

PHASE 1 PRELIMINARY RISK ASSESSMENT

71-73 CAVERSHAM ROAD, READING, BERKSHIRE RG1 8JA



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EXECUTIVE SUMMARY

RPS Consulting Services Ltd (RPS) was commissioned by Quod, on behalf of S2 Caversham Ltd, to undertake a Phase 1 Preliminary Environmental Risk of 71-73 Caversham Road, Reading, Berkshire RG1 8JA. The report has been commissioned prior to the proposed redevelopment of the site.

Current Site and Surrounding Land Use

The site covers an area of approximately 0.16 hectares and currently comprises a vacant former retail building fronting Caversham Road with three individual office buildings to the rear. The site is located in an area of predominantly commercial land use. It is proposed to redevelop the former retail unit with an eight storey, 44 unit residential development.

History of Site and Surrounding Land use

A review of historical maps indicates that the site comprised a malthouse to c.1912. Buildings of unspecified use were present to c.1956. The site was redeveloped as a warehouse in the centre/east and a photographic works in the west until c.1969 and then a motor accessories warehouse until c.1979. The motor accessories warehouse was no longer indicated to be present and the building reduced in size to represent its current day layout by c.1993.

Off-site historical potential sources of contaminants of concern include: a malthouse extending adjacent to the west (1877 to c.1899), latterly a chemical warehouse (1969 to c. 1982); a timber yard located approximately 25m to the south (1879 to c. 1931); a railway foundry and works located approximately 25m to the east 1879 to c. 1881); a car depot/garage approximately 40m to the south (1969 to c.1993); an engineering works approximately 40m to the south (1956 to c. 1988); a motor warehouse approximately 60m to the south (1969 to c.1984); and an engineering works (coach building), latterly car engineering, approximately 90m to the north (1956 to c. 2014).

Environmental Setting

The site is indicated to be underlain by an unproductive stratum relating to the Langley Silt Member. The Langley Silt Member is indicated to be underlain by a Principal Aquifer, relating to the Seaford Chalk Formation and Newhaven Chalk Formation. The site is not indicated to be located in a groundwater Source Protection Zone (SPZ). The nearest potable groundwater abstraction source is located approximately 305m to the west of the site and the River Thames approximately 600m to the north east, at its closest point.

Outline Conceptual Site Model

An outline conceptual site model (CSM) has been derived on the basis of the desktop study and site reconnaissance. Following the redevelopment works, the potential risks to future site users via the dermal contact and ingestion pathways in areas of the site comprising building cover and hardstanding will be mitigated. Furthermore, the pathway for the airborne migration of soil/dust from these areas towards off-site receptors would not be active. However, these pathways may remain active in any areas of soft landscaping introduced.

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.

Although the Langley Silt Member is likely to be relatively impermeable, there is considered to be potential for contaminants of concern (if present) beneath the site to migrate on or off-site via granular horizons of the Made Ground (if present) or the Langley Silt Member. These may subsequently impact off-site human health receptors via the dermal contact, ingestion and vapour inhalation pathways.

Recommendations

The outline CSM produced upon completion of the desk study assessment has identified a number of potential pollutant linkages that may be active upon the redevelopment of the site. These are predominantly

associated with historical on site uses including a warehouse, works, photographic works and motor accessories warehouse.

It is therefore recommended that the potential for the identified pollutant linkages to be active is assessed through a Phase 2 Environmental Site Investigation of the site. It is recommended that the site investigation should comprise targeted environmental sampling (including soil and groundwater sampling, groundwater level monitoring and ground gas monitoring) to confirm if any potential pollutant linkages will be active upon the redevelopment of the site.

1 INTRODUCTION

1.1 Preamble

- 1.1.1 RPS Consulting Services Ltd (RPS) was commissioned by Quod, on behalf of S2 Caversham Ltd, to undertake a Phase 1 Preliminary Environmental Risk Assessment of 71 to 73 Caversham Road, Reading, Berkshire RG1 8JA. The report has been commissioned prior to the proposed redevelopment of the site.
- 1.1.2 The site covers an area of approximately 0.16 hectares and currently comprises a vacant former retail building fronting Caversham Road with three individual office buildings to the rear. A site location plan is presented as Figure 1.
- 1.1.3 This Phase 1 Preliminary Risk Assessment Report has been commissioned to support the planning application for the proposed redevelopment of the site.

1.2 Objectives

- 1.2.1 The principal objectives of this assessment were as follows:
- To assess potential sources of contamination at the site, associated with historical and current land uses both on site and in the surrounding area;
 - To review the environmental setting to assess the sensitivity of the surrounding area to contamination/pollution;
 - Produce an outline Conceptual Site Model (CSM) detailing how any contamination may impact the identified receptors via pollutant linkages; and
 - Recommendations for further investigation of potential pollutant linkages, where considered necessary.

1.3 Legislation and Guidance

- 1.3.1 This report has been produced in general accordance with:
- Contaminated Land (England) Regulations 2006 (as amended);
 - DEFRA Environmental Protection Act 1990: Part 2A - *Contaminated Land Statutory Guidance* (2012);
 - DEFRA and Environment Agency (2004) Contaminated Land Report 11 (CLR 11): *Model Procedures for the Management of Land Contamination*;
 - National Planning Policy Framework (2019);
 - CIRIA Document C665: *Assessing Risks Posed by Hazardous Ground Gases to Buildings*;
 - British Standard requirements for the '*Investigation of potentially contaminated sites - Code of practice*' (ref. BS10175:2011+A1:2013);
 - British Standard requirements for the '*Code of practice for ground investigations*' (ref. BS5930:2015); and
 - British Standard requirements for the '*Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings*' (ref BS8485:2015+A1:2019).
- 1.3.2 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 (if proposed);

1.3.3 Although not part of the scope of this report, the following may be commented on for information only where readily observed, reported or identified:

- Asbestos-containing materials; and
- Japanese Knotweed (invasive plant species). It should be noted that its identification can be limited by the seasons, dense vegetation, physical, infrastructural, health & safety and other constraints.

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

2 SITE RECONNAISSANCE AND DESK STUDY

2.1 Site Reconnaissance

- 2.1.1 This section of the report is based upon observations made during a site visit carried out on 12th August 2019. Access to the office premises in the west of the site was not permitted as part of the site walkover. A site boundary plan is provided as Figure 2. Selected photos are shown in Appendix B.



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

The Site

Table 1 – Summary of on-site activities

Section	Description
Background:	The site is located approximately 400m north west of Reading Railway station at National Grid Reference SU712740. It is roughly rectangular in shape and occupies an area of approximately 0.16ha.
Site Layout:	At the time of the walkover the site comprised approximately 60% building cover and 40% tarmac cover. The larger building known as 71-73 Caversham Road (formerly used for retail) was located in the east of the site with three smaller individual office buildings in the west. An external area of hardstanding in the centre of the site was used for car parking (see Photo 1, Appendix B).
	The site was accessed from a gate on Northfield Road. The site sloped very slightly from east to west.
Activity / Operations:	The building associated with 71- 73 Caversham Road was vacant at the time of the walkover. RPS understands the site was formerly used as an ironmongers. The central part of the site was used for car parking. Three individual office buildings

Section	Description
	were located in the west of the site, however, these buildings were not accessible at the time of the walkover.
Building Structure(s):	All buildings on site were two storeys in height and of brick construction with pitched roofs (See photo 2, Appendix B).
Surface Cover:	The external areas in the centre of the site comprised tarmac of reasonable to fair quality. An indentation in the tarmac was noted running north to south across the site. The former retail building fronted immediately onto pavement with Caversham Road beyond. Internal areas of 71-73 Caversham Road comprised concrete in the north and brick in the south of the ground floor.
Drainage:	No surface water drainage plans have been made available for review as part of this assessment. Three surface water drains were observed in areas of external hardstanding. No potential oil/water interceptors were reported or identified onsite. A Thames Water Asset Plan provided to RPS indicates two foul water drainage runs to originate in the south west of the site, running north-eastwards into municipal sewer beneath Northfield Road. No trade effluent discharges that would potentially require the freeholder to obtain consent to discharge were identified during the site visit.
Bulk Storage / Tanks:	No underground or above ground bulk storage tanks were noted or reported to be present on site, and no evidence of former underground tanks (including scaring or vents) was noted.
Waste:	Wooden pallets and panels were observed to the rear of 71-73 Caversham Road and in the external area of tarmac hardstanding (See photo 3, Appendix B). General waste accumulation was observed in a gated side-alley running from the front to the rear of 71-73 Caversham Road, along the southern boundary of the site. A waste storage area was located in the south of the site (See photo 4, Appendix B). This consisted of a 1,000 litre general waste wheeled bin and a 200 litre recycling waste bin relating to the offices in the west of the site.
Air Emissions:	No air conditioning units were observed during the walkover.
Electricity Sub-Stations /Transformers:	No electricity substations were observed to be present on site at the time of the walkover.
Visual Evidence of Contamination:	Evidence of paint spillage was observed in a former paint storage area in the south west corner on the ground floor of 71-73 Caversham Road (See photo 5, Appendix B).
Statutory Nuisance:	RPS is not aware of any complaints relating to statutory nuisance at the site.
Other Issues:	An Asbestos Survey (Ref: 1056581) for the site was conducted by <i>The National Britannia Group</i> , in November 2004. This survey was conducted across the buildings 71/77 Caversham Road. Very low to low risk asbestos containing materials were identified in the building. No Japanese Knotweed or Giant Hogweed (invasive plant species) were readily identified on [or adjacent to] the site at the time of the survey. (It should be noted that the identification can be limited by the seasons and in areas of dense vegetation growth).

The Surrounding Area

2.1.2 The site is located in an area of predominantly commercial land uses. At the time of the site inspection, neighbouring land consisted of the following:

Table 2 – Neighbouring Land Uses

Direction	Description
-----------	-------------

North:	Northfield Road and Shurgard Self storage beyond.
East:	Caversham Road and Thames Valley Network Rail Office beyond (presumed vacant).
South:	A commercial unit (PureGym Reading) with Reading Fire Station beyond.
West:	Northfield Road and residential apartments and properties (with garden areas) beyond.

2.2 Proposed Development

- 2.2.1 It is proposed to redevelop 71-73 Caversham Road, the former retail building in the east of the site, with an eight storey, 44 unit residential development. Areas of soft landscaping are proposed to be introduced at ground floor level. A proposed development plan is included as Figure 3.

2.3 Site History

Historical Map Review

- 2.3.1 The following review is based on past editions of readily available Ordnance Survey (OS) maps. These include scales of 1:1,250, 1:2,500 and 1:10,000 dated 1877 to present. Extracts from selected historical maps are given as Figure 4 to Figure 9.

Table 3 – Historical Site Uses

On-site Land Use and Features	Dates
The site comprised three buildings in the centre/east and two in the west of the site (extending off-site in the west), marked malthouse.	1877 to c. 1912
Then the central and eastern buildings were indicated to be divided into three individual buildings.	1912 to c.1956
Then the site had been redeveloped. A rectangular building labelled warehouse was present the central and eastern portions of the site and a photographic works was located in the western portion of the site.	1956 to c. 1969
Then the warehouse was indicated as a motor accessories warehouse and two small building of unspecified use were present in the south west of the site.	1969 to c. 1979
Then the motor accessories warehouse was no longer indicated, and the building was reduced in size. The photographic works was indicated as a works and two small structures were indicated adjacent to the works in the southwest.	1979 to c. 1993
The building layout along the western boundary comprises two rectangular buildings in a reverse 'L' shape configuration and the two small structures in the southwest were no longer indicated. This appears to represent the present-day site layout.	1993 to c.2014

Table 4 – Historical Neighbouring Site Uses

Surrounding Land Uses (250m radius)	Orientation	Distance	Dates From	To
Malthouse	West	Adjacent	1877	c.1899
Then warehouse			1956	c.1969
Then Chemical Warehouses			1969	c.1982
Then Warehouses			1982	c.1993
Warehouse	West	Adjacent	1956	c.1993
Warehouse	West	20m	1956	c.1993
Timber yard	South	25m	1879	c.1931
Railway foundry (Iron)	East	25m	1879	c.1881
Engineering works	North	30m	1956	c.1982

Surrounding Land Uses (250m radius)	Orientation	Distance	Dates From	To
Great Western Railway Works (with associated railway sidings) <i>Then works</i>	East	35m	1879 1956	c.1956 c.1988
Warehouse <i>Then car depot and motor warehouse</i> <i>Then depot</i> <i>Then garage</i>	South	40m	1956 1969 1979 1984	c.1969 c.1979 c.1984 c.1993
Electricity sub-station	North east	40m	1971	Recent
Engineering works <i>Then works</i>	South	40m	1956 1979	c. 1979 c.1988
Warehouse <i>Then motor warehouse</i>	South	60m	1956 1969	c.1969 c.1984
Fire station	South	70m	1956	Present
Warehouse	North west	75m	1956	c.1989
Coal depot	North east	90m	1899	c.1956
Engineering works (coach building) <i>Then motor car engineering works</i> <i>Then works</i>	North	90m	1956 1969 1979	c.1969 c.1979 c. 2014
Railway sidings	South east	90m	c.1879	
Smithy	North east	175m	c.1899	c.1979
Saw mill <i>Then warehouse</i>	North east	180m	c.1899 c.1979	c.1970 c.1994
Goods stations	South east	190m	c.1879	c.1900
Warehouse	South	200m	1956	c. 1969
Printing works <i>Then works</i>	West	230m	1912 1956	c.1956 c.2014
Depot	North east	230m	1979	c. 1994
Factory	South	240m	1957	c.1969
Electrical sub-station	North west	240m	1969	c.1993
Railway station	South east	240m	1912	c.1958

Site Planning History

2.3.2 Readily available relevant planning records for the site, available on Reading Borough Council's planning website are indicated below:

- Planning application ref: 070882, date valid 04th July 2017 – Application Permitted.
Refurbishment of existing office space at 1 Northfield Road, including provision of coverway between buildings.

2.3.3 No conditions pertaining to the investigation of potentially contaminated land were placed on the decision notice.

2.4 Environmental Setting

Geology

- 2.4.1 Based on British Geological Survey (BGS) mapping (1:50,000-scale) and the Environment Agency (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
Langley Silt Member	Indicated to comprise Clay and Silt. Likely to be up to a few metres in thickness in the vicinity of the site.	Unproductive Stratum
Seaford Chalk Formation and Newhaven Chalk Formation	Indicated to comprise Chalk. Likely to be of significant thickness in the vicinity of the site.	Principal Aquifer

- 2.4.2 Made Ground is likely to be present across the site as a result of past construction and demolition activities. No site investigation reports have been reviewed to verify this.

Hydrogeology

- 2.4.3 The site is located above a Unproductive Stratum relating to the Langley Silt Member. These formations have a low permeability and have negligible significance for water supply or base flow. This is underlain by the Seaford Chalk Formation and Newhaven Chalk Formation classified by the EA as a Principal Aquifer. These formations provide a high level of water storage and may support water supply and / or river base flow on a strategic scale.
- 2.4.4 According to EA data, the site is not located in a groundwater Source Protection Zone (SPZ).
- 2.4.5 Under the Water Framework Directive, the Environment Agency's local River Basin Management Plan classifies groundwater chemical quality beneath the site as poor quality.
- 2.4.6 Information provided by the EA indicates that there are records of nine active licensed groundwater abstractions within 2km of the site. These are detailed in the table below:

Table 6 – Licensed Groundwater Abstractions

Licence Holder	Approx. Distance and Direction from Site	Source	Use
Manrose Manufacturing Ltd.	305m West	Thames Groundwater	Non- Evaporative Cooling Potable
Primark Stores Ltd	520m West	Thames Groundwater	Potable
Hillier Group of Companies	600m West	Thames Groundwater	Process water
Berendsen UK Limited	730m North east	Thames Groundwater	Laundry use
Hillier Group of Companies	800m West	Thames Groundwater	Process water
Network rail Infrastructure Limited	820m West	Thames Groundwater	Transfer between sources
Drayton	1130m West	Thames Groundwater	General farming and domestic

Drayton	1540m West	Thames Groundwater	General farming and domestic
Royal Berkshire Hospital	1680m West	Thames Groundwater	Potable

Surface Water

- 2.4.7 There are two watercourses within 1km of the site which are classified within a River Basin Management Plan published by the EA under the European Water Framework Directive (2000). Details of these are presented in the table below:

Table 7 – Nearby Watercourses and Water Bodies

Watercourse / Body	Quality Classification	Approx. Distance and Direction from Site
River Thames: Wallingford to Caversham	Chemical Quality: Good Ecological Quality: Moderate	600m North east
River Kennet	Chemical Quality: Good Ecological Quality: Moderate	875m South east

- 2.4.8 Information provided by the EA indicates that there are records of two active licensed surface water abstractions within 2km of the site. The details of these are as follows:

Table 8 - Licensed Surface Water Abstractions

Licence Holder	Use	Approx. Distance and Direction from Site
The Reading Sustainability Centre CIC	Transfer between sources	825m South
Oracle Shopping Centre Ltd	Lake and Pond throughflow	940m South

Fluvial / Tidal Flood Risk

- 2.4.9 According to the EA flood map, the site is located within Flood Zone 2, with the annual probability of flooding classified as greater than 1 in 1000 (0.1%) but less than 1 in 100 (1%).

Ecologically Sensitive Sites

- 2.4.10 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.

Radon

- 2.4.11 According to the Indicative Atlas of Radon in England and Wales published by the Health Protection Agency (part of Public Health England) and the British Geological Survey, the site is not located in an area at risk from radon gas.

Coal Authority

- 2.4.12 The Interactive Map Viewer on the Coal Authority website indicates that the site is not located in a coal mining reporting area.

2.5 Authorised Processes and Pollution Incidents

Landfills and Waste Sites

- 2.5.1 Data provided by the EA, Local Authority and BGS indicates that there are no recorded licensed or known historical landfill sites located within 250m of the site.

Environmental Permits

- 2.5.2 EA and Local Authority data indicates that there are three processes regulated by an Environmental Permit (under the Environmental Permitting Regulations 2010) within 500m of the subject site. These are outlined in the table below:

Table 9 – Environmental Permits

Licence Holder	Approx. Distance and Direction from Site	Permitted Activity
Scenery Salvage	300m West	Part B -Combustion and Incineration
Rivermead Accident Repair	400m West	Part B -Respraying of road vehicles
Snax 24 Limited	410m North	Part B - Unloading of petrol into storage at service stations

COMAH Sites

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

Pollution Incidents

- 2.5.4 Environment Agency data indicates that there are records of 'major' or 'significant' pollution incidents within 500m of the site. These are outlined in the following table:

2.6 Unexploded Ordnance

- 2.6.1 Reference to the Zetica Regional Unexploded Bomb Risk (UXB) map indicates that the site is in an area of low potential risk from Unexploded Bombs.

3 OUTLINE CONCEPTUAL SITE MODEL

3.1 Background

3.1.1 An outline conceptual site model (CSM) consists of an appraisal of the *source-pathway-receptor* 'contaminant 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 (Hazard).
- **Pathway** for the contaminant to move/migrate to receptor(s).
- **Receptor** (Target) that could be affected by the contaminant(s).

3.1.2 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. Further details on the Part 2A regime are presented within Appendix C.

3.2 Potential Pollutant Linkages

3.2.1 Each stage of the potential pollutant linkages have been assessed individually on the basis of information obtained during the site reconnaissance and desk study exercise and are discussed in the following section.

Potential Contaminant Sources

On Site – Current

- 3.2.2 The former use of 71-73 Caversham Road as an ironmongers is not considered to represent a significant potentially contaminative land use.
- 3.2.3 Made Ground may be present beneath the site, where present this could represent a potential source of contaminants of concern and / or ground gas.

On Site – Historical

3.2.4 Historical maps indicate the following contaminant sources on site:

- **A Malthouse (central and western areas);**
- **Warehouse (central and eastern areas);**
- **Photographic Works (western area);**
- **Motor Accessories Warehouse (central and eastern areas); and**
- **Works (central).**

Off-site – Current

3.2.5 Current off-site potential sources of contaminants of concern in the vicinity include the industrial units to the east of the site. Although this site is now presumed vacant, previous occupants were indicated as Network Rail. Reading Fire Station is also located approximately 70m to the south of the site.

Off-Site – Historical

- 3.2.6 Historical maps indicate several potential contamination sources in the near vicinity of the site including: a malthouse extending adjacent to the west (1877 to c.1899), latterly a chemical warehouse (1969 to c. 1982); a timber yard located approximately 25m to the south (1879 to c. 1931); a railway foundry and works located approximately 25m to the east 1879 to c. 1881); a car depot/garage approximately 40m to the south (1969 to c.1993); an engineering works approximately 40m to the south (1956 to c. 1988); a motor warehouse approximately 60m to the south (1969 to c.1984); and an engineering works (coach building), latterly car engineering, approximately 90m to the north (1956 to c. 2014).

3.3 Potential Pathways

- 3.3.1 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.
- 3.3.2 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.
- 3.3.3 Although the Langley Silt Member is likely to be relatively impermeable, there is considered to be potential for contaminants of concern (if present) beneath the site to migrate on or off-site via granular horizons of the Made Ground (if present) or the Langley Silt Member. These may subsequently impact off-site human health receptors via the dermal contact, ingestion and vapour inhalation pathways.

3.4 Potential Receptors

- 3.4.1 Potential human health receptors include future site users and off-site human health receptors.
- 3.4.2 Providing 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.
- 3.4.3 The nearest surface water feature is The River Thames, which is located approximately 600m to the north east of the site. Given its distance from the site, the river is not considered to be a potentially sensitive receptor.
- 3.4.4 The Seaford Chalk Formation and Newhaven Chalk Formation are both classified as Principal Aquifers and are therefore considered to represent a potential controlled water.

3.5 Outline Conceptual Site Model

- 3.5.1 An outline CSM has been developed on the basis of the site reconnaissance and desk study. The CSM is used to identify potential sources, pathways and receptors (i.e. potential pollutant linkages) on site and is summarised in the table below:

Table 10 – Outline Conceptual Site Model

Potential Source	Contaminants of Concern	Via	Potential Pathways	Linkage Potentially Active?	Receptors
On site – current: Made ground On site – historical: Malthouse, warehouse, photographic works, motor accessories warehouse and works.	Metals, hydrocarbons, solvents and asbestos	Soil	Direct contact/ingestion	✓	Future site users
			Inhalation of volatiles	✓	
			Airborne migration of soil or dust	✓	Off-site users
			Leaching of mobile contaminants	✓	Principal Aquifer
		Groundwater	Direct contact/ingestion	✓	Future site users
			Inhalation of volatiles	✓	Off-site users
Off-site – current: Network Rail warehouse and fire station Off site – historical: Malthouse, chemical warehouse, timber yard, railway foundry car depot/garage, engineering works, motor warehouse and engineering works.	Metals, hydrocarbons, and solvents	Groundwater	Vertical and lateral migration in permeable strata	✓	Principal Aquifer
			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 a number of potential pollutant linkages that may be active upon the redevelopment of the site. These are predominantly associated with the historical on site uses including a warehouse, works, photographic works and motor accessories warehouse.

It is therefore recommended that the potential for the identified pollutant linkages to be active is assessed through a Phase 2 Environmental Site Investigation of the site. The scope of this investigation should include the following:

- Drilling of a number of boreholes across the site targeting identified potential sources and pollutant linkages;
- Installation of groundwater and gas monitoring wells in selected boreholes;
- Collection of soil and groundwater samples from beneath the site with chemical analysis of these samples for contaminants of concern;
- Ground gas monitoring from wells installed at the site;
- Assessment of ground conditions and generic quantitative risk assessment of soil and groundwater chemical analysis results to determine the potential for the identified potential pollutant linkages to remain active upon redevelopment of the site; and
- Provision of recommendations (where necessary) for remediation/mitigation measures to ensure that any identified potential pollutant linkages are not active upon redevelopment of the site.

FIGURES

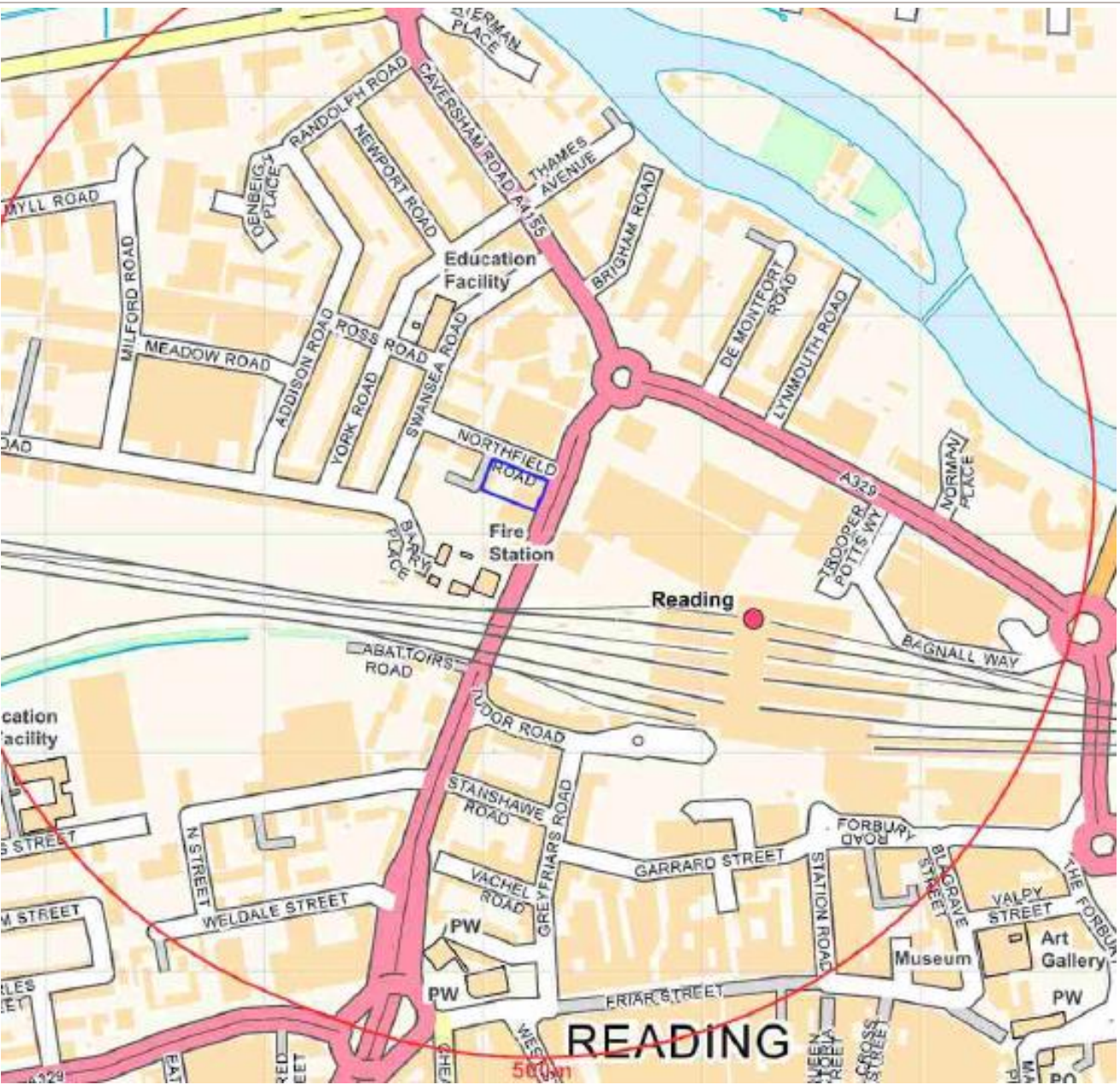


Figure 1: Site Location Plan



Figure 2: Site Boundary Plan

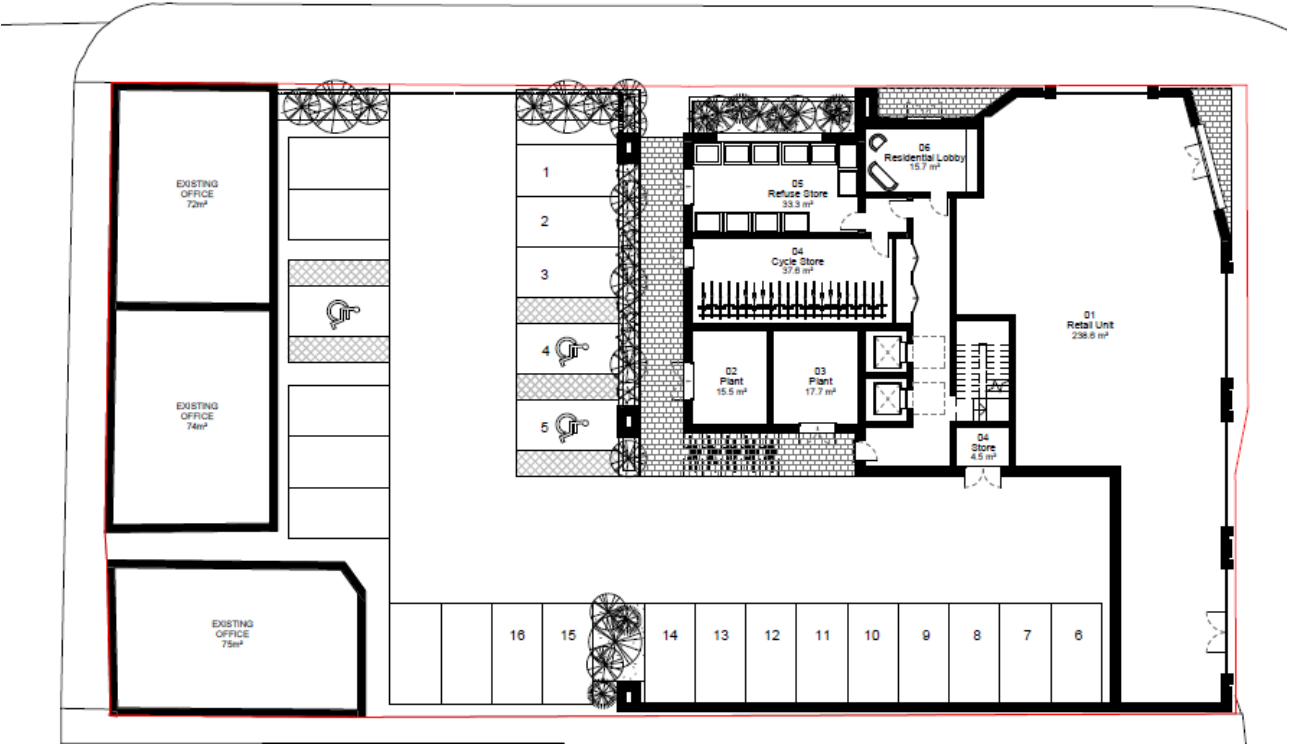


Figure 3: Proposed Development Plan (Ground Floor)

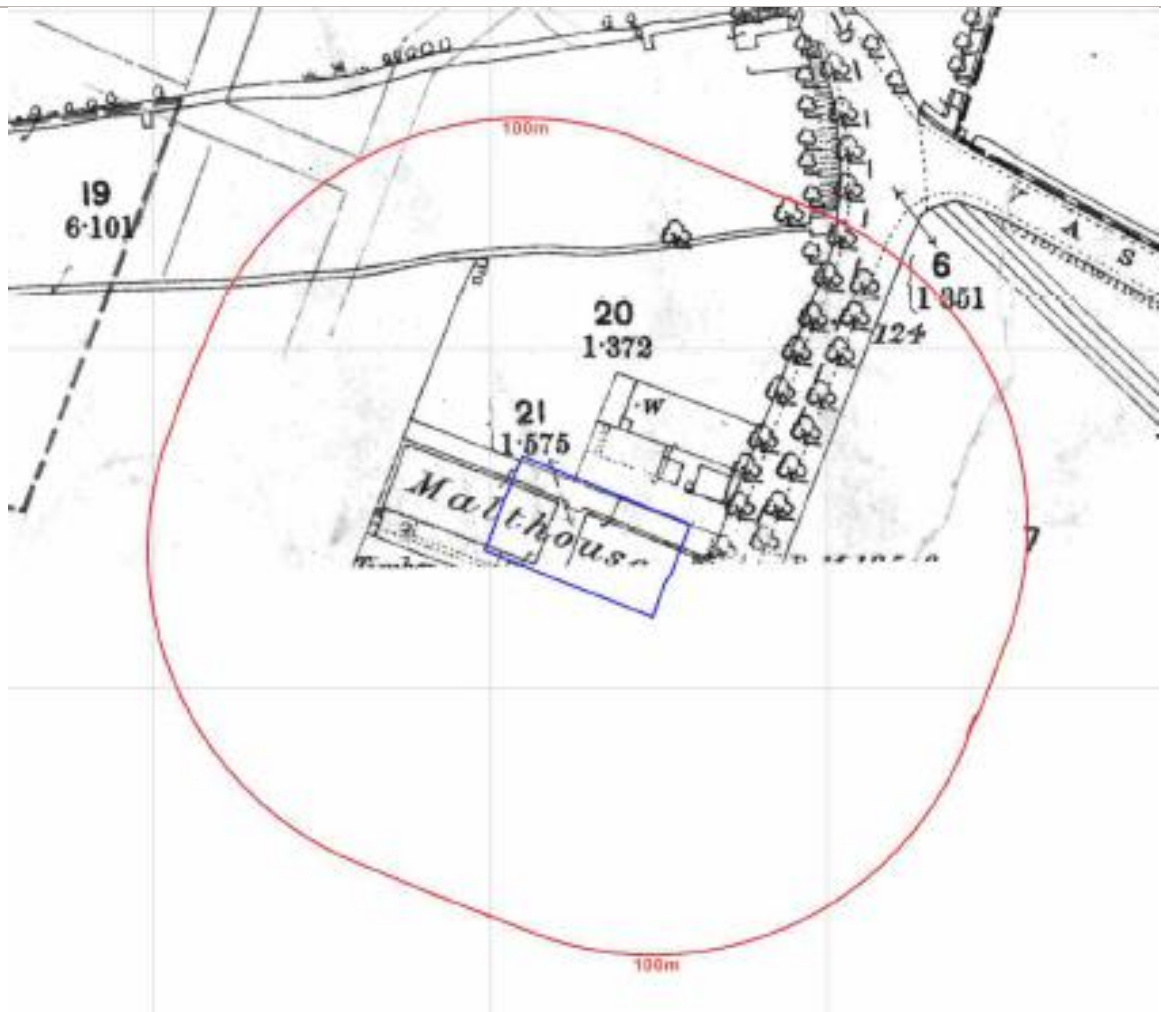


Figure 4: Historical Map Extract 1877



Figure 5: Historical Map Extract 1912

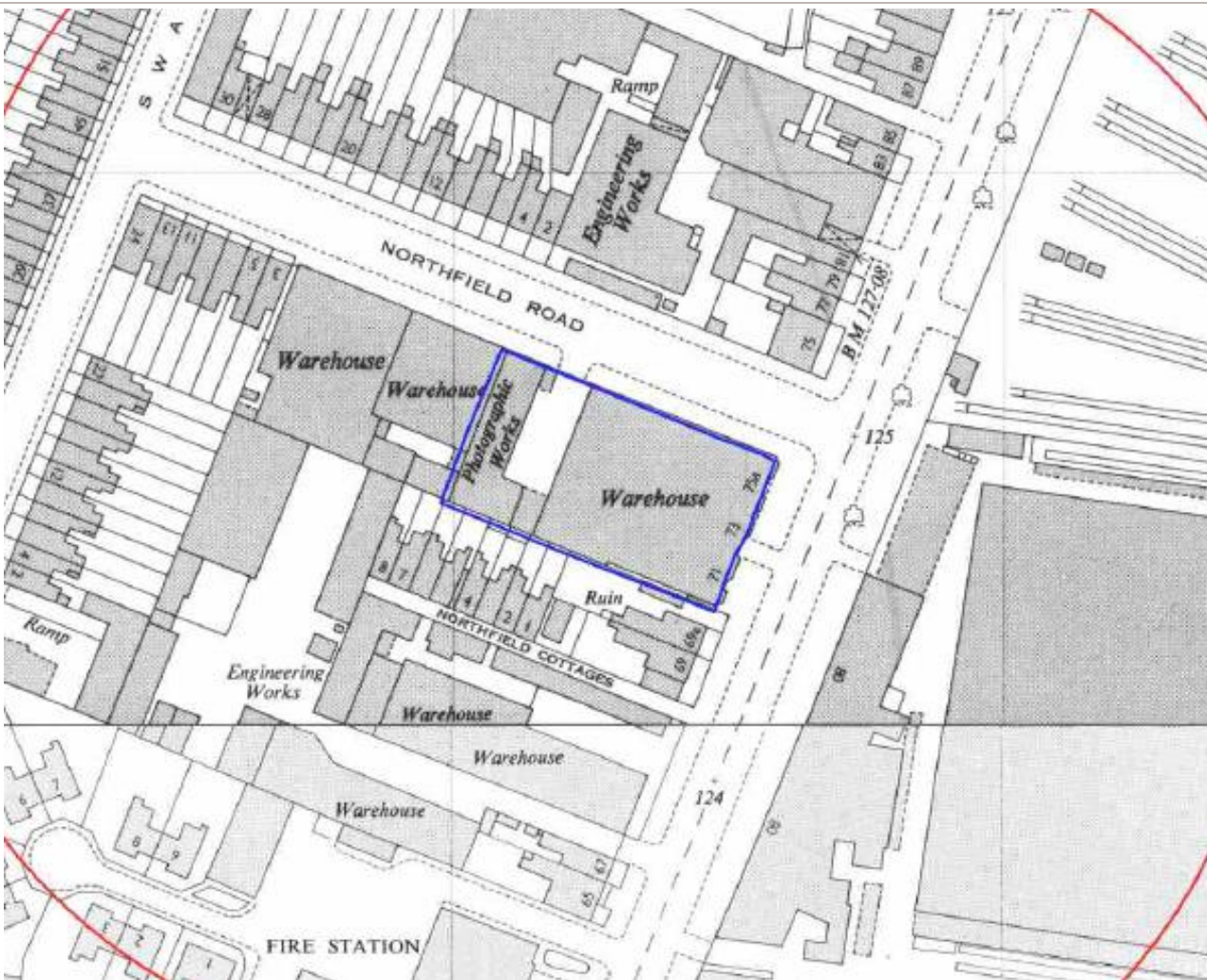


Figure 6: Historical Map Extract 1956

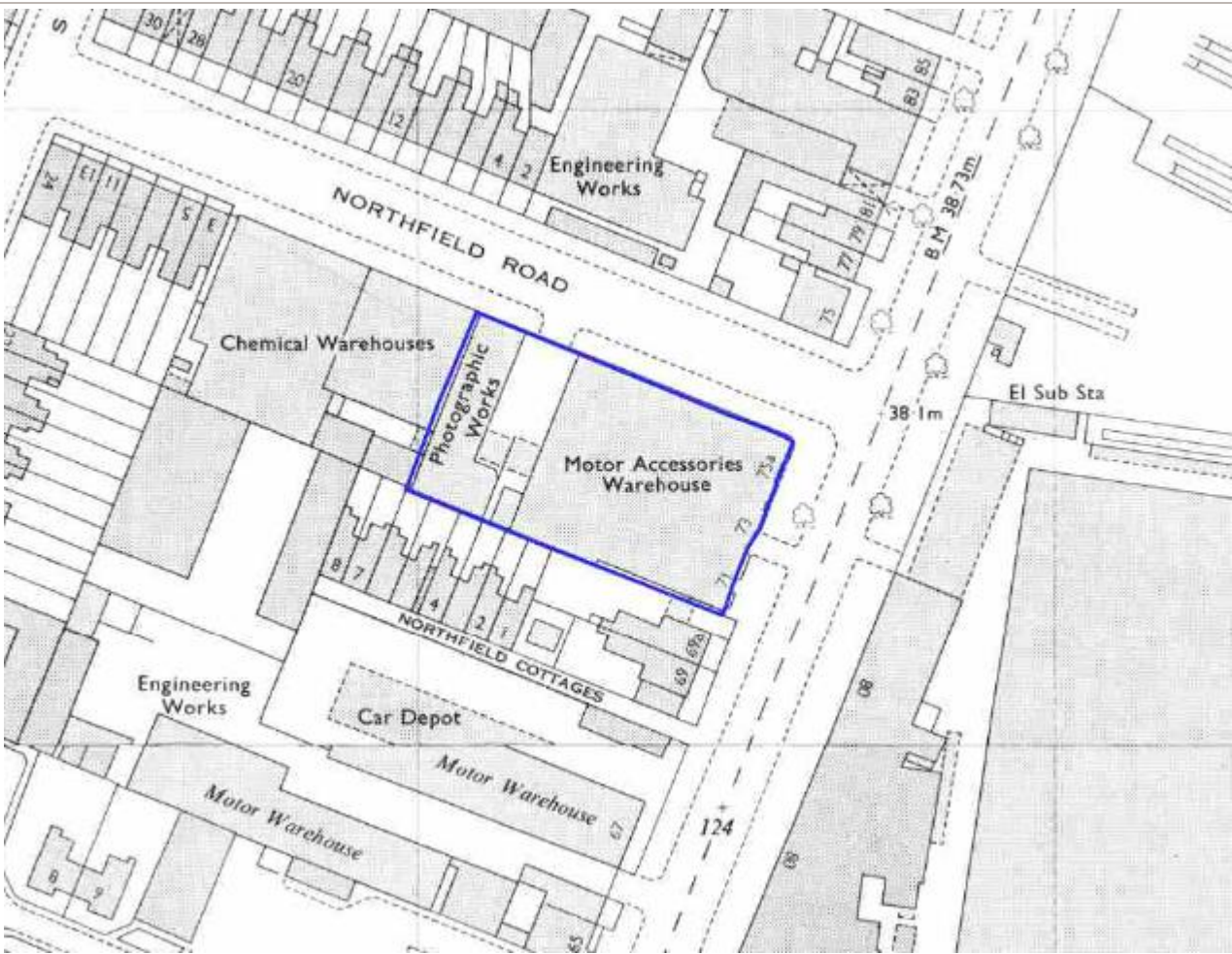


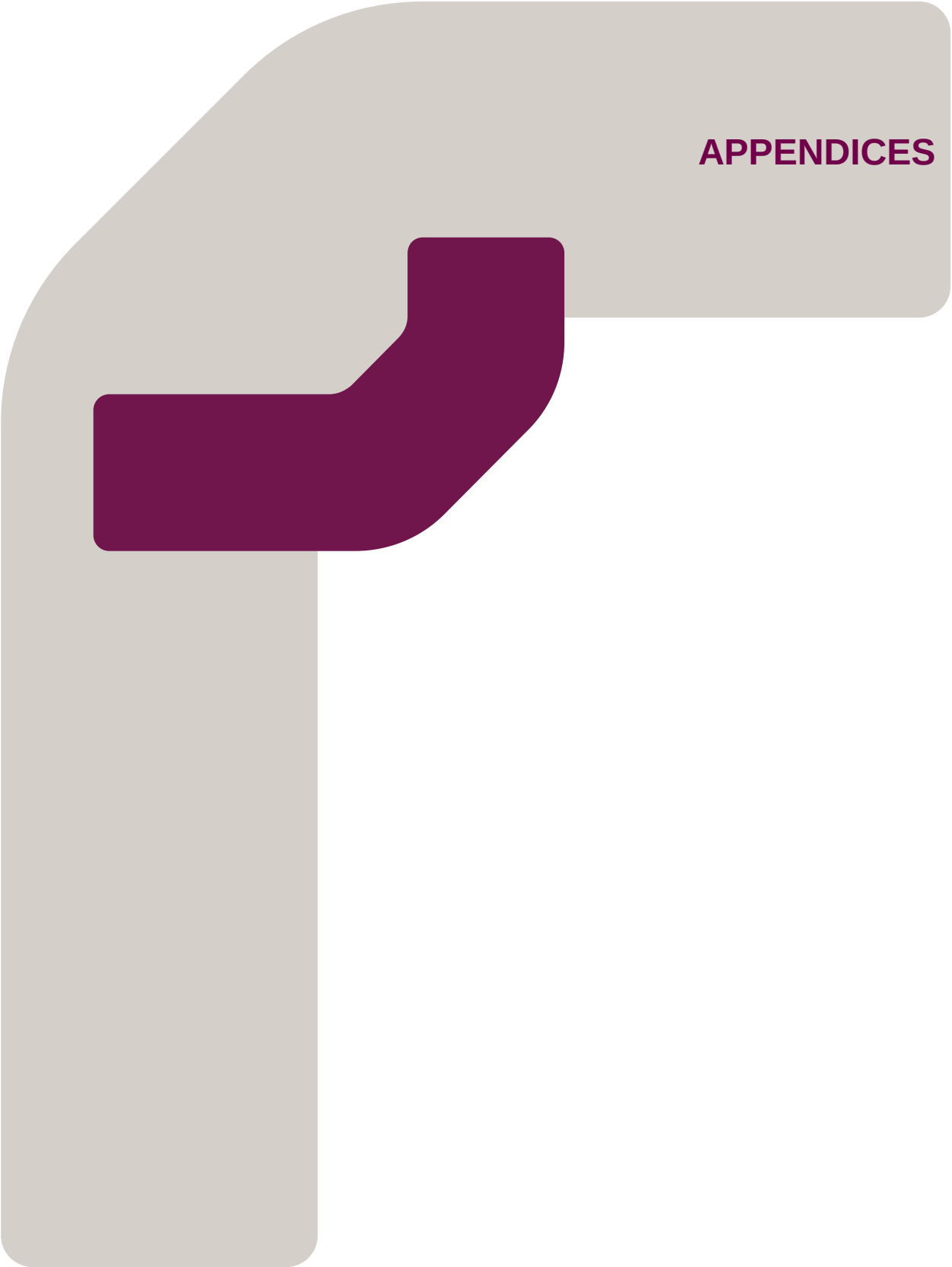
Figure 7: Historical Map Extract 1969



Figure 8: Historical Map Extract 1979



Figure 9: Historical Map Extract 1993



APPENDICES

Appendix A

General Notes

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GENERAL NOTES

PHASE 1 - ENVIRONMENTAL RISK ASSESSMENT / DESK STUDY ENVIRONMENTAL REVIEW

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 "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

Photograph 1: The rear of 71-73 Caversham Road and tarmac area located in the centre of the site.



Photograph 2: Front of 71-73 Caversham Road



Photograph 3: Pallets and wooden waste observed in parking space on southern boundary



Photograph 4: General waste and recycling bins presumed to be associated with adjacent office buildings.



Photograph 5: Paint storage area located on the ground floor of 71-73 Caversham Road.



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:

1. *significant harm* is being caused or there is a *significant possibility* of such harm being caused; or
2. *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:

1. Chronic or acute toxic effect, serious injury or death to humans
2. Irreversible or other adverse harm to the ecological system
3. Substantial damage to, or failure of, buildings
4. Disease, other physical damage or death of livestock or crops
5. The pollution of controlled waters⁴.

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

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.

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

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).