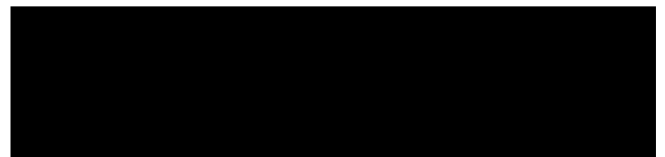




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Preliminary Contamination Risk Assessment

PROPOSED REDEVELOPMENT OF DEPOT AND GARAGE BUILDINGS
LOCATED AT 46A TO 47 PIER ROAD,
LITTLEHAMPTON,
BN17 5LW

Consultant:

Mr Wood BEng. MSc. IEMA.

Consultant in Contaminated Land

Report Ref: 19CLR4622CW

Report Date: 9th December 2019



Executive Summary

Reports 4 Planning have been commissioned by Mr Robert Luff of Robert Luff and Co. to undertake a Preliminary Risk Assessment of a commercial property located at 46A to 47 Pier Road, Littlehampton, BN17 5LW.

The site is located on Clifton Road close to Pier Road to the south of Littlehampton. The tidal River Arun is located 30m to the west with the high tide of the English Channel located 500m to the south. The building has for the last fifty years at least been used as a garage where the servicing and repair of cars is undertaken as well as more recently some car wash operations. Other buildings include three smaller garages used for storage and a larger workshop which appears to be currently empty. It is proposed that the existing buildings are demolished and a new commercial and residential unit built.

In order to proceed with the funding application and planning application for the site an assessment is required of the risk posed by potential contamination. The process of assessing any risk from potential contamination is begun with the preparation of a Phase I Deskstudy and Preliminary Risk Assessment. This report aims to fulfil this purpose by identifying and assessing any potential contamination affecting the site in accordance with DEFRA's and the Environment Agency's 'Model Procedures for the Management of Land Contamination (CLR 11)' and NPPF (particularly paragraphs 109 (fourth and fifth bullet points) and 120 of this document).

The purpose of the Preliminary Risk Assessment is to develop an initial conceptual model of the site and establish whether or not there are potentially unacceptable risks posed by contaminative sources from either historical or current, and either on-site or off-site previous land uses which may be affected by the proposed development. Using recognised national guidance, a Desktop Study has been undertaken on the site utilising many different information sources to gain an understanding of any historical or current risks to the site.

Following a site walkover conducted on 25th November 2019 a conceptual model of the site was developed which demonstrates significant potential pollutant linkages and through the risk assessment it has not been possible to prove that the site is uncontaminated for the proposed end use at this time. This relates to the historical siting of gas holders on site and more recent use of the site as a depot and garaging. At least one (and possibly more) tanks have been located on site as indicated in local authority datasets and on historical mapping since 1984. Minor staining is observed within the current building and there is the possible infilling of underground inspection pits. Some areas of the site were inaccessible during the site reconnaissance visit and so these areas also require further inspection.

Therefore further work is required in order to confirm and characterize the presence or otherwise of contamination on site. This will take the form of an intrusive investigation and further generic or detailed risk assessment. If the pollutant linkages are confirmed as unacceptable then some form of remediation will be required. Should this be required, we believe that given the size of the site that the level of remediation should be viable, being relatively simple and low key.

The report is based on the assumption by the author that the Local Planning Authority will follow guidance detailed in the NPPF where for all development involving disturbance to land, the LPA would impose a Condition requiring the reporting of all other instances of contamination currently unreported found during the course of development. Should instances of previously unreported contamination be found then the submission for approval of an assessment of the risks and proposed remediation scheme will be submitted to the Local Planning Authority.

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1.0 INTRODUCTION

Reports 4 Planning have been commissioned by Mr Robert Luff of Robert Luff and Co. to undertake a Preliminary Risk Assessment of a commercial property located at 46A to 47 Pier Road, Littlehampton, BN17 5LW.

The site is located on Clifton Road close to Pier Road to the south of Littlehampton. The River Arun is located 30m to the west with the high tide of the English Channel located 500m to the south. The building has for the last fifty years at least been used as a garage where the servicing and repair of cars is undertaken as well as more recently some car wash operations. Other buildings include three smaller garages used for storage and a larger workshop which appears to be currently empty. It is proposed that the existing buildings are demolished and a new commercial and residential unit built.

As part of the planning application process it has been requested that a contamination assessment is prepared and submitted. The purpose of this Phase I Deskstudy and Preliminary Risk Assessment report is to gather information on the site to develop an initial conceptual site model (CSM) and establish whether or not there are any potentially unacceptable risks posed by either current or historical use of the land or the surrounding area which may affect the proposed development. The consultant who has prepared this report is a Contaminated Land Consultant with over fifteen years' experience in Brownfield Development, Contaminated Land, Risk Assessment, and Land Condition Surveys. He is a member of the Institute of Environmental Management and Assessment. The Preliminary Risk Assessment report was undertaken based on Desk Study findings utilising publically available data, along with data sourced directly and indirectly from various providers including the Environment Agency, the Local Authority, the British Geological Survey, The Coal Authority and Ordnance Survey. This has allowed characterization of the site with respect to its Geology, Hydrology, Hydrogeology, History and Environmental Setting. The Site Characterisation has been undertaken in general accordance with the procedures identified within CLR11 – Model Procedures for the Management of Land Contamination (Environment Agency – but now officially withdrawn), R & D Publication 66:2008, *BS10175 Investigation of potentially contaminated sites: Code of Practice* and the Environment Agency's *Guiding Principles for Contaminated Land (GPLC 1 & 2) 2010*.

Predominantly these procedures relate to 'past' contamination, and assume that legislative controls such as Pollution Prevention and Control authorisations control current potentially polluting activities. Emphasis is therefore upon historic site use and how this may affect potential future users of the site should the proposed development plans be realised. In accordance with CLR11 a Preliminary Environmental Risk Assessment contained in this report has considered all the relevant Receptors, potential Pathways, and Sources of contamination and assessed these for the level of risk posed to the site and future site users. In accordance with current guidance the information has been used to develop a Conceptual Site Model (CSM) for the site. All Pollutant Linkages must be present and the consequent linkage must be established in order to determine the requirement and scope of any future geo-environmental investigation.

Reasonable skill and care has been exercised in preparation of this report in accordance with the technical requirements of the brief. Notwithstanding the efforts made by the professional team in undertaking this contamination assessment, it is possible that ground conditions other than that potentially indicated by this report may exist at the site.

2.0 SOURCES OF INFORMATION

This report draws upon many different information sources in order to gain a full understanding of the environmental setting of the site. These are summarized below:

2.1 Internet Sources

- British Geological Survey Borehole Database
- Environment Agency Pollution Inventory Database
- Multi-Agency Geographic Information for the Countryside Database
- 1:50,000 British Geological Survey Digital Map of Great Britain
- www.old-maps.co.uk

2.2 Reports

- Groundsure Dataset Report, GS-6505001
- Groundsure Historical Maps, GS-6505002;

2.3 Site Observations

- Site observations have been made during 25th November 2019 and photographic evidence is provided in Appendix B.

3.0 SITE RECONNAISSANCE

3.1 Site Location

The proposed development site is located on Clifton Road to the back of Pier Road in Littlehampton, BN17 5LW.

The site is located at Grid Reference 502785, 101699.

Figure 1 Site Location Plan and Figure 2 Aerial Photograph shows the location of the site in relation to its surrounding land uses. Figure 3 shows existing site plans.

3.2 Site Access

The site can be accessed directly from Clifton Road across the southern and western boundary of the site.

3.3 Site Description

The proposed development site is irregular in shape and measures 0.0638ha in size. There are a number of buildings on site, of which the largest is Littlehampton Garage located in the eastern section of the plot. This single storey building is brick built with a wooden roof frame and sloping flat roof. The building is surfaced with concrete throughout. Large openings on the southern elevation provide vehicular access inside the building where a number of cars are seen under repair and restoration. Car ramps, and potential evidence of former inspection pits can be seen. A small area to the north of the main workshop again provides a maintenance area for one car and a small kitchen. The building has numerous examples of materials storage including car parts and some containerised fuel, waste oil and detergents.

Further along Clifton Road towards Pier Road there is another depot/workshop with a high door access. This building has an external open concreted yard which appears to be unused. This building was inaccessible at the time of survey.

Located in the western side of the plot are three garages, which again were inaccessible at the time of survey which one would assume would be used for storage. There are some external areas of the site surfaced to concrete.

An aerial photograph showing the site is provided as Figure 2 with photographs taken during the site reconnaissance visit provided in Appendix A.

3.3.1 Site Topography

The site relatively flat with no discernible changes in topography.

3.3.2 Structures

No detailed building survey was completed as part of this assessment, however buildings appeared to be structurally sound with no obvious failings indicative of failing ground conditions.

3.3.3 Surfacing

All internal and external areas of the site have been inspected. Some minor staining of the concrete is seen within the garage area itself. The concrete area outside the garages appears to have been well used, however no significant staining could be seen.

3.3.4 Vegetation

There is little to no managed vegetation present at the site.

3.3.5 Underground and Aboveground Storage Tanks

No evidence of any above or underground storage tanks are currently present on the site. It is noted from the historical mapping that an above ground tank did in recent times be located in front of the three smaller garage in the western section of the site. However this is no longer present. Steel strips located within the concrete floor within the garage perhaps indicate the presence of former inspection pits which have since been infilled.

3.3.6 Raw Material and Chemical Use and Storage

The site contains of some stored cars. Other materials observed include some small quantities of waste oil, petrol plastic containers, paints and detergents.

3.3.7 Solid Wastes

Solid materials include waste oil contained in containers. Other wastes include old car filters and batteries.

3.3.8 Hazardous and Industrial Waste

Materials include waste oil contained in containers. Other wastes include old car filters and batteries.

3.3.9 Air Emissions

No evidence of significant air emission sources was observed.

3.3.10 Wastewater / Sewers

It is understood that mains drains are located beneath the site and evidence of inspection covers etc are present within the site boundary externally.

3.3.11 Stormwater

Stormwater appears to enter the ground but its destination is unknown.

3.3.12 Asbestos Containing Materials (ACM)

No certified asbestos survey was undertaken as part of this assessment. It is possible that asbestos is present within the cement bonded sheets on the roof of the garages and possibly within the fabric of the building itself.

3.3.13 Polychlorinated Biphenyls (PCBs)

PCBs were historically used as a dielectric filler liquid in some types of large scale transformers, switchgear, capacitors and the starter units in some fluorescent lights and fractional horsepower motors. Typically these are large pieces of electrical equipment commonly found on power lines. They were used because of their good electrical insulation properties, fire resistance and chemical stability. An international agreement in 1986 (EU Directive 96/59/EC) banned most of these uses and agreement was also reached to phase out remaining uses and safely dispose of PCBs by the end of 2010. It should be

assumed that any large scale capacitor or transformer made before 1976 contains PCBs unless it is known otherwise. PCBs are known to harm the environment and can damage health.

3.3.14 Ionising Radiation

No evidence of Ionising Radiation sources were made at the site.

3.3.15 Spills and Releases

Minor staining is observed within the garage on the concrete slab. Little to no evidence observed externally, although some areas of the site were inaccessible for inspection.

3.4 Surrounding Land Use

3.4.1 North

The site is bordered to the north by residential property and other small buildings used for storage.

3.4.2 East

The site is bordered to the east by Clifton Road and further by residential property.

3.4.3 South

The site is bordered to the south by a Clifton Road and further by a cafe and other retail units on Pier Road.

3.4.4 West

The site is bordered to the west by retail units on Pier Road.

A selection of photographs showing the property is provided in Appendix A.

4.0 CURRENT LAND USES

4.1 Current Site Use

Part of the site is used by Littlehampton Garage who undertake car repair and car washing at the site. Other buildings include three small garages and a larger depot/workshop which was inaccessible at the time of reconnaissance visit.

4.2 Potentially Contaminative Current Surrounding Land Use

The following records of potentially contaminative sites are made within 250m of the site:

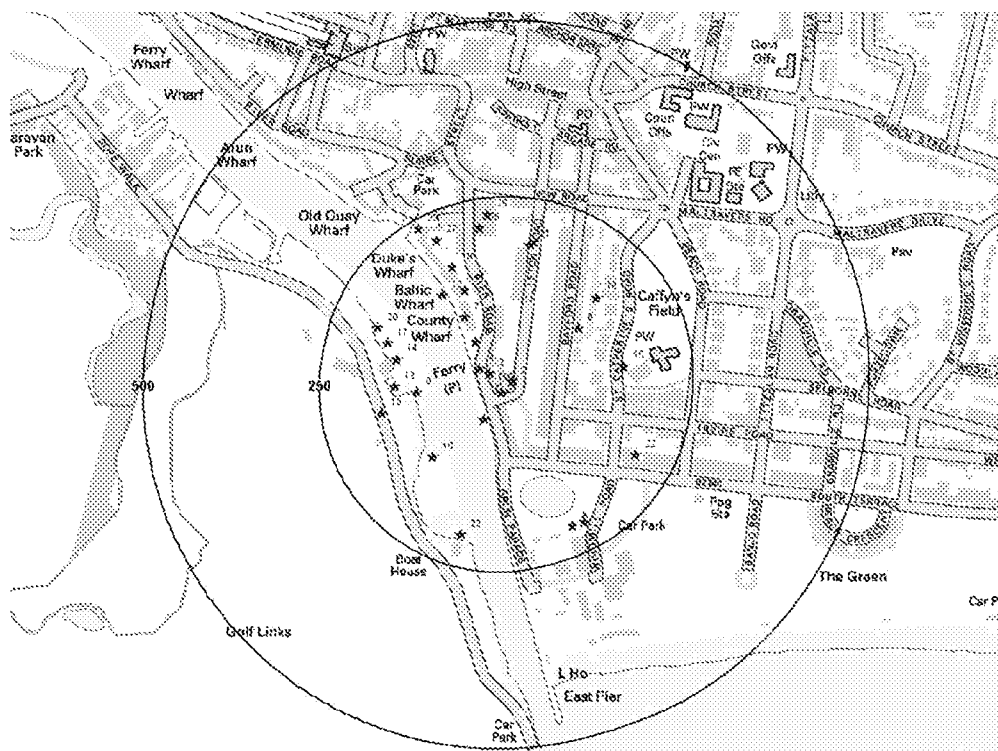


Table 1: Potentially Contaminative Current Sites

Distance (m)	Direction	Company	Activity
0	On site	Tank / Depot	Tanks
14	W	Works	Container and Storage
29	W	Ferry Terminal	Ferries
110	NE	Spraying	Signs
152	E	Electricity Sub Station	Electrical Feature
185	N	Electricity Sub Station	Electrical Feature
193	SE	Electricity Sub Station	Electrical Feature
208	SE	Electricity Sub Station	Electrical Feature

4.3 Petrol and Fuel Sites

There are no records of any active petrol filling stations within 500m of the site.

4.4 Underground High Voltage Electricity Cables and High Pressure Gas Transmission Pipelines

There are no records of any such feature within 500m of the site.

5.0 HISTORICAL LAND USES

5.1 Site and Surrounding Area Historical Land Use

5.1.1 Site Observational Evidence

The site is currently used as a garage and for other industrial use. There is no other evidence available to suggest, in the short term at least, that the site has been used for any other purpose.

5.1.2 Historical Maps Assessment

A number of historical maps have been reviewed for the site and reviewed for potential evidence which may indicate potentially contaminative land uses for either the site or surrounding land within 250m of the site. Copies of the historical maps are provided in Appendix B and are discussed below:

Table 2: Historical Land Use

Map Year (Scale)	Site Use	Surrounding Land Use
1879 (1:2,500)	The site appears to be developed and consists of a Gas Works. There is one large gas holder, and part of another, located in the western section of the site.	The following notable features / changes are observed: North: Ballast Wharf shown 100m north. Coal Wharf shown 130m north. Timber Wharf and Saw Mills shown 220m north. West: River Arun located 45m west. South: Large excavation shown 100m south – possible sand and gravel pit. Windmill shown 245m south. East: School shown 80m east.
1898 (1:500)	Site no longer shown as developed – former gas holders now removed. Not other buildings.	The following notable features / changes are observed: North: Large new Norfolk Saw Mill shown 100m north. Timber Yard shown 280m north west. Wharfs and docks remains north. East: General increase in housing stock east of site.
1912 (1:2,500)	No changes to the site observed.	The following notable features / changes are observed: North: Large tank shown 200m north. South: Pond shown 120m south.

		General increase in housing stock north and east of site.
1932 (1:2,500)	Site redeveloped to include a single large building covering most of the site area.	The following notable features / changes are observed: East: Allotment gardens shown 130m east.
1958 (1:2,500)	No significant change to site.	The following notable features / changes are observed: North: Mill 100m+ shown larger than before. Land use within 100m of the site residential and retail.
1968 (1:2,500)	Three smaller garage units appear in the western section of the site. Open yard to the rear.	The following notable features / changes are observed: North: Small builders yard shown 130m north. Small works site shown 25m north west.
1970 (1:1,250)	No significant changes shown to site.	The following notable features / changes are observed: South: Small electrical substation shown 110m south east.
1972 (1:1,250)	No significant changes shown to site.	No significant changes observed.
1978 (1:1,250)	No significant changes shown to site.	The following notable features / changes are observed: North: Large mill now shown as a timber yard. Further builders yard shown 210m north.
1984 (1:1,250)	Appears that a new building is located on site slightly smaller than before. Now no longer extends to footpath on the southern boundary. Site shown as a depot. Single reference to a tank located externally on southern elevation of wall.	No significant changes to the surrounding area observed.
1994 (1:1,250)	No significant changes shown to site.	No significant changes to the surrounding area observed.
2003 (1:1,250)	No significant changes shown to site. Tank remains.	No significant changes to the surrounding area observed.

Historical mapping shows that the site was developed in 1879 when two gas holder tanks were located on the site. These had been removed by 1898. The site was developed by 1932 with a building which remained until shortly after 1978. At this time the building covered the entire eastern section of the site and up to the boundary line along the southern boundary. Mapping of 1984 showed that a new building is present (or at least a

5.1.3 Potentially Contaminative Historical Uses

Table 3: Potentially Contaminative Historical Sites

Distance (m)	Direction	Activity	Date
0	On site	Gas Works	1876
52	NW	Wharf	1957
69	N	Ballast Wharf	1876
79	N	Wharf	1957
93	N	Sawmills	1932
124 - 209	NW	Wharf	1876- 1981
222	S	Corn Windmill	1910

The following records are made of historical tanks within 250m of the property.

Table 4: Historical Tanks

Distance (m)	Direction	Activity	Date
0	On site	Gas Works	1878
0	On site	Unspecified tanks	1994
193	N	Unspecified Tanks	1932
243	N	Unspecified Tanks	1912

5.1.5 Historical Energy Features Database

The following records of sites with historical energy features are known within 250m of the property.

Table 5: Historical Energy Features

Distance	Direction	Activity	Date
0	On site	Gas Works	1878
146	E	Electricity Sub Station	1994
153	NE	Electricity Sub Station	1994
198	SE	Electricity Sub Station	1984
207	SE	Electricity Sub Station	1994
210	SE	Electricity Sub Station	1994
246	N	Electricity Sub Station	1994

5.1.6 Historical Petrol and Fuel Sites

There are no records of any historical petrol and/or fuel sites within 500m of the property.

5.1.7 Historical Garage and Motor Vehicle Sites

The following records of sites with historical garage and motor vehicle sites within 500m of the property.

Table 6: Historical Garage and Motor Vehicle Sites

Distance	Direction	Activity	Date
339	N	Garage	1957
418	NW	Garage	1957
440	N	Garage	1957 - 1984

5.1.8 Historical Potentially Infilled Land

The following records of potentially infilled land are made for sites located within 250m of the site:

Table 7: Potentially Infilled Land

Distance	Direction	Activity	Date
52	NW	Unspecified Wharf	1938
69 - 79	N	Ballast Wharf	1876
86 - 94	S	Pits and Pond	1876 - 1896
125	S	Pond	1974
132m +	NW	Wharf	Various

5.1.9 Department of Environment (DEFRA) Industry Profiles

The old Department of Environment (now DEFRA) Profiles provide information on the processes, materials and waste associated with individual industries with regard to land

contamination. DOE Industry Profiles provide information on the processes, materials and wastes associated with individuals industries. They are not definitive studies but they introduce some of the technical considerations that need to be borne in mind at the start of an investigation for possible contamination.

6.0 GEOLOGY

6.1 Artificial and Made Ground

BGS records show that there are no potential deposits of artificial or made ground at or within 50m of the site.

6.2 Superficial and Drift Geology

The British Geological Survey 1:50,000 Geological Map of Great Britain shows that there are recorded deposits of raised beach deposits consisting of sand and gravel located within 50m of the site.

6.3 Solid Geology

The British Geological Survey 1:50,000 Geological Map of Great Britain shows that the solid geology beneath, or within 50m, of the site is recorded as being of the Lewes Nodular Chalk formation consisting of chalk.

6.4 Mining

Information provided by the Coal Authority indicates that the site is not located within 75m of a coal mining area.

6.5 Non-coal Mining

There are no non-coal mining features at or within 50m of the site boundary.

6.6 Brine Affected Areas

There are no brine affected areas within 75m of the site.

6.7 Shrink Swell

The maximum Shrink Swell Hazard for the site has been rated by the BGS as Negligible. Ground conditions are predominantly of a non-plasticity and no special actions are required.

6.8 Landslides

The maximum Landslide Hazard for the site has been rated by the BGS as Very Low. There is a possibility of slope instability problems after major changes in ground conditions.

6.9 Soluble Rocks

The maximum Soluble Rocks Hazard for the site has been rated by the BGS as Very Low. Significant soluble rocks are present but problems are unlikely.

6.10 Compressible Ground

The maximum Compressible Ground Hazard for the site has been rated by the BGS as Negligible. No special actions are required.

6.11 Collapsible Rocks

The maximum Collapsible Rocks Hazard for the site has been rated by the BGS as Very Low.

6.12 Running Sand

There is a very low potential for running sand problems if the water table rises or if sandy strata is exposed to water. No special actions are required.

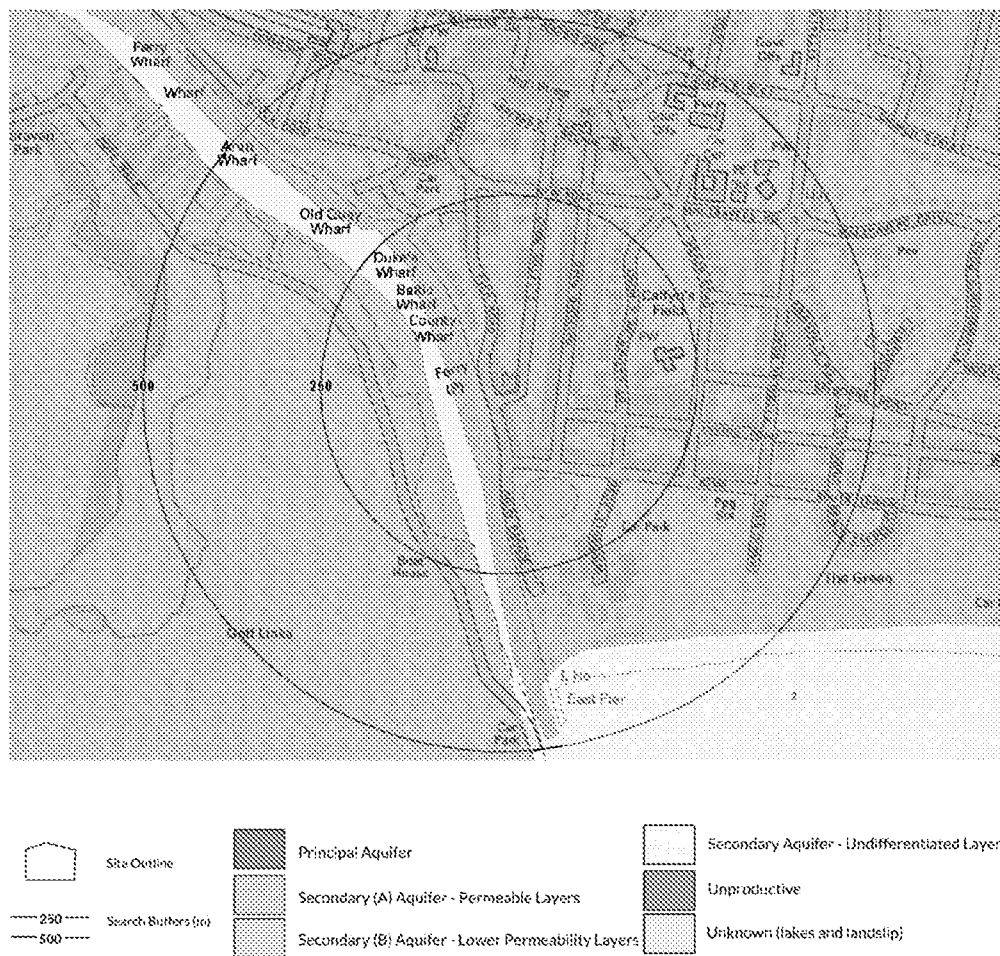
6.13 Radon

The Indicative Atlas of Radon in England and Wales as prepared by both the Health Protection Agency and the British Geological Survey shows that the site is located in a radon area as between 1% and 3% of properties are above the Action Level. No radon protection measures are necessary.

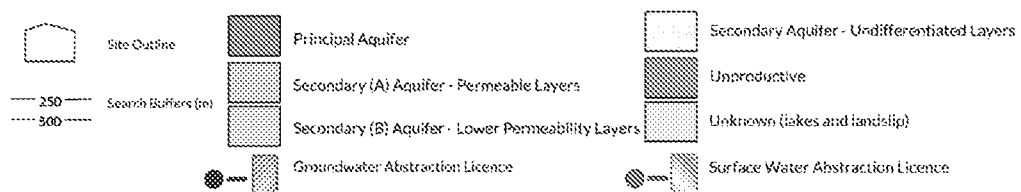
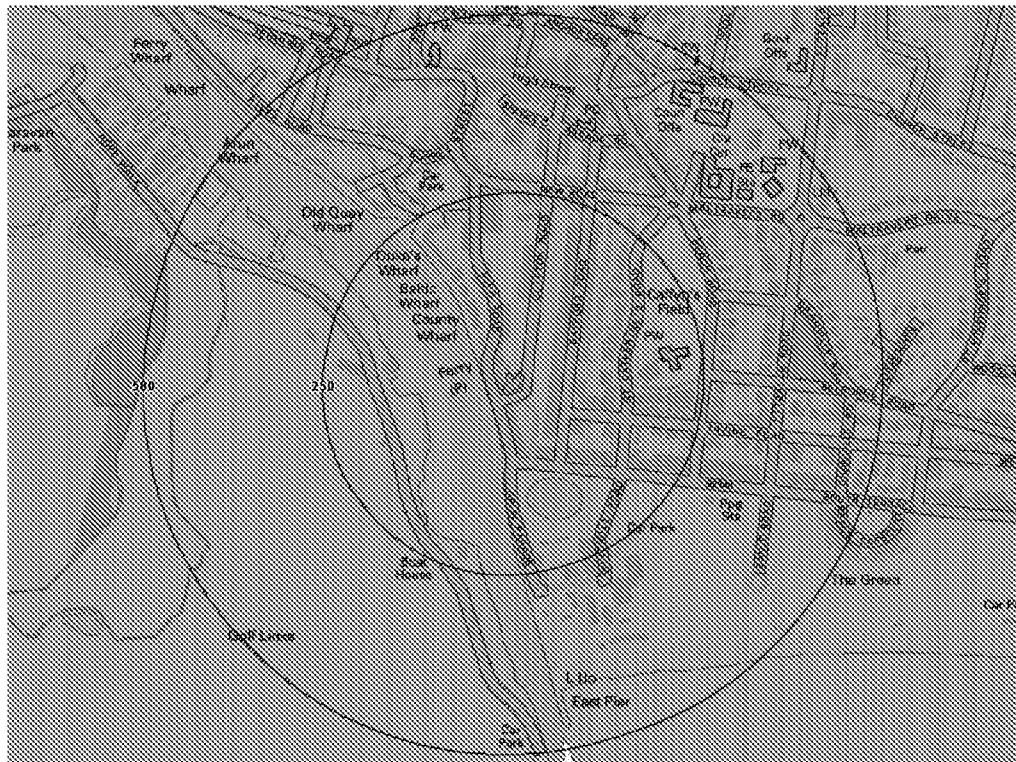
7.0 HYDROGEOLOGY

7.1 Groundwater Vulnerability and Soil Classification

The site is located on ground where a Secondary aquifer is present within the superficial deposits. This is a geology with permeable layers capable of supporting water supplies at a local rather than a strategic scale, and in some cases, form an important source of base flow to rivers.



The aquifer within the bedrock at the site is classed as a principal aquifer which is a geology of a high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. The major aquifer has a high leaching potential which is often assumed for sites located in urban areas.



7.2 Groundwater Abstraction Licences

There are no active groundwater abstraction licences issued for sites located within 1000m of the site.

7.3 Discharge Consents

There are no Red List Discharge Consents recorded in the Groundsure Report within 250m of the site.

The nearest licensed discharge consent has been issued for a site 48m NW of the site for treated effluent to tributary of River Rother.

7.4 Source Protection Zones

The site is not located in a total or inner source protection zone.

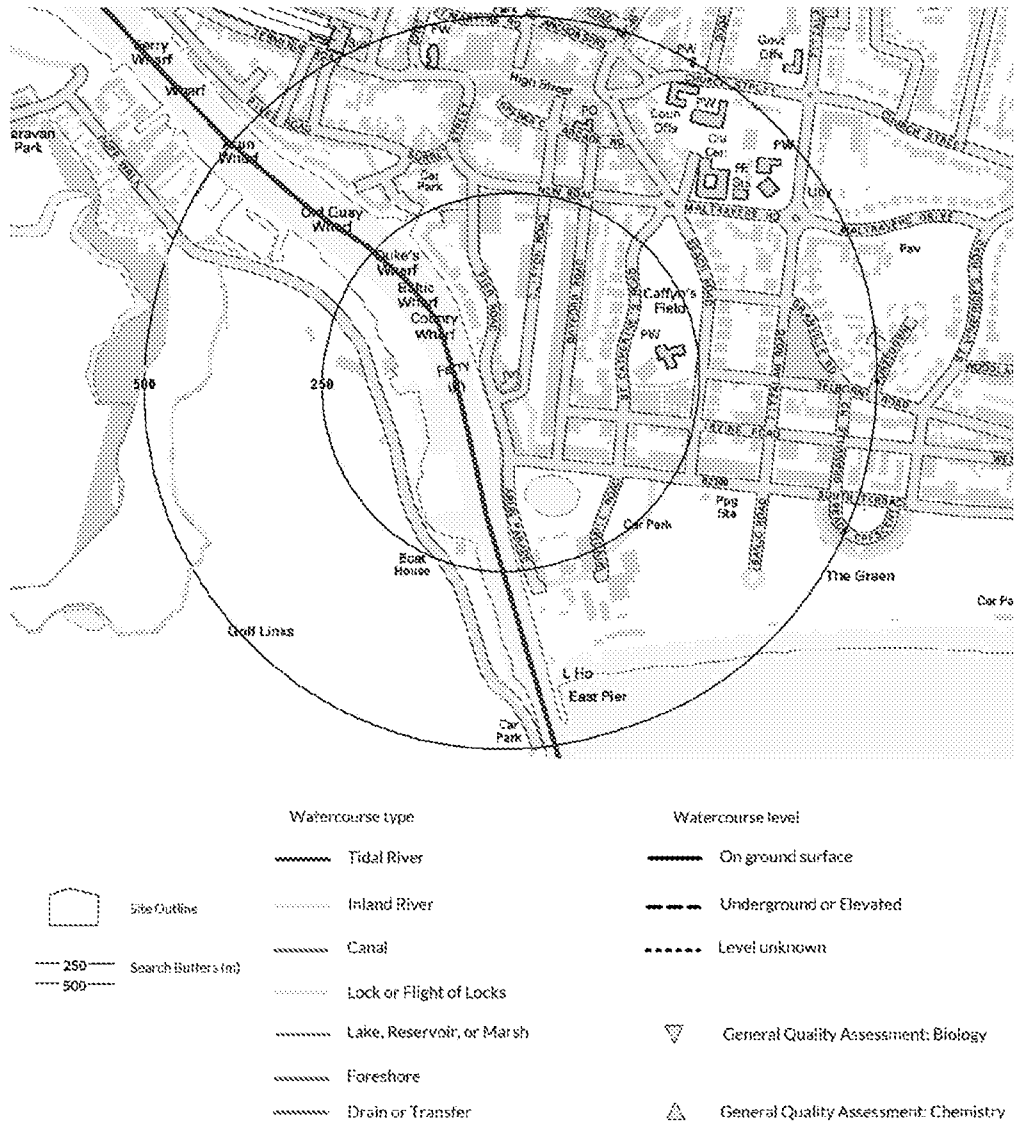
8.0 HYDROLOGY

8.1 Surface Waters

The nearest water feature is located 22m west of the site.

8.1.1 Main Rivers

The River Arun is located 58m west of the site.



8.1.2 River Quality

There is no river quality information available for any feature within 1,500m of the site.

8.2 Surface Water Abstraction Licenses

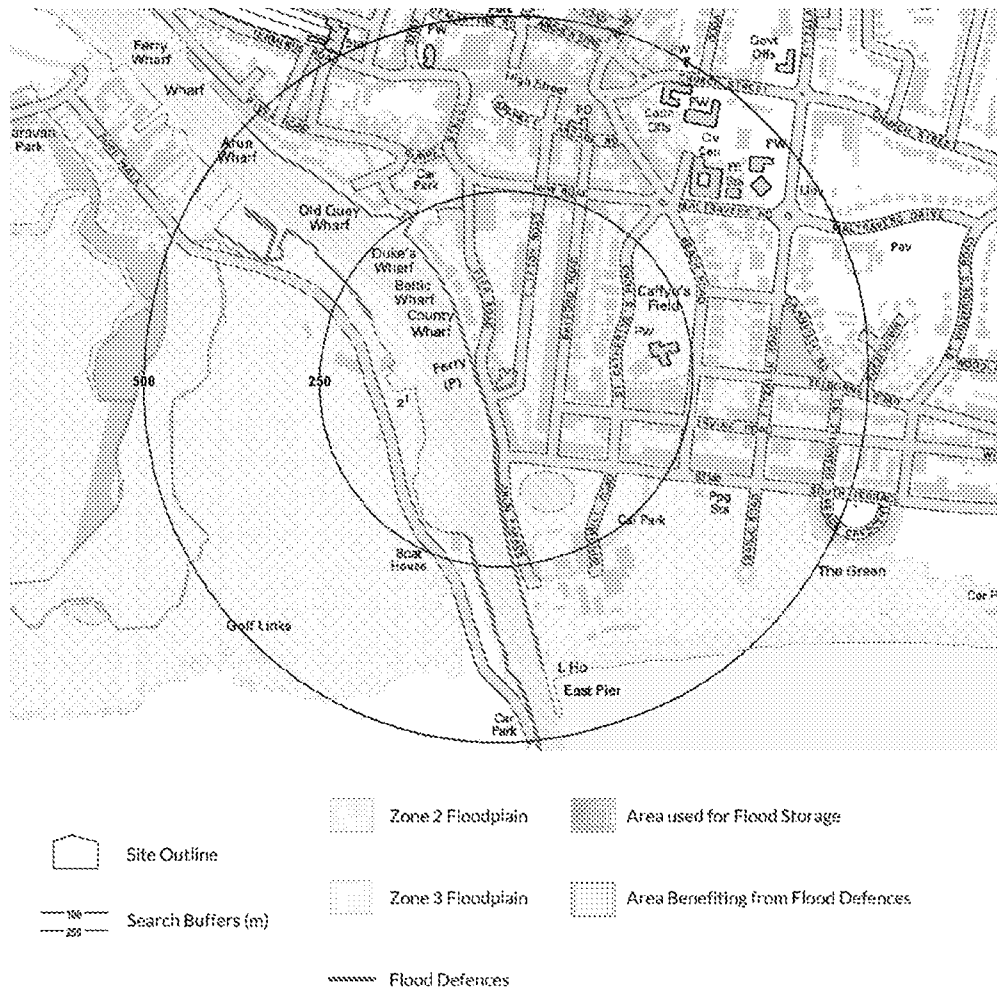
There are no active surface water abstraction licenses is located within 1,000m of the site.

8.3 Potable Water Abstraction Licenses

There are no active potable water abstraction licenses associated to sites within 2,000m of the site.

8.4 Flooding

8.4.1 Environment Agency Flood Protection Zones



The Environment Agency Flood map (from rivers and the sea) shows that the site is located within a Zone 2 and Zone 3 flood risk zone for fluvial (rivers).

Environment Agency/Natural Resources Wales Zone 2 floodplains estimate the annual probability of flooding as less than 1 in 1000 (0.1%).

Environment Agency/Natural Resources Wales Zone 3 floodplains estimate the annual probability of flooding as less than 1 in 100 (1%).

There is a Low (greater than 1 in 1000) risk of flooding on site.

8.4.2 Flood Defences

Flood Defences are present 22m west of the site.

There are no areas shown as benefiting from flood defences within 250m of the site.

There are no areas which are shown to benefit from flood storage within 250m of the site.

8.4.3 Groundwater Flooding Susceptibility Areas

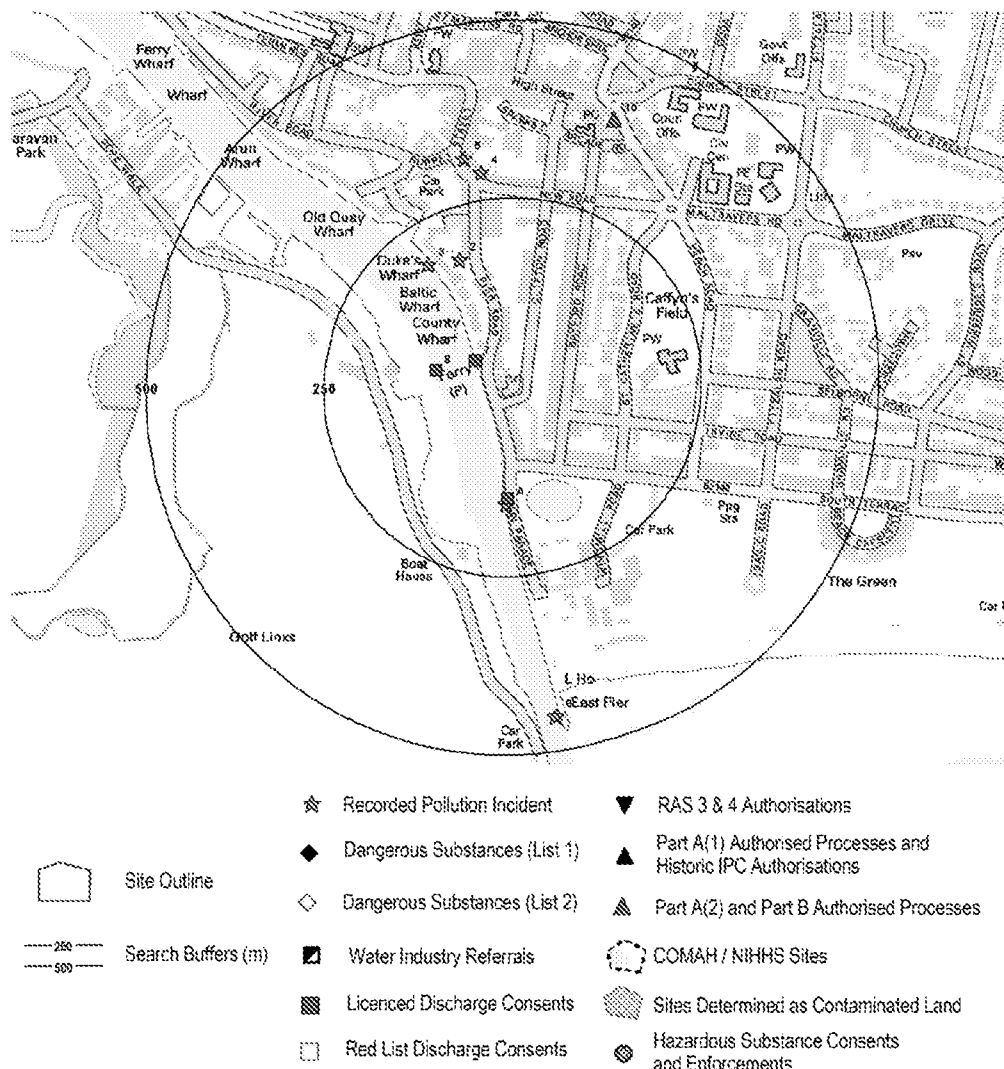
British Geological Survey shows that the site may be affected by Clearwater flooding which is associated with unconfined aquifers.

Where potential for groundwater flooding of property situated below ground level is indicated, this means that given the geological conditions there may be a groundwater flooding hazard to basements and other below surface infrastructure. Unless other relevant information, e.g. records of previous flooding, suggests groundwater flooding has occurred before in this area you need take no further action in relation to groundwater flooding hazard. If there are records of previous incidences of groundwater flooding, then is recommended that other information e.g. rainfall history, property type, and land drainage information in addition to previous records of flooding be investigated in order to establish relative, but not absolute, risk of groundwater flooding.

There is potential for flooding at the surface and there is a High confidence rating in this result.

The confidence rating is on a threefold scale - Low, Moderate and High. This provides a relative indication of the BGS confidence in the accuracy of the susceptibility result for groundwater flooding. This is based on the amount and precision of the information used in the assessment. In areas with a relatively lower level of confidence the susceptibility result should be treated with more caution. In other areas with higher levels of confidence the susceptibility result can be used with more confidence.

9.0 AUTHORISATIONS, INCIDENTS AND REGISTERS



9.1 Industrial Sites Holding Licenses / Authorisations

There are no sites located within 250m of the site where records of historic IPC authorisations have been made.

There are no sites located within 250m of the site where records of Part A(1) and IPPC authorisations have been made.

There are no sites located within 500m of the site where records of List 1 Dangerous Substances Inventory Sites have been made.

There are no sites located within 500m of the site where records of List 2 Dangerous Substances Inventory Sites have been made.

Beech Road Dry Cleaners holds a Part B licence for a dry cleaning process.

9.2 Dangerous or Hazardous Sites

There are no COMAH or NIHHS sites within 500m of the subject property.

9.3 Environment Agency Recorded Pollution Incidents

There are no records of any List 1 Environment Agency Recorded Pollution Incidents within 250m of the site.

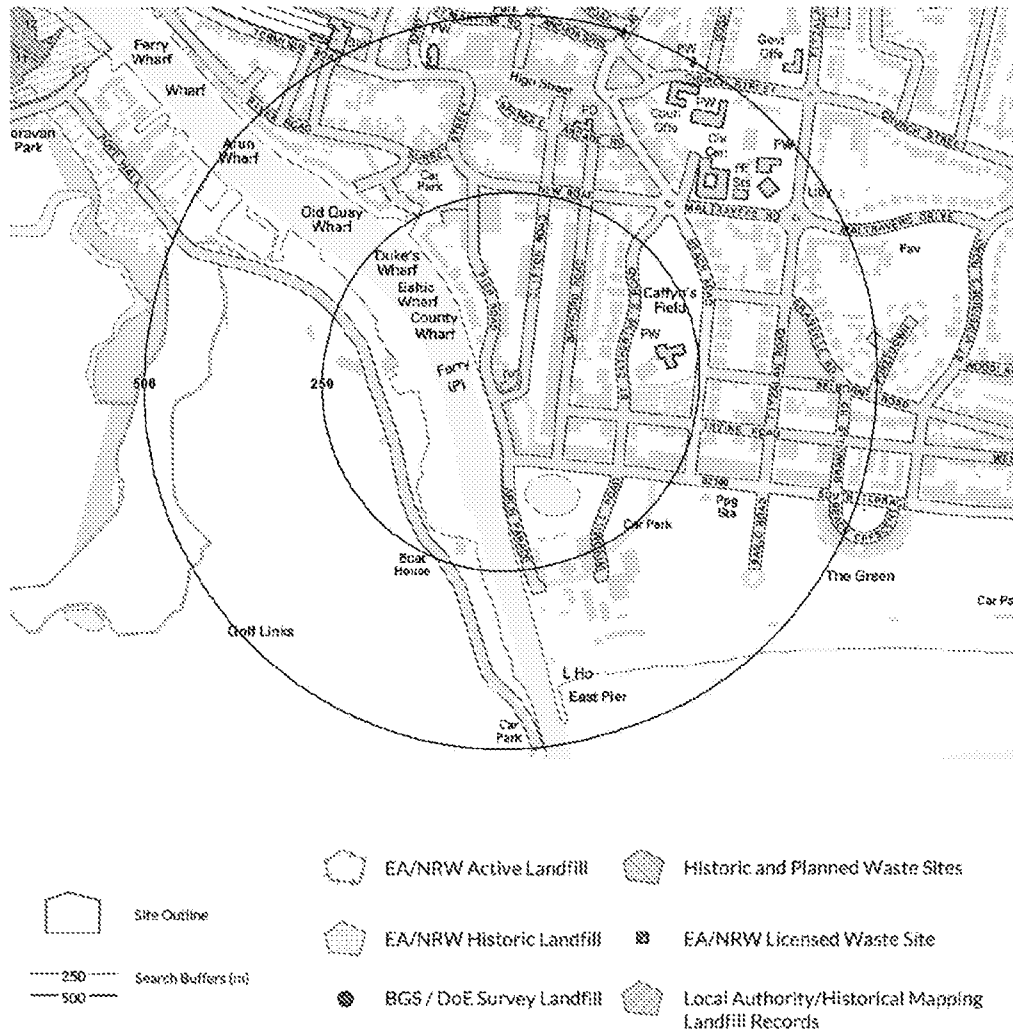
Within 250m of the site, a category 3 minor water impact occurred on 28th February 2002 caused by release of pollutants. No major incidents are reported.

9.4 Sites Determined as Contaminated Under Part IIa EPA 1990

No sites have been determined as Contaminated Land under Part IIa EPA 1990 within 500m of the site.

10.0 WASTE

10.1 Landfill Sites



The Environment Agency holds a record of an historical inert, commercial and household landfill site located 715m north west of the site, last recorded in 1975. An industrial landfill site was surrendered 715m NW of the site.

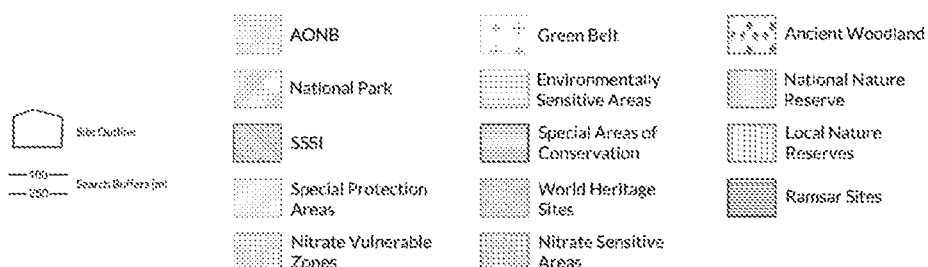
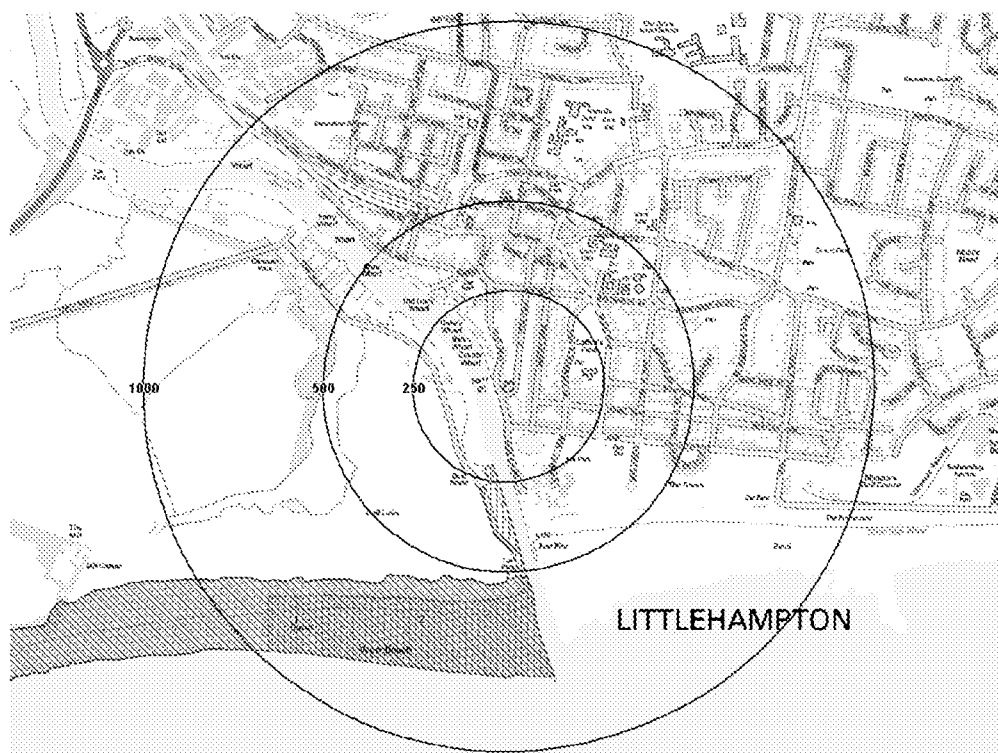
A refuse tip is located 780m north west of the site as seen on 1967 mapping.

10.2 Other Waste Sites

The Environment Agency and others hold various records of waste transfer stations located within 250m of the site. The nearest being 1154m north west of the site.

11.0 DESIGNATED ENVIRONMENTALLY SENSITIVE SITES

The following designated environmentally sensitive sites are located within 250m of the sites:



11.1 Sites of Special Scientific Interest

Climping Beach located 510m south of the site is designated as a SSSI.

11.2 Local Nature Reserve

West Beach located 205m south of the site is designated as a LNR.

11.3 Nitrate Vulnerable Zone

Land located 1860m north east of the site is susceptible to the application of nitrates.

12.0 PRELIMINARY ENVIRONMENTAL RISK ASSESSMENT

12.1 Introduction

The current contaminated land regime is explained in Part IIA of the Environmental Protection Act 1990 and was introduced on the 1st April 2000 in England. Also, this assessment has been completed taking into account the advice and guidance contained in the NPPF and particularly paragraphs 109 (fourth and fifth bullet points) and 120 of this document. In general, the purpose of these aspects of the legislation is to achieve the identification of contaminated land and the remediation of contaminated land to ensure the such land poses no significant risk to human health and/or the environment.

Contaminated Land is defined as:

‘any land which appear to the local authority in whose area it is situated, to be in such a condition, by reason or substances in, on, or under the land, that: significant harm is being caused or there is a significant possibility of such harm being caused; or pollution of controlled water is being or is likely to be caused.’

For land to be classified as contaminated land a relevant Pollutant Linkage must be identified. A Pollutant Linkage will only be present where the Source-Pathway-Receptor factors are all present and where they are not all present, no risk assessment is possible. This is common with the Model Procedures as described in CLR-11.

Statutory Definitions	
Contaminant Source (Hazard)	A substance which is in, on or under the land and which has the potential to cause harm or cause pollution of controlled waters
Receptor (Target)	A living organism or group of organisms, an ecological system or property, controlled waters which are or could be polluted by a contaminant
Pathway (Route)	One or more routes or means which either allows the contaminant to cause significant harm to that receptor, or that there is a significant possibility of such harm being caused to the receptor, or that pollution of controlled waters is being or likely to be caused.

A Preliminary Environmental Risk Assessment involves assessing the likely probability and consequence of a Pollutant Linkage and determining a consequent level of risk.

The term ‘risk’ is widely used in different contexts and situation but a prescriptive definition is provided by the Guidelines for Environmental Risk Assessment and Management (DEFRA et al, 2000):

Risk is a combination of the probability, or frequency, of occurrence of a defined hazard and the magnitude of the consequence of the occurrence’.

A hazard is defined as *‘a property or situation that in particular circumstance could lead to harm’.*

The risk category for a particular scenario can be assessed in terms of the consequences and probability of an occurrence which can be defined as follows:

Classification of a Consequence

Classification	Definition
Severe	1 – short term (acute) risk to human health likely to result in significant harm 2 – short term risk to controlled waters 3 – catastrophic damage to buildings / structures 4 – short term risk to an ecosystem or organism within the particular ecosystem.
Medium	1 – chronic damage to human health (long term risk) 2 – pollution of a sensitive water resource 3 – a significant change in an ecosystem or organism within the ecosystem
Mild	1 – pollution of non-sensitive water resources 2 – significant damage to buildings / structures
Negligible	1 – harm (not necessarily significant) which may result in financial loss; 2 – non permanent health effects to humans (easily prevented by PPE for example) 3 – easily repairable effects of structural (building damage).

Classification of a Probability

Classification	Definition
High	1 – there is a complete pollution linkage and an event appears very likely to occur in the short term and is inevitable in the long term 2 – evidence of harm to the receptor
Medium	1 – there is a complete pollution linkage which means that it is probable that an event will occur 2 – the event is not inevitable but possible in the short term and likely in the long term
Low	1 – there is a complete pollution linkage and circumstance are possible under which an event could occur 2 – it is not certain that an event will occur in the long term, and it is less likely to occur in the short term
Negligible	1 – there is a complete pollution linkage but circumstance are such that is improbable that an event would occur even in the long term.

The consequences of a risk and the probability of an event taking place can be assessed and the likely risk category can be determined as follows:

Probability	Consequence				
		Severe	Medium	Mild	Negligible
	High	High	High	Medium / Low	Negligible
	Medium	High	Medium	Low	Negligible
	Low	High / Medium	Medium	Low	Negligible
	Negligible	Medium / Low	Medium / Low	Low	Negligible

High Risk – there is a high probability that severe harm could risk a receptor, or there is evidence that a receptor is being harmed. The risk is realised is likely to result in liability and/or significant harm, and urgent investigation or remediation will be required.

Medium Risk - it is probable that harm will arise to a receptor. However it is relatively unlikely that such harm would be severe, or if harm does occur then the harm is likely to be relatively mild. Investigation will be required to determine the liability, and some remedial works may be required in the long term.

Low Risk – it is possible that harm may arise to a receptor, but it is likely that the harm would be mild.

Near Zero Risk – There is a very low risk of harm to the receptor. In the event of harm being realised the harm is not likely to be severe.

12.2 Potential Sources

The current and historical use of the site has been carefully assessed. All potential risks have been determined and assessed as part of this study.

A number of off-site sources are also recorded in the vicinity of the site and are discussed below.

12.3 Potential Pathways

Exposure pathways link any contamination to the receptor. All or any of the following potential pathways may apply:

Future Site Workers, including Construction Workers

<i>Oral Pathway (W-O)</i>	Indoor /outdoor ingestion of dust Indoor/outdoor ingestion of soil Indoor/outdoor ingestion of Flora/Fauna Ingestion of tainted mains water
<i>Inhalation Pathway (W-I)</i>	Indoor/outdoor inhalation of fugitive dust Indoor/outdoor inhalation of soil vapour
<i>Dermal Pathway (W-D)</i>	Indoor/Outdoor exposure to soil through dermal contact

Future Site Users, Occasional Visitors and Neighbouring Residents including Children

<i>Oral Pathway (O-O)</i>	Indoor ingestion of dust (post construction) Outdoor ingestion of soil (post construction) Indoor/outdoor ingestion of Flora/Fauna
<i>Inhalation Pathway (O-I)</i>	Outdoor inhalation of fugitive dust Indoor inhalation of fugitive dust (post construction) Outdoor inhalation of soil vapour Indoor inhalation of soil vapour (post construction)
<i>Dermal Pathway (O-D)</i>	Outdoor exposure to soil through dermal contact

Indoor exposure to soil dust through dermal contact

Flora (potential new on-site or off-site flora affected by potential contamination on the site, or migrating onto or from the site).

Plant Uptake (Fl-PU) General uptake of contaminants by plants growing in the vicinity of, or on, the site

Fauna (on-site or off-site affected by potential contamination on the site, or migrating from the site)

Oral Pathway (Fa-OP) Consumption of contaminated Flora located on site

Water Resources

Surface Water Mobilisation (SWM) Surface water run-off from site, migrating off site
Also infiltration into the site from site.

Groundwater Mobilisation (Leaching Potential) (GWM)

Percolation and mobilisation of contaminants within the soil into waters held locally within pore space beneath the site.

12.4 Potential Receptors

The following potential receptors have been identified for the site:

Human Receptors (H)	Site workers, adults. Child/Adult future site users.
Flora and Fauna (FL, FA)	Future, on and off-site Fauna and Flora
Water Resources (SW, GW)	secondary superficial aquifer, principal bedrock aquifer;
Site Infrastructure (SI)	Existing and future foundations and drainage services
Environmental	N/A

Under the proposals the site is to be developed for residential purposes. Although it is assumed that the building will be used to house vulnerable adults in time it is possible that children may reside at the site and so this has been assumed as the **Critical Receptor**.

12.5 Qualitative Risk Assessment

A qualitative risk assessment has been undertaken to provide an initial assessment of the potential risks caused by contaminant sources identified during this assessment to potential future users of the site, building structures, and the aquatic environment. **The assessment has been made on the understanding that the site is used for long term commercial (ground floor) and residential (upper floors) use.** This is detailed in the table below:

Table 8 Risk Assessment

Hazard Identification		Hazard Assessment		Risk Estimation		Risk Evaluation	
Sources	Location	Potential Contaminants	Pathway	Receptor	Magnitude of Consequence	Probability of Occurrence	Risk Appraisal Rationale
Current / Historical use of the site, Gas Holders Depot Garage	On site	Made Ground – unknowns PAHs, metals, clinker, hydrocarbons Fuels, oils,	W-O, W-I, W-D, O-O, O-I, O-D, FLPU, FaOP SWM, GWM	H, SW, GW, FL, FA	Medium	Medium	- Probable made ground - Possible legacy of contamination in shallow soils from gas holder and associated site usage - Confirmed presence of now removed above ground tank - Inaccessible areas of the site and unknown usage of commercial buildings and yard area - Possible infilled inspection pits in current garage - Asbestos (roofing sheets) - Unknown use as a depot - Minor staining observed on concrete within garage; - Site usage and storage of oils, waste oils and detergents - Further site assessment required in this regard.
Works Site	14m west	Small building within unknown operations	W-O, W-I, W-D, O-O, O-I, O-D, FLPU, FaOP SWM, GWM	H, SW, GW, FL, FA	Mild to medium	Mild to Medium	- Unknown risks associated with building used as a depot in close proximity to site; - Further site assessment required in this regard.

Wharfs	100m north +	Range of organic, inorganic possible	W-O, W-I, W-D, O-O, O-I, O-D, FLPU, FaOP SWM, GWM	H, GW, FA, SW, FL,	Mild	Medium	Low	- Possible localised impacts, but risks to site in absence of ground gas risk is low - No further site assessment required in this regard.
Tanks	200m north	Possible hydrocarbons	W-O, W-I, W-D, O-O, O-I, O-D, FLPU, FaOP SWM, GWM	H, GW, FA, SW, FL,	Mild	Medium	Low	- General low risk from feature given location and distance - Negligible risk of ground gas - No further site assessment required in this regard.
Builders Yard	130m north	Metals, fuels, oils,	W-O, W-I, W-D, O-O, O-I, O-D, FLPU, FaOP SWM, GWM	H, GW, FA, SW, FL,	Mild to negligible	Low	Low to negligible	- General low risk from feature given location and distance - Negligible risk of ground gas - No further site assessment required in this regard.
Electrical Sub Stations	Various – 146m east	Oils, PCBs	W-O, W-I, W-D, O-O, O-I, O-D, FLPU, FaOP SWM, GWM	H, GW, FA, SW, FL,	Mild	Low to Medium	Low	- No likely impact - No impact observed – no viable pathway - Low volume source materials - No further site assessment required in this regard.
Timber Yard	130m north	Metals, inorganics, PAHs,	W-O, W-I, W-D, O-O, O-I, O-D, FLPU, FaOP SWM, GWM	H, GW, FA, SW, FL,	Mild to negligible	Low	Low to negligible	- General low risk from feature given location and distance - Negligible risk of ground gas - No further site assessment required in this regard.
Historical Landfill site	715m north	Organic and inorganic	W-O, W-I, W-D, O-O, O-I, O-D, FLPU, FaOP SWM, GWM	H, GW, FA, SW, FL,	Mild	Low	Low	- Located at significant distance from site. - No further site assessment required in this regard.

13.0 CONCEPTUAL SITE MODEL

The model assessment has been made on the understanding that the site is used for **Commercial and Residential Purposes**. Those potential pathways which may give rise to unacceptable contaminative risk under this scheme have been brought forward and form part of the Model as discussed below.

Table 10: Conceptual Site Model

Conceptual Site Model			
Receptor	Linkage	Source	Risk
Demolition / Ground workers	Inhalation	Organic vapours arising from on-site sources Asbestos	Low – low risk of acute risk but some risk due to unknown ground conditions and possibility of organic materials Bonded asbestos expected Further assessment required.
	Ingestion and dermal contact	Organic or inorganic contaminants	Low acute risk – site workers to use PPE No further assessment required.
Future site users	Inhalation	Organic vapours arising from on-site sources and off-site sources	Identified risk due to unconfirmed ground conditions. Possibility of organic materials Further assessment required.
	Ingestion and dermal contact	Shallow soil contamination from potential on-site and/or migratory off-site.	Identified risk due to unconfirmed ground conditions. Possibility of organic materials Further assessment required.
	Direct	Radon	No risk.
Neighbouring Residents	Inhalation	Disturbed vapours arising from on-site development	Mild – possible impact of vapours /odour when disturbing shallow soils. Further assessment required.

	Ingestion and dermal contact	Shallow soil contamination from on-site sources being disturbed through development and transposed off-site through air.	Mild – possible impact of vapours /odour when disturbing shallow soils. Further assessment required.
Groundwater resources	Infiltration and leaching of potential wastes from spillages	Downward and lateral migration of mobile contaminants and possible disturbance and creation of new fractures result of development adversely affecting flow to other receptors	Site located on secondary superficial aquifer and principal bedrock aquifer which could be impacted if significant source material present. Possible high water table would flush the site. Further assessment required.
Surface waters	Possible mobilisation of shallow soil contaminants from site to east	Shallow soil contamination from off site and on site sources being mobilised through surface waters off site.	Nearby river could be impacted if significant source material present. Possible high water table would flush the site if continuity exists. Further assessment required.
Local flora and fauna	Uptake from soil and Ingestion	Shallow soil contamination from off site and on site sources	None present or proposed. No further assessment required.

The Conceptual Site Model shows that the site is viewed as a medium risk. Possible contaminative sources have been identified and further assessment will be required.

13.0 CONCLUSIONS AND RECOMMENDATIONS

Following a site walkover conducted on 25th November 2019 a conceptual model of the site was developed which demonstrates significant potential pollutant linkages and through the risk assessment it has not been possible to prove that the site is uncontaminated for the proposed end use.

This relates to the historical siting of gas holders on site and more recent use of the site as a depot and garaging. At least one (and possibly more) tanks have been located on site as indicated in local authority datasets and on historical mapping since 1984. Minor staining is observed within the current building and there is the possible infilling of underground inspection pits. Some areas of the site were inaccessible during the site reconnaissance visit and so these areas also require further inspection.

Therefore further work is required in order to confirm and characterize the presence or otherwise of contamination on site. This will take the form of an intrusive investigation and further generic or detailed risk assessment. If the pollutant linkages are confirmed as unacceptable then some form of remediation will be required. Should this be required we believe that the level of remediation required should be viable, being relatively simple and low key.

Any remediation will need to be undertaken to the satisfaction of the Local Authority and any other Regulatory Body involved in the development. This is normally undertaken by the formulation of an Options Appraisal (including Remediation Strategy), Implementation Plan, Verification Plan, Monitoring and Maintenance Plan, and Verification Report.

The report is based on the assumption by the author that the Local Planning Authority will follow guidance detailed in the NPPF where for all development involving disturbance to land, the LPA would impose a Condition requiring the reporting of all instances of contamination found during the course of development, including removal of concrete floor slab. Should instances of previously unreported contamination be found then the submission for approval of an assessment of the risks and proposed remediation scheme will be submitted to the Local Planning Authority.

The report is supplied subject to our standard terms and conditions and these should be read alongside the report.