Castledine & Co
Environmental consultants

4 Wymeswold Road, Hoton
Loughborough
Leicestershire LE12 5SN

Proposed Residential Development

Garlands Lane Farm,
Garlands Lane,
Barlestone,
NUNEATON,
Warwickshire, CV13 0JD

Phase 1 Environmental Investigation

Tel: 01509 880399 Mob: 07779 305682 Email: admin@castledine.co

CONTENTS

		Page No.
	QUALITY ASSURANCE	2.
1.	INTRODUCTION	3.
2.	SCOPE	3.
3.	PROJECT UNDERSTANDING	3.
4.	LIMITATIONS	3.
5.	SITE DESCRIPTION	4
6.	REGULATORY AUTHORITY AND ENVIRONMENTAL DATA	4.
7.	POTENTIAL CONTAMINATION	6.
8.	POLLUTANT LINKAGE ASSESSMENT	6.
9.	CONCEPTUAL SITE MODEL	7.
10.	ENVIRONMENTAL RISK ASSESSMENT	10.
11.	FURTHER ENVIRONMENTAL INVESTIGATION	10.
12.	LIKELY REMEDIAL ACTIONS	10.
13.	RECOMMENDATIONS	10.

APPENDICES

APPENDIX 1	LANDMARK ENVIRONMENTAL REPORT
APPENDIX 2	PHOTOGRAPHS

Status: Final Report

Reference: GFB

Date: 11/08/11

QUALITY ASSURANCE.

Castledine and Co. confirm that all reasonable efforts have been made to ensure that information contained within this report is accurate. Castledine and Co. would further confirm that due care; attention and technical skill were used in the creation of this report.

Signed for and on behalf of Castledine and Co.

Kevin Castledine

1. INTRODUCTION

Castledine and Co. has been appointed by the clients Messrs A & T Sanderson to undertake a Phase I Desk Study at Garland Lane Farm, Garland Lane, Barlestone. CV13 0JD. A site location plan is contained within Appendix 1.

2. SCOPE

Castledine and Co. has prepared this report for the sole use and reliance of Messrs A & T Sanderson and their appointees. This report may not be used or relied upon by any unauthorised third party, without the explicit written agreement of Castledine and Co.

The report has been prepared in compliance with conditional requirements Hinckley and Bosworth planning consent reference 11/00408/FUL.

The report has been completed to fulfil the requirements of a preliminary risk assessment in accordance with CLR11 "Model Procedures for the Management of Land Contamination". 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 the subject property; and
- To develop a preliminary conceptual site model (CSM).

3. PROJECT UNDERSTANDING.

It is understood that the proposal is to change the use of that of a farm yard and buildings to that of two houses, inclusive of private gardens.

No previous investigation reports have been viewed pertaining to the site as part of this assessment.

4. 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 & Co. 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 that time.

This survey has not included asbestos within existing structures, invasive plant species 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 on 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.

5. SITE DESCRIPTION.

Castledine & Co. conducted a walkover survey on 5th August 2011.

The site is on the B582 Garland Lane situated between the villages of Barlestone and Bagworth at grid reference 444290 306560 and is approximately 2926 m² in area.

The site is a former farm and the former farm buildings are to be converted to 2 dwellings. The site is adjoined on the south west boundary by the original farmhouse which remains in residential use. The Oaks Farm Park Visitors Centre is located to the north of the site on the opposite side of the B582. The remainder of the site is bounded by agricultural fields.

A stream is located approximately 50m from the southern site boundary.

The retained buildings are of brick/block construction and all have intact concrete floors. Several floors have been partially excavated to prove the foundations. Excavations reveal underlying clay which is devoid of any visual or olfactory signs of contamination.

Site coverage comprises concrete and mixed aggregate hardstanding. It is evident that these areas will require the importation of soil for aesthetic reasons and to support plant growth.

Agricultural chemicals were noted as being stored old freezers units within one of the buildings. An above ground diesel storage tank is present n the main yard. No evidence of actual or potential contamination was noted during the walkover survey.

The farm tenant has lived on the farm for some considerable time and is not aware of any previous contamination incidents at or in the vicinity of the site.

Site photographs are presented within Appendix 2.

No evidence of contamination was noted during the walk over survey.

6. REGULATORY AUTHORITY AND OTHER ENVIRONMENTAL DATA

A Landmark Sitecheck Report 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 of the Report is presented in Appendix 1. Additional geological information has been obtained from the 1:50,000 geological map of the area

6.1 Contaminated Land.

There are no records of any contaminated land or local authority recorded landfill sites on, or within 250m of the site.

6.2 Hydrological

The site is located on a Non Aquifer.

There is one record of a discharge consents within 250m of the site. This relates to sewerage discharge from the adjacent Oak Farm, Garland Lane.

6.3 Permitted Processes.

No permitted processes are recorded in within 250m of the site.

6.4 Waste

No waste management facilities are recorded in within 250m of the site.

6.5 Hazardous Substances.

There are no hazardous substance notifications within 250m of the site.

6.6 Soils and Geology

The site is underlain by Mercia Mudstone of the Triassic Age. This formation generally comprises red clays with bands of sandstone and gypsum. This bedrock layer is shown to be overlain in the site area by Glaciofluvial, Sand and Gravel deposits and Diamiction (poorly sorted) Glacial Till. The site is underlain by Mudstones of the Mercia Mudstone Formation and superficial deposits of Mid Pleistocene Till.

The property is not located in a radon affected area, as less than 1% of homes are above the National Radiological Protection Board (NRPB) action level for radon of 200Bq m-3.

6.7 Industrial Land Use

A full listing of recorded historic and current industrial activities with the potential to influence the environmental status of the site is described in the Sitecheck Report. A summary is presented in Table 1 below:

TABLE 1. POTENTIALLY SIGNIFICANT CONTAMINATION SOURCES

Feature	No. within 250m of site Boundary	Closest to site	Comments
Potentially infilled land.	2	Undisclosed pond, marsh etc. Last recorded in 1955. Distance from site approximately 100m. Bearing S.	Is unlikely to affect the site environment.

7. POTENTIAL CONTAMINATION

The following potentially significant contamination has been identified.

Onsite

- A range of contaminants from historical and current agricultural activities including chemical use and storage, fuel use and storage and vehicle/equipment maintenance. The potential contaminants may include, but are not necessarily limited to, metals, TPHs, PAHs and, VOCs.

Offsite

- Given the distances of any potential sources and the limited potential for lateral migration of any hazardous substances present, it is considered reasonable to discount the significance of any offsite contamination.

8. LINKAGE ASSESSMENT

8.1 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;

8.2 Receptors

Receptors are defined as people, living organisms, ecological systems, controlled waters, atmosphere, structures and utilities that could be adversely affected by contaminant(s). The following receptors are considered relevant to this investigation:

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.

Ecological Receptors

- Flora of the proposed development

9. PRELIMINARY CONCEPTUAL SITE MODEL

The preliminary 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 source-pathway-receptor (Hazard) model set within the context of the ground conditions and existing/proposed site uses.

The preliminary CSM is presented in **Table 2** below.

Table 2 SUMMARY OF SIGNIFICANT POLLUTION LINKAGES

Source	Pathway	Receptor	Consequence	Probability	Risk
On site: Metals, PAH and Organic(VOC/fuel/oil) contamination in near surface deposits from existing and historic on-site sources.	Inhalation. Ingestion. Direct contact	Existing users. Construction workers, maintenance workers	Md	Ul	L
		Future residential users	Md	Li	M
On site: Metals, PAH and Organic(VOC/fuel/oil) contamination in near surface deposits from existing and historic on-site sources.	Lateral migration offsite	Nearby controlled water. (nearby stream)	Md	Ul	L

KEY: H = High, M = Moderate, M/L = Moderate/Low, L = Low, VL = Very Low
Sv = Severe, Md = Medium, Mi = Mild, Mr = Minor Hi = High, Li = Likely, Lw = Low Likelihood, Ul = Unlikely

This preliminary CSM matrix provides the basis for decision making. It should be used with caution, recognising the over-simplification that it will normally represent. Each plausible linkage has been evaluated qualitatively against individual hazard assessments to determine the likelihood and consequence of a given hazard occurring. The final column Risk evaluations for each plausible pollutant linkage have been determined in accordance with the Risk Matrix provided in **Table 3.**

A description of each Risk output is provided in **Table 4**.

Table 3. RISK 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 (Ul)	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

Based on current onsite and surrounding activities, the pollution linkage assessment combined with the historical and topographical knowledge of the site has indicated that it represents a **Moderate Risk** to human health set in the context of the proposed development.

Table 4 CLASSIFICATION OF RISK

Very high risk (Vh)	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.
High risk (Hi)	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.
Moderate risk (Md)	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.
Low risk (Lw)	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.
Very low risk (Vl)	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

10. PRELIMINARY ENVIRONMENTAL RISK ASSESSMENT

Based on the information contained in this report, it is the opinion of Castledine & Co. that the site represents a **Moderate** Human Health Risk with respect to the proposed residential development. The identified risk drivers being onsite Metals, PAH and Organic (VOC/Fuel oil) contamination.

Under the assessment requirements outlined in Part IIA Environmental Protection Act 1990; it is considered that within its current use, the site is unlikely to be classified as being 'contaminated land'.

Other risks are provisionally assessed to be low to negligible at this stage. The risks would have to be reassessed at the appropriate redevelopment stage. The risks are based on the hazards presented by potential land contamination only. For example, the risks to surface waters do not reflect the potential for chemical spills to reach the surface water drains while the risks to site users do not consider direct exposure to such chemicals

11. FURTHER ENVIRONMENTAL INVESTIGATION

Considering the established risks associated with the proposed residential use, an intrusive environmental investigation of the site is recommended. This would most likely be a requirement of the Local Planning Authority.

The suggested investigation should include near surface soil testing and the excavation of up to four trial pits and/or boreholes. Particular attention should be paid to potential onsite Metals, PAH and hydrocarbon/fuel oil contamination. Trial pits/boreholes should be logged and sampled by a suitably qualified environmental practitioner. Chemical analysis of selected soil samples should be conducted for Metals, speciated PAH and banded Hydrocarbons.

12. LIKELY REMEDIAL ACTIONS

It is likely that imported, clean topsoil for the gardens and soft landscaped areas will be necessary for aesthetic purposes and to support plant growth. This provision would double as a cover system for any post clearance, residual contamination. In this case, verification of the depth and quality of this cover will be a likely requirement of the Local Planning Authority.

The presence beneath buildings of any post clearance volatile hydrocarbon contamination may necessitate the provision within floor slab, of a proprietary vapour impermeable membrane, suitably sealed at wall cavities and service entry points and passive sub-floor ventilation.

13. RECOMMENDATIONS

It is recommended that this report be submitted for the approval of Hinckley and Bosworth Borough Council in partial compliance with land contamination requirements of Planning Consent 11/00408/FUL.

APPENDIX 1 SITECHECK REPORT

APPENDIX 2 PHOTOGRAPHS