

Report for:


**Pegasus Group**

**Residential Development on Land at  
Newgate Lane (North), Fareham**

*Phase I Contaminated Land Assessment*

**Status: FINAL**

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## 1. INTRODUCTION

ACCON UK Limited (ACCON) has been commissioned by Pegasus Group to carry out a Phase One Contaminated Land Assessment for a proposed residential development on Land at Newgate Lane (North), Fareham. The site is located in the administrative area of Fareham Borough Council (FBC).

The proposed development site would be residential and contain up to 75 dwellings. A site location and site layout plan have been reproduced in **Appendix 1**.

The report includes:

- A full desk top survey of relevant historic data;
- A preliminary Conceptual Model of the site identifying all potential and actual contaminants, receptors and pathways (pollution linkages);
- A risk assessment of the actual and potential pollution linkages identified; and
- Recommendations for further works, where necessary.

The purpose of the Phase One Contaminated Land Assessment is to develop an outline Conceptual Model and identify any potential pollutant linkages for the site and its surroundings, providing an assessment of the overall environmental condition of the site and its potential to impact on the surrounding area. The linkages and data gaps identified will be used to design any recommended further assessment and intrusive investigations, where necessary.

### 1.1. Scope of the Phase 1 Land Quality Risk Assessment

The scope of work involved:

- Conducting a site reconnaissance to ascertain how the site is currently used, as well as current site conditions;
- Reviewing plans, aerial photographs and planning records;
- Reviewing Groundsure data for site conditions, including historical maps;
- Liaising with the Local Authority;
- Collating information about the site's setting and conditions, to form a Conceptual Model and a preliminary environmental risk assessment; and
- Making recommendations regarding Phase II intrusive investigations, where necessary.

## 2. INFORMATION SOURCES

One of the objectives of the Phase I Contaminated Land Assessment is to:

- Collate information concerning potential contaminants, pathways and receptors; and
- Identify other relevant characteristics of the site and its surroundings.

This involves a study of the site's current and historical land use. In this case, we have carried out a desk study, data gathering exercise and site walkover.

### 2.1. Desk Study

In addition to conducting a site walkover, information used to characterise the site and its surroundings were obtained from the following sources:

- Planning records held by FBC;
- A current Groundsure EnviroInsight report on site conditions with historical Ordnance Survey mapping (Note that the Groundsure report was for both this development site and included a development site to the south);
- Health Protection Agency Indicative Radon Atlas for England and Wales;
- BRE 211: Radon: Protective Measures for New Buildings;
- Google Earth;
- British Geological Survey website; and
- Environment Agency data.

### **3. SITE CONDITIONS**

#### **3.1. External Site Reconnaissance Survey**

An external site reconnaissance survey was undertaken on Wednesday 11<sup>th</sup> April 2018. As access to the site was not permitted at the time, observations were been made from the red line boundary.

The site was divided into, most of which were separated by hedgerows or trees and/or wire, metal or wooden fencing. These broad areas are referred to below and are outlined in the site Location Plan in **Appendix 1.1**.

The River Alver cuts through the site from north to south near the western boundary of the site with smaller waterways leading off from it. The old Newgate Lane bounds the west of the site and the new Newgate Lane bounds the east of the site. There are isolated residential properties along east side of Newgate Lane.

Hambrook Lodge is located to the south of the site, although not within the red line boundary.

Access onto the proposed development site was not permitted at the time of the site reconnaissance survey so all observations had to be made from the boundary of the site.

The north and east parts of the site appear to be in agricultural use.

During the external reconnaissance survey there was evidence of water pooling on the site, however in the weeks leading up to the survey there was persistent heavy rain in the area.

The site is bounded by low level barbed wire fences. There are overhead cables running along the northern edge of the site in an approximate east-west direction and it was identified that the site is generally flat.

#### **3.2. Ecology**

The site is currently divided into several agricultural fields and areas for horse/pony grazing. Most of the boundaries separating the agricultural fields were denoted by shrubs/hedgerows and some large mature trees. It is therefore possible that these areas of the site could provide habitats for on-site fauna.

The Groundsure report indicates that there are no records of protected species or Environmentally Sensitive sites within 1km of the site.

#### **3.3. Geology**

Information regarding the geology of the site has been obtained from the British Geological Society (BGS) and the Groundsure report.

##### **3.3.1. Made Ground**

The Groundsure report indicates that the site is underlain by Made Ground; however, it is anticipated that the made ground only underlies areas that have been previously developed. In addition, the farmed land may not follow the geological sequence underlying the surrounding area due to ploughing.

### 3.3.2. Superficial Geology

The BGS data indicate that the majority of the site is underlain River Terrace Deposits (sand, silt and clay).

### 3.3.3. Bedrock Geology

According to BGS data, the underlying solid geology below the site comprises Wittering Formation (sand, silt and cane) Whitecliffe Sand Member (sand) and London Clay Formation (clay, silt and sand).

### 3.3.4. Ground Subsidence/Stability

Ground stability data for the site indicate that there is a moderate hazard potential for shrink-swell clay, very low for landslides, low hazard for collapsible deposits and running sand and negligible hazard for ground dissolution for soluble rocks and compressible deposits

The site is not located in an area where coal mining is known to have taken place.

### 3.3.5. Radon

The site is not located within an area where radon protection is required (BRE 211, 2007).

## 3.4. Hydrogeology and Licensed Abstractions / Discharges

### 3.4.1. Aquifer Characteristics

The Groundsure Report indicates that part of the site has a high leaching potential, which is defined as “soils which readily transmit liquid discharges because they are shallow or susceptible to rapid flow directly to rock, gravel or groundwater.” The remaining areas of the site are of an intermediate leaching potential, which are “soils which can possibly transmit a wide range of pollutants.” The site is also located within an area which has the potential to flood at the surface.

The aquifer characteristics are summarised in **Table 3.1**. It is assumed that the areas with the highest leaching potential and groundwater permeability are in the areas underlain by Secondary (A) aquifers.

**Table.3.1 - Aquifer Characteristics**

Strata	Geological Unit	Hydro-geological Classification	Description
Made Ground	No records of Made Ground on site	N/A	N/A
Superficial geology	River Terrace Deposits (sand, silt and clay)	Secondary (A) Aquifer	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.
Bedrock geology	Gault Formation	Secondary (A) Aquifer	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.



### 3.5. Hydrology and Licensed Surface Water Abstractions and Discharges

There are no surface water abstraction consents within 250m from the site. The Groundsure Report indicates that none of the site is located within Flood Zone 2 or 3. There are no flood defences within 250m of the site and it does not benefit from flood defences or storage.

The hydrological assessment is summarised in **Table 3.2**.

**Table 3.2 - Hydrological Assessment**

Surface Water Feature	Location	Comments
Rivers	River Alder (on site) – width of section of river approximately 2m.	No information on biological or chemical water quality available.
Unclassified Watercourse(s), Canals, Ponds, Lakes	Three additional (unnamed) rivers are identified on the proposed development site. The width of these rivers ranges from 1.5m to 2.1m  There are a number of other watercourses located in close proximity of the development site, which feed into the River Alder and the unnamed rivers.	-
Flooding (EA) Data	No part of the site is located within Flood Zones 2 and 3	-
Surface Water Flooding	Some signs of water pooling on site during the site walkover, however prior to the site visit there were significant periods of heavy rain.	-

#### 3.5.1. Surface/Ground Water Abstractions

There are no parts of the site which are located in a groundwater Source Protection Zone (SPZ) and none have been identified within 500m of the site.

There are no records of ground, surface or potable water extraction within 1km of the site.

## 4. CURRENT AND HISTORIC LAND USE

### 4.1. Site Location

The site occupies an area of land located between the old Newgate Lane and the new realigned Newgate Lane.

A map of the site can be seen in **Appendix 1**. The site is located within the administrative boundary of FBC.

### 4.2. Current Land Use

Much of the site currently comprises grazing/farmland and Hambrook Lodge lies on the southern boundary of the site but is not included in the red line boundary.

### 4.3. Historic Land Use

The following section provides an overview of the historical research conducted for the site. Information was obtained by reviewing historical map extracts provided within the Groundsure report. A summary of historical information is presented in **Table 4.1**.

**Table 4.1 - Historic Map Review**

Date	Site Description and potential contamination sources	Description of surrounding area and potential contamination sources
1856-1860	The site is generally undeveloped with "Peel Common" labelled in the south-west corner of the site. There is a pond near the western boundary of the site.	There are buildings located on the current site of Hambrook Lodge, which are labelled "Peel" Roads are present adjacent to the western and southern boundaries of the site. Stubbington Windmill is to the south-west of the site
1895-1898	No significant changes	There are some additional buildings around Stubbington Windmill. Hope Cottage located south of Woodcote Lane
1907-1910	No significant changes	The land to the north and north-west of Stubbington Windmill now includes kennels a brick works and a kiln. There are additional properties (most likely residential along Newgate Lane and Woodcote Lane
1927-1932	No significant changes	Residential properties and a post office are now located to the west of Newgate Lane, to the south of Woodcote Lane
1939-1942	No significant changes	Additional residential properties located to the west of Newgate Lane. The Barracks is located approximately 500m north of the site.
1957-1965	Drainage channels are now present on site	Large development of Woodcot is approximately 300m east of the site. Hope Cottage is now labelled Peel House. There are additional residential properties to the south of Woodcote Lane
1971-1975	There is an electrical substation located in the south-west corner of the site.	Woodcot has expanded to the south.

Date	Site Description and potential contamination sources	Description of surrounding area and potential contamination sources
1982-1990	The electrical substation is no longer present on the site. There is a building located to the north of Hambrook Lodge in the centre of the site.	The sewage treatment works is now located approximately 175m west of the proposed development site, which includes bunding around the sewage treatment works site.
1990-present	<b>No significant changes</b>	Although not yet present on the historic plans, a new bypass road has been constructed along the eastern boundary of the site.

#### 4.4. Landfill and Waste

The following information relating to landfill and waste has been obtained from the Groundsure report:

- There are no active landfill sites recorded on or within c. 250m of the site.
- There are no historic landfill sites recorded on or within c.250m of the site.
- There is bunding located around the boundary of the WwTW however this is likely to be inert and is very unlikely to pose any risk to the site.

#### 4.5. Statutory Requirements /Authorisations

**Table 4.2 - Statutory Requirements /Authorisations**

Type	Location	Comments
Local Authority Pollution Prevention and Controls	None located within 250m of the site	-
Local Authority Integrated Pollution Prevention and Control	None located within 250m of the site	-
Registered Radioactive Substances	None located within 250m of the site	-
Prosecutions Relating to Authorised Processes	None located within 250m of the site	-
Enforcement and Prohibition Notices	None located within 250m of the site	-
COMAH sites	None located within 250m of the site	-
Potentially Contaminative sites	One Located on site, five additional sites located within 250m	Tank identified on site 26m west – Unspecified Works or Factories 37m west - industrial engineers 63m west - Unspecified Works or Factories 66m west – second-hand vehicles 228m east – Electrical Substation
Petrol and Fuel sites	None located within 250m of the site	-

## 4.6. Pollution Incidents and Discharge Consents

**Table 4.3 - Pollution Incidents and Discharge Consents**

Type	Location	Comments
Discharge Consents	None located within 500m of the site	-
Water Industry Act Referrals	None located within 500m of the site	-
Environment Agency recorded pollution incidents	None located within 250m of the site	-

## 5. PRELIMINARY CONCEPTUAL MODEL

### 5.1. Land Quality Risk Assessment

The review of available data and historic maps has shown that the majority of the site has not experienced any development in the past and that there are limited sources of potential land contamination on the proposed development site. There is one building in the central area of the site, a very limited area of potential infill in the north-east of the site and a potential tank.

Based on this assessment there is unlikely to be any significant widespread contamination on the site, however there may be potential hot-spots of contamination, especially around the tank areas.

The purpose of this section is to develop an outline Conceptual Model which is relevant to the site and to identify any potential pollutant linkages – circumstances where receptors are exposed to contaminants via pathways and circumstances where there is a risk.

The information gathered in previous sections has been used to identify the likely contaminants, receptors and pathways present at the site. The elements of the Conceptual Model identified in the Tables that follow are used in **Section 6** which considers the Potential Pollutant Linkages, their significance and acceptability.

### 5.2. Contaminant(s)

The statutory guidance for Part IIA of the Environmental Protection Act 1990, DEFRA Circular 01/2006, defines a Contaminant as:

*“...a substance which is in, on or under the land and which has the potential to cause harm or to cause pollution of controlled waters”.*

The preliminary Conceptual Model considers the potential for pollutant linkages. That potential is based upon the likely presence of contaminants within soils underlying the site and the surrounding area. The sources of contamination which are reasonably likely to be present are identified in **Table 5.1** and potential contaminants in **Table 5.2**.

**Table 5.1 - Potential Sources of Contamination**

Area	Potential Source of Contamination	TPH	PAH	Metals	PCB	Asbestos	Ground gases	Other Contaminant(s)
Site	Potentially infilled pond on the north-west of the development site.						✓	
	Current agricultural land use across farm area							Insecticides and herbicides.
	Building located in the centre of the site to the north of Hambrook Lodge		✓	✓		✓		
	Records of a tank in the central area of the site	✓	✓	✓		✓		Depending on what the tank contains/contained there could be a range of potential contaminants.
Surrounding Area	Second hand car sales to the west of the site (opposite side of Newgate Lane)	✓		✓				-
	Historic works and factories	✓				✓		Most of these sites have since been rebuilt on and are unlikely to have any significant sources of contamination which could impact the site
	Made ground/bunding associated with the construction of the WwTW (approx. 175m to the west of the site)	✓	✓	✓		✓	✓	The construction of these bunds are relatively recent (late 1980s-early 1990s) and are likely to be constructed of inert materials due to their proximity to existing residential properties
	New bypass road	✓	✓					Due to the modern construction of this road which opened fully in 2018 there are unlikely to be significant levels of contamination

**Table 5.2 - Potential Contaminants**

Contaminant Phase	Elements and Compounds	Notes
<b>Sorbed phase – contaminants sorbed onto soil particles</b>	Metals, PCBs, asbestos, polyaromatic hydrocarbons (PAH), TPH and pesticides (insecticides and herbicides)	Given the nature of the historic use of the site and the lack of significant development, there is not likely to be significant widespread contamination on the site. There is the potential for hot spots of contamination around the barn and dilapidated buildings to the north of Hambrook Lodge and the recorded tank on site. These could be a source of PAH, asbestos fibres and metals, whilst the tank could also be a source of TPH. As the majority of the site has been in agricultural use there is the potential for pesticides to be present.
<b>Free phase – contaminants present in soil and /or porosity as non-aqueous phase liquid (NAPL)</b>	Metals, PCBs, TPH	Metals and PCBs could collectively be derived from sources such as the barn building in the central part of the site.
<b>Dissolved phase – contaminants dissolved in groundwater</b>	Metals, TPH	Metals and TPHs could be derived from the second hand vehicle site located to the west of the site.  Depending on the extent of potential contamination from the tank on site, metals and TPHs could also impact on the ponds and drainage channels on site.
<b>Gaseous phase- present as ground gases</b>	Carbon dioxide, methane	Ground gases can migrate to the surface from the saturated and unsaturated zones of the underlying soil. Ground gases could be derived from sources such as the potentially infilled historic on-site and off-site ponds and river/drain and tanks.

### 5.3. Receptors

The statutory guidance for Part IIA of the Environmental Protection Act 1990, DEFRA Circular 01/2006, defines a Receptor as:

*“either (a) a living organism, a group of organisms, an ecological system or a piece of property which (i) is in a category listed in Table A as a type of receptor, and (ii) is being, or could be, harmed, by a contaminant; or (b) controlled waters which are being, or could be, polluted by a contaminant”.*

**Table 5.3** lists all of the receptors that should be considered in a contaminated land assessment. A tick (✓) has been used where we consider that the receptors are likely to be

present. Those that are considered unlikely to be present are excluded from further assessment and have been marked with a cross (✘).

**Table 5.3 - Potential Receptors**

Receptor Type	Receptors	Present (✓ / ✘)	Notes
<b>Humans</b>	Human beings	✓	The humans considered to be present are the construction workers and future site users, who could be affected.  Construction workers and ground workers who may be involved in the construction works and maintenance of underground utilities are not considered, as ground related risks during their temporary activities should be governed by the Health & Safety at Work Act. They are therefore <b>unlikely</b> to be affected.
<b>Eco-systems</b>	Any designated ecological system, or living organism forming part of such a system	✓	The Groundsure report identifies that there are no Environmentally Sensitive sites within 250m of the site. However there is likely to be some areas of vegetation as part of the proposed development in terms of amenity spaces, etc.
<b>Property (Flora and Fauna)</b>	Crops, including timber	✘	Following redevelopment, residences may grow fruits and vegetables in their own gardens. There may also be domestic animals kept at the site.
	Produce grown domestically, or on allotments for consumption	✓	
	Livestock	✘	
	Other owned or domesticated animals	✓	
	Wild animals which are the subject of shooting or fishing rights	✘	
<b>Property (Buildings)</b>	A 'building' means any structure or erection, and any part of a building including any part below ground level but does not include plant or machinery comprised in a building.	✓	New buildings are to be constructed.
<b>Controlled Waters</b>	Inland freshwaters: Rivers	✓	There are currently rivers and drainage channels identified as present on the site, which may remain (in part at least) on the site with the proposed development in place.
	Territorial waters	✘	None located within close proximity to site.
	Coastal waters	✘	None located within close proximity to site.



Receptor Type	Receptors	Present (✓ /✗)	Notes
Controlled Waters	Inland freshwaters: Lakes /ponds	✓	There are currently a number of drainage channels, ponds and a river identified on the development site
	Groundwater	✓	The majority of the site located over a Secondary (A) Aquifer within the superficial geology and could be affected.

#### 5.4. Pathways

The statutory guidance for Part IIA of the Environmental Protection Act 1990, DEFRA Circular 01/2006, defines a Pathway as:

*“...one or more routes or means by, or through, which a receptor: (a) is being exposed to, or affected by, a contaminant; or (b) could be exposed or affected”.*

Following an assessment of the environmental and geological setting of the site and considering the proposed land use, it is considered that a number of potential pathways for contaminant impact could exist. **Tables 5.4** and **5.5** examine the human and environmental receptor exposure pathways separately and indicate which pathways are considered further.

**Table 5.4 - Potential Human Receptor Exposure Pathways**

Exposure Pathway	Critical Medium	Potential Presence (✓ /✗)	Notes
Ingestion of soil	Soil	✓	The ingestion, dermal contact and inhalation pathways are considered to be present through the public and private amenity spaces provided on the Development site.
Ingestion of contaminated vegetables	Vegetables	✓	
Ingestion of soil attached to vegetables	Soil	✓	
Dermal contact with soil	Soil	✓	
Inhalation of fugitive soil dust/ asbestos fibres	Soil	✓	

**Table 5.5 - Potential Environmental Receptor Exposure Pathways**

Pathways	Potential Presence	Notes
<b>Ecological</b>	Ingestion of soil / dust	Pathway may exist through any planting of trees and shrubs in the amenity spaces on the site.
	Ingestion of food/water	
	Dermal Exposure	
	Inhalation of vapour/dust	
<b>Property: Flora and Fauna</b>	Root Uptake	-
	Leaf Contact	
	Ingestion of soil	
	Ingestion of food	

Pathways		Potential Presence	Notes
	Ingestion of water	✓	
	Dermal Exposure	✓	
<b>Property: Buildings</b>	Contact with building materials	✓	Future development of the site could be affected by aggressive contaminants that could penetrate or corrode services. Water supply pipes can be susceptible to penetration by hydrocarbons which may then affect the quality of the water supply. Although this is unlikely based on the site history.
	Build-up of gases / vapours	✓	There is a small potential for gases/ vapours to be present below/ in close proximity to the site due to some small areas of infilled land on and adjacent to the site.
<b>Controlled Waters: Surface Waters</b>	Surface runoff	✓	There will be a significant reduction in permeable surfaces once Development is complete.
	Movement of contaminants via drains etc.	✓	It is unlikely that any contaminants originating from the site would be able to penetrate pipes in concentrations that would significantly affect off-site controlled waters. Contaminants may migrate along service lines followed by drains towards surface waters.
	Migration via groundwater	✓	There is a Secondary (A) Aquifer in the superficial geology below parts of the site. Migration via groundwater could occur at site.
<b>Controlled Waters: Groundwater</b>	Leaching from soil	✓	Part of the site is located over a Secondary (A) Aquifer in the superficial geology.
	Movement of contaminants via drains etc.	✓	

## 6. PRELIMINARY RISK ASSESSMENT

### 6.1. Potential Pollutant Linkages, their Significance and Recommendations

**Section 5** described the elements present within the Conceptual Model for the site. Those potential contaminants, pathways and receptors that are present are now integrated within the context of potential pollutant linkages. The linkages discussed below are considered to be plausible.

The text seeks to examine the significance of the potential pollutant linkages and describes the linkages using the phrases below:

- **Pollutant linkage is significant:** meaning that humans or the environment are or will be at an unacceptable risk and that remedial works may be required;
- **Further data required to be obtained via detailed inspection:** meaning that additional information is needed; and
- **Pollutant linkage unlikely to be significant:** meaning that no further action is required.

The text also includes comments regarding any uncertainty and recommendations regarding further risk assessment. The recommendations also provide an outline scope for further visual inspection, sampling and intrusive investigations where necessary.

### 6.2. Harm to Human Health

The risks to humans living on or visiting the site are driven by the potential presence of contamination caused by historic and current activities.

The first set of pollutant linkages examines the potential for people to be exposed to contaminated soil by ingesting, inhaling or touching the soil, where the intake of contaminants could be harmful to health. A number of potentially contaminative activities have previously occurred on and in close proximity to the site.

With respect to human health, pollutant linkages on the site could be present, therefore, our conclusion at this point is that **further data should be obtained for the site** - meaning that intrusive investigation should be undertaken as there will be public and private amenity space and buildings included in the Development site which could provide pollutant pathways. **Table 7.1** identifies the particular sources of contamination that are likely to affect human health.

### 6.3. Harm to Ecosystems

There is currently no information with respect to any ecological survey undertaken on the proposed development site and therefore, it is concluded that **further data should be obtained for the site** - meaning that intrusive investigation should be undertaken in areas where ecologically sensitive receptors are identified. The Groundsure report indicates that there are no Environmentally Sensitive sites within 250m of the site, the risk to ecological receptors across the remainder of the site is likely to be low. **Table 7.1** identifies the particular sources of contamination that are likely to affect ecological receptors.

## 6.4. Harm to Property

In the context of this assessment, property includes domestic animals and produce (home grown vegetables). With respect to these receptors, pollutant linkages on the proposed site could be present however this is unlikely to be widespread across the site.

It is concluded that further data should be obtained on the site, in the areas which have been identified as potential hot spots for contamination (i.e. around the recorded tank and the building in the central area of the site) especially if these hotspots will correspond with proposed amenity areas within the proposed development, which could provide the pollutant pathways. **Table 7.1** identifies the particular sources of contamination that are likely to affect domestic animals and domestic produce.

## 6.5. Damage to Buildings/Structures

Any risks to proposed buildings or structures derive from the potential for solid contaminants to cause deterioration of the proposed structure's foundations or underground infrastructure.

The likelihood of aggressive contaminants that could penetrate or corrode services on the site is low. It is also possible that water supply pipes could be susceptible to hydrocarbon penetration, which could then affect water supply quality, and therefore testing should be undertaken in the areas which may be contaminated as identified in **Table 7.1**

## 6.6. Pollution of Controlled Waters

The risks to controlled waters (River and drainage channels on site and Secondary (A) aquifer underlying the site) are likely to be driven by the leaching/ entrapment of potential contaminants in waters carried in surface runoff and groundwater flow. With respect to controlled waters, pollutant linkages could be present, therefore, our conclusion at this point is that further data should be obtained for the site – meaning that intrusive investigation should be undertaken in the potential hotspot areas identified in **Table 7.1**.

## 7. IDENTIFICATION OF SIGNIFICANT ENVIRONMENTAL ISSUES

As there has not been any intrusive investigation of the site, our preliminary Conceptual Model has examined the *potential* for pollutant linkages. That potential is based upon the likely presence of contaminants and biodegradable materials within the soil. The most significant likely sources of contamination are identified in **Table 7.1**. It should be noted that ACCON have considered sources of potential contamination that are up to 250m from the site could pose a risk to on-site receptors. Potentially contaminative sources identified on the site could also pose risks to on-site and off-site receptors.

**Table 7.1 - Significant Environmental Issues**

Area	Potential Source of Contamination	Overall Risk Rating	
On site	Alluvium superficial deposits underlying site and a potential small area of infill in the north-west corner of the site	Medium	Potential source of carbon dioxide and methane to which future receptors could be exposed. Would affect future site users, and potentially domestic animals and ecological receptors.
	Current use of most of the site for agricultural purposes	Medium	Potential source of insecticides and herbicides in all areas currently used for arable farming. Would affect future site users, the Secondary (A) aquifer on site, on-site surface water features, and potentially ecological receptors, in these areas.
	Tank identified on site to the north of Hambrook Lodge	High	Potential source of TPH and metals which could affect future site users, and potentially buildings, domestic animals, produce and ecological receptors.
	Barn and dilapidated building on site to the north of Hambrook Lodge		Possible source of TPH, PAH, asbestos and metals due to unknown use of the building (could have been used to store agricultural vehicles). Could affect future site users and potentially domestic animals, ecological receptors and produce. The TPH, PAH and metals may affect the secondary (A) aquifer and the on-site surface water features and the TPH could also affect buildings.
Surrounding area <250m	Second hand vehicle sales (west of the site opposite side of Newgate Lane)	Medium	Potential source of TPH and metals which could affect future site users, and potentially buildings, domestic animals, produce and ecological receptors, within 250m of the source.
	Made ground associated with the construction of	Low	Due to the construction being relatively recent (late 1980s) and the proximity of

Area	Potential Source of Contamination	Overall Risk Rating	
	the bunds which surround the WwTW to the west of the site		existing residential receptors the materials utilised in the bunding is unlikely to be a source of contamination.
	Historic brick works/factories to the south-west of the proposed development site	Low	There are residential properties now located on the historic site and as a result, contamination is unlikely to be a significant issue.

## 8. CONCLUSIONS AND RECOMMENDATIONS

The purpose of a Phase I Contaminated Land Assessment is to develop an outline Conceptual Model and identify any potential pollutant linkages for the site and its surroundings, providing an assessment of the overall environmental condition of the site and its potential to impact the surrounding environment. If the Phase 1 report identifies that there is a risk of contaminants being present on the site and that these potential contaminants may pose a risk to sensitive receptors, or if there are any significant data gaps, a more intrusive Phase 2 survey would be required. A Phase 2 survey generally takes the form of an intrusive survey that involves taking samples of the ground and any controlled waters for further detailed analysis.

For this site, the Phase 1 study has identified that there are a very small number of potential sources of contamination on the site and in close proximity to it, due to the current and historical land uses. As a result this assessment has identified that there is a possibility that some contamination may remain on site, which could pose a risk to human health, controlled waters and future domestic animals, home grown produce, ecological receptors and buildings.

ACCON recommends that a limited Phase 2 Investigation should be undertaken to ascertain the potential risks from the contaminants identified within this assessment. Due to the small scale and isolated nature of the potential contaminants on the site, it is likely that only localised invasive investigation will be required.

The information reported herein is based on the interpretation of data collected during the desk study investigations. The scope of this evaluation has excluded intrusive investigation of the site.

This report has been prepared with all reasonable skill, care and diligence, and taking account of the manpower and resources devoted to it by agreement with the client.

The evaluation and conclusions do not preclude the existence of contamination, which could not reasonably have been revealed by the comprehensive desk studies. Hence, this report should be used for information purposes only and should not be construed as a comprehensive characterisation of all site conditions, something which can only be done via extensive physical site investigations. It has been concluded that further site investigation is recommended as potential land contamination at this site may constrain the future development of the site.

## APPENDIX 1

### Site Location Plan and Indicative Site Layout



### Appendix 1.1: Site Location Plan





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