



**Castledine  
Environmental**

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LAND CONTAMINATION SURVEYS

**Phase 1 Land Contamination  
Risk Assessment**

for

**Proposed Works on Clopton Hall**

on the site of

**Clopton Hall, Clopton Green,  
Rattlesden IP30 0RN**

**Date: July 2023**

Status:	Final Report
Reference:	3411D P1 Moody - Rattlesden
Date:	04/07/2023

## EXECUTIVE SUMMARY

The site is currently occupied by Clopton Hall and its associated outbuildings and open, well-maintained garden areas. Historically, the site has been occupied as such since at least circa.1884 and the site has seen little change since this time. The main changes that have taken place include the election and removal of glasshouses in the far north west and west of site and on the rear face of the hall itself. The outbuildings – which are proposed to be converted into a garage and residential annex usage – have also remained present on site since at least circa.1884. No significant sources of contamination have been identified other than the bunded fuel tank. No significant sources of offsite contamination have been identified, with the farmyard located north of site not considered a significant hazard to the site and outbuilding area and its proposed end-usage.

Based on the information contained in this report, it is the opinion of Castledine Environmental that the site represents a **LOW** level of risk with respect to the proposed development.

**It is not envisaged that any further works or investigation are required.**

**It is recommended that the buildings involved should be subject to an asbestos survey (and subsequent removal, if identified) by appropriately qualified personnel. This should be carried out prior to any demolition or redevelopment occurring in order to ensure site works do not cause future contamination of the site.**

**It is recommended that a watching brief (as outlined in Appendix E) should be carried out by the site supervisor during the course of demolition, site clearance and construction works for any obvious contamination (e.g. oil spillage in ground, buried waste, possible asbestos containing material). Should previously unreported or undiscovered contamination be identified, then development should stop and Castledine Environmental should be contacted to determine if further assessment or changes to the remediation scheme are required.**

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**1.0 QUALITY ASSURANCE**

Castledine Environmental confirm that all reasonable efforts have been made to ensure that the information outlined within this report is accurate.

Castledine Environmental would further confirm that due care, attention and technical skill were used in the creation of this report.

For and on behalf of Castledine Environmental

Kevin Castledine

(Director)

**2.0 LIMITATIONS**

The conclusions and recommendations made in this report are limited to those based on the findings of the investigation. Where comments are made based on information obtained from third parties, Castledine Environmental assumes that all third-party information is true and correct. No independent action has been undertaken to validate the findings of third parties. The assessments and interpretation have been made in line with legislation and guidelines in force at the time of writing, representing best practice at the time.

This survey has not included asbestos within existing structures, invasive plant species, geotechnical considerations or any elements unconnected with potential ground contamination at the site. If required, such surveys should be undertaken by suitably accredited organisations.

There may be other conditions prevailing at the site which have not been disclosed by this investigation and which have not been taken into account by this report. Responsibility cannot be accepted for conditions not revealed by the investigation.

### 3.0 INTRODUCTION

Castledine Environmental have been appointed by Mr. Moody & Dr. Dormer to undertake a Phase 1 Desk study on a site at Clopton Hall, Rattlesden, Suffolk IP30 0RN.

### 4.0 SCOPE

Castledine Environmental have prepared this report for the sole use and reliance of Mr. Moody & Dr Dormer and their appointees for the purpose of ensuring compliance with:

- Paragraph(s) 174, 179, 183 & 184 of the National Planning Policy Framework 2021
- Part C1 of the building regulations
- Support of a Planning Application

This report may not be used or relied upon by any unauthorised third party, or for any other proposed use than that specified above, without the explicit written agreement of Castledine Environmental

The report consists of a preliminary risk assessment in accordance with BS10175:2011+A2:2017, CLR11 “Model Procedures for the Management of Land Contamination” and LCRM “Land Contamination Risk Management”.

The objectives of the report are:-

- To assess historical activities at the site with respect to their potential impact on the site environment.
- To characterise the environmental setting of the site, identify migration pathways and vulnerable receptors for contamination originating at the site, focusing on potential soil and groundwater liabilities.
- To assess historical and current surrounding land use in relation to known or potential off-site contamination issues that may impact on the subject site and
- To develop a preliminary conceptual site model (CSM).

## 5.0 SITE DESCRIPTION

The site is located in Rattlesden, Suffolk at National Grid Reference: 598357,259937 and is approximately 1.74ha in area. The site is an irregular rectangle in shape and is orientated slightly north east to south west. The site is located in a predominantly rural area and is directly bounded by a dilapidated, former farmyard north of site and open field in the remaining directions.

The site interior comprises Clopton Hall and its associated grounds and outbuildings. The hall itself is located in the north eastern / eastern extent of site, with outbuildings located directly east / south east of this. The remainder of the site is then occupied by large, open lawned and grassed areas with a small thicket of trees located in the south west and along the western boundary of site. The outbuilding area, which is proposed to be converted in a residential annex was noted to be constructed of brick and a mixture of concrete and soil flooring with timber structure throughout the buildings. Heaps of building stone, which in some areas was slightly overgrown, along with the building, were noted in the yard area here. On the western face of the outbuilding a plastic, bunded tank was noted atop a brick-plinth. No significant evidence of hydrocarbon spillages or staining were noted, either visually or olfactory. No potentially asbestos containing materials were noted on the site walkover. The bunded oil tank is considered a potential source of contamination. Topographically, the site is level.

Photos of the site are present in Appendix D

## 6.0 REGULATORY AUTHORITY AND OTHER ENVIRONMENTAL DATA

An environmental search listing historical and environmental factors likely to affect the property has been reviewed. The most pertinent information is summarised in the following sections.

A copy is presented in Appendix A.

Additional geological and hydrological data was obtained from the British Geological Survey.



**6.1 HYDROLOGICAL****6.1.1 AQUIFER****6.1.1.1 SUPERFICIAL GEOLOGY**

ID	Distance (m)	Direction	Designation	Description
1	0	On Site	Secondary (Undifferentiated)	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
1	0	On Site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

**6.1.1.2 BEDROCK GEOLOGY**

ID	Distance (m)	Direction	Designation	Description
1	0	On Site	Principal	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers

**6.1.2 ABSTRACTIONS AND PRIVATE WATER SUPPLIES**

None recorded within 250m of site; the nearest record beyond this is an active surface water abstraction licence located 481m south east of site and related to spray irrigation and in effect from 17/02/2021.

**6.1.3 SOURCE PROTECTION ZONE**

The site is located in a Type 3 Total Catchment Source Protection Zone (SPZ) – Source protection zones define the sensitivity of an area around a potable abstraction site to contamination.

**6.1.4 GROUNDWATER VULNERABILITY AND SOIL LEACHING POTENTIAL**

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

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

ID	Location	Summary	Soil / Surface	Superficial geology	Bedrock geology
1	On site	Summary Classification: Secondary superficial aquifer - Medium Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Intermediate Infiltration value: 40-70% Dilution value: <300mm/year	Vulnerability: Medium Aquifer type: Secondary Thickness: >10m Patchiness value: >90% Recharge potential: Low	Vulnerability: Low Aquifer type: Principal Flow mechanism: Intergranular
2	On site	Summary Classification: Secondary superficial aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Intermediate Infiltration value: >70% Dilution value: <300mm/year	Vulnerability: High Aquifer type: Secondary Thickness: >10m Patchiness value: >90% Recharge potential: Low	Vulnerability: Low Aquifer type: Principal Flow mechanism: Intergranular

**6.1.5 POTENTIAL SURFACE WATER**

The Groundsure report records an unnamed, surface level watercourse located on site (in the north east of site) and a small lakes or large ponds located 66m and 84m south east of site and further unnamed, surface level watercourses located 73m south east and 170m, 174m NE of site.

**6.1.6 DISCHARGE CONSENTS**

None recorded within 500m of site.

**6.2 PERMITTED PROCESSES**

None recorded within 500m of site.

**6.3 POLLUTION INCIDENTS**

None recorded within 500m of site.

**6.4 RADIOACTIVE SUBSTANCES REGISTRATIONS**

None recorded within 500m of site.

**6.5 WASTE****6.5.1 LICENSED WASTE MANAGEMENT FACILITIES (LOCATIONS)**

None recorded within 500m of site.

**6.5.2 LANDFILL SITES**

None recorded within 500m of site.

**6.6 HAZARDOUS SUBSTANCES**

None recorded within 500m of site.

**6.7 ECOLOGICAL RECEPTORS**

The Groundsure report records the site as being located within the River Gipping surface waters Nitrate Vulnerable Zone (NVZ) and the Sandlings and Chelmsford groundwaters NVZ. The Ely Ouse and Cut-off Channel surface waters NVZ is located 299m north of site and 2 No. areas of designated ancient woodland are located 451m east and 478m north east of site.

## 6.8 SOILS AND GEOLOGY

"Contains British Geological Survey materials © NERC 2023" obtained from <http://www.bgs.ac.uk/data/mapViewers/home.html> under the [Open Government Licence](#)

### 6.8.1 SUPERFICIAL DEPOSITS

Both BGS geological mapping and the Groundsure report record superficial geological deposits of the Lowestoft Formation on site, comprising an extensive sheet of chalky till, together with outwash sands and gravels, silts and clays. The till is characterised by its chalk and flint content.

Records of the Croxton Sand and Gravel Member, comprising sands and gravels are then located 66m west of site and Glacial Head Deposits, comprising similar, clayey deposits are recorded 241m east of site.

### 6.8.2 SUPERFICIAL DEPOSITS PERMEABILITY

The Groundsure report records the site as being within an area where the maximum permeability of superficial deposits is recorded as 'moderate' and the minimum permeability as 'low' and facilitated by mixed flow mechanisms.

### 6.8.3 BEDROCK DEPOSITS

Both BGS geological mapping Groundsure report record bedrock geology of the Crag Group underlying site, comprising sands, predominantly flint gravels, silts and clays.

### 6.8.4 BEDROCK PERMEABILITY

The Groundsure report records the site as being within an area where the maximum permeability of bedrock geology is recorded as 'high' and the minimum permeability as 'high' and facilitated by intergranular flow mechanisms.

### 6.8.5 ARTIFICIAL GROUND

BGS geological mapping records no artificial deposits located on or within 250m of site.

**6.8.6 BGS ESTIMATED BACKGROUND SOIL CHEMISTRY**

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

The Groundsure report records arsenic, lead & bioaccessible lead, cadmium, chromium and nickel at background concentrations of 15-25mg/kg, 100mg/kg & 60mg/kg, 1.8mg/kg, 60-90mg/kg and 30-45mg/kg, respectively.

Assuming a worst-case generic acceptance threshold (GAC) of 1% soil organic matter (SOM), none of the recordings are above the generic acceptance thresholds of 37mg/kg, 200mg/kg (both lead and bioaccessible lead), 11mg/kg, 910mg/kg and 180mg/kg, respectively.

**6.8.7 COAL MINING**

The site is not located in a coal mining reporting area.

**6.8.8 SURFACE WORKINGS**

ID	Distance [m]	Direction	Land Usage	Year of Mapping
A	0	On site	Pond	1950
A	0	On site	Pond	1884
A	0	On site	Pond	1977
B	5	NE	Pond	1950
B	5	NE	Pond	1884

ID	Distance [m]	Direction	Land Usage	Year of Mapping
B	5	NE	Pond	1978
C	7	NE	Pond	1977
C	9	SE	Fish ponds	1953
C	9	SE	Fish ponds	1905
C	16	SE	Fish ponds	1950
C	17	SE	Fish ponds	1884
C	17	SE	Fish ponds	1884

### 6.8.9 RADON

The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level. No radon protective measures are necessary as described in publication BR211:2015 by the Building Research Establishment.

### 6.9 AERIAL PHOTOGRAPHY

Aerial photography shows the following:

#### 6.9.1 GOOGLE MAPS

The site is shown as occupied by Clopton Hall and its associated and surrounding grounds, comprising large, open lawned areas with the hall located in the east/north eastern extent of site. The area immediately north of site appears to be a dilapidated, slightly overgrown farmyard.

#### 6.9.2 GOOGLE EARTH

8 No. images are held in the historic imagery dataset, as follows:

Date	Description
December 2000	The site is shown as occupied by Clopton Hall and its associated and surrounding grounds, comprising large, open lawned areas with the hall located in the east/north eastern extent of site. The area immediately north of site appears to be a dilapidated, slightly overgrown farmyard which is at this time very overgrown.
August 2007	No major change on site other than an increase in vegetation density and also in the farmyard north of site.
December 2007	No major or discernible change on site.
April 2015	No major or discernible change on site.
June 2018	No major or discernible change on site; the farmyard to the north of site has been cleared of vegetation. A pond or pit which is water filled is now clearly visible immediately north of the NE extent of site.
September 2020	No major or discernible change on site.
April 2021	No major or discernible change on site.
September 2021	No major or discernible change on site.

#### 6.10 GOOGLE STREET VIEW

Google Street View imagery is unavailable for the site due to its location at the termination of a private access track. A number of static photograph locations are held on Google Maps, however, these are of the access track rather than the site interior.

#### 6.11 HISTORIC MAPPING

The following historic maps have been reviewed as part of this assessment, found in the appendices.

Map	Onsite	Offsite
OS County Series: 1884, 1:2,500	The site is shown as occupied by Clopton Hall which is located in the east / NE of site. 2 No. linear ponds are located north and east of this (remaining persistent until the present-day) and a glasshouse is located in the far NW of site.	The surrounding areas to site comprise a farmyard north of site and field in the remaining directions. A series of large ponds are located approx.65m SE of site (remaining persistent until the present-day) and further ponds are located north of the NE extent of site (also persistent until the present-day) and approx.55m NW of site. A tank is marked approx.302m NW of site.
OS County Series: 1883-1888, 1:10,560	No discernible change on site.	Surrounding areas see little site relevant change.
OS County Series: 1903, 1:10,560	No discernible change on site.	Surrounding areas see little site relevant change.
OS County Series: 1905, 1:10,560	No discernible change on site.	Surrounding areas see little site relevant change.
OS County Series: 1950, 1:10,560	No discernible change on site.	Surrounding areas see little site relevant change.
Provisional: 1953- 1958, 1:10,560	No discernible change on site.	Surrounding areas see little site relevant change.
National Grid: 1974- 1975, 1:2,500	The glasshouse in the NW of site has been removed and a new glasshouse is located in the far western extent of site. A new glasshouse is now located on the southern face of the hall itself.	A long, linear barn is now directly located NW of site and extending north from here. The pond located approx.55m NW of site has been removed.
National Grid: 1979- 1981, 1:10,000	No discernible change on site.	Surrounding areas see little site relevant change.
National Grid: 1993- 1995, 1:2,500	No discernible change on site.	Surrounding areas see little site relevant change.
National Grid: 2001, 1:10,000	No discernible change on site.	Surrounding areas see little site relevant change.
Landline: 2003, 1:1,250	No discernible change on site.	Surrounding areas see little site relevant change.
National Grid: 2010, 1:10,000	No discernible change on site.	A number of farm buildings in the farmyard north of site have been removed.
National Grid: 2022, 1:10,000	No discernible change on site.	Surrounding areas see little site relevant change.



**6.12 CURRENT LAND USE DATA**

None recorded within 250m of site.

**6.13 PETROL AND FUEL SITES**

None recorded within 500m of site.

**6.14 HISTORICAL PETROL AND FUEL SITE DATABASE**

None recorded within 500m of site.

**6.15 POTENTIAL CONTAMINATIVE LAND USES IDENTIFIED ON MAPPING**

The Groundsure report records a historical refuse heap located 495m south of site and identified from historical mapping dated circa.1953; and a historical gravel pit located in the same are (approx.498m south of site) and identified from historical mapped dated circa.1884.

**6.16 HISTORICAL TANK DATABASE**

ID	Distance(m)	Direction	Use	Date
1	302	NW	Unspecified tank	1973
2	494	NW	Unspecified tank	1973

**6.17 HISTORICAL ENERGY FACILITIES**

None recorded within 500m of site.

**6.18 HISTORICAL GARAGE DATABASE**

None recorded within 500m of site.

**7.0 POLLUTANT LINKAGE ASSESSMENT**

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

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

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

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

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

## **7.1 SOURCES**

The following potential sources of contamination have been identified.

### **7.1.1 ONSITE**

- Plastic bunded oil tank (west of outbuilding)

### **7.1.2 OFFSITE**

No significant potential sources of offsite contamination have been identified.

## **7.2 PATHWAYS**

A pathway is defined as a mechanism or route by which a contaminant comes into contact with, or otherwise affects a receptor. Pathways by which the identified receptors may be impacted upon in the context of the proposed development are identified as follows:

- Ingestion;
- Skin contact;
- Inhalation;
- Plant uptake,
- Direct contact by buried structures;
- Leaching of soluble contamination into groundwater

### 7.3 RECEPTORS

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

- Human Health
  - Current users of the site;
  - Future users of the site;
  - Users of neighbouring sites;
  - Construction workers; and
  - Services personnel working in trenches.
  - Construction Materials
- Buried concrete, which may be affected by high concentrations of sulphate and/or low pH, in the soils and groundwater underlying the site; and
- Buried water pipes.
- Controlled Waters
- Ecological Receptors
- Flora and fauna using the proposed development

### 8.0 CONCEPTUAL SITE MODEL

The Conceptual Site Model (CSM) is a hypothesis of the nature and sources of contamination, potential receptors that may be the recipient of contamination arising from those sources and any pathways that may exist. It creates a plausible source-pathway-receptor pollutant linkage (hazard), set within the context of the ground and proposed end use of the site.

### 8.1 PRELIMINARY CONCEPTUAL SITE MODEL

#### 8.1.1 SOIL CONTAMINATION

The site is currently occupied by Clopton Hall and its associated outbuildings and open, well-maintained garden areas. Historically, the site has been occupied as such since at least circa.1884 and the site has seen little change since this time. The main changes that have taken place include the election

and removal of glasshouses in the far north west and west of site and on the rear face of the hall itself. The outbuildings – which are proposed to be converted into a garage and residential annex usage – have also remained present on site since at least circa.1884. No significant sources of contamination have been identified other than the bunded fuel tank. No significant sources of offsite contamination have been identified, with the farmyard located north of site not considered a significant hazard to the site and outbuilding area and its proposed end-usage.

#### **8.1.2 HAZARDOUS GROUND GAS AND VAPOURS**

No significant potential source of ground gas generation have been identified and the site is located in an area where superficial geology is predominantly low in permeability and thus limits credible pathways to site, both laterally and vertically. No significant potential sources of hazardous vapours have been identified, with the onsite tank and the area around it noted to be clean and atop concrete; however, it is recommended that this feature is professionally removed offsite, thus limiting potential future contamination from the feature.

TABLE 1. SUMMARY OF SIGNIFICANT POLLUTION LINKAGES

Contaminant	Pathway	Receptor	Probability of Pollutant Linkage	Consequence	Risk	Possible Mitigation
Contaminated Soils	Direct Ingestion & Direct Contact	Site Workers	UI	Md	L	Site workers to wear appropriate PPE for health and safety reasons along with adherence to relevant HSE guidance.
Contaminated Soils	Inhalation of Dust	Site Workers	UI	Md	L	
Contaminated Soils	Direct Ingestion & Direct Contact	End Users	UI	Md	L	No significant potential sources of contamination identified other than the bunded oil tank – which is recommended to be professionally removed. It is then recommended that a Watching Brief (inline with Appendix F) be applied during all site works. Whilst no immediately identifiable asbestos was noted on site, due to the age of the structures and any redevelopment occurring that a professional asbestos survey be carried out on site – to limit the potential for future contamination of the site and for site worker safety.
Contaminated Soils	Inhalation of Dust	End Users	UI	Md	L	
Contaminated Soils	Direct Ingestion	Flora and Fauna	UI	Md	L	
Contaminated Soils	Vertical and lateral migration	Controlled Waters	UI	Md	L	
Contaminated Soils	Direct contact	Services	UI	Md	L	
Ground Gases (Methane and CO <sub>2</sub> )	Vertical and lateral migration	End Users & Building Envelope	UI	Md	L	
Volatile and Semi-volatile Organic Compounds	Vertical and lateral migration	End Users & Building Envelope	UI	Md	L	
Radon	Vertical and lateral migration	End Users & Building Envelope	UI	Md	L	Site is not located in a Radon Affected Area.

KEY: Probability of pollutant linkage Hi = Highly likely, Li = Likely, Lw = Low Likelihood, UI = Unlikely  
 Consequence Sv = Severe, Md = Medium, Mi = Mild, Mr = Minor,  
 Overall Risk VH = Very High, H = High, M = Moderate, M/L = Moderate/Low, L = Low, VL = Very Low

Based on the preliminary CSM for the site, an environmental risk assessment has been undertaken. A simple matrix can provide a consistent basis for decision making. It should be used with caution, recognising the over-simplification that it will normally represent. The probability and consequences are defined according to parameters relevant to the situation; the boundaries of risk acceptability (and tolerability, where relevant) indicated on the matrix provided in Table 2, can be tailored to the factors influencing the significance of the risk. Individual situations are mapped onto the matrix to provide a ready and consistent indication of their acceptability or tolerability.

TABLE 2. RISK CLASSIFICATION MATRIX

		Consequence			
		Severe (Sv)	Medium (Md)	Mild (Mi)	Minor (Mr)
Probability	High (Hi)	Very high risk	High risk	Moderate Risk	Moderate/Low Risk
	Likely (Li)	High risk	Moderate Risk	Moderate/Low Risk	Low Risk
	Low Likelihood (Lw)	Moderate Risk	Moderate/Low Risk	Low Risk	Very Low Risk
	Unlikely (Ui)	Moderate/Low Risk	Low Risk	Very Low Risk	Very Low Risk

Source: CIRIA Report C552, Contaminated Land Risk Assessment. A Guide to Good Practice, 2001

These attributes are evaluated qualitatively against individual hazard assessments to determine the likelihood of a given hazard occurring. The risk evaluations for each plausible pollutant linkage are given in the last three columns of Table 1.

TABLE 3. CLASSIFICATION OF RISK

<b>Very high risk (Vh)</b>	There is a high probability that severe harm could arise to a designated receptor from an identified hazard, OR, there is evidence that severe harm to a designated receptor is currently happening. This risk, if realised, is likely to result in a substantial liability. Urgent investigation (if not undertaken already) and remediation are likely to be required.
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<b>High risk (Hi)</b>	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short-term and are likely over the longer term.
<b>Moderate risk (Md)</b>	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild. Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer-term.
<b>Low risk (Lw)</b>	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.
<b>Very low risk (VI)</b>	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.

Source: CIRIA Report C552, Contaminated Land Risk Assessment. A Guide to Good Practice, 2001

## 9.0 ENVIRONMENTAL RISK ASSESSMENT

Based on the information contained in this report, it is the opinion of Castledine Environmental that the site represents a **LOW** level of risk with respect to the proposed development.

**It is not envisaged that any further works or investigation are required.**

**It is recommended that the outbuildings on site should be subject to an asbestos survey (and subsequent removal, if identified) by appropriately qualified personnel. This should be carried out prior to any demolition or redevelopment occurring in order to ensure site works do not cause future contamination of the site.**

**It is recommended that a watching brief (as outlined in Appendix E) should be carried out by the site supervisor during the course of demolition, site clearance and construction works for any obvious contamination (e.g. oil spillage in ground, buried waste, possible asbestos containing material). Should previously unreported or undiscovered contamination be identified, then development should stop and Castledine Environmental should be contacted to determine if further assessment or changes to the remediation scheme are required.**

**10.0 SUMMARY OF RISKS****10.1.1 SOIL CONTAMINATION**

The site is currently occupied by Clopton Hall and its associated outbuildings and open, well-maintained garden areas. Historically, the site has been occupied as such since at least circa.1884 and the site has seen little change since this time. The main changes that have taken place include the election and removal of glasshouses in the far north west and west of site and on the rear face of the hall itself. The outbuildings – which are proposed to be converted into a garage and residential annex usage – have also remained present on site since at least circa.1884. No significant sources of contamination have been identified other than the bunded fuel tank. No significant sources of offsite contamination have been identified, with the farmyard located north of site not considered a significant hazard to the site and outbuilding area and its proposed end-usage.

**10.1.2 GROUND GASSES AND VAPOURS**

No significant potential source of ground gas generation have been identified and the site is located in an area where superficial geology is predominantly low in permeability and thus limits credible pathways to site, both laterally and vertically. No significant potential sources of hazardous vapours have been identified, with the onsite tank and the area around it noted to be clean and atop concrete; however, it is recommended that this feature is professionally removed offsite, thus limiting potential future contamination from the feature.

**11.0 RECOMMENDATIONS**

It is recommended that the outbuildings on site should be subject to an asbestos survey (and subsequent removal, if identified) by appropriately qualified personnel. This should be carried out prior to any demolition or redevelopment occurring in order to ensure site works do not cause future contamination of the site.



It is also recommended that the bunded oil tank be professionally removed.

A watching brief (as outlined in Appendix E) should be carried out by the site supervisor during the course of demolition, site clearance and construction works for any obvious contamination (e.g. oil spillage in ground, buried waste, possible asbestos containing material). Should previously unreported or undiscovered contamination be identified, then development should stop and Castledine Environmental should be contacted to determine if further assessment or changes to the remediation scheme are required.

**12.0 REFERENCES****12.1 LEGISLATION AND REGULATIONS****12.1.1 ACTS**

- [1] Environmental Protection Act 1990, Part IIA: inserted by Environment Act 1995, Section 57. See Environment Act 1995 for text of Part IIA.

**12.1.2 PLANNING REGULATIONS**

- [2] The Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 SI1999/No.293
- [3] The Town and Country Planning (Environmental Impact Assessment) (England and Wales) (Amendment) Regulations 2000 SI2000/No.2867

**12.1.3 CONTAMINATED LAND REGULATIONS**

- [4] The Contaminated Land (England) Regulations 2000. SI2000/No.227
- [5] The Contaminated Land (England) (Amendment) Regulations 2001 SI2001/No.663
- [6] The Contaminated Land (England) Regulations 2006 SI2006/No.1380

**12.2 STATUTORY GUIDANCE**

- [7] Department of Environment, Food and Rural Affairs. 2012. *Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance*. Department of Environment, Food and Rural Affairs
- [8] Communities and local Government, 2018: National Planning Policy Framework.

**12.3 BRITISH STANDARDS**

- [9] BS 5930:2015 Code of practice for site investigations
- [10] BS 10175:2011+A2:2017 Investigation of potentially contaminated sites - Code of practice
- [11] BS 8485:2015+A1:2019 BS 8485 - 2015 - Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings
- [12] BS 8576:2013 Guidance on investigations for ground gas. Permanent gases and Volatile Organic Compounds (VOCs)

**12.4 NON STATUTORY TECHNICAL GUIDANCE****12.4.1 ENVIRONMENT AGENCY**

- [13] Cassella Stranger, 2002. Model Procedures for the Management of Contaminated Land, Contaminated Land Report (CLR) 11, Department for Environment, Food, and Rural Affairs.

**12.4.2 CIRIA PUBLICATIONS**

- [14] Wilson, S., Oliver, S., Mallett, H., Hutchings, H., and Card, G.. 2007, *C 665 Assessing risks posed by hazardous ground gases to buildings* London: Construction Industry Research and Information Association
- [15] Mallett, H., Cox, L., Wilson, S. and ,Corban M... 2014, *C 735 Good practice on the testing and verification of protection systems for buildings against hazardous ground gases* London: Construction Industry Research and Information Association

**12.4.3 CL:AIRE**

- [16] Card G, Wilson S, Mortimer S. 2012. *A Pragmatic Approach to Ground Gas Risk Assessment. CL:AIRE Research Bulletin RB17.* CL:AIRE, London, UK. ISSN 2047- 6450 (Online)

**13.0 APPENDICES**

**APPENDIX A ENVIRONMENTAL SEARCH**

Separate Groundsure Report

**APPENDIX B HISTORICAL MAPPING**

Separate Map Packs (2 No. files)





APPENDIX D

SITE PHOTOS AND LOCATIONS



Site Walkover Photos

**Photo No.1: Facing north from south of Clopton Hall showing the southern face and large, open gardened area**



**Address: Clopton Hall, Rattlesden, Suffolk**

**Client: Mr. Moody & Dr. Dormer**

**Photo No.2: Facing slightly NE from outside the SW corner of Clopton Hall showing the rear (southern) face of the building**





**Site Walkover Photos**

**Address: Clopton Hall, Rattlesden, Suffolk**  
**Client: Mr. Moody & Dr. Dormer**

**Photo No.3: Facing west from NE of the hall showing further, well-maintained garden and lawned areas**

**Photo No.4: Facing north in the same location showing the gardened areas located NE of the hall**







Site Walkover Photos

**Address: Clopton Hall, Rattlesden, Suffolk**  
**Client: Mr. Moody & Dr. Dormer**

**Photo No.5: Bunded fuel tank noted on western face of the outbuildings located SE of the hall itself**

**Photo No.6: Facing west in the small yard are located between outbuilding and shed showing building stone storage**





**Site Walkover Photos**

**Address: Clopton Hall, Rattlesden, Suffolk**  
**Client: Mr. Moody & Dr. Dormer**

**Photo No.7: Facing north showing example shot of flooring within the outbuilding and adj. brewhouse.**

**Photo No.8: Facing west from just south of the outbuilding (right) showing access to rear garden area of the Hall**





Site Walkover Photos

Photo No.9: Facing west from outside the eastern face of the hall and north of the outbuildings showing rear of buildings



Address: Clopton Hall, Rattlesden, Suffolk

Client: Mr. Moody & Dr. Dormer

Photo No.10: Facing south from outside the NE corner of Clopton hall showing the rear of the outbuildings area



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**APPENDIX E****WATCHING BRIEF**

It remains possible that previously unexpected soil conditions may be encountered during the construction process. Examples may include oily pockets within the soil, potential for asbestos containing materials, black ashy materials, soils exhibiting strong odours, brightly coloured materials, and former demolition materials.

Should previously undiscovered contamination be encountered during the demolition/construction of the new buildings the following course of action should be adhered to:

1. The ground workers should report any suspected contamination immediately to the Client's site supervisor. The supervisor should contact the Client or their appointed agent who will in turn contact Castledine Environmental to request an engineer to visit the site to assess the extent of the 'contamination'.
2. Castledine Environmental shall make records of their inspection, and pass details of these to the Local Authority.
3. Where the conditions revealed differ from those previously anticipated, the Castledine Environmental shall take samples as deemed appropriate to be dispatched for appropriate chemical testing.
4. Depending on the results of the testing either:
  - a. no further work will be required;
  - b. a further detailed risk assessment will be required; and/or
  - c. Localised specific remedial measures will be necessary.  
Appraisal criteria will vary depending on the nature of the assessment.
5. The results of any such testing will be sent to the Local Authority Pollution Control Section, Local Authority development control section, and the appointed building inspector. If remediation is required, the LA/Building inspector will be informed of the date and time of the proposed works.

6. Remediation will be undertaken in accordance with a method statement submitted for approval. The works shall be supervised where necessary by Castledine Environmental who shall provide a Verification Report for the Local Authorities.
7. A copy of the discovery strategy should be lodged on site and provisions made to ensure that all workers are made aware of their responsibility to observe, report and act on any potentially suspicious or contaminated materials they may encounter.

APPENDIX F

DISCOVERY STRATEGY

