A PHASE I DESK STUDY TO ADDRESS PART I OF CONDITON 8 OF PLANNING PERMISSION, REFERENCED H12-0518-16, FOR A PROPOSED RESIDENTIAL DEVELOPMENT AT:

LAND AT 69 MARRIOTTS GATE, LUTTON, PE12 9HW



CLIENT: **Mr Simon Barker**

REFERENCE: **DJM/16.301/PhaseI**

DATE: **5 September2016**

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1. INTRODUCTION

A F Howland Associates Limited was instructed by Mr Simon Barker to carry out a Phase I Desk Study at Land at 69 Marriotts Gate, Lutton, PE12 9HW (Fig. 16.301/PhaseI/1). This was required to address Condition 8 Part i of Planning Permission (Referenced H12-0518-16) for the proposed construction of two 3 bedroom residential dwellings with associated parking and soft garden areas.

This report was prepared for the use of the Client and his advisors. Other parties using the contained information do so at their own risk and any duty of care to those parties is specifically excluded. The report has been carried out in general accordance with accepted best practice and methodologies (BSI, 2013) (DEFRA and EA, 2004) (DCLG, 2013).

2. SITE LOCATION

The site is located at 69 Marriotts Gate and was accessed directly off School Lane, just to the west of the junction with Marriotts Gate, in the village of Lutton at an elevation of approximately 5 mOD. The site comprised a rough rectangular shaped plot (defined in Fig. 16.301/PhaseI/2) and was unoccupied, though a concrete base of a former residential garage remained central on site.

3. GEOLOGY, HYDROGEOLOGY, AND HYDROLOGY

3.1 GEOLOGY

The regional geology is mapped for the area by the British Geological Survey[1] to show bedrock geology of the Ampthill Clay Formation (Mudstone). Superficial deposits of Tidal Flat Deposits (silt and clay) are mapped overlying the bedrock geology.

The site is not within an area where there are deemed to be mineral resources (Harrison *et* al., 2002).

Consideration should be given to the potential effects of radon gas which can be produced from certain soils and rocks. Building Research Establishment report BR211 (BRE, 2015) indicates that the site is in an area that requires no specific protection from this potential source of contamination.

[1] http://mapapps.bgs.ac.uk/geologyofbritain/home.html – Accessed 2 September 2016

3.2 HYDROGEOLOGY

The bedrock geology and superficial deposits are designated as Unproductive Strata. The site is not within a Groundwater Source Protection Zone, Drinking Water Safeguard Zone or a Groundwater Vulnerability Zone. There are no groundwater or surface water abstraction licences within 1 km of the site. Therefore there is not considered to be any significant groundwater underlying the site, although there could be perched water within the superficial deposits and atop the bedrock.

3.3 HYDROLOGY

There nearest surface water feature is a drainage ditch along the western boundary of the site. Given the low lying nature there are prevalent drainage ditches within the surrounding area. The nearest surface water course, Lutton Leam, is approximately 700 m south east of the site.

4. POLLUTION INCIDENTS, LANDFILL AND OTHER WASTE SITES

There are no pollution incidents, historic or current landfills within 1 km of the site.

5. REVIEW OF HISTORICAL ARCHIVES

A review of publically available historical information has been undertaken, including OS mapping and aerial imagery. A summary of the pertinent details is presented in Table 1 below.

Source	Date	Detail
OS Mapping	**1888 1:2,500** **1889 1:10, 560**	The site is in two parts; the northern section is a portion of a garden for the property on the corner of the present-day Marriotts Gate and Roper's Gate/Low Gate junction, whilst the southern half of the site is an unoccupied plot of land on the corner of the present-day School Lane and Marriotts Gate. As indicated the present-day road layout surrounding the site is already established. The site is centrally located in the village of Lutton. There is a pump surveyed 10 m north east of the site and the Crispin Inn surveyed a further 20 m north east of the site. A school is surveyed immediately to the west. South of the site between School Lane and Marriott's Gate are residential houses. A pond is surveyed approximately 50 m north of the site. Other features in Lutton include a smithy, St Nicholas's Church, Lutton House and the Black Horse Public House between 100 m and 150 m north east of the site. Marrowbone Hall is surveyed 140 m west of the site. The village of Lutton is surrounded by agricultural land, which given the low elevation has prevalent field drains.
OS Mapping	**1904 1:2,500** **1905 – 1906 1:10,560**	There appears to be no significant changes to the site. The pump and smithy are no longer surveyed. There is a small structure surveyed in the grounds of the school immediately to the west of the site. The cemetery associated with St Nicholas's church has been extended to the west so at its closest extent is now 80 m north of the site. There are no other significant changes noted to the surrounding area.
OS Mapping	**1931 1:2,500 & 1:10,560**	There appears to be no significant changes to the site. A building approximately 70 m south east along School Lane is surveyed as Coronation Hall. Marrowbone Hall is now surveyed as Kingston Hall. There are no other significant changes noted in the surrounding area.
OS Mapping	**1938 – 1952 1:10,560**	There appears to be no significant changes to the site or surrounding area.
OS Mapping	**1956 – 1959 1:10,560**	There are no significant changes to the site. Coronation Hall is no longer surveyed. There appear to be no other significant changes to the surrounding area.

Source	Date	Detail
OS Mapping	**1974 1:2,500**	The site is no longer in two parts and forms the garden to the property on the corner of Marriotts Close, which is believed to be no.69. There are two structures now surveyed on the site which are considered to be related to the residential use of the site, either as garages and/or garden sheds. There is another structure surveyed in the garden area, considered off site, which has a glazed roof. There is a drain surveyed along the western boundary of the site. There is a drain south east of the site, running parallel to Marriotts Gate, which is considered likely to connect via a culvert beneath Marriotts Gate/School Lane to the drain west of the site. The school immediately to the west of the site is surveyed in two parts, as the Old School House and as a village hall. There has been development to the south of the site along Marriotts Gate which is considered to predominately be residential, but also includes a series of nurseries surveyed approximately 180 m to the south. There is another small development approximately 180 m south east associated with Barholme Avenue which is likely to be residential in nature. A sewage works is surveyed 160 m south east of the site. The Crispin Inn is now surveyed as the The Jolly Crispin (Inn). There is an electricity substation surveyed approximately 155 m north east of the site. There are no other significant changes to the surrounding area noted.
OS Mapping	**1975 – 1978 & 1978 – 1991 1:10,000**	The resolution of these maps is poorer so indicates that there are no structures on the site. However this may not be the case, as garages/garden sheds are unlikely to be mapped at the scale of these maps. There are no other significant changes to the site or surrounding area noted.
Aerial Imagery	**1999 – 2007**	The images show the site is part of 69 Marriotts Gate and confirm the site is set within the centre of Lutton, which is generally considered to be residential in nature. In 1999 there are two structures in the western area set within a well maintained garden area. There are new residential developments, one along Roper's Gate immediately to the north of the site and the other 100 m south west of the site. In 2005 the image shows the site as previous but with bare soils. There is a residential development under construction approximately 120 m east of the site. In 2007 the images shows cars in front of a garage on the site. There are still indicated to be bare soils on site. The residential development east of the site has been extended westwards and is 50 m east from the site at its closest extent.

Table 1 – Summary of Historical Archive Information

6. WALKOVER SURVEY

A walkover survey was carried out on the 23 August 2016 to enable the identification of current land uses and other relevant details not otherwise identified from the archival information. The salient features are shown on Figure 16.301/PhaseI/2, appended.

The site was a small, roughly rectangular, plot of land with a concrete hardstanding pad in the southern western area of the site. This was surrounded by overgrown vegetation and discarded construction materials. Anecdotal evidence suggests there was a residential garage on the hardstanding prior to attending site which was dismantled to be used elsewhere. Further evidence suggests that until 7 years ago the site was a part of the neighbouring residential property (69 Marriotts Gate) but was then separated. The neighbouring property then rented the garage and plot to use for storing their car and kept the surrounding plot maintained until the planning process for redevelopment commenced.

Access was gained directly from School Lane, just off the junction with Marriotts Gate (defined in drawing 16.287/PhaseI/2). The site and surrounding area were generally level.

The concrete hardstanding occupied the south western area of the site. It was formerly the pad for a pre-fabricated brick/concrete panelled residential garage which had a potential cement board roof, which is considered a possible asbestos containing material. The garage was dismantled prior to attending site with rare fragments of cement board found surrounding the concrete hardstanding. There was also a dismantled timber shed lying to the side of the hardstanding as well as other discarded construction material, which included timber, metal and plastic. In the eastern area of the site there was another small pile of construction material which included concrete, timber and pieces of cement board panels which are considered potential asbestos containing material. The remainder of the site was surfaced with overgrown vegetation and largely inaccessible because of this.

The site had a drainage ditch along the western boundary which was dry. There were semi-mature trees and hedgerows demarcating the western and northern boundary also. The eastern boundary was delineated by timber fencing. The southern boundary was partly opening to School Lane and partly semi-mature hedging.

The site was predominately surrounded by residential dwellings, although Lutton Village Hall was immediately to the west of the site.

7. DISCUSSION OF ENVIRONMENTAL ISSUES

The current residential redevelopment proposals for the site include the construction of two dwellings with associated soft garden areas.

The site is underlain by bedrock comprising Ampthill Clay Formation (mudstone) with overlying superficial Tidal Flat deposits. All deposits are unproductive. The site is not within a Groundwater Source Protection Zone, Drinking Water Safeguard Zone or Groundwater Vulnerability Zone. There is a drainage ditch, although dry, along the western boundary of the site. There are no other significant surface water features, other than drainage ditches associated with the low lying nature of the area, within 500 m of the site. There are no water abstraction licences within 1 km of the site. There is not considered to be any significant groundwater underlying the site.

The site is within an area that requires no specific radon protection. The site is not within an area where mineral resources are present.

There are no active or historic landfills or pollution incidents with 1 km of the site. There are no other potential areas of infilled ground identified on or off site. Therefore there does not appear to be any significant source of ground gas on or off site.

A review of historical and contemporary archives suggests the site was a garden and unoccupied plot of land, with structures first surveyed during the 1970's, which are considered to be a residential garage and garden shed. The site was a part of the neighbouring residential property until 7 years ago when the site was separated. However the site was continued to be used by the neighbouring property as a residential garage until the planning process started earlier this year regarding the redevelopment of the site. The garage was understood to have been dismantled prior to our attendance on site. The site has always been situated in the village of Lutton which has seen general expansion. The wider surrounding area is agricultural and low lying, with prevalent drainage ditches present.

The historical and current use of the site as a garden with a garage and shed are unlikely to have introduced significant contamination. Potential asbestos containing materials were found on the site surface which may have been introduced during the dismantling

of the garage, as well as associated with other discarded construction material on the site. This material is considered to be on the site surface only and was introduced recently; the material should be removed prior to the development of the site.

The wider residential land use surrounding the site is unlikely to have introduced any significant contamination that would adversely affect the site.

Human end-users and construction workers are considered to be at a low risk as significant contamination is unlikely providing potential asbestos containing material is removed prior to commencement of the redevelopment. Furthermore, construction worker exposure is short term and appropriate personal protection equipment, including gloves and proper hygiene practices, will reduce the risk further.

Given there is not considered to be significant groundwater underlying the site, the sensitivity of any present is negligible. Therefore, given that significant contamination is also unlikely, groundwater is considered to be at a very low risk.

Surface water is considered to be at a low to moderate sensitivity as a drainage ditch demarcates the western boundary. However significant leachable or mobile contamination is considered unlikely so surface water is considered to be at a low risk.

Plastic water supply pipes are considered to be at a low risk given the unlikely presence of significant contamination.

If during the construction phase of the development significant contamination is found then work should be stopped and the contamination assessed including quantification and a re-evaluation of the risks to receptors made.

8. PRELIMINARY CONCEPTUAL MODEL

Following a review of the archival information and the walkover survey a Preliminary Conceptual Model was devised to determine the risk to appropriate targets from the potential contaminating activities assessed for the site.

A Preliminary Conceptual Model (PCM) collates the evidence gained and establishes the potential linkages that may exist under the principle of “source-pathway-receptor”. This is presented in Table 2 below.

A risk category is determined for the potential linkages and an assessment made of risk and the significance of that risk from professional judgement. Where appropriate, further work is recommended to assess whether the potential linkages are realised.

Source of Contamination	Pathway	Receptor	Probability and Reasoning	Consequence and Reasoning	Risk Classification
Potentially contaminated soils (historical and current use)	Direct contact (inhalation/ ingestion)	Human end-users	**Unlikely** – Potential on site contamination is considered to be unlikely providing potential asbestos containing material is removed from the site surface	**Medium** – Potential exposure to unidentified contamination leading to chronic damage to human health	**Low risk**
		Construction workers	**Unlikely –** Potential on site contamination is considered to be unlikely providing asbestos containing material is removed from the site surface. Suitable personal protective equipment, including gloves and safety glasses, alongside the short term exposure further minimises the risks posed.		
	Percolation of leachate / mobile contaminants	Groundwater	**Unlikely** – Potential on site contamination is considered to be unlikely.	**Minor** – No significant groundwater is considered to be present and any would have negligible sensitivity	**Very Low Risk**
		Surface Water	**Unlikely** – Potential on site contamination is considered to be unlikely.	**Mild** - Surface water is considered to be of low to moderate sensitivity	**Low Risk**
	Direct Contact	Water supply pipes	**Unlikely** – Potential on site contamination is considered to be unlikely	**Medium-** Permeation of contaminants into water supply pipes	**Low Risk**
Hazardous ground gas (unidentified fill)	Gas migration through permeable strata, ingress and accumulation into structures	Human end-users	**Unlikely** - No significant on or off site sources are identified.	**Severe** - Acute risk to (human) end users and structures	**Low Risk**
		Structures			**Low Risk**
Radon Gas		Human end-users	**Unlikely** – Site outside of radon affected area	**Medium** - Chronic risk to human end users	**Low Risk**

Table 2 – Preliminary Conceptual Site Model

9. SUMMARY AND RECOMMENDATIONS

1. A Phase I investigation was undertaken to address Condition 8 Part i of Planning Permission, referenced H12-0518-16, to assess the contamination risk for a proposed residential redevelopment at a plot of land at 69 Marriotts Gate, Lutton, PE12 9HW.
2. The site has historically been a garden and unoccupied plot of land associated with 69 Marriotts Gate. In the 1970's a residential garage and shed were added. The site was split from the neighbouring property approximately 7 years ago but was continued to be used as a residential garden and garage. The site became unoccupied earlier this year, with the garage dismantled prior to our site attendance.
3. The immediate surrounding area has remained residential throughout the historical records.
4. Geological mapping indicates the site to be underlain by bedrock geology mapped as the Ampthill Clay Formation with overlying superficial Tidal Flat deposits. All deposits are considered unproductive.
5. The site is within an area that does not require any specific protection measures from radon.
6. The site is not within an area where there are mineral resources.
7. There is not considered to be significant groundwater beneath the site, though any perched groundwater is of a negligible sensitivity. The site is not within a Groundwater Source Protection Zone, Drinking Water Safeguard Zone or Groundwater Vulnerability Zone. There are no water abstraction licences within 1 km of the site.
8. The nearest surface water feature is a drainage ditch along the western boundary of the site, although this was dry during the site walkover. There are prevalent drainage ditches in the surrounding area due to the low lying nature of the area. Therefore surface water is considered to be of a low to moderate sensitivity.
9. The historical and recent use of the site is unlikely to have introduced significant soil contamination. However pieces of cement board, which are a potential asbestos containing material, were found on the site surface which is considered

to have been introduced recently, potentially during the dismantling of the former pre-fabricated garage. This material should be removed and disposed of appropriately prior to construction.

10. The residential land use surrounding the site is not considered to have had any significant impact to the site.
11. Human end users are considered to be at a low risk as significant contamination is considered to be unlikely. Construction workers are considered to be at a low risk also, particularly as exposure is considered to be short term.
12. Groundwater is of negligible sensitivity and given the unlikely presence of significant contamination groundwater is considered to be at a very low risk.
13. Surface water is of a low to moderate sensitivity and is at a low risk from on site contamination.
14. There are no potentially significant sources of ground gas, including infilled ground or historic or active landfills, identified within 1 km of the site. Therefore the site is considered to be at a low risk from ground gas migration.
15. Plastic water supply pipes are considered to be at a low risk as potential soil contamination is unlikely.
16. The site is considered to be suitable for the proposed residential redevelopment as long as the potential asbestos containing material on the site surface is removed.
17. If however during the construction phase of the development significant contamination is found then work should be stopped and the contamination assessed including quantification and a re-evaluation of the risks to receptors.

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5 September2016

APPENDIX A: REFERENCES

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APPENDIX B: DRAWINGS

Drawing 16.301/PhaseI/1	Site Location Plan
Drawing 16.301/PhaseI/2	Relevant Feature Plan



North

Circle indicates approximate location of site

Scale 1: 50,000 @ A4

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A F Howland Associates
Geotechnical Engineers

Site: Land at 69 Marroitts Gate, Lutton

SITE LOCATION PLAN

Client : Mr Simon Barker

Date : September 2016 **Dwg :** 16.301/Phasel/1

Photo 1 – Looking along southern boundary of the site



Photo 2 – Looking north towards site from School Lane



Photo 3 – Dry drainage ditch on western boundary





Photo 8 – Looking west across northern area of the site



Photo 9 – Looking south east across the site



Photo 10 – Looking east across the the site



Photo 4 – Discard material on site



Photo 5 – Discard material on site, including possible asbestos containing cement board



Photo 6 – Cement board on hardstanding, possible asbestos containing material



Photo 7 – Dismantled shed



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Client:	Mr Simon Barker
Site:	Land at 69 Marriotts Gate, Lutton
Job No.:	16.301
Drawing title:	Relevant Feature Plan
Drawing No.:	16.301/Phasel/2
Date:	September 2016

APPENDIX C: RISK ASSESSMENT CLASSIFICATION

Classification	Definition	Examples
Severe	Short term (acute) risk to human health. Short term risk of pollution of sensitive water resource. Catastrophic damage to buildings/property. A short term risk to a particular ecosystem, or organism forming part of such ecosystem.	High concentrations of cyanide on the surface of an informal recreation area. Major spillage of contaminants from Site into controlled water.
Medium	Chronic damage to Human Health. Pollution of sensitive water resources. A significant change in a particular ecosystem, or organism forming part of such ecosystem.	Concentrations of a contaminant from Site exceeds the generic, or Site specific assessment criteria. Leaching of contaminants from a Site to an aquifer.
Mild	Pollution of non-sensitive water resources. Significant damage to buildings/structures and crops ("significant harm" as defined in the Circular on Contaminated Land, DETR, 2000). Damage to sensitive buildings/structures or the environment.	Pollution of non-classified groundwater. Damage to building rendering it unsafe to occupy (e.g. foundation damage resulting in instability).
Minor	Harm, although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve. Non-permanent health effects to human health (easily prevented by means such as Personal Protective Clothing, etc). Easily repairable effects of damage to buildings/structures.	The presence of contaminants at such concentrations that protective equipment is required during Site works. The loss of plants in a landscaping scheme.

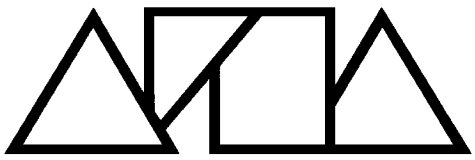
Classification of consequence

Classification	Definition
High Likelihood	There is a pollution linkage and an event which would either appear very likely in the short term and almost inevitable over the long term, or, there is evidence at the receptor of harm or pollution.
Likely	There is a pollution linkage and all the elements are present and in the right place which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.
Low Likelihood	There is a pollution linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such event would take place, and is less likely in the shorter term.
Unlikely	There is a pollution linkage but circumstances are such that it is improbable that an event would occur even in the very long term

Classification of probability

		CONSEQUENCE			
		Severe	Medium	Mild	Minor
PROBABILITY	High Likelihood	Very High Risk	High Risk	Moderate Risk	Moderate/ Low Risk
	Likely	High Risk	Moderate Risk	Moderate/ Low Risk	Low Risk
	Low Likelihood	Moderate Risk	Moderate/ Low Risk	Low Risk	Very Low Risk
	Unlikely	Moderate/ Low Risk	Low Risk	Very Low Risk	Very Low Risk

Comparison of consequence against probability



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