



**CLARENDON HOUSE
QUEENS ROAD, READING RG1 4BN**

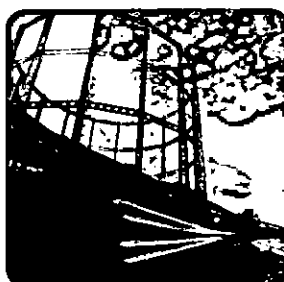
PHASE 1 PRELIMINARY RISK ASSESSMENT

FOR

LANGHAM PROPERTIES LIMITED



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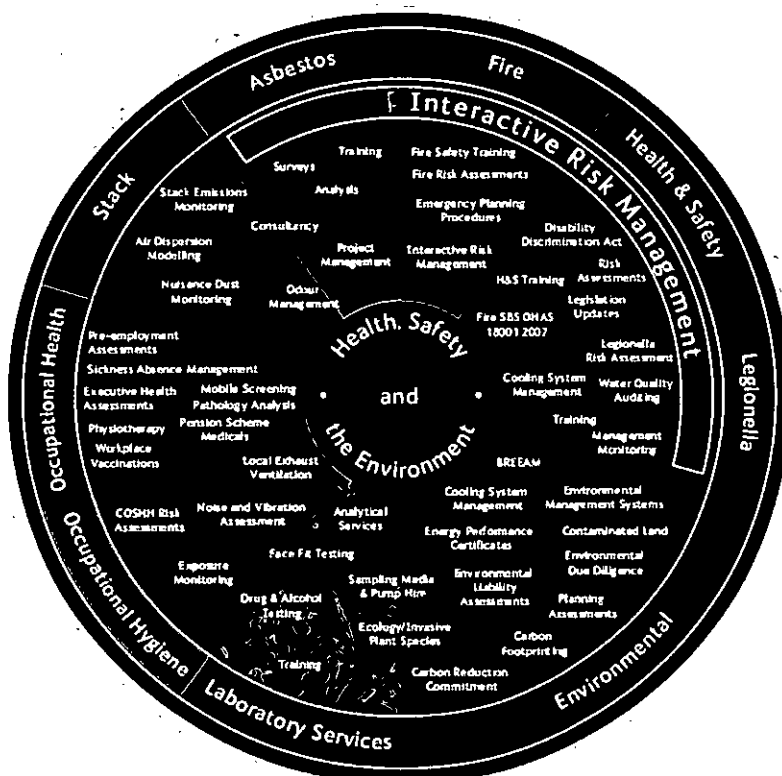
June 2017

Our Ref: HLEI53111/001R

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Report Status:	Draft	
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Date:	June 2017	
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Part 2A (The Contaminated Land Regime)

EXECUTIVE SUMMARY

RPS Health, Safety & Environment (RPS) was commissioned by Langham Properties Limited to undertake a Phase 1 Preliminary Risk Assessment of Clarendon House, Queen's Road, Reading RG1 4BN. The site currently comprises a four storey purpose built office block, with a single level of basement and associated ground level car parking to the north. The report has been commissioned in relation to the proposed refurbishment and conversion of the building to residential use under the Permitted Development Regulations.

History

The eastern and northern portions of the site were occupied by what appeared to be residential dwellings with private gardens from at least 1877 to circa 1957. Potential commercial type buildings were present in the centre, west and south of the site. From 1957 until circa 1989, a paint works was labelled in the centre/west of the site, in place of the former potential commercial type buildings. From 1989, the site was indicated to be present in its current configuration, with Clarendon House in the south of the site and car parking in the north.

Former potentially contaminative land uses in the vicinity of the site included; a tank of unspecified content or capacity, present adjacent to the western boundary of the site; a number of wharves; warehouses; a depot; timber yards; factories; a printing works; saw mills; and a gas works.

On Site and Surrounding Land Use

Current site use is not considered to represent a potentially significant source. However, Made Ground potentially present beneath the site - resulting from previous construction and demolition activities - may represent a potential source of contaminants of concern, as well as ground gas.

The site is located in an area of mixed residential and commercial use. No current potentially significant contaminative land uses have been identified in the surrounding area.

Environmental Setting

The site is situated on a Secondary A Aquifer, relating to the Kempton Park Gravel Formation, overlying a Principal Aquifer, relating to the White Chalk Subgroup. The site is not located within a source protection zone and the nearest licensed groundwater abstraction is indicated to be present approximately 505m to southeast of the site. The nearest surface water feature is the River Kennet, located approximately 35m to the north of the site at its nearest point.

Outline Conceptual Site Model

An outline Conceptual Site Model (CSM) has been derived on the basis of the desk study and site reconnaissance. The current use of the site is not considered to be significantly contaminative. However, a paint works formerly present in the centre of the site may represent a historical source of contamination.

The site is to remain in its current form, with the office building refurbished to form residential apartments. In areas of the site covered by buildings or hardstanding the risks to future on site human health receptors via the pathways of dermal contact and ingestion will be mitigated. However, in areas of soft landscaping, the pathways of dermal contact and ingestion could still be active. In addition, there would be potential for the airborne migration of soil/dust from these areas.

There is the potential for ground gas and volatile contaminants of concern in soil and/or groundwater (if present) beneath the site to impact future site users via the inhalation pathway in indoor areas.

Groundwater within granular layers of the underlying Made Ground and Kempton Park Gravel Formation and the White chalk Subgroup beneath may constitute potential pathways for the off-site migration of contaminants of concern (where present). These may impact neighbouring site users via the direct contact, ingestion and vapour inhalation pathways.

Potential contaminants of concern associated with current and historical land uses in the vicinity of the site also have the potential to migrate onto site via groundwater within the underlying permeable strata.

Recommendations

The outline CSM produced upon completion of the desk study assessment has identified potential pollutant linkages that may be active upon the site's change from commercial to residential use.

A Phase 2 Environmental Site Investigation, comprising a number of boreholes for soil testing and the installation of wells for the purposes of ground gas and groundwater monitoring, is recommended in order to confirm whether these potential pollutant linkages will be active upon the site's change in use.

Other Issues

Given its age, it is possible that asbestos containing materials have been used in the construction and/or maintenance of the office building on site. A representative of the building management company was unaware whether an asbestos register was available for the building. An intrusive asbestos survey will likely be required prior to the proposed refurbishment.

RPS can provide further specialist advice on this issue upon request.

1 INTRODUCTION

1.1 Preamble

RPS Health, Safety & Environment (RPS) was commissioned by *Langham Properties Limited* to undertake a Phase 1 Preliminary Risk Assessment of Clarendon House, Queen's Road, Reading RG1 4BN. A site location plan is presented as Figure 1. The site currently comprises a four storey purpose built office block, with a single level of basement and associated ground level car parking to the north.

The report has been commissioned in relation to the proposed refurbishment and conversion of the building to residential use under the Permitted Development Regulations.

1.2 Scope of Work

The scope of works for this assessment was as follows:

- To undertake a site inspection;
- To review the historical land uses to assess the potential for ground contamination;
- To review the environmental setting to assess the sensitivity of the surrounding area to contamination/pollution;
- To undertake a qualitative environmental risk assessment of the site's current and proposed use; and
- Produce an outline Conceptual Site Model (CSM) detailing potential pollutant linkages associated with the redevelopment of the site.

1.3 Legislation and Guidance

This report has been produced in general accordance with:

- Environment Agency (EA) Contaminated Land Report 11 (CLR 11): *Model Procedures for the Management of Land Contamination*;
- *Contaminated Land (England) Regulations 2006 (as amended)*;
- *DEFRA Environmental Protection Act 1990: Part 2A - Contaminated Land Statutory Guidance (2012)*;
- *National Planning Policy Framework (2012)*;
- British Standard requirements for the 'Investigation of potentially contaminated sites - Code of practice' (ref. BS10175:2011); and

- British Standard requirements for the '*Code of practice for site investigations*' (ref. BS5930:2015).

Where appropriate, consideration has also been given to the following:

- The potential for environmental liabilities to occur under other associated regimes, for example the *Water Resources Act (1991)* and the *Environmental Damage Regulations (2009)*; and
- Key constraints on site redevelopment.

Details of the limitations of this type of assessment are described in Appendix A.

2 SITE RECONNAISSANCE AND DESK STUDY

2.1 Site Reconnaissance

This section of the report is based upon observations made during a site visit carried out on 26th May 2017. A site boundary plan is shown as Figure 2. Selected photos are shown in Appendix B.



General view of the site. For further photos see Appendix B.

2.1.1 The Site

Table 1 – Summary of Site Reconnaissance

Section	Description
Background:	The site is located in a mixed residential and commercial area of Reading at National Grid Coordinates 472180, 173290. The site is irregular in shape and occupies an area of approximately 0.23 ha.
Site Layout	At the time of the visit, the site comprised an office building in the south, facing Queens Road. An associated car park occupied the north and centre of the site (photo 1), with an access way in the northwest corner, leading to Kennet Way.
Activity / Operations:	The building in the south comprised a four storey office, with a single level of basement. At the time of the walkover, the office building was vacant. The basement was occupied by a boiler room (photo 2), two store rooms, a gas intake and an electricity intake plant room. The car park in the north and centre of the site was in use at the time of the walkover.
Building Structure(s):	The office building comprised a concrete frame, brick clad structure.
Topography and Surface Cover:	The site was relatively flat, with no significant slopes observed. External surfacing predominantly comprised tarmac, with limited areas of soft landscaping (along the southern boundary and in the southeast and northwest corners). The basement floor of the building comprised a concrete slab.
Drainage:	A number of manholes and surface water drains were observed within the car park (photo 3). No oil/water interceptors were observed to be present.

Section	Description
	No drainage plans for the site were made available for review by RPS.
Bulk Storage / Tanks:	No evidence of above or below ground bulk storage was observed on site during the walkover.
Waste:	The office building was vacant at the time of the walkover and no waste streams associated with the site were observed to be present.
Air Emissions:	No potentially significant sources of air emissions were identified at the site at the time of the walkover.
Electricity Substations /Transformers:	No electricity transformers or substations were observed on site during the walkover.
Visual Evidence of Contamination:	No visual evidence of contamination was noted during the site walkover.
Other Issues:	No <i>Japanese Knotweed</i> or <i>Giant Hogweed</i> (invasive plant species) were readily identified on the site at the time of the survey. <i>(It should be noted that the identification can be limited by the seasons and in areas of dense vegetation growth).</i> Given its age, it is possible that asbestos containing materials have been used in the construction and/or maintenance of the office building on site. A representative of the building management company was unaware whether an asbestos register was available for the building. An intrusive asbestos survey will likely be required prior to the proposed refurbishment.

2.1.2 The Surrounding Area

The site is located in an area of mixed residential and commercial land use. At the time of the site inspection, neighbouring land consisted of the following:

Table 2 – Neighbouring Land Uses

Direction	Description
<i>North</i>	Grantley Heights, a six storey residential block with communal parking at ground level, beyond which is Kennet Side and the River Kennet.
<i>East</i>	Watlinton Street, beyond which is a residential development, up to 10 storeys in height.
<i>South</i>	Watlinton Street/Queens Road, beyond which is Wesley Methodist Church and a two storey residential dwelling.
<i>West</i>	Queens Wharf, a residential development up to seven storeys in height.

2.2 Proposed Development

It is proposed to refurbish the existing building for conversion to residential use under the Permitted Development Regulations. It has been assumed that no new areas of soft landscaping are to be introduced as part of the conversion.

2.3 Site History

2.3.1 Historical Map Review

The following review is based on past editions of readily available Ordnance Survey (OS) maps and historical building plans dated 1877 to 2017. Extracts from selected historical maps and plans are given as Figures 3 to 7.

Table 3 – Historical Site Uses

On-site Land Use and Features	Dates
The eastern and northern portions of the site were occupied by what appeared to be residential dwellings with private gardens. Potential commercial type buildings were present in the centre, west and south of the site.	1877 to c.1957
A paint works was labelled in the centre/west of the site, in place of the previous commercial type buildings.	1957 to c.1989
The site was present in its current configuration, with Clarendon House in the south of the site and car parking in the north.	1989 to present

Table 4 – Historical Neighbouring Site Uses

Surrounding Land Uses (250m radius)	Orientation	Distance	Dates	
			From	To
Tank of unspecified content or capacity *	West	Adjacent	1989	Present
Two wharves	North	30m	1877	c.1971
Office building			1971	Present
Printing works	Northeast	40m	1957	c.1991
Likely commercial buildings	West	60m	1912	c.1931
Then warehouse			1931	c.1991
Warehouse	Southwest	60m	1957	c.1971
Then depot			1971	c.1989
Builder's yard	Northwest	70m	1957	c.1991
Biscuit factory including electricity substation	North	110m	1877	c.1991
Gas works and saw mill	Northeast	120m	1877	c.1957
Then part of biscuit factory			1957	c.1995
Timber yard	Northwest	130m	1877	c.1971
Queens Wharf	West	130m	1877	c.1899
Star Lane Wharf	West	160m	1877	c.1971
Abbey Saw Mills	Northwest	200m	1877	c.1957
Then Abbey Wharf			1957	c.1971

* This tank no longer appeared to be present at the time of the walkover.

2.3.2 Site Planning History

Available online planning records from Reading Borough Council indicate that a planning application for the redevelopment of the site as a five to six storey residential block, comprising 24 apartments was approved on 16th December 1998 (reference 980612). No conditions relating to the investigation of potentially contaminated land were indicated to have been placed on this permission.

This permission does not appear to have been acted upon.

No other relevant planning applications for the site were identified on Reading Borough Council's planning website.

2.4 Environmental Setting

2.4.1 Geology

Based on British Geological Survey (BGS) mapping (1:50,000-scale) and the EA Groundwater Vulnerability mapping (1:100,000-scale), the stratigraphic sequence and aquifer classifications beneath the site are indicated to be as follows:

Table 5 – Descriptions of Geological Strata

Strata	Description & approximate thickness	Aquifer Classification
Kempton Park Gravel Formation	Sand and gravel, locally with lenses of silt, clay or peat. Likely to be of limited thickness beneath the site.	Secondary A
White Chalk Subgroup	Chalk with bands of flint. Likely to be in excess of 200m in thickness beneath the site.	Principal

In addition to the strata detailed above, Made Ground is likely to be present beneath the site as a result of previous construction and demolition activities. No site investigation reports have been reviewed to confirm this.

2.4.2 Hydrogeology

EA mapping indicates that the site overlies a Secondary A Aquifer, relating to the Kempton Park Gravel Formation. These formations are formed of permeable layers capable of supporting water supplies at a local scale, in some cases forming an important source of base flow to rivers.

The White Chalk Subgroup, indicated to be present beneath the Kempton Park Gravel Formation, is classified as a Principal Aquifer. These are layers of rock or drift deposits that have high intergranular and/or fracture permeability, meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale.

According to EA data, the site is not located in a groundwater Source Protection Zone (SPZ).

Information provided by the EA indicates that there are three records of active licensed groundwater abstractions within 1km of the site. These are summarised in the table below:

Table 6 – Groundwater Abstractions

License Holder	Purpose	Distance and Direction
Royal Berkshire Hospital	Potable	505m Southeast
M J Gleeson Group Plc	Pollution remediation	570m Northeast
Primark Stores Limited	Potable	970m West

The chemical quality of groundwater beneath the site has been classified as 'poor' under the EA local River Basin Management Plan for the area.

2.4.3 Surface Water

The nearest surface water feature is the River Kennet, a tributary of the River Thames, located approximately 35m to the north of the site at its nearest point. The chemical quality of the watercourse is classified as 'good' under the EA's local River Basin Management Plan.

The River Thames is located approximately 740m to the north of the site. The chemical quality of this watercourse is also classified as 'good' under the EA's local River Basin Management Plan.

Information provided by the EA indicates that there are records of two licensed surface water abstractions within 1km of the site. These are summarised in the table below:

Table 7 – Surface Water Abstractions

License Holder	Purpose	Distance and Direction
Oracle Shopping Centre Ltd	Lake and pond through flow	585m West
The Reading Sustainability Centre CIC	Transfer between sources	870m North

2.4.4 Fluvial / Tidal Flood Risk

According to the EA flood map for planning (rivers and the sea), the site is located within an EA designated Flood Zone 2 (i.e. land assessed as having between a 1 in 1000 and 1 in 100 annual probability of flooding from the rivers or the sea (0.1% to 1%) in any year). This flood zone appears to be associated with the nearby River Kennet.

A flood risk report has been provided by RPS under separate cover (reference HLEF53150-001R, dated May 2017).

2.4.5 Ecologically Sensitive Sites

Natural England data indicates that there are no ecologically sensitive sites that constitute environmental receptors as defined within Table 1 of the DEFRA Environmental Protection Act 1990: Part 2A - Contaminated Land Statutory Guidance (2012), located within a 1km radius of the site.

2.4.6 Radon

According to the Indicative Atlas of Radon in England and Wales published by the Health Protection Agency (part of Public Health England) and the BGS, the site is located in a low risk area from radon gas, whereby less than 1% of homes are above the action level.

2.4.7 Coal Authority

The site is not indicated to be located within a coal mining area.

2.4.8 Chalk Cavities

Data provided by the BGS and the Peter Brett Associates (PBA) mining cavities and natural cavities database indicates that there are no records of man-made or natural cavities within the White Chalk Subgroup beneath the site.

The closest record of chalk mining is located approximately 155m to the south of the site. The closest record of natural cavities within the chalk is located approximately 610m to the west of the site.

2.5 Authorised Processes and Pollution Incidents

2.5.1 Landfills and Waste Sites

Information provided by the EA, Local Authority and BGS indicate that there are no recorded landfills sites or waste management facilities within 250m of the site.

2.5.2 Environmental Permits

EA and Local Authority data indicates that there are two processes regulated by an active Environmental Permit (under the Environmental Permitting Regulations 2010) located within 500m of the subject site. These relate to a petrol filling station (Part B), located approximately 265m to the southeast and a crematorium (Part B), located approximately 290m to the southwest of the site.

2.5.3 COMAH Sites

There are no records of active operations under the Control of Major Accident Hazards (COMAH) Regulations 1999, located within 500m of the site.

2.5.4 Pollution Incidents

EA data indicates that there are no records of significant or major pollution incidents to controlled waters within 500m of the site.

2.6 Regulatory Consultations

The Environmental Health Department at the Reading Borough Council was contacted regarding any known contamination issues at the site. RPS is currently awaiting a response.

The Petroleum Officer at Reading Borough Council Trading Standards was contacted regarding records of flammable storage / bulk underground storage tanks relating to the site. RPS is currently awaiting a response.

3 OUTLINE CONCEPTUAL SITE MODEL

3.1 Background

An outline CSM consists of an appraisal of the *source-pathway-receptor* 'pollutant linkages' which is central to the approach used to determine the existence of 'contaminated land' according to the definition set out under Part 2A of the Environmental Protection Act 1990. For a risk to exist (under Part 2A), all three of the following components must be present to facilitate a potential 'pollutant linkage'.

- **Source** referring to the source of contamination.
- **Pathway** for the contaminant to move/migrate to receptor(s).
- **Receptor** that could be affected by the contaminant(s).

Receptors include human beings, other living organisms, crops, controlled waters and buildings / structures. The National Planning Policy Framework, used to address contaminated land through the planning process, follows the same principles as those set out under Part 2A. See Appendix C for further details on the Part 2A regime.

3.2 Potential Pollutant Linkages

Each stage of the potential pollutant linkage components has been considered individually on the basis of information obtained during the site reconnaissance and desk study exercise and is discussed in the following section.

3.2.1 Potential Contaminant Sources

The paint works in the centre of the site from 1957 until circa 1989 may represent a potential historical source of contaminants of concern.

Current site use is not considered to represent a potentially significant source. However, Made Ground potentially present beneath the site - resulting from previous construction and demolition activities - may represent a potential source of contaminants of concern, as well as ground gas.

Former potentially contaminative land uses in the vicinity of the site included; a tank of unspecified content or capacity, present adjacent to the western boundary of the site; a number of wharves; warehouses; a depot; timber yards; factories; a printing works; saw mills; and a gas works.

A petrol filling station is indicated to be present approximately 265m to the southeast of the site, which may represent a potential source of contaminants of concern. However, this is operated under an environmental permit and given its distance is not considered to represent a potentially significant risk to the site. This has therefore not been considered further as a potential source of contaminants of concern as part of this assessment.

3.2.2 Potential Pathways

The site is to remain in its current form, with the office building refurbished to form residential apartments. In areas of the site covered by buildings or hardstanding the risks to future on site human health receptors via the pathways of dermal contact and ingestion will be mitigated. However, in areas of soft landscaping, the pathways of dermal contact and ingestion could still be active. In addition, there would be potential for the airborne migration of soil/dust from these areas.

There is the potential for ground gas and volatile contaminants of concern in soil and/or groundwater (if present) beneath the site to impact future site users via the inhalation pathway in indoor areas.

Groundwater within granular layers of the underlying Made Ground and Kempton Park Gravel Formation and the White chalk Subgroup beneath may constitute potential pathways for the off-site migration of contaminants of concern (where present). These may impact neighbouring site users via the direct contact, ingestion and vapour inhalation pathways.

Potential contaminants of concern associated with current and historical land uses in the vicinity of the site also have the potential to migrate onto site via groundwater within the underlying permeable strata.

3.2.3 Potential Receptors

Potential human health receptors comprise future site users and neighbouring residential and commercial site users.

Provided construction workers adopt appropriate levels of hygiene and personal protective equipment, they are not considered to be at significant risk from potential contaminants of concern and have not been considered further as part of this assessment.

The nearest surface water feature is the River Kennet, located approximately 35m to the north of the site at its nearest point.

The River Thames is located approximately 745m to the north of the site and given its distance from the site, is not considered to be at significant risk from potential contaminants of concern beneath the site. It has therefore not been considered further as a receptor as part of this assessment.

The Kempton Park Gravel Formation Secondary A Aquifer and White Chalk Subgroup Principal Aquifer indicated to be present beneath the site are considered potential receptors. However, it should be noted that the site does not lie within a groundwater SPZ and the nearest licensed groundwater abstraction is indicated to be present approximately 505m to the southeast.

3.3 Outline Conceptual Site Model

An outline CSM has been developed based on each of the stages discussed above and the proposed use of the site. The CSM details the potentially active pollutant linkages identified between each of these components and is presented below:

Table 8 – Outline Conceptual Site Model

Potential Source	Contaminants of Concern	Via	Potential Pathways	Linkage Potentially Active?	Receptors
On site – historical: Paint works On site – Current: Made Ground	Metals, hydrocarbons, solvents and asbestos	Soil	Direct contact/ingestion	✓	Future site users
			Inhalation of volatiles	✓	Future site users
			Airborne migration of soil or dust	✓	Off-site users
			Leaching of mobile contaminants	✓	Secondary A Aquifer Principal Aquifer
		Groundwater	Direct contact/ingestion	✓	Future site users Off-site users
			Inhalation of volatiles	✓	Future site users Off-site users
			Vertical and lateral migration in permeable strata	✓ ✓ ✓	Secondary A Aquifer Principal Aquifer River Kennet
Off site – historical: Tank adjacent to western boundary; Wharves, warehouses, a depot, timber yards, factories printing works, saw mills and a gas works. Off-site – current: N/A	Metals, solvents and hydrocarbons	Groundwater	Direct contact/ingestion	✓	Future site users
			Inhalation of volatiles	✓	Future site users
On and off-site – Made Ground / natural strata or bio-degradation of contamination	Carbon dioxide and methane	Ground Gas	Inhalation of ground gas	✓	Future site users
			Explosive risks	✓	Future site users

4 CONCLUSIONS AND RECOMMENDATIONS

The outline CSM produced upon completion of the desk study assessment has identified potential pollutant linkages that may be active upon the site's change from commercial to residential use.

A Phase 2 Environmental Site Investigation, comprising a number of boreholes for soil testing and the installation of wells for the purposes of ground gas and groundwater monitoring, is recommended in order to confirm whether these potential pollutant linkages will be active upon the site's change in use.

Other Issues

Given its age, it is possible that asbestos containing materials have been used in the construction and/or maintenance of the office building on site. A representative of the building management company was unaware whether an asbestos register was available for the building. An intrusive asbestos survey will likely be required prior to the proposed refurbishment.

RPS can provide further specialist advice on this issue upon request.



FIGURES



Figure 1: Site Location Plan

Map Date: Current

Scale: Not to scale

Site Location

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Figure 2: Site Boundary Plan

Scale: Not to scale

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Figure 3: Historical Map Extract

Map Date: 1879

Scale: Not to scale

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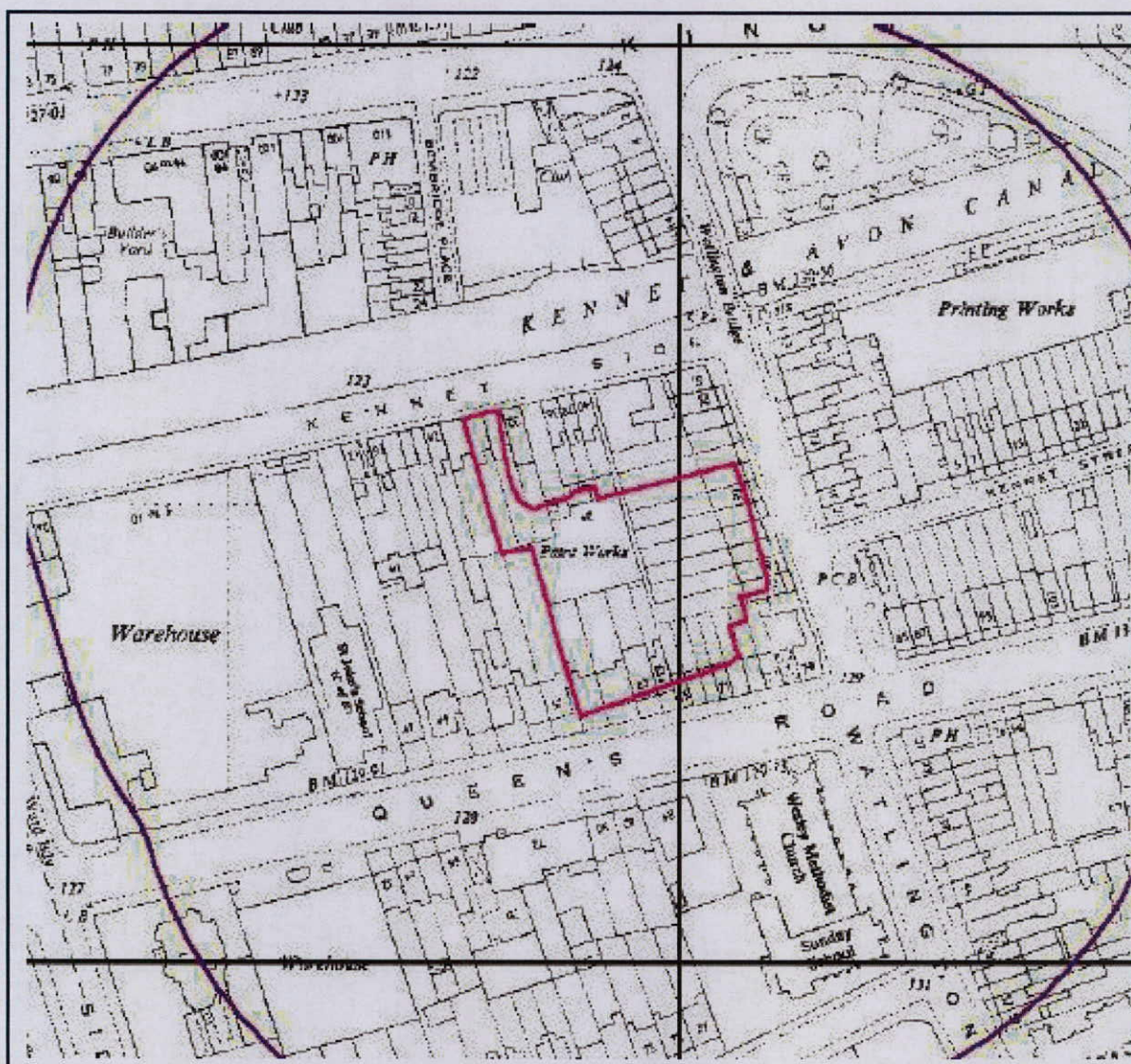


Figure 4: Historical Map Extract

Map Date: 1957

Scale: Not to scale

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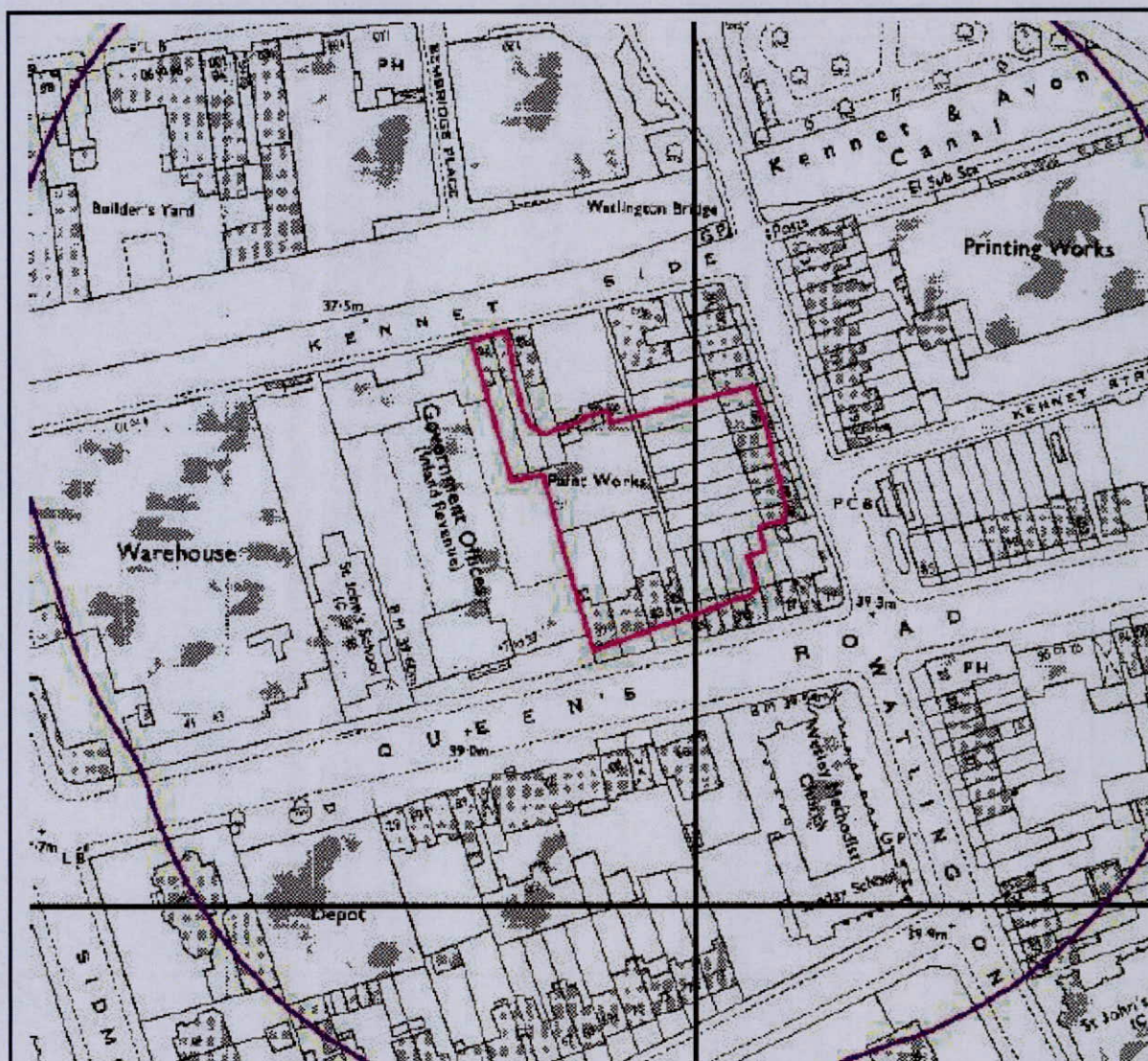


Figure 5: Historical Map Extract

Map Date: 1971

Scale: Not to scale

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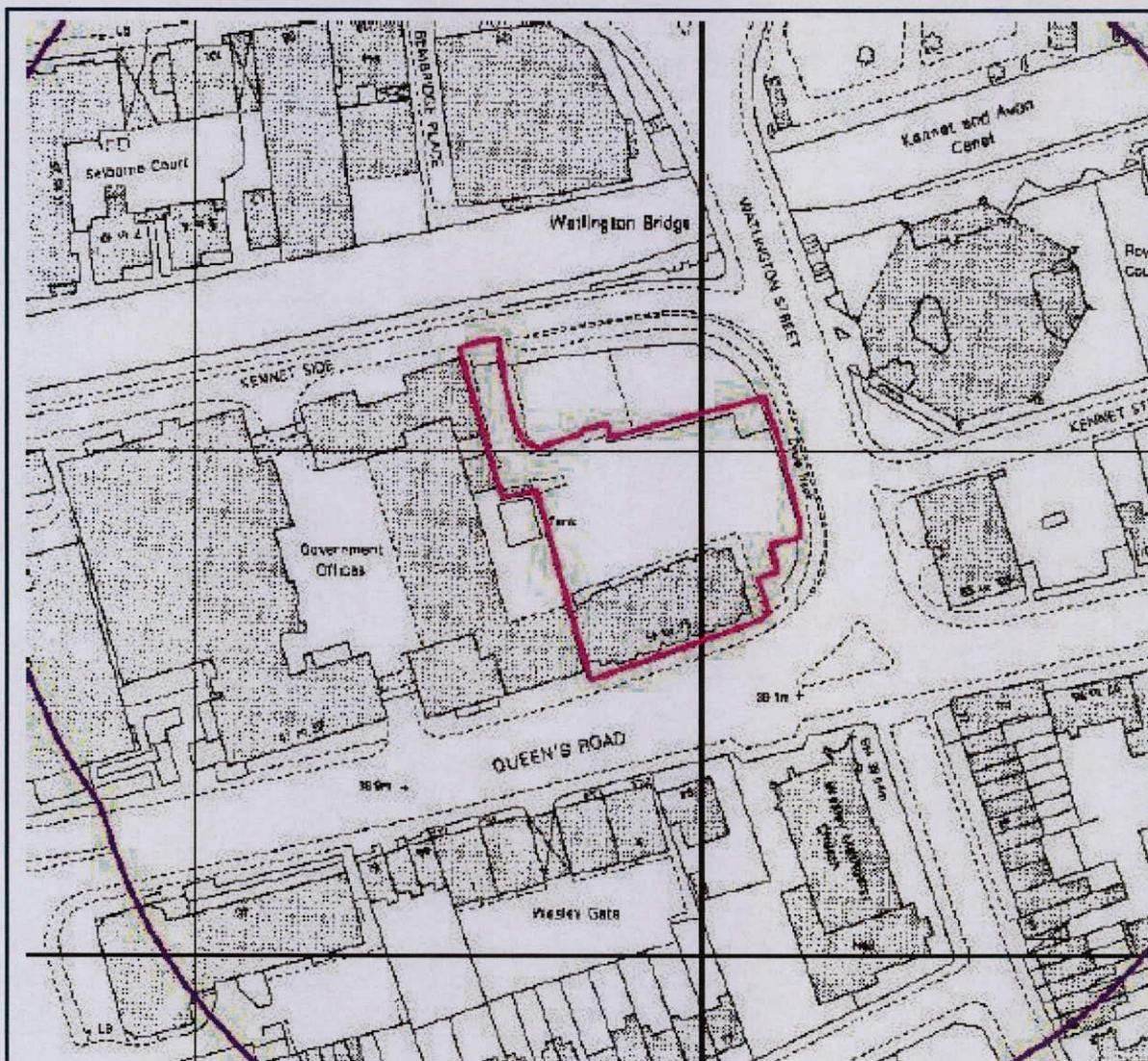


Figure 6: Historical Map Extract

Map Date: 1991

Scale: Not to scale

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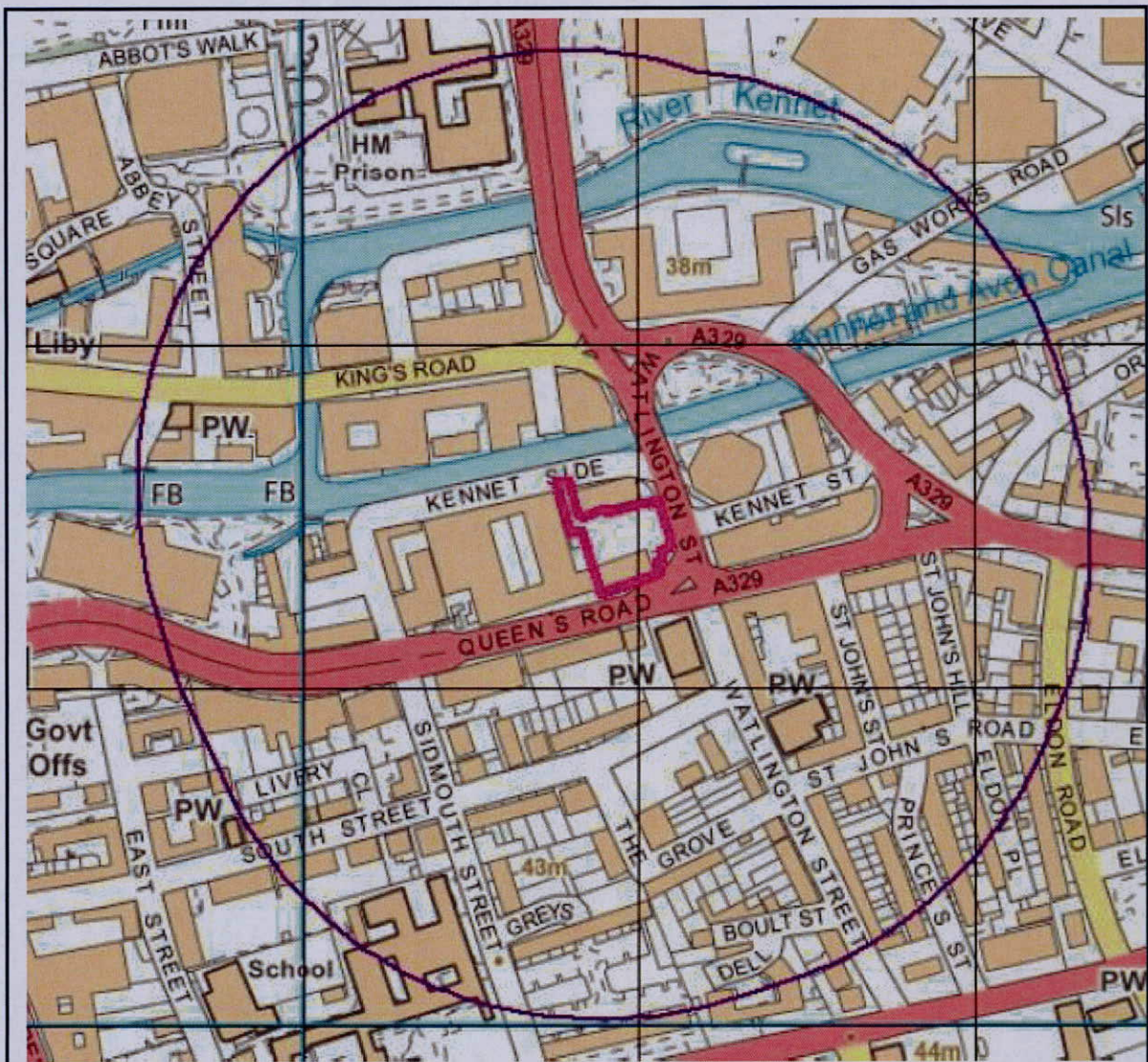


Figure 7: Historical Map Extract

Map Date: 2017

Scale: Not to scale

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APPENDIX A

General Notes

RPS HEALTH, SAFETY & ENVIRONMENT

Phase 1 - Environmental Risk Assessment / Desk Study Environmental Review

General Notes

1. A "desk study" means that no site visits have been carried out as any part thereof, unless otherwise specified.
2. This report provides available factual data for the site obtained only from the sources described in the text and related to the site on the basis of the location information provided by the Client.
3. The desk study information is not necessarily exhaustive and further information relevant to the site may be available from other sources.
4. The accuracy of maps cannot be guaranteed and it should be recognised that different conditions on site may have existed between and subsequent to the various map surveys.
5. No sampling or analysis has been undertaken in relation to this desk study.
6. Any borehole data from British Geological Survey sources is included on the basis that: "The British Geological Survey accept no responsibility for omissions or misinterpretation of the data from their Data Bank as this may be old or obtained from non-BGS sources and may not represent current interpretation".
7. Where any data supplied by the Client or from other sources, including that from previous site investigations, have been used it has been assumed that the information is correct. No responsibility can be accepted by RPS for inaccuracies in the data supplied by any other party.
8. This report is prepared and written in the context of an agreed scope of work and should not be used in a different context. Furthermore, new information, improved practices and changes in legislation may necessitate a re-interpretation of the report in whole or in part after its original submission.
9. The copyright in the written materials shall remain the property of the RPS Company but with a royalty-free perpetual licence to the Client deemed to be granted on payment in full to the RPS Company by the Client of the outstanding amounts.
10. The report is provided for sole use by the Client and is confidential to them, their professional advisors, no responsibility whatsoever for the contents of the report will be accepted to any person other than the Client. [Unless otherwise agreed]
11. These terms apply in addition to the RPS HSED "Standard Terms & Conditions" (or in addition to another written contract which may be in place instead thereof) unless specifically agreed in writing. (In the event of a conflict between these terms and the said Standard Terms & Conditions the said Standard Terms & Conditions shall prevail.) In the absence of such a written contract the Standard Terms & Conditions will apply.

APPENDIX B

Photographs

Photo 1: Car park



Photo 2: Boiler Room



Photo 3: Drainage cover



APPENDIX C

Part 2A (The Contaminated Land Regime)

Contaminated Land Definition

Under Section 57 of the Environmental Act 1995, Part 2A was inserted into the Environmental Protection Act 1990 to include provisions for the management of contaminated land.

Subsequent regulations were first implemented in England in April 2000, Scotland in July 2000 and Wales in July 2001¹, providing a definition of 'contaminated land' and setting out the nature of liabilities that can be incurred by owners of contaminated land and groundwater.

According to the Act, contaminated land is defined as 'any land which appears to the local authority in whose area the land is situated to be in such a condition, by reason of substances in, on or under the land that:

- a) *significant harm* is being caused or there is a *significant possibility* of such harm being caused; or
- b) *significant pollution* of controlled waters² is being caused or there is a significant possibility of such pollution being caused³

The guidance on determining whether a particular possibility is significant is based on the principles of risk assessment and in particular on considerations of the magnitude or consequences of the different types of significant harm caused. The term 'possibility of significant harm being caused' should be taken, as referring to a measure of the probability, or frequency, of the occurrence of circumstances that could lead to significant harm being caused.

The following situations are defined where harm is to be regarded as significant:

- i. Chronic or acute toxic effect, serious injury or death to humans
- ii. Irreversible or other adverse harm to the ecological system
- iii. Substantial damage to, or failure of, buildings
- iv. Disease, other physical damage or death of livestock or crops
- v. The pollution of controlled waters⁴.

¹ In England by The Contaminated Land (England) Regulations 2000, updated by The Contaminated Land (England) (Amendment) Regulations 2012; in Scotland by The Contaminated Land (Scotland) Regulations 2000, updated by the Contaminated Land (Scotland) Regulations 2005; and in Wales by The Contaminated Land (Wales) Regulations 2001, updated by the Contaminated Land (Wales) Regulations 2006.

² In Scotland the term "controlled water" has been updated to "water environment" under the Contaminated Land (Scotland) Regulations 2005 in line with the Water Environment and Water Services (Scotland) Act 2003.

³ The definition was amended in 2012 by implementation of the Water Act 2003.

⁴ Groundwater in this context does not include waters within underground strata but above the saturated zone.

With regard to radioactivity, contaminated land is defined as 'any land which appears to be in such a condition, by reason of substances in, on or under the land that harm is being caused, or there is a *significant possibility of such harm being caused*⁵.

The Risk Assessment Methodology

Risk assessment is the process of collating known information on a hazard or set of hazards in order to estimate actual or potential risks to receptors. The receptor may be humans, a water resource, a sensitive local ecosystem or future construction materials. Receptors can be connected with the hazard via one or several exposure pathways (e.g. the pathway of direct contact). Risks are generally managed by isolating or removing the hazard, isolating the receptor, or by intercepting the exposure pathway. Without the three essential components of a source (hazard), pathway and receptor, there can be no risk. Thus, the mere presence of a hazard at a site does not mean that there will necessarily be attendant risks.

The Risk Assessment

By considering where a viable pathway exists which connects a source with a receptor, this assessment will identify where pollutant linkages may exist. A pollutant linkage is the term used by the DEFRA in their standard procedure on risk assessment. If there is no pollutant linkage, then there is no risk. Therefore, only where a viable pollutant linkage is established does this assessment go on to consider the level of risk. Risk should be based on a consideration of both:

- The likelihood of an event (probability) - takes into account both the presence of the hazard and receptor and the integrity of the pathway.
- The severity of the potential consequence - takes into account both the potential severity of the hazard and the sensitivity of the receptor.

For further information please see the Contaminated Land section on the DEFRA website (www.defra.gov.uk)

⁵ The Radioactive Contaminated Land (Modification of Enactments) (England) Regulations 2006 and Contaminated Land (Wales) Regulations 2006.