



Contaminated Land Review for Proposed Car Wash & Valeting Site at Vale Road, Northfleet, Gravesend, Kent, DA11 9RE.

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Summary

This report consists of a review of contaminated land reports produced in relation to development on land at Vale Road, Northfleet, Gravesend, Kent, DA11 9RE for a planning application for a commercial car wash and valeting centre.

Previous reports include a Phase I desk study and subsequent intrusive investigations by Brownfield Solutions and a further targeted investigation by Lustre Consulting.

Evidence of some contamination has been identified across the wider industrial estate surrounding the development plot as a result and mitigation measures identified.

The above reports were written with a view of redevelopment of the wider site for a residential end use.

This report concludes that a potential risk to identified receptors in the form of the principal aquifer underlying the site and further users of the site exists and so mitigation measures have been identified to reduce the risk posed and break the Source-Pathway-Receptor pollutant linkage.

The report further recommends that a watching brief is maintained throughout the construction and any signs of potential contamination found are fully investigated, with appropriate remedial action taken as necessary.



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Introduction

Martin Environmental Solutions has been commissioned, to undertake a review and assessment of potential contamination affecting a site for Proposed Car Wash & Valeting Site at Vale Road, Northfleet, Gravesend, Kent, DA11 9RE.

The report consists of a review of previous work undertaken on the wider industrial site in the form of a Phase I assessment by Brownfield Solutions Ltd, in February 2017 ref: BM/C3476/6655 and a Phase II intrusive investigation in June 2019, ref PD/C3476/8382 Rev A. Lustre Consulting also undertook a further intrusive investigation in November 2021 ref: 3869-210913-ML. Finally, following a site walkover survey in July 2026 an evaluation of the potential risk to the identified receptors is undertaken for the small site area that is proposed as a car wash.

The previous reports covered the full Industrial estate which stretches to the north, west and south of the proposed Car wash development site. The reports were also undertaken with a view of a residential end use development.

This report has been written in line with the 'BS 10175: 2026 Investigation of potentially contaminated sites – Code of Practice' and Land Contamination Risk Management (LCRM).

Aims and Objectives of the report

The aims and objectives of this report are as follows:

- Assess the likelihood of contamination affecting the site,
- Identify any likely receptors to be affected by the potential contamination,
- Identify the pathways by which the receptors will be exposed to any potential contamination,
- Identify any areas where further investigation will be required.



The Site:

Site Address: Land off Vale Road, Northfleet, Gravesend, Kent, DA11 9RE.

Grid reference: 562761; 173633

An aerial photograph of the site is included in Figure 1.

Current Site use:

The development site is situated to the west of Vale Road, fronting onto the road a large industrial area is located to the rear, north and south of the site. This wider site forms the development area considered within the former Phase I & Phase II reports. The site is currently empty, and unoccupied, as is most of the wider industrial site. Residential properties are located on the far side of the Vale Road.

Research

Details of Research

This report has been based on the previous investigations, and a new site walkover survey. The following are considered:

- the historic and current use of the site,
- any known waste disposal activities in the area,
- any regulated industrial activities within the vicinity of the site including recorded industrial accidents,
- on the geology, hydrogeology, hydrology of the area,
- identification of any environmentally sensitive sites,
- any natural hazards.
- The results of the intrusive investigation.



Phase I Desk Study

The phase one desk study report was conducted by Brownfield Solutions in February 2017 for a residential development and is attached in Appendix 1.

Site History

The information has been identified from the Phase I report by Brownfield Solutions, including a review of the available historic mapping.

The earliest map dated 1865 indicates the site to be an undeveloped field. A railway line is shown along the southern boundary of the wider site. By 1895 residential properties are shown to the north and east and a number of chalk pits are present to the east and northeast. By 1909 the site is designated as allotments, two glass houses are present in the south west corner of the wider site. A building is also present in the north east corner.

By 1932 the allotments and glass houses are gone and the southern two thirds of the wider site is a chalk pit. A larger building is shown to the northern boundary. Further residential properties are shown to the north and east along with a number of schools. Another chalk pit is shown to the far side of the railway line south of the site.

The 1939 map shows a reduction in size of the chalk pit, the building has now increased in size to cover the majority of the northern edge of the wider site.

1952 mapping identifies the building as a garage, the chalk pit has reduced in size and a small structure is shown in the centre of the wider site. Other chalk pits in the area are identified as old.

A series of tanks is shown along the southern edge of the wider site in 1972. The chalk pit only occupied the southeast corner. A Building is shown on the car wash site. The chalk pit to the south is identified as a refuse tip.

Historic aerial photographs confirm the wider site layout in the 1940's, the building to the centre of the site in the 1960's, a possible petrol station is shown on the site at this time. By 1990 a number of HGV's are seen across the wider site. Buildings are present on the car wash site. By 2003 the car wash site appears to be a car sales centre the rest of the industrial estate a mixture of parked vehicles and haulage trucks and skips. The buildings on the car wash site are demolished by 2007. The east of the wider site including the development site is unused by 2018, with a builders merchants in the



southwest corner. 2022 see the site as cleared with the exception of the builders merchants which moves out by 2024.



Regulatory Information

Relevant information obtained from the Groundsure report, appended to the Brownfield Desk Study Report, is summarised below.

No permitted activities that have been identified within 500m of the site as defined in the Environmental Permitting (England and Wales) Regulations 2016 or previous legislation.

Two pollution incidents have been identified in the surrounding area (250m). The nearest 11m northeast related to a diesel spill in 2003, with a minor impact on water. the second firefighting run-off 81m south with no impacts, again in 2003.

There are no nearby discharge consents recorded.

Four landfill land waste treatment sites are recorded within 250m of the development site. The nearest 85m south of the proposed development at Springhead Road, accepting household, inert, commercial and industrial waste until 1984. At 51m northeast at Dykes Pit accepting inert waste until 1993. 104m northeast at Northfleet Power station inert and industrial sludge was deposited until 1992.

Potentially contaminative site identified in the area include vehicle repair garages, on the wider industrial site and in the surrounding area, a skip hire company and, vehicle hire company on site. An electrical sub-station located ~73m northeast.

Geology and Hydrogeology

Information from the British Geology Survey 1:50,000 mapping identifies the bedrock in the area as Seaford Chalk Formation.

The information obtained on the hydrogeology of the area identifies the site as having a Principal aquifer in the bedrock capable of supporting water supplies at a strategic scale, and in forming an important source of base flow to rivers.

No current groundwater abstraction licenses have been identified in the immediate area.

The site is located within a zone 1, Source Protection Zone.



Environmental Sensitivity

The property is in an area identified as having less than 1% of properties above the action level of 200 Becquerel's per cubic metre, based on specific property search. Radon protection measures are not required in line with BR211.

No additional natural hazards have been identified & the site has very low/negligible risk of shrink swell, running sand, and compressible ground.

The site is not located within a coal mining area as identified by the Coal Authority.

Conclusions from the Phase I Desk Study Investigation

The phase I desk study report identified potential risks from on-site garages, unspecified tanks and made ground from the previously filed chalk pit. Possible off-site sources of contamination were identified from the railway line to the south, refuse pit and infilled chalk pits, vehicles repair garages, substation and various works over 500m away.

Possible contaminants were identified as for each potential source. Receptors were identified as the end user, in the terms of the report residential receptors and the underlying aquifer.

A preliminary Conceptual Model identified a risk from ground gas, made ground, the on-site garages and tanks through inhalation, ingestion, and direct contact, along with migration through the groundwater to the aquifer.

An intrusive investigation was recommended.



Phase II Investigations

Brownfield Solutions Investigation

The first Phase II investigation was undertaken by Brownfield Solutions in June 2019, report ref PD/C3476/8382, see Appendix 2.

The investigation consisted of 6 window samples and 3 boreholes across the wider site. A number of soil samples were taken and analysed for the presence of heavy metals, Petroleum Hydrocarbons, VOC's and Asbestos. In addition, seven monitoring wells were installed across the site.

Made ground was recorded across the site between 0.4-9.4m bgl. Made ground representing the infill material used within the former chalk pit was identified as soft to firm clays with varying amounts of sand, gravel, cobbles, brick fragments, concrete, glass, and flint. Some ash was identified in one location along with clinker gravel in the same location, this being the far southwestern corner of the wider site.

No groundwater was encountered in any sampling point.

The nearest sampling point to the car wash development site was Borehole 2 (BH2), Window sample 5 & 6 (WS5 & WS6)

No hydrocarbon odours or staining were identified during the works. Utilising Benzo(a)pyrene (B(a)P as a surrogate marker exceedances of the Polyaromatic hydrocarbon (PAH) screening values were identified for a residential setting. Further assessment/remedial action was recommended.

Exceedances of the lead screening values were identified in BH2 and WS2, WS2 being the southeast corner of the wider site.

No elevated VOC's or BTEX & MTBE compounds were detected.

Chrysotile asbestos fibres were found in BH2 at 6.5m consisting of <0.001%.

No elevated ground gas concentrations were recorded over the six monitoring sessions.

A review of the sample results has confirmed exceedances of the current S4UL/C4SL values for a commercial operation of benzo(a)pyrene (110mg/kg in BH2 at 0.2m) within the made ground asphalt layer.

The report recommended the use of a clean cover system for soft landscaping across the site. The report was written for a proposed residential scheme.



Lustre Consulting Investigation

The second intrusive investigation was undertaken by Lustre Consulting in November 2021, see Appendix 3. The report was produced with a residential end use in mind and concentrated on the potential former underground fuel storage tanks. Located just to the west of the car wash development site. Underground storage tanks were understood to be present on the subject site associated with the former use as a petrol filling station

The investigation consisted of one borehole to 28.5m bgl to assess groundwater quality and five trial-pits between 1.3-4.6m bgl. Soil samples were taken from the excavations and analysed for Total Petroleum Hydrocarbons (TPH) and BTEX. Along with leachate testing for metals, pH, TPH BTEX, VOC's & PAHs. Ground water was also analysed for the same contaminants.

Excavations TP201 and TP202 were undertaken in close proximity to the east of the suspected underground structures. TP201 ground conditions in this location were identified as concrete over Made Ground to a depth of 0.3m bgl. This was then underlain by appearance of natural soils comprising orangish brown sandy gravelly CLAY. Natural soils were proved for 1m and the excavation was terminated. These ground conditions are consistent with those outside of the former chalk pit by Brownfield Solution Ltd e.g. WS5 and WS6.

TP202 was undertaken approximately 0.5m to the west. This identified bituminous material to a depth of 0.1m bgl over Made Ground to a depth of 1.3m bgl. Made Ground comprised black sandy gravelly silty CLAY with moderate ash content. Gravels were predominantly anthropogenic including glass, slate, brick, metal and concrete. This was broadly similar to ground conditions identified within the chalk pit by Brownfield Solutions Ltd e.g. BH2.

Evidence of former petrol filling station infrastructure was identified in the form of orange wiring likely associated with pumps and defunct pipework. Defunct pipework was observed entering the edge of the excavation and was orientated in NW/SE direction. No USTs were identified in these exploratory holes.

Additional excavation were then undertaken in a second area to the rear (west) of the car wash development to try and locate the tanks (based on anecdotal evidence). This area is located **off-site**, adjacent to the west of the subject site boundary. A visual



inspection of the area identified a manhole cover which when lifted contained infrastructure consistent with a UST fill point.

Two cylindrical tanks were identified beneath the concrete. The tanks measured approximately 1.8m in diameter and are estimated to be 10m in length. The depth to the top of the tank was estimated to be 1.7m bgl. **No evidence of corrosion, damage or loss of integrity.** No visual or olfactory evidence of hydrocarbon contamination associated with tanks was observed (no odour or elevated PID readings).

Chemical assessment of soil samples taken from the base of the excavation on three sides of the tank confirmed that TPH concentrations within the soils were low and below the screening values for a commercial end use.

Groundwater Results

Borehole BH201 was located to the southwest of the car wash site.

Groundwater leachate testing of recovered soils from BH201 identified elevated level of lead, nickel and zinc within the samples from BH201. No TPH, BTEX PAH or VOCs were identified. The report concluded that metals have the potential to be liberated from made ground within BH201.

Groundwater was identified at 20.15m bgl, chemical analysis identified elevated levels of Boron and Nickel.

The report concluded that

“Overall site investigation works (drilling of BH201) identified that groundwater was present beneath the subject site at depth of 21m bgl in close proximity to the interface between the base of the infilled Made Ground and top of the natural chalk strata. During return groundwater monitoring, no significant impacts from contamination were identified by visual or olfactory assessment.

The leachate testing, undertaken to ascertain whether contaminants identified in the infilled ground had the potential to impact groundwater, has identified that metals (lead, nickel and zinc) within the Made Ground were readily leachable. However, concentrations of these metals in leachate were only **marginally** in excess of the WQS and do not indicate a significant



potential to impact groundwater quality. It is also noted that whilst nickel has been identified as a contaminant of concern by leachate testing; Made Ground is not a significant source of this contaminant. Previous chemical assessments undertaken by Brownfield Solutions Ltd of 11 samples identified consistently low concentrations ranging from 4.2 to 53 mg/kg. Nonetheless, the infilled Made Ground has the **potential** to impact groundwater quality if conditions exist that enable or enhance the leaching of soils”.

“Considering that the groundwater data recovered demonstrates lower concentrations of contaminants than the leachate assessment, this supports the observation that the existing site conditions, which largely prevents infiltration of surface water, is assisting in preventing the deterioration of groundwater quality. “

The report finally concluded that a closed drainage system allowing no infiltration of surface water through the infilled ground would be suitable at protecting the principal aquifer. A clean cover system to all soft landscaped areas and the use of barrier pipe work for all mains water connections.



Site Walkover

A site walkover was undertaken on the 1st July 2026 and confirmed much of what had already been identified from the information obtained on the site. The photographs in Appendix 4 provide some indication of the current layout and condition of the site.

The site is accessed from Vale Road. The site was unoccupied at the time of the visiting as was the wider industrial site with the exception of southeast corner which was occupied by a shed retail company.

Residential properties are located to the far side of the road and the railway line is present to the south of the wider industrial estate. To the north a car repair and tyre fitting centres occupy part of the large building.

The site has asphalt surface around the west, south and east boundary with a thick concrete base in the centre and to the northern boundary.

No signs of contamination, discoloration or olfactory evidence, dead or dying vegetation were seen during the walkover.

The current owners are unaware of any issues on site which could have led to contamination.



Conclusions

The previous reports were conducted with a view to place residential housing on the site. The current scheme is for a commercial car wash.

Potential Contaminants

Following a review of the information gathered on the history of the site, and from the previous investigations into the contamination present along with a recent a site walkover. Potential contamination has been identified on site that may impact on the proposed future development of the small area of the car wash and principal aquifer.

Potential contaminants include the presence of PAH at a shallow depth, principally benzo(a)pyrene impact on human health while the potential heavy lead levels present a potential risk to both human health and leaching into the ground water.

Receptors and Pathways

Potential receptors which may be affected by any unknown contamination on site will include:

- Construction workers who are likely to be affected by any potential contamination as they will initially be working in the ground and are likely to be the ones who unearth any potential contaminants.
- Future users of the site, including staff and visitors to the site. For the purpose of evaluating any effects from any contamination found during any intrusive investigation future users/visitors to the site should be regarded as an adult female.
- The underlying groundwater which may be contaminated by migrating pollutants present on the site. There is also the potential for further pollution of the groundwater or the watercourse from disturbing any potential contaminants on site.

The pathways by which these receptors may be exposed to any unforeseen potential contamination will include:

Construction workers

- Inhalation, of gases or vapours released during ground work or fine particles.



- Ingestion of the contaminants, principally from cross contamination with contaminated soil and inadequate hand washing before smoking and eating.
- Absorption through the skin following contact with contaminated soil.

Future users and visitors

- Inhalations of gas/vapours or fibres, particularly if these are allowed to enter the new structures through the ground and build up in an enclosed area.
- Ingestion of contaminants, through the ingestion of contaminated soil from the garden area via direct contact, e.g., playing in the garden.
- Absorption of contaminants from dermal contact with contaminated soil.

Groundwater

There is a potential for any contaminants to migrate through the ground into the groundwater and aquifer.

Neighbouring sites

If present on site contaminants have the potential to migrate to neighbouring sites through ground water or air blown transfer.



Conceptual Model

The table represents a basic conceptual model. It highlights the potential sources of pollutants identified from the gathered information, and potential pathways in which any contaminants could reach the identified receptors.

Pathway	Description	Identified sources	Receptor at risk	Probability	Consequence	Risk
1	Run off and seepage into groundwater from any spillages	Historic site use	Groundwater	Low likelihood	Mild	Low
2	Migration of gases into the building.	N/A	Future users	-	-	-
3	Inhalation of gases/ vapours outside	Ground gas (none found during monitoring)	Construction workers/future users	Unlikely	Minor	Very Low
4	Inhalation of fine particles	Infilled / made ground	Construction workers	Low likelihood	Mild	Low
5	Direct ingestion of contaminated soil	Infilled / made ground	Construction workers	Low likelihood	Medium	Moderate/ low
6	In-direct ingestion of contaminated soil	Infilled / made ground	Future users	Unlikely	Mild	Very low
7	Absorption via direct dermal contact with contaminated soil	Infilled / made ground	Construction workers	Low likelihood	Mild	low



		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

Recommendations

Human Health

The site will be a commercial car wash, current plans will see a hardstanding across the site with the only area of soft land scaping being along the eastern boundary of the site.

A new drainage system will be installed on site, as such construction workers will be excavating the shallow layer of the site.

The following works are to be undertaken.

- Removal of the current surface cover of the site,
- excavation of trenches for new mains water connections, aco drains, the silt trap, and the three stage separator. These to be bedded on clean imported stone and backfilled with clean imported material.
- Any identified contaminated material to also be excavated and the excavation backfilled with clean imported material.
- A new impermeable surface to be applied to the site. This should be reinforced to ensure no structural degradation over time and will include anchors / foundation for the proposed canopies and acoustic screens.

The following measures shall be undertaken through the ground works.

- **Construction workers must take reasonable precautions to prevent contact with contaminated ground, adequate welfare facilities must be provided to enable construction workers to wash hands etc while at work and before eating or drinking.**
- **Any excavated material must be suitably stored in a protected, bunded and covered area awaiting removal from site to a suitable licensed waste facility, in order to prevent further contamination and run-off. Appropriate waste transfer notes obtained and retained for the waste as its removed from site.**



- Any mains water connections should be constructed from barrier pipework to prevent leaching into the water supply and should be installed within clean trenches, backfilled with clean imported material.
- Photographic evidence should be retained of all excavations.
- An impervious hardstanding shall be applied across the site, this will prevent further users of the site coming into contact with any contaminants.

Ground Water

Ground water has been identified at a depth of 21m bgl, with contamination in the form of heavy metals with a leachate potential located above this level elsewhere on the wider industrial site. In relation to the development area the installation of a closed drainage system followed by hardstanding across the site. This will prevent surface water on site from infiltrating the ground, the water being collected, stored and possibly reused as part of the operations but ultimately being disposed off into the foul drainage system. This removes the potential for any on-site buried contamination to leach into the aquifer.

Recommendations are therefore:

- A closed drainage system for all surface water collected on site
- An impervious hardstanding across the whole site to prevent infiltration of any surface water across the site (Vegetation to the front of the site will need to be within planting containers).

The above remediation measures will break the source-pathway-receptor pollutant linkages, ensuring that the site is safe for use and the identified receptors protected

It is further recommended that a **watching brief** is maintained throughout the construction of the new building and any signs of potential contamination found are fully investigated, with appropriate remedial action taken as necessary and the local planning authority informed of the findings.

Figure 1 – Aerial Photograph





Appendix 1 – Brownfield Solutions – Phase I Report

See Separate Documents



Appendix 2 – Brownfield Solutions – Phase II Report

See Separate Document



Appendix 3 – Lustre Consulting Phase II Report

See Separate Document

Appendix 4 – Site Walkover Photographs

Western boundary of the site looking south



Southern boundary of the site looking east



and then west



Eastern boundary of the site looking north then south



Northern boundary looking west and east



The central concrete standing looking south to north



Looking across the site from the northwest to southeast corners



Looking from the northeast to southwest corner





Appendix 5 – Conceptual Model Risk Assessment

A Preliminary Risk Assessment is usually undertaken as part of a desk study, outlines potential risks posed by potential contamination to all receptors by defining plausible “pollution linkages” and developing a preliminary conceptual model (PCM).

The purpose of this model is to define all possible complete pollution linkages, where the requisite source – pathway – target elements are present, and these elements being defined as:

- a contaminant (source) is a hazardous substance or agent, present at levels that have the potential to cause harm or damage a receptor
- a pathway is the means by or through which a contaminant comes into contact with, or otherwise affects, the receptor
- a receptor (target) is an entity (human being, aquatic environment, flora and fauna etc) that is vulnerable to the adverse effects of the contaminant

This relationship is termed a “pollution linkage”. It should be recognised that for a health or environmental risk to exist, all three elements of the relationship or linkage must be present, i.e.

- if there is no contaminant, or contaminant present at levels below those considered to be harmful or damaging to a receptor, then there can be no adverse effect on a receptor
- if there is no receptor present that can be adversely affected by a contaminant, no harm or damage can arise
- even where both a contaminant and a receptor are present, no harm or damage will occur if there is no pathway by or through which a linkage between the two can be established

The absence of one or more of each component (source, pathway, receptor) would prevent a pollutant linkage being established and there would be no significant environmental risk.



Consequence of Risk

CLASSIFICATION	DEFINITION	EXAMPLES
Severe	Highly elevated concentrations likely to result in "significant harm" to human health as defined by the EPA 1990, Part 2A, if exposure occurs. Equivalent to EA Category 1 pollution incident including persistent and/or extensive effects on water quality; leading to closure of a potable abstraction point; major impact on amenity value or major damage to agriculture or commerce. Short term risk of pollution of sensitive (H1/H2) water resource. Major damage to aquatic or other ecosystems, which is likely to result in a substantial adverse change in its functioning or harm to a species of special interest that endangers the long-term maintenance of the population. A short term risk to a particular ecosystem, or organism forming part of such ecosystem. Catastrophic damage to crops, buildings or property.	Significant harm to humans is defined in circular 01/2006 as death, disease, serious injury, genetic mutation, birth defects or the impairment of reproductive functions. Major fish kill in surface water from large spillage of contaminants from site. Highly elevated concentrations of List I and II substances present in groundwater close to small potable abstraction (high sensitivity). Explosion, causing building collapse (can also equate to immediate human health risk if buildings are occupied).
Medium	Elevated concentrations which could result in "significant harm" or "significant possibility of significant harm" to human health as defined by the EPA 1990, Part 2A if exposure occurs. Equivalent to EA Category 2 pollution incident including significant effect on water quality; notification required to abstractors; reduction in amenity value or significant damage to agriculture or commerce. Pollution of a highly sensitive (H1/H2) water resource. Significant damage/change to aquatic or other ecosystems, which may result in a substantial adverse change in its functioning or harm to a species of special interest that may endanger the long-term maintenance of the population. Significant damage to crops, buildings or property.	Significant harm to humans is defined in circular 01/2006 as death, disease, serious injury, genetic mutation, birth defects or the impairment of reproductive functions. Damage to building rendering it unsafe to occupy e.g. foundation damage resulting in instability. Ingress of contaminants through plastic potable water pipes.
Mild	Exposure to human health unlikely to lead to "significant harm". Equivalent to EA Category 3 pollution incident including minimal or short lived effect on water quality; marginal effect on amenity value, agriculture or commerce. Pollution of moderately sensitive (M1/M2) water resources. Minor or short lived damage to aquatic or other ecosystems, which is unlikely to result in a substantial adverse change in its functioning or harm to a species of special interest that would endanger the long-term maintenance of the population.	Exposure could lead to slight short-term effects (e.g. mild skin rash). Surface spalling of concrete.



	Significant damage to crops, buildings, structures and services ("significant harm" as defined in Circular 1/2006).	
Minor	No measurable effect on humans. Equivalent to insubstantial pollution incident with no observed effect on water quality or ecosystems. Repairable effects of damage to buildings, structures and services. Pollution of low sensitive (L1/L2) water resource. 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 and services.	The loss of plants in a landscaping scheme. Discoloration of concrete.



Probability of Risk Occurring

CLASSIFICATION	DEFINITION	EXAMPLES
High Likelihood	There is pollutant linkage and an event would 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.	a) Elevated concentrations of toxic contaminants are present in soils in the top 0.5m in a residential garden. b) Ground/groundwater contamination could be present from chemical works, containing a number of USTs, having been in operation on the same site for over 50 years.
Likely	There is pollutant 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.	a) Elevated concentrations of toxic contaminants are present in soils at depths of 0.5-1.0m in a residential garden, or the top 0.5m in public open space. b) Ground/groundwater contamination could be present from an industrial site containing a UST present between 1970 and 1990. The tank is known to be single skin. There is no evidence of leakage although there are no records of integrity tests.
Low Likelihood	There is pollutant linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a long period such an event would take place, and is less likely in the shorter term.	a) Elevated concentrations of toxic contaminants are present in soils at depths >1m in a residential garden, or 0.5-1.0m in public open space. b) Ground/groundwater contamination could be present on a light industrial unit constructed in the 1990s containing a UST in operation over the last 10 years – the tank is double skinned but there is no integrity testing or evidence of leakage.
Unlikely	There is pollutant linkage but circumstances are such that it is improbable that an event would occur even in the very long-term.	a) Elevated concentrations of toxic contaminants are present below hardstanding. b) Light industrial unit <10 yrs old containing a double skinned UST with annual integrity testing results available.

Calculation of Risk

		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



Appendix 6 - Report limitations and exclusions

Basis of Risk Assessment

The methods used follow a risk-based approach with the potential risk assessed using the 'Source – pathway – receptor pollution linkage concept.

Limitations and Exceptions of this Report

This report was undertaken for at the request of Design Solutions and as such should not be entrusted to any third party without written permission of **Martin Environmental Solutions**. No other third parties may rely upon or reproduce the contents of this report without the written permission of **Martin Environmental Solutions**. If any unauthorised third party comes into possession of this report, they rely on it at their own risk and the authors do not owe them any duty of care or skill.

This report has been compiled from a number of sources, within the time constraints of the programme, which **Martin Environmental Solutions** believes to be trustworthy. However, **Martin Environmental Solutions** is unable to guarantee the accuracy of information provided by third parties.

The findings and opinions provided in this document are made in good faith and are based on data provided by third parties (Groundsure, Environment Agency, The Coal Authority, and Regulatory Bodies) and the report should be read in conjunction with the limitations on the document control form. The accuracy of map extracts cannot be guaranteed and it should be recognised that different conditions on /adjacent to the site may have existed between and subsequent to the various map surveys.

This report is prepared and written in the context of the purposes stated above and should not be used in a different context. Furthermore, new information, improved practices and legislation may necessitate an alteration to this report in whole or in part after its submission.

The conclusions and recommendations of this report are based on the development described, for any other development the report may require revision.

All of the comments and opinions contained in this report, including any conclusions, are based on the information obtained by **Martin Environmental Solutions**. The conclusions



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The report should be read in its entirety, including all associated drawings and appendices.

Martin Environmental Solutions cannot be held responsible for any misinterpretations arising from the use of extracts that are taken out of context.

This report does not comprise a geotechnical assessment of the strata underlying the site.

Any borehole data from the British Geological Survey sources is included on the following basis: 'The British Geological Survey accept no responsibility for omissions or misinterpretations of the data from their Data Bank as this may be old or obtained from non-BGS sources and may not represent current interpretation'.

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Any risks identified in a Phase I Desk Study Report are perceived risks. Actual risks can only be assessed following a physical investigation of the site.

The findings of this report are based on finite information obtained from research and consultations. Martin Environmental Solutions cannot guarantee the reliability of all such information and the searches should not be considered exhaustive. The findings of the report may need to be reviewed as any future exploratory investigations progress and in the event that additional archive information becomes available.

Notwithstanding the findings of this study (and any subsequent investigations), if any indication of contaminated soil (visual or olfactory) is encountered at any stage of the development further investigation may be required.



Arboricultural Survey and advice on arboricultural issues are considered to be outside the scope of this report except for their effect on the foundations to the proposed buildings.

Where identification of any species is made, especially invasive plants such as Japanese Knotweed, Himalayan Balsam or Giant Hogweed, this should only be considered as a preliminary assessment and subject to confirmation by a professional Arboriculturist. Martin Environmental Solutions takes no responsibility for failing to identify, or the incorrect identification of, any tree or plant species on site.

Our investigations exclude surveys to identify the presence or indeed absence of asbestos in buildings/infrastructure on site. If asbestos is suspected to be present, we recommend specialists in the identification and control / disposal of asbestos are appointed prior to commencement of any works on site or, if appropriate, purchase of the site. The presence of asbestos on site may have considerable effects on the cost / timescale in developing the site. There is good guidance in relation to Asbestos available on the Health and Safety Executive (HSE) web site.

Whilst a site walkover has been undertaken as part of this report, the survey does not constitute either an asbestos or structural survey and all areas of the site may not have been visited / inspected.