Phase I Desk Study Environmental Assessment, Land Adjacent to A41, Bicester

For
Tesco Stores Limited

Delta-Simons Project No. 11-0549.01
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## Authorisation, Context and Purpose

Delta-Simons was instructed by Tesco Stores Limited to carry out a Phase I Desk Study Environmental Assessment of the Site, prior to the submission of a planning application to develop the Site with a Tesco store, car parking and a petrol filling station (PFS). The Assessment adheres to the principal aims of BS10175:2011 with regard to the consideration of potential soil and groundwater contamination and ground gas. The Report also provides a general land quality statement to highlight the commercial implications arising from the redevelopment.

## Current Site Use

The Site currently consists of agricultural land. It appears from ordnance survey maps that the Site slopes downwards from the north-west to the south-east of the Site by approximately 1-2 metres.

## Geology

Alluvium (clay, silt, sand and gravel) is present in the west of the Site. The Kellaways Clay Member (mudstone) is located across the majority of the Site at a maximum anticipated thickness of 3 metres, however, the Cornbrash Formation (limestone) outcrops in the west of the Site and is located beneath the Kellaways Clay Member. The Cornbrash Formation is estimated to be approximately 5 metres in thickness and is underlain by the Forest Marble Formation (mudstone with beds of limestone).

## Hydrogeology

The Kellaways Clay Member is classified as being Unproductive Strata, whilst the Alluvium and Cornbrash Formation are classified as Secondary A Aquifers.

## Surface Water Features

The nearest surface water feature to the Site is Town Brook located approximately 200 m to the north of the Site.

## Radon

Using the Building Research Establishment (BRE) guidelines, no radon protection measures are considered to be required in the construction of new buildings.

## Coal Mining

A Coal Authority Report is not required for properties in the location of the Site.

## Historical Land Use

### Site:

No significant potentially contaminative land uses have been identified at the Site from a review of available historical maps. However, it should be noted that the Site is likely to have been in agricultural use throughout its history, and, therefore, there is the potential for localised contamination from pesticides/herbicides and fuels associated with spillages from agricultural machinery cannot be completely ruled out.

### Surrounding Area:

Potential contaminative land uses have not been identified within the near surrounding area of the Site (within 250 m radius), however, a sewage farm and railway lines present since circa 1881 to the present day have been identified.

## Envirocheck® Report Summary

An Envirocheck® report has been provided to Delta-Simons for the purposes of this environmental review. No issues have been identified in relation to the Site.

Potential off-Site sources of contamination have been identified within 250 m of the Site, which include: two PFS’s and a sewage works.

## Conceptual Site Model

Following a source-pathway-receptor risk assessment, pollutant linkages are considered to be unlikely. However, there remains a potential risk to construction workers.

## Conclusions and Recommendations

On the basis of the information obtained and reviewed as part of this Assessment and the conclusions drawn above, Delta-Simons considers that a limited intrusive investigation (including groundwater and ground gas monitoring) should be undertaken, alongside a geotechnical investigation:

- Provide outline waste classification data;
- Confirm background levels of soil and groundwater concentrations; and
- Provide topsoil/subsoil testing.

Construction workers should be made aware of the possibility of encountering contamination and appropriate safe working methods should be in place with appropriate PPE provided as and when identified within the contractors risk assessment.
<table>
<thead>
<tr>
<th>Statements of Risk</th>
<th>Based upon available information reviewed as part of this Assessment, the following statements of risk are considered to apply to the Site in relation to soil and groundwater contamination and ground gas:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statutory Liability</td>
<td>Low in terms of investigatory works under Part 2A, low to moderate in terms of planning conditions.</td>
</tr>
<tr>
<td>Third Party Liability</td>
<td>Low.</td>
</tr>
<tr>
<td>Commercial Risk</td>
<td>Low.</td>
</tr>
</tbody>
</table>

*This sheet is intended as a summary only. Further detail and limitations of the assessment is provided within the main body of the Report.*
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1.0 INTRODUCTION

1.1 Authorisation, Context and Purpose

Delta-Simons Environmental Consultants Limited ("Delta-Simons") was instructed by Tesco Stores Limited (the "Client") to carry out a Phase I Desk Study Environmental Assessment of a parcel of agricultural land adjacent to the A41 on the southern outskirts of Bicester (hereafter referred to as the "Site"), prior to the submission of a planning application for redevelopment into a Tesco retail store, car parking and a petrol filling station (PFS).

The Environmental Assessment will adhere to the principal aims of BS10175:2011 with regard to the consideration of potential soil and groundwater contamination and ground gas. In summary the assessment will:

- Assess the likelihood of finding contamination, its nature and its extent;
- Evaluate the environmental setting of the Site and identify sensitive receptors;
- Provide information from which likely contaminant-pathway-receptor relationships can be identified and formulate a Conceptual Site Model (CSM); and
- Consider the need for an intrusive Site investigation.

This Assessment also provides a general land quality statement to highlight the potential commercial implications arising from the development of the Site.

1.2 Scope of Works

The scope of works for the Phase I Desk Study Environmental Assessment is presented in Table 1.
Table 1 - Scope of Works (excerpt as taken from BS 10175:2011)

<table>
<thead>
<tr>
<th>Data Collection</th>
<th>1. Documentary research:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>– Review Site history (location, surroundings);</td>
</tr>
<tr>
<td></td>
<td>– Review current Site use (including adjacent areas); and</td>
</tr>
<tr>
<td></td>
<td>– Review Site geology (including Radon &amp; Coal), hydrogeology and hydrology;</td>
</tr>
<tr>
<td></td>
<td>2. Review a commercially available regulatory database known as Envirocheck®;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Interpretation and Reporting</th>
<th>3. Formulate an initial CSM;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4. Undertake preliminary risk assessment;</td>
</tr>
<tr>
<td></td>
<td>5. Assess need for, and scope of, further investigation; and</td>
</tr>
</tbody>
</table>

1.3 Limitations

A Site reconnaissance has not been undertaken, however, given the current use of the Site, this is not considered to represent a significant limitation in terms of this preliminary Assessment.

This Report provides an assessment of the potential contamination status of the ground below the Site based upon the available information. It does not provide a flood risk assessment or a geotechnical assessment/interpretation of the ground conditions and as such, any comments relating to such matters are for information only.

In summary, the Phase I Environmental Assessment has been produced in accordance with the principles of BS10175 in relation to a Preliminary Investigation. However, although reference may be made to archaeological and ecological issues, or the potential presence of Asbestos Containing Materials (ACMs), the Report does not constitute an archaeological or ecological assessment, nor does it constitute an asbestos inspection.

Delta-Simons obtained, reviewed and evaluated information in preparing this Report from the Client, Landmark Information Group and others. Delta-Simons’ conclusions, opinions and recommendations are based upon this information. Delta-Simons does not warrant the accuracy of the information provided to it and will not be responsible for any opinions which Delta-Simons has expressed, or conclusions which it has reached in reliance upon information which is subsequently proven to be inaccurate.
2.0 SITE DESCRIPTION

2.1 Site Details

Site particulars are provided in Table 2 below.

<table>
<thead>
<tr>
<th>National Grid Reference (NGR)</th>
<th>The approximate NGR for the centre of the Site is 457900, 221730.</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Site Location</td>
<td>The Site is located to the south and east of the A41 on the southern outskirts of Bicester.</td>
</tr>
<tr>
<td></td>
<td>A location map and plan of the Site is provided as Figure 1.</td>
</tr>
<tr>
<td>Site Description</td>
<td>The Site currently consists of agricultural land. It appears from ordnance survey maps that the Site slopes downwards from the north-west to the south-east of the Site by approximately 1-2 metres.</td>
</tr>
<tr>
<td></td>
<td>A layout plan of the Site is shown on Figure 2.</td>
</tr>
<tr>
<td>Surrounding Area</td>
<td>Beyond the A41 to the north is Bicester Village Retail Park. To the east, south and west is predominantly agricultural land within close proximity to the Site (within 200 metres). Further to the south is a garden centre and to the south-east is a sewage works.</td>
</tr>
</tbody>
</table>

2.2 Proposed Development

The Site is proposed to be developed with a Tesco food retail store and service yard located in the east, an eight pump PFS in the west, car parking across the centre of the Site, and areas of landscaping predominantly in the west of the Site with a pond. The proposed development plan is provided as Figure 3. It is noted that an outline planning application has been granted for land to the east and south of the Site to be developed into a business park.

No cut and fill volumes have been provided to Delta-Simons, however, it is anticipated that some remodelling will be required for the proposed development.
3.0 ENVIRONMENTAL SETTING

3.1 Geology

From British Geological Survey (BGS) online data and a BGS report for land located adjacent to the Site, the majority of the Site is not underlain by any superficial deposits, except in the far west of the Site, in which Alluvium (clay, silt, sand and gravel) is present. The bedrock comprises the Kellaways Clay Member (mudstone) across the majority of the Site at a maximum anticipated thickness of 3 metres, however, the Cornbrash Formation (limestone) outcrops in the west of the Site and is located beneath the Kellaways Clay Member. The Cornbrash Formation is estimated to be approximately 5 metres in thickness, which is underlain by the Forest Marble Formation (mudstone with beds of limestone).

From a borehole identified on the BGS GeoIndex website that was drilled adjacent to the north-east of the Site in 1984 (ref: SP52SE90), the ground conditions comprised Alluvium/Glacial Till to 1.4 metres below ground level (m bgl) over the Kellaways Clay Member to 2.3 m bgl over the Cornbrash Formation to at least 5.8 m bgl.

3.2 Hydrogeology

According to Environment Agency (EA) information provided online, the Alluvium and Cornbrash Formation are classified by the EA as being a Secondary A Aquifer and the Kellaways Clay Member is classified as being Unproductive Strata.

The Site is not located within a groundwater Source Protection Zone.

From the borehole drilled to the north-east of the Site in 1984, groundwater was encountered at approximately 1 m bgl.

According to the Envirocheck\® report, there are two groundwater abstractions located within 1 km of the Site. The closest is located approximately 200 m to the north of the Site and was used in 2004 for pollution remediation at a PFS. The other is located approximately 750 m to the south-west of the Site used for general farming and domestic purposes.
3.3 Surface Water Features

The nearest surface water feature to the Site is Town Brook located approximately 200 m to the north of the Site. There are also drains located approximately 230 m to the south, 250 m to the east, and Langford Brook is located approximately 300 m to the south-east of the Site.

According to the Envirocheck® report, there are no licensed surface water abstractions located within 1 km of the Site.

The Site is not located within an area which is considered by the EA to be at risk from fluvial or tidal flooding.

3.4 Environmentally Sensitive Areas

Environmentally Sensitive Areas include Nitrate Sensitive Areas, Sites of Special Scientific Interest (SSSI’s), Areas of Outstanding Natural Beauty (AONB), National Parks, National Nature Reserves, Special Areas of Conservation, Special Protection Areas (SPA) and Ramsar sites.

From information provided within the Envirocheck® report, the Site or surrounding area (within a 1 km radius) is not designated as a relevant Environmentally Sensitive Area.

3.5 Environmental Sensitivity

The Site is predominantly situated on Unproductive Strata, however, Secondary A Aquifers are located in the west of the Site, with the surrounding area predominantly occupied by agricultural land, except to the north which is commercial, and the nearest surface water feature is a brook located approximately 200 m to the north of the Site. As such, the physical Site setting is considered to be of a low to moderate environmental sensitivity.
4.0 SITE HISTORY

4.1 Site History: Ordnance Survey Maps

A study of historical OS maps presented with the Envirocheck® report has been undertaken to identify any potentially contaminative former land uses at the Site and within the surrounding area. These maps date from 1881 to 2009. The key features and land uses of the Site and surrounding area identified from the available information are summarised below. Copies of the OS historical maps are included in Appendix II. It should be noted that the boundary provided on the maps is incorrect, however, the Site is shown to the north-west of the highlighted area.

<table>
<thead>
<tr>
<th>On-Site Features</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>On the earliest map editions, the Site is undeveloped and is likely to have been of agricultural use.</td>
<td>Across the Site.</td>
</tr>
<tr>
<td>The Site remains undeveloped throughout the historical maps.</td>
<td>Across the Site.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Surrounding Features</th>
<th>Direction</th>
<th>Approximate Distance from the Site (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The near surrounding area is predominantly undeveloped throughout the map editions, however, the following have been identified from 1881 to the present day:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>∆ A sewage farm; and</td>
<td>300</td>
<td>South</td>
</tr>
<tr>
<td>∆ Railway lines.</td>
<td>400</td>
<td>East</td>
</tr>
</tbody>
</table>

4.2 Summary of Historical Sources of Potential Contamination

No significant potentially contaminative land uses have been identified at the Site from a review of available historical maps. However, it should be noted that the Site is likely to have been of agricultural use throughout its history, and, therefore, there is the potential for contamination from pesticides/herbicides and fuels associated with spillages from agricultural machinery.

Potential contaminative land uses have not been identified within the near surrounding area of the Site (within 250 m radius), however, a sewage farm and railway lines present since circa 1881 to the present day have been identified.
5.0 REVIEW OF STATUTORY & FURTHER INFORMATION

5.1 Landmark Envirocheck® Report

The Landmark Envirocheck® Report provides a database of environmental information held by various statutory bodies including; the EA, Local Authority (LA), Health & Safety Executive (HSE), National Radiological Protection Board (NRPB) and the Coal Authority. A full copy of the Envirocheck report is presented in Appendix I and the most relevant information from the Envirocheck Data Sheet is summarised in Table 3 below. It is noted that the distances quoted in Table 3 are approximate distances from the centre of the Site.

Table 3 - Relevant Data from Envirocheck® Report

<table>
<thead>
<tr>
<th>Information Type</th>
<th>Details/Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discharge Consents</td>
<td>The closest consent is associated with the sewage works located approximately 300 m to the south of the Site, and is considered to represent a potential off-Site source of contamination.</td>
</tr>
<tr>
<td>Local Authority Poll. Prevention &amp; Controls</td>
<td>There are two controls associated with PFS’s located approximately 120 m to the north-west and 200 m to the north of the Site. These are considered to represent potential off-Site sources of contamination.</td>
</tr>
<tr>
<td>Pollution Incidents to Controlled Waters</td>
<td>The closest three incidents occurred approximately 100 m and 200 m, both to the north of the Site in the 1990’s and were was classified as being ‘minor’. Given the minor classification and the time since these occurred, they are not considered to represent a significant concern to the Site.</td>
</tr>
<tr>
<td>Contemporary Trade Directory Entries</td>
<td>The majority of contemporary trade directory entries appear to be associated with the retail park to the north of the Site, therefore, they are not considered to represent a significant concern to the Site. However, there are entries associated with the PFS’s mentioned above, which are considered to represent potential off-Site sources of contamination.</td>
</tr>
<tr>
<td>Fuel Station Entries</td>
<td>As mentioned above, there are two PFS’s located approximately 120 m to the north-west and 200 m to the north of the Site, both stated as being open, which are considered to represent potential off-Site sources of contamination.</td>
</tr>
</tbody>
</table>

It should be noted that potential issues associated with water abstractions, flood risk and environmentally sensitive areas, as provided in the Envirocheck® report, are discussed in Section 3.0 of this Report.

5.2 Radon and Coal Information

An assessment of the potential for radon and coal mining issues is shown in Table 4:
<table>
<thead>
<tr>
<th>Other Information</th>
<th>Yes/No</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is the Site in a radon-affected area and are radon protection measures required?</td>
<td>No</td>
<td>Reference to the NRPB Radon Affected Areas of England and Wales indicates that less than 1% of homes in the area are above the action level for radon. Reference to Buildings Research Establishment publication BRE211 ‘Radon: Guidance on Protective Measures for New Buildings’ (2007) indicates that no radon protective measures are recommended in the construction of new buildings within the area of the Site.</td>
</tr>
<tr>
<td>Is the Site in a known area affected by potential coal mining issues?</td>
<td>No</td>
<td>Reference to information held by the Coal Authority indicates that the Site is not located within an area that is likely to be affected by coal mining activity.</td>
</tr>
</tbody>
</table>
6.0 CONCEPTUAL SITE MODEL

6.1 Introduction

A conceptual exposure model represents in written form, pictorial representation, or a network diagram, the relationships between contaminant sources, pathways and receptors, to support the identification and assessment of possible pollutant linkages (and an assessment of known pollutant linkages where identified).

Where possible pollutant linkages are identified, a preliminary risk assessment is carried out to assess the likelihood that each possible linkage exists and to decide whether these pose potentially unacceptable risks to people or to specific parts of the wider environment, including property and require further assessment. Where this linkage is of a form that subsequently leads to land being identified as ‘contaminated land’ under the terms of Part 2A of the Environmental Protection Act 1990, the linkage is termed a significant pollutant linkage.

At the preliminary risk assessment stage, which is usually based upon desk top information, the decision on whether a possible pollutant linkage poses a potentially unacceptable risk is based upon professional judgement.

Assessing risks from land contamination underpins the “suitable for use” approach adopted for Part 2A of the Environmental Protection Act 1990 regulatory regime and for planning policy.

6.2 Conceptual Model

6.2.1 Summary of Site Description & Environmental Setting

The Site is currently undeveloped agricultural land. The geology beneath the Site predominantly consists of the Kellaways Clay Formation (mudstone) classified as Unproductive Strata, however, Alluvium and the Cornbrash Formation (limestone) are present in the west of the Site, both of which are classified as being a Secondary A Aquifer. The nearest surface water feature to the Site is a brook located approximately 200 m to the north of the Site. The surrounding area predominantly consists of agricultural land, however, there is a retail park beyond the A41 to the north of the Site.
6.2.2 Contaminant Sources

Tables 5 and 6 below show the identified on-Site and off-Site potential sources of contamination.

Table 5 - On-Site Contaminant Sources

<table>
<thead>
<tr>
<th>Potential Source Area</th>
<th>Potential Contaminants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Former and current use of the Site for agricultural purposes.</td>
<td>Pesticides, herbicides and hydrocarbons.</td>
</tr>
<tr>
<td>Organic matter within the topsoil, subsoil and Alluvium.</td>
<td>Ground gas.</td>
</tr>
</tbody>
</table>

Table 6 - Off-Site Contaminant Sources

<table>
<thead>
<tr>
<th>Potential Source(s)</th>
<th>Current Status of Land</th>
</tr>
</thead>
<tbody>
<tr>
<td>A sewage farm and railway lines, located within 400 m to the Site, as identified on the historical maps.</td>
<td>These remain in the latest map edition.</td>
</tr>
<tr>
<td>Two PFS’s located approximately 120 m to the north-west and 200 m to the north of the Site, as identified from the Envirocheck® report.</td>
<td>Both are stated as being open, and it is noted that from water abstraction records, it is understood that pollution remediation has been undertaken at the PFS located approximately 200 m to the north of the Site.</td>
</tr>
</tbody>
</table>

6.2.3 Pathways

The main pathways that can be considered include:

- Exposure via direct contact and ingestion during redevelopment works and in landscaped areas of the proposed development;
- Exposure via the inhalation of volatile vapours during redevelopment and across the Site during the proposed future use;
- Leaching of contamination from soils through infiltration of rainfall and migration into groundwater in the Secondary A Aquifer in the west of the Site;
- Migration of dissolved phase contamination in groundwater off-Site and towards surface water;
- Migration of contamination through drains and service runs;
- Vertical and lateral migration of ground gas into enclosed spaces and sub-floor voids;
- Direct filtration into water supply pipes following degradation of plastic pipes by direct contact with hydrocarbon contaminated soils; and
- Plant uptake in the proposed landscaped areas.
6.2.4 Receptors

The main receptors that can be considered include:

- Future Site users, including employees and Site visitors;
- Construction workers during the redevelopment of the Site;
- Any perched groundwater within the Unproductive Strata beneath the Site and groundwater in the Secondary A Aquifer in the west of the Site;
- Vegetation within proposed landscaped areas;
- Water supply pipes;
- The proposed buildings at the Site;
- Neighbouring properties and users; and
- Brooks and drains located approximately 200 m from the Site.

6.3 Pollutant Linkages

Based on the information obtained from this Assessment, the following preliminary risk assessment table has been formulated, which identifies all possible pollutants and pollutant linkages at the Site in the context of the proposed redevelopment comprising a Tesco store, car parking and a PFS.
## Conceptual Site Model Summary

<table>
<thead>
<tr>
<th>Source(s)</th>
<th>Receptor(s)</th>
<th>Pathway(s)</th>
<th>Pollutant Linkage?</th>
<th>Comments</th>
<th>Additional Site Investigation Requirements/ Mitigation Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potentially contaminated soils from the sources identified in Table 5.</td>
<td>Groundwater beneath the Site.</td>
<td>Leaching of soils by infiltration of rainwater and vertical migration through permeable deposits below the Site.</td>
<td>Unlikely</td>
<td>Given the potential sources of contamination identified, the risk of significantly contaminated soils is considered to be low, therefore, the risk to groundwater is also low.</td>
<td>Whilst this possible pollutant linkage is unlikely, it is considered prudent to undertake a limited intrusive investigation, alongside a geotechnical investigation.</td>
</tr>
<tr>
<td></td>
<td>Construction workers.</td>
<td>Direct ingestion, direct contact &amp; inhalation of dust/ vapours.</td>
<td>Possible</td>
<td>Site workers may become exposed to localised contaminated soils and groundwater during intrusive groundworks of the redevelopment works.</td>
<td>Construction workers should be made aware of the possibility of encountering contamination and appropriate safe working methods should be in place with appropriate personal protective equipment (PPE) provided as and when necessary.</td>
</tr>
<tr>
<td></td>
<td>Future Site users.</td>
<td>Direct ingestion, direct contact &amp; inhalation of dust/vapours.</td>
<td>Unlikely</td>
<td>Given that significant contamination is unlikely to be present, the risk to future Site users is considered to be low.</td>
<td>Whilst this possible pollutant linkage is unlikely, it is considered prudent to undertake a limited intrusive investigation, alongside a geotechnical investigation.</td>
</tr>
<tr>
<td></td>
<td>Water supply pipes.</td>
<td>Direct infiltration following contact with hydrocarbon contamination.</td>
<td>Unlikely</td>
<td>The risk of hydrocarbon contamination being present is considered to be low. However, the development proposals includes a potential source of hydrocarbon contamination (the PFS).</td>
<td>It is considered prudent to undertake limited hydrocarbon testing during the limited intrusive investigation and liaise with the local water authority in order to confirm any requirement for upgraded pipework.</td>
</tr>
<tr>
<td></td>
<td>Plants in the landscaped areas.</td>
<td>Root uptake.</td>
<td>Unlikely</td>
<td>Given the potential sources of contamination identified, the risk to plants in any new landscaped areas is considered to be low.</td>
<td>A suitable layer of clean topsoil and subsoil may be required for landscaped/garden areas. Subject to appropriate testing, clean topsoil and subsoil currently on-Site may be suitable for re-use.</td>
</tr>
</tbody>
</table>
## Conceptual Site Model Summary

<table>
<thead>
<tr>
<th>Source(s)</th>
<th>Receptor(s)</th>
<th>Pathway(s)</th>
<th>Pollutant Linkage?</th>
<th>Comments</th>
<th>Additional Site Investigation Requirements/ Mitigation Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off-Site receptors: adjacent agricultural land and the nearby surface water features.</td>
<td>Lateral migration through groundwater within the Secondary A Aquifer beneath the Site.</td>
<td>Unlikely</td>
<td>Given that significant contamination beneath the Site is unlikely, and the geology predominantly consists of Unproductive Strata, the risk to off-Site receptors is considered to be low.</td>
<td>It is considered prudent to undertake a limited intrusive investigation, alongside a geotechnical investigation.</td>
<td></td>
</tr>
<tr>
<td>Potentially contaminated groundwater (migration from off-Site sources as identified in Table 6 above).</td>
<td>Future Site users and construction workers.</td>
<td>Lateral migration of contamination through groundwater between the off-Site potential sources and the Site.</td>
<td>Unlikely</td>
<td>There are current potential off-Site sources of contamination, which could migrate on-Site, however, given the distances from the Site, the risk is considered to be low.</td>
<td>It is considered prudent to undertake groundwater monitoring during a limited intrusive investigation, alongside a geotechnical investigation.</td>
</tr>
<tr>
<td>Potential for ground gas.</td>
<td>Buildings and future Site users.</td>
<td>Accumulation of gas in enclosed spaces and sub-floor voids.</td>
<td>Unlikely</td>
<td>Ground gases could be present associated with any organic material and Alluvium, however, the risk for a commercial end-use that is likely to be well ventilated is considered to be low.</td>
<td>It is considered prudent to undertake ground gas monitoring during a limited intrusive investigation, alongside a geotechnical investigation. Should elevated concentrations of ground gases be identified during the monitoring, basic ground gas protection measures may be required.</td>
</tr>
</tbody>
</table>
7.0 ASSESSMENT OF RISKS AND LIABILITIES

For the purposes of this preliminary contaminated land risk assessment, the Site has been considered in the context of it being redeveloped with a Tesco store, car parking and a PFS.

This Assessment considers both perceived and actual risks using the Source, Pathway, Receptor concept, with the principal measure of risk being whether significant harm (to people, animals, property (including buildings, cattle etc.), or ecosystems) or pollution of controlled waters (surface water bodies, aquifers, coastal waters, or territorial waters) is being caused, or whether there is a significant possibility of such harm being caused.

7.1 Regulatory Body Enforcement

7.1.1 Part 2A of the EPA 1990

Based on the available information and the current use of the Site, Delta-Simons considers there to be a low risk that the Site is likely to be considered by the LA as warranting investigatory works under Part 2A of the Environmental Protection Act 1990.

7.1.2 Planning Control

Contaminated land, or the possibility of it, is a material planning consideration in the preparation of development plans and the decisions on planning applications. Following submission of this Phase I Environmental Assessment Report, alongside the planning application, Delta-Simons considers that a set of conditions may be imposed, in line with the Model Conditions issued by the Department for Communities and Local Government (DCLG) in 2008 as follows:

1. An investigation and risk assessment in accordance with a scheme to assess the nature and extent of any contamination. A written report is subject to the approval of the LPA;
2. If significant contamination is identified, a detailed remediation scheme to bring the Site to a condition suitable for the intended use; and
3. In the event that contamination is found at any time when carrying out the approved development that was not previously identified it must be reported in writing immediately to the LPA.
7.1.3 Water Resources Act
Based on the available information, Delta-Simons considers there to be a low risk that the Site, in its current state, is likely to present a risk of pollution to controlled waters and invoke prosecution under the WRA.

7.1.4 Waste Management
The waste management licensing regime contained in Part 2 of the environmental protection agency (EPA) 1990 deals with the operation of waste-related processes. Where material on-Site is already liable to be dealt with under Part 2 of the EPA, it cannot also constitute contaminated land under Part 2A. Some remedial options may require a licence or other compliance procedures (e.g. a mobile treatment licence, an environmental permit, a waste management license exemption).

The costs for the disposal of materials from Site should be considered. In particular, non inert soil requiring disposal to landfill is likely to incur landfill tax, currently at a rate of £64 per tonne. Based upon current information, the disposal of material classified as hazardous will incur costs of up to £150-£300 per cubic metre, whilst non-hazardous material is likely to incur costs in the region of £80-£140 per cubic metre. The implementation of the Landfill Directive is the key driver behind elevated disposal costs and alternative remediation technologies, which should be considered prior to redevelopment in order to minimise off-Site disposal of arisings and is also a more sustainable option. If remediation is required and is not possible on-Site, an off-Site treatment centre should be considered as an alternative to landfill.

Given that some remodelling of the Site will be required for the development, it is considered that the ground investigation should include soil analysis for preliminary waste classification for any material which may be required to be sent to landfill or for off-Site treatment. A further detailed waste classification, including Waste Acceptance Criteria (WAC) testing, may also be required. However, it should be noted that the management of materials during the development at the Site should be undertaken in order to re-use wherever possible any materials which are considered to be ‘suitable for use’.

7.2 Third Party Liability
Delta-Simons considers that the risk of legal action from a third party with regard to contamination migration from the Site is low.
7.3 Commercial Impact

Delta-Simons considers there to be a low risk of significant adverse cost impacts from the redevelopment, in relation to contamination issues. However, it should be noted that there is the potential for additional costs associated with redevelopment abnormals, as discussed below.

7.4 Redevelopment

There is the potential that abnormal costs may be incurred during redevelopment, as follows:

- To complete a limited intrusive investigation and a waste classification exercise, however, a combined Geotechnical and Environmental scope of works would offer cost savings;
- To undertake any further assessments, for example a Quantitative Risk Assessment (QRA) and subsequent soil and groundwater remediation, however, this is considered unlikely to be required;
- To remove soils for engineering purposes (e.g. foundation and service trench arisings, engineering cut, etc);
- To supply personal protective equipment (PPE) for construction workers;
- To use clean and certified topsoil and subsoil in any proposed landscaped areas, however, given the current agricultural use, it may be possible to reuse current material, subject to testing;
- To use clean inert material in any new service runs across the Site;
- To provide basic ground gas protection measures beneath the proposed development; and
- To use upgraded water supply pipes, if required by the local water authority.
8.0 CONCLUSIONS & RECOMMENDATIONS

8.1 Conclusions
The Site currently consists of agricultural land and it appears to have been of this use throughout the period of available historical maps. The Site is proposed to be developed into a Tesco store with associated car parking, and a petrol filling station (PFS).

Following a desk study, no significant potential sources of contamination have been identified at the Site, however, the potential for localised contamination cannot be completely discounted primarily from pesticides/herbicides and fuel spillages associated with agricultural machinery.

A source-pathway-receptor risk assessment has been undertaken in the context of the proposed redevelopment and in accordance with Part 2A of the Environmental Protection Act, 1990, and pollutant linkages are considered to be unlikely. However, there remains a potential risk to construction workers.

8.2 Recommendations
On the basis of the information obtained and reviewed as part of this Assessment and the conclusions drawn above, Delta-Simons considers that a limited intrusive investigation (including groundwater and ground gas monitoring) should be undertaken, alongside a geotechnical investigation to:

- Provide outline waste classification data;
- Confirm background levels of soil and groundwater concentrations; and
- Provide topsoil/subsoil testing.

Construction workers should be made aware of the possibility of encountering contamination and appropriate safe working methods should be in place with appropriate PPE provided as and when identified within contractors risk assessments.

8.3 Statement of Risk
Based upon available information, Delta-Simons considers that the risks of the following potential environmental liabilities are as follows:
Table 7 – Liabilities and Risks

<table>
<thead>
<tr>
<th>Potential Liability</th>
<th>Level of Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulatory Body Enforcement.</td>
<td>Low in terms of investigatory works under Part 2A, low to moderate in terms of planning conditions.</td>
</tr>
<tr>
<td>Third Party Liability.</td>
<td>Low.</td>
</tr>
<tr>
<td>Commercial Risk.</td>
<td>Low.</td>
</tr>
</tbody>
</table>
9.0 LIMITATIONS TO ENVIRONMENTAL ASSESSMENTS

The recommendations contained in this Report represent Delta-Simons' professional opinions, based upon the information referred to in Section 1.3 of this Report, exercising the duty of care required of an experienced Environmental Consultant. Delta-Simons does not warrant or guarantee that the Site is free of hazardous or potentially hazardous materials or conditions.

This Report was prepared by Delta-Simons for the sole and exclusive use of the Client and for the specific purpose for which Delta-Simons was instructed as defined in Section 1.1 of this Report. Nothing contained in this Report shall be construed to give any rights or benefits to anyone other than the Client and Delta-Simons, and all duties and responsibilities undertaken are for the sole and exclusive benefit of the Client and not for the benefit of any other party. In particular, Delta-Simons does not intend, without its written consent, for this Report to be disseminated to anyone other than the Client or to be used or relied upon by anyone other than the Client. Use of the Report by any other person is unauthorised and such use is at the sole risk of the user. Anyone using or relying upon this Report, other than the Client, agrees by virtue of its use to indemnify and hold harmless Delta-Simons from and against all claims, losses and damages (of whatsoever nature and howsoever or whensoever arising), arising out of or resulting from the performance of the work by the Consultant.
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A different perspective