quantitative screening in respect of the relevant pathways.

A proportionate Phase 2 intrusive site investigation may be undertaken, with the following objectives:

- Characterise any Made Ground, as well as natural strata underlying the site
- Obtain data on soil chemical composition
- Enable environmental monitoring as required
- Update and refine the initial conceptual site model
- Provide data to enable basic waste characterisation in line with waste duty of care requirements if required at the construction stage.

Findings of the Phase 2 investigation and risk assessment will determine whether remediation or mitigation measures are required, in line with LCRM.

- End of report.

APPENDIX A – SITE PLAN

KILN CLOUGH FARM

55

BRADLEY FOLD ROAD

NOTE: EXISTING HEDGEROW AND WALL ALONG FRONTAGE TO BE REDUCED TO 0.9M TO ALLOW VISIBLE SIGHT LINES

EXISTING BOUNDARY WALL
2.4 X 60M SIGHT LINE

PROPOSED 1.8M HIGH TIMBER BOARDED BOUNDARY FENCE. DROPPING TO 0.9M NEAR FRONTAGE TO ALLOW SIGHT LINES

CROSS HATCHING INDICATES EXTENT OF EXISTING BOUNDARY WALL TO BE REDUCED TO MAX 900MM IN HEIGHT

GARDEN AREA

EXISTING ACCESS TO REMAIN

TURNING AREA

2.4 X 60M SIGHT LINE

EXISTING PAVEMENT

2

1

EXISTING BOUNDARY WALL

AGRICULTURAL BUILDING TO BE CONVERTED

1.8M HIGH TIMBER BOARDED FENCE TO BOUNDARY

GARDEN AREA

TITUS COTTAGE

REV	DESCRIPTION
A	SIGHT LINES ADDED 23.07.19 D.D.
B	VISIBILITY SPLAY DIMENSIONS AMENDED 11.09.19 R.S.P.
C	ADDITIONAL BOUNDARY TREATMENT ADDED 20.09.19 R.P.

PROPOSED SITE PLAN

PROPOSED CONVERSION OF AGRICULTURAL BUILDING LAND ADJ TITUS HOUSE, 55 BRADLEY FOLD ROAD, AINSWORTH, BURY, BL2 5QR

CLIENT:	MR. MOHAMMADI	
DWG NO:	PL K753/01	
SCALE:	1/200 @ A1	
DRAWN BY:	R.P.	
DATE:	01/03/19	
REV:	C	

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