

# **HERTS & ESSEX SITE INVESTIGATIONS**

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**GEOTECHNICAL ASSESSMENTS - ENVIRONMENTAL ASSESSMENT - DESKTOP STUDY - CONTAMINATED LAND**

**Report For :**

**Higgins Homes PLC**

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## **Phase I DESK TOP STUDY REPORT**

**Site location :**

**Former Cherry Garden School,  
Macks Road,  
Bermondsey,  
London  
SE16 3XU**

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**October 2019  
Report No. 15629**

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## ***LIST OF ABBREVIATIONS***

BGS	British Geological Society
CIRIA	Construction Industry Research and Information Association
EA	Environment Agency
EFDC	Epping Forest District Council
GL	Ground Level
GW	Groundwater
HESI	Herts & Essex Site Investigations
LAPPC	Local Authority Pollution Prevention and Control
NOS	Not Otherwise Specified (waste material)
NHBC	National House-Building Council
OS	Ordnance Survey
PAH	Poly Aromatic Hydrocarbons
SPZ	Source Protection Zone
TPH	Total Petroleum Hydrocarbons
UFST	Underground Fuel Storage Tanks

## **DESK STUDY GENERAL NOTES**

***This report has been prepared based on the findings of investigations into the site conditions using current available data which has been recovered from Envirocheck to provide environmental data in relation to the site and surrounding area. Where possible, local sources have been researched to gain a better understanding of the site conditions. As part of this review, research has been undertaken with the Local Authority and the Environment Agency as to the site condition.***

***We can confirm that this report has been prepared based on the information gained and that this information is not exhaustive and that subsequent research may reveal additional facts that may influence the reporting. Where possible, this information has been researched.***

***All geological information has been researched using the British Geological Society website, (the geology viewer). The disclaimer associated with this portal confirms 'The British Geological Society accept no responsibility for omissions or misinterpretations of the data from their Data Bank as this may be old or obtained from Non-BGS sources and may not represent current interpretation.***

***The 'Copyright' within this report including plans and all other prepared documents prepared by Herts & Essex Site Investigations, (HESI), is owned by HESI and no such report, plan or document may be reproduced, published or adapted without their written consent. Complete copies of this report may, however, be made and distributed by the client as an expedient in dealing with matters relating to this commission.***

***The accuracy of map extracts cannot be guaranteed and it should be recognized that different conditions on site may have existed between subsequent to the various map surveys.***

***We can confirm that within the assessment of the site, various websites have been visited and as such, we cannot confirm the validity of these sites and as such, this information is accepted de facto and without prejudice. Anyone relying on these sources does so at their own risk, however, Herts & Essex Site Investigations does undertake all reasonable care to ensure this data is relevant and correct.***

***It should be confirmed that the extent of review of this report has undertaken a broad review of on site features which would promote a contamination ground risk, however, this does not include ecological features and in particular Japanese Knotweed which should be reviewed under separate cover.***

***A review of the site will be made to confirm the extent of obvious Asbestos product or sheet materials either on the surface of the site soils or evident above ground, however, does not constitute a full Asbestos Survey by any means. This should be sought under separate cover.***

## DOCUMENT INFORMATION AND CONTROL SHEET

### Client

Higgins Homes PLC  
One Langston Road  
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IG10 3SD

### Environmental Consultants :

#### **Herts & Essex Site Investigations.**

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### Qualifications

#### **C.S.Gray**

- ONC - Civil Engineering
- HNC – Civil Engineering
- P.G. Certificate – Geotechnical Engineering, (Inc. Environmental Engineering)
- P.G. Diploma – Geotechnical Engineering, (Inc. Environmental Engineering),
- Master of Science, (Geotechnical Engineering), (Inc. Environmental Engineering)
- SNIFFER modelling course
- CONSIM Groundwater Assessment Course.
- (30 Years in Geotechnical and Environmental Engineering)
- Asbestos Awareness Course;
- Non-Licensed Work with Asbestos Including>NNLW.
- Site Supervisors Safety Training Scheme, (SSSTS).
- First Aid Course in Construction – 3 Day Course – 3 years
- CSCS Labourer Card

### Document Status and Approval Schedule

Issue No	Status	Date	<b>Prepared by :</b> Rebecca Chamberlain Signature / Date	<b>Technical review by :</b> Chris Gray Martyn Smith Signature / Date	<b>Checked By :</b> Chris Gray Martyn Smith Signature / Date
1	Final	October 2019			

## **REPORT ISSUE RECORD**

As part of Herts & Essex Site Investigations approved Quality Management System, the company is required to document the issue of all reports to provide the client with a traceable control mechanism to prevent the issue of unauthorised copies.

All final copy reports are issued to the client on paper headed with Herts & Essex Site Investigations to assist in the identification of copied reports. Additionally, final copies are printed 'Velum' coloured paper for easy identification of final copy reports.

Notwithstanding the above, clients are at liberty to make copies of full or parts of these reports as they see fit, should they wish to do so. Additional controlled copies of documents may be supplied upon request, although, may be charged for, dependent upon the number of copies.

Please note, this reports has not been sent to the Local Authority, NHBC or Environment Agency with only the below issues made. Should copies be required for sending the relevant authorities, this can be undertaken upon request.

Controlled copies of this report have been issued according to the following schedule :-

Issue No	Recipient	Type	No. of copies	Date
1	HESI, (File Copy)	Electronic Copy	1	October 2019
2	Higgins Homes PLC	Electronic Copy	1	October 2019
3				
4				
5				
6				
7				
8				

## EXECUTIVE SUMMARY

### PHASE 1 DESK TOP STUDY REPORT

<b>Client</b>	Higgins Homes PLC		
<b>Site Location</b>	Former Cherry Garden School, Macks Road, Bermondsey, London SE16 3XU		
<b>Existing Development</b>	Vacant primary School		
<b>Proposed Development</b>	It is proposed to develop residential dwellings within the site area in the form of flats, duplexes and houses formed of between two and six storeys. Private gardens as well as communal landscaping is also proposed.		
<b>Site Settings and Previous Uses</b>	<p>From the earliest map reference that site area is recorded as terraced residential dwellings with rear gardens, in about 1940 the area was redeveloped (likely due to bomb damage during the war) the site and land to the east, south and west remain residential land. From 1973 the site area was redeveloped to form the school which remains in place to date.</p> <p>Surrounding the site residential land remains in place to the east, south and west. Some commercial shops are in place to the south east of the site area. To the north of the site area a grassed recreational area is in place.</p>		
<b>Nearest Surface Water Feature</b>	The nearest surface water feature is recorded as 704 meters to the east of the site which is recorded as a pond within Southwark Park.		
<b>Geological and Hydrological Profile</b>	<b>Geology</b>		<b>Aquifer Classification</b>
	<b>Made Ground</b>	Shallow Made Ground Anticipated	Not Classified
	<b>Kempton Park Gravel Member</b>	Chalky till, together with outwash sands and gravels, silts and clays	Secondary A Aquifer
	<b>Lambeth Group</b>	Clay	Secondary A Aquifer
<b>Groundwater Abstractions</b>	The nearest abstraction well is located 775 meters to the east of the site which is recorded as a Public Administration: Drinking, Cooking, Sanitary, Washing, (Small Garden) and Municipal Grounds: Make-Up or Top Up Water.		
<b>Source Protection Zone</b>	The site does not lie within a Source Protection Zone.		
<b>Potential Sources of Contamination</b>	<b>On Site</b>		
	<ul style="list-style-type: none"> <li>Parking area</li> <li>School</li> <li>Terrace dwellings and gardens- Redeveloped</li> <li>(possible bomb damage)</li> <li>Made Ground</li> </ul>	<b>Off Site</b>	
		<ul style="list-style-type: none"> <li>Made Ground (bomb Damage)</li> </ul>	
<b>Previous Investigations</b>	No reports relating to contaminated land are known to us at the time of writing this report relating to the site.		

<b>Human Health Risk</b>	<p>We would suggest that there are potential sources of contamination relating to the historical land use of the site that, may be in place within the upper subsoil which will require assessment.</p> <p>Potential pathways in place within the site area recorded as :-</p> <ul style="list-style-type: none"> <li>Dermal Contact;</li> <li>Inhalation of dust and fibres;</li> <li>Ingestion of home grown produce;</li> <li>Ingestion of dust and fibres</li> <li>Ingestion of contaminated water through water main pipework;</li> <li>Inhalation of vapours from soils;</li> <li>Inhalation of vapours from Groundwater.</li> <li>Inhalation Asbestos dust and fibres (from Asbestos within the building);</li> <li>Inhalation Asbestos dust and fibres (from asbestos within the soil).</li> </ul>
<b>Ground Water Risk</b>	<p>Considering the Secondary Aquifers within the site area there is a potential for groundwater to be in place and to be impacted on by the site area, although risks of contamination within the site area recorded as low, the follow pathways may be in place: -</p> <ul style="list-style-type: none"> <li>Leaching, lateral migration of shallow groundwater system underlying the site and subsequent abstraction well;</li> <li>Leaching, lateral migration of shallow surface water system adjacent to the site.</li> </ul>
<b>Surface water Risk</b>	<p>Considering the nature of the feature and the distance from the site area the risk are reduced.</p> <p>A watching brief should be maintained throughout the development, should any significant pollution or suspect materials be encountered reassessment to the risk should be undertaken.</p>
<b>Vapour Risk</b>	<p>Sources of contamination that may promote a vapour risk are recorded in place as such risk maybe in place.</p> <p>Potential pathways in place within the site area recorded as: -</p> <ul style="list-style-type: none"> <li>Inhalation of vapours from soils - Visual and chemical tests to be completed initially;</li> </ul>
<b>Land Gas Risk</b>	<p>Increased depths of made ground are potentially in place within the site area. As such, potentially waste product and degradable materials may also be in place and promote a land gas risk.</p> <p>Based on this, we would confirm that a minimum of six monitoring rounds should be completed over falling or low atmospheric pressures or frozen ground conditions. Appropriate reporting should be completed post site monitoring.</p>
<b>Recommend ations</b>	<p><b>Next Steps</b></p> <ul style="list-style-type: none"> <li>Intrusive shallow based excavation using window sampler to assess the geological conditions and recover samples;</li> <li>Initially assess soils for presence / absence of fuels and if encountered :- <ul style="list-style-type: none"> <li>Install standpipe for the monitoring of both groundwater and land gas / vapour risks;</li> </ul> </li> <li>Targeted sampling to assess on site source risk;</li> <li>Spatial sampling for use in statistical analysis;</li> <li>Consideration through the site assessment as to the presence of Asbestos product within the site and subsoil within the site;</li> <li>Assess the risk to and from the groundwater - Leachate testing and groundwater sampling if required;</li> <li>Visual observations of the subsoil encountered to make initial assessment of the potential risk from contamination.</li> <li>Watching brief to record assess and report on unexpected contamination.</li> </ul> <p>Based on the above, a risk assessment should be completed when the findings of the investigation have been completed. This will result in a revised conceptual model based on actual site conditions and confirm the risks in place.</p>



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## **PRELIMINARY RISK ASSESSMENT – DESK TOP STUDY - PHASE 1 REPORT**

### **1 Context and Objectives of this report**

#### **1.1 Introduction**

We have been asked by Higgins Homes PLC to undertake an investigation of the above site in order to assess the potential environmental impact of the existing and historical use of the site on the proposed development sufficient to document the level of risk and impact on future users and the environment.

Higgins Homes PLC are proposing to develop new residential dwellings, forming flats duplexes and houses. The standard we will use in the derivation of risk has therefore been assigned as a 'Residential Land Use with Home Grown Produce'.

#### **1.2 Reference to the Current Planning Application Details**

At the time of writing this report no planning application has been submitted with Southwark Council.

#### **1.3 Decision Notice Relating to Contaminated Land**

No conditions are in place for the site area.

#### **1.4 Report Objectives**

The objectives of the project were as follows:-

A review of the geological, hydrological and hydrogeological setting of the Site, and public domain environmental information to build up an understanding of the Site and its environmental setting/sensitivity;

- Review of historical land uses for the Site and surrounds with a particular emphasis on identifying potential ground hazards and on-site and off-site contamination sources;
- A visual walkover inspection of the Site to review current and recent Site activities, the condition of the Site, potential ground related hazards and activities or areas that might have the potential to cause ground contamination as well as possible indicators of contamination; and
- Preparation of a Conceptual Site Model (CSM) with a view to identifying potentially significant source-pathway-receptor linkages followed by a qualitative risk assessment.

#### **1.5 Timescales of the Assessment**

The timescales for the site investigation process are based on immediate site investigation data and the assessment of the site conditions based on this report at present. The scope of this report which define the following:-

- Any immediate risks identified within the site that may promote a high risk to the immediate site conditions;
- Any current site use features that would promote a risk that required 'quick' action;
- Any construction or medium term risks within the site which may be present during the construction process within the site;
- Any long term risks within the site that may require long term assessments or interim monitoring;
- Any risks within the site that may change upon the change in use of the site to form the proposed development.

#### **1.6 Level of Technical Confidence Expected**

The scope of this report has been prepared in order to assess the historical impact of the site and any previous site uses on the existing and proposed development scheme. The level of risk will be prepared and assessed based on historical mapping and environmental information which has been gained to support the development of this report.

Whilst this is the case, gaps in map records and information will be in place that would reduce the readers confidence of the information sought. As such, this report has been prepared as a preliminary or Indicative Report with a Medium Confidence Level.

## 1.7 Management Constraints

The site investigation has been prepared based on a budget and time scales which has been agreed with the client. The desk top study fees have been agreed at this time which will dictate a way forward.

## 2 Broad Characteristics of the site

### 2.1 The Site

The site is located within a residential area of London, the details of which are summarised in Table 1 with the location plan of the site shown in Appendix 2, Sheet 1.

**Table 1 Site Detail**

<b>Site Address :</b>	Former Cherry Garden School, Macks Road, Bermondsey, London SE16 3XU
<b>Site assessed under</b>	Site Owners Request - Aid as part of future planning
<b>Current use of land :</b>	Primary School
<b>Previous use of site, (if known)</b>	As above
<b>Grid Reference</b>	NGR 534340, 178850
<b>Site Area</b>	0.23 Hectares
<b>Local Authority</b>	Southwark Council
<b>Gradient of the site</b>	The site and the surrounding area form a level area of land.
<b>Proximity of Controlled Waters, (if known)</b>	The nearest surface water feature is recorded as 704 meters to the east of the site area, where a pond is in place with Southwark Park.

### 2.2 Existing Site Use

The site area forms a vacant school, with a parking area and recreational areas.

### 2.3 Surrounding Land Uses

The surrounding land uses are detailed below :-

- To the north of the site area Alexis Street is in place with a grassed recreational area in place beyond;
- To the east of the site area commercial and Residential land is in place;
- To the south of the site area Southwark Park Road is in place with residential land beyond;
- To the west of the site area Mack's Road is in place with residential flats beyond;

## **2.4 Site Reconnaissance**

The site walk over visit was undertaken in October 2019 on which the weather conditions were recorded as overcast with rain shower though the day.

### **Access**

At the time of the walk over the site was being occupied by guardians, there was limited access onto the site area. Within the north west of the site area a tarmac parking area is in place, with metal fence and gates in place off of Mack's Road to the west and Alexis Street to the north. Within the northern boundary of the site area there is also a gated access onto the recreational area within the east of the site area. At the time of the walk over there was limited access into the site area and therefore also within the building.

### **Site Area**

Within the east of the site area there is a tarmac parking area in place, this area is accessed from Mark Road to the west and Alexis Street to the north. Limited features are in place within this area, some surface drainage gullies were seen in place.

The main building is accessed from the car park area within the east. The building forms a partly single storey and some parts two storey buildings within the center and south of the site area. Limited access was possible at the time of the walk over although it is recorded that classrooms, and amenities are in place although is no longer in use. There is potential for a boiler room to be in place, housing the heating system for the site.

Within the east and south east of the site area hard landscaped recreational areas are in place, with various play equipment, seating area as well as smaller fenced off area. Some small plant beds are in place.

### **Vegetation**

Limited plants and vegetation are recorded in place across the site area, some small tree pits and plant beds are in place to the boundary of the site area, all of which are in a good state of health.

### **Above or below ground fuel or oil storage tanks**

From our examination of the site, no above or underground tanks were seen in place within the site.

### **Asbestos Containing Materials**

No Asbestos containing materials were reviewed on site from our walk over inspection. We recommend that an asbestos survey of the building be carried out, if not done so already, prior to any demolished or works on site; A full Asbestos survey will be required in order to fully consider Asbestos within any fill material on site.

### **Surrounding Area**

To the north of the site area a recreational area in place, forming a treed and grassed area as well as enclosed grassed area to the north east of the site area.

To the east of the site area there are commercial units in place off of Southwark Road, with residential unit above and also to the north east of the site area.

To the south of the site area on the opposite side of the road residential units area in place, also to the west of the site area residential flats are in place.

### **Site Levels and Ground Cover**

The site area and the surrounding land form a level area.



**Current site activities**

The site area is currently not in use although was previously a school.

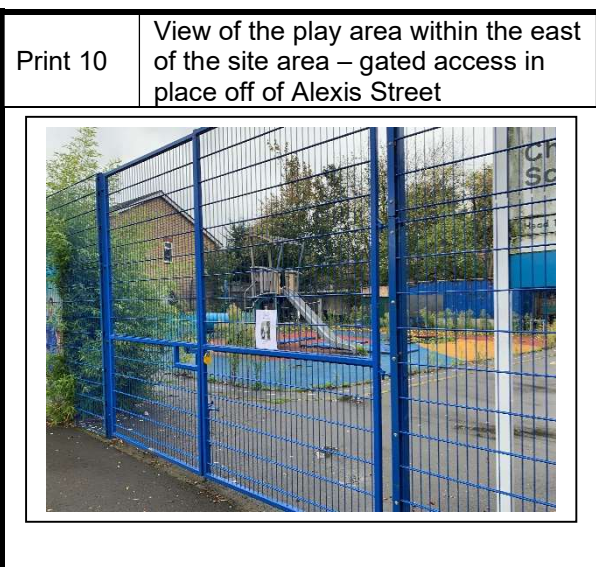
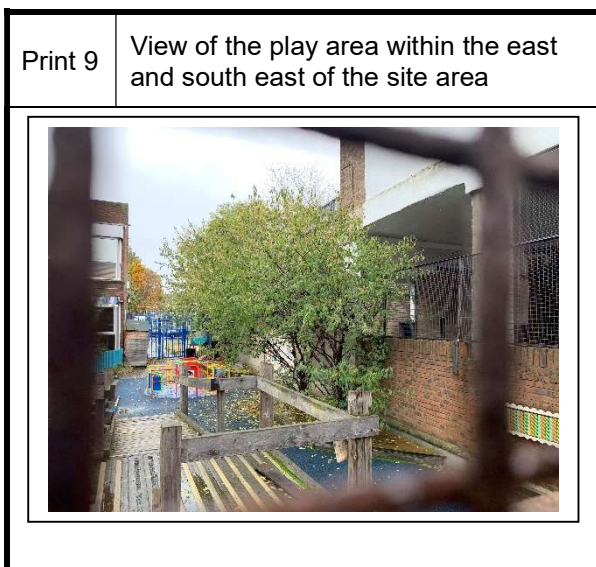
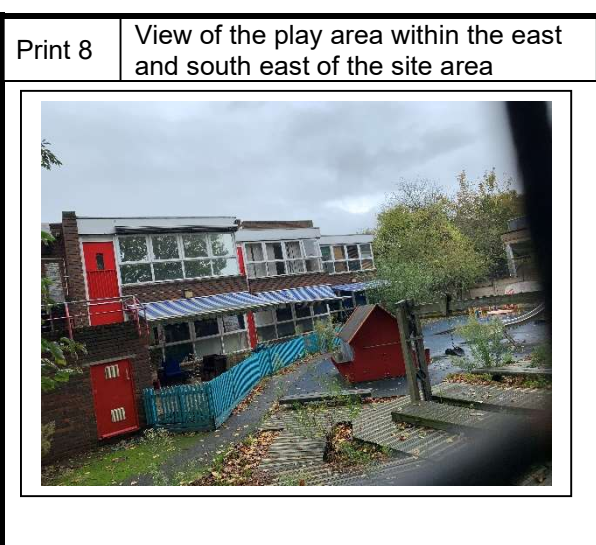
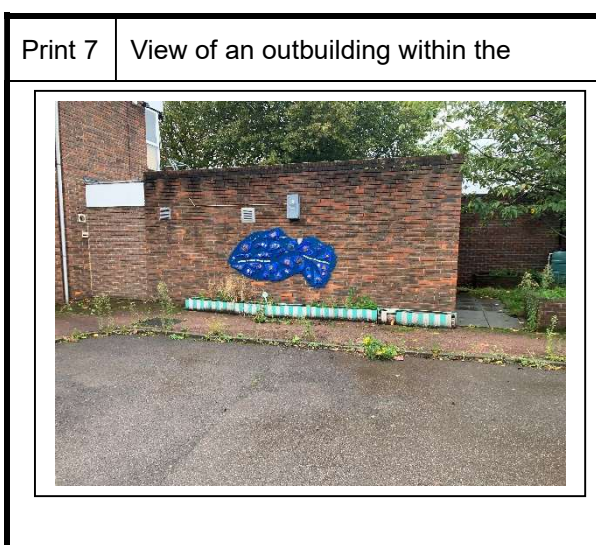
**Effluent, Site Drainage and Services**

Drainage and services are in place within the site area, a service search has been completed and shows the majority of these run around the boundary of the site within the footpaths and where they do come onto the site these are recorded within the west. These searches do not take into account local drainage and services within the site area.

**2.5 Site Reconnaissance – Photos**

Print 1	View of the site area looking from the opposite side of Alexis Street	Print 2	View of the parking area within the west of the site area looking to the south
			

Print 3	View of the parking area within the west of the site area looking to the southeast	Print 4	View within the parking area within the west of the site area looking to the north
			



**Table 2 Walk Over Inspection Risk**

<b>Feature</b>	<b>Location</b>	<b>Elevation</b>	<b>Is Risk Present?</b>	<b>Location To Target</b>
Parking area	On Site – E	At GL.	✓	Within the area
School	On Site	At GL	✓	Site wide
Commercial shops	Off Site – W	At GL	X	

### **3 Details of Searches Undertaken**

Within this report, various searches have been undertaken in order to assess the risk associated with the development of the site from the historical and current use of the site and surrounding area. These include:-

- Environmental Data Search 1:10,000;
- Environmental Data Search 1:2,500;
- Site Sensitivity Maps and Data Sheets;
- Historical Maps;
- Internet Search;
- Local Authority Search – Planning Files;
- Consultation with Site Owner / Architect.

### **4 Information on Historical and Current Activities on the Site and Surrounding Area**

The history of the site's land-use and development from Victorian times onwards has been researched from Ordnance Survey, (O.S.) maps. Extracts of the O.S. Maps and plans are presented in Appendix 4. Reference to historical maps provides invaluable information regarding the land use/history of the site, but historical evidence may be incomplete for the period pre-dating the first edition and between successive map references.

#### **4.1 Discussion of the Development History**

A summary of the historical development of the site and surrounding area, based on the information obtained from the above sources is provided in Table 3. It should be noted that these maps are only a small section of time and represent the timescales given in each of the map records. It is highly possible that development or features may have been developed within or surrounding the site which may influence the site and this should be bourn in mind when assessing the history of the site.

**Table 3**                      **Historic Maps Assessment**

<b>Date</b>	<b>On Site Feature</b>	<b>On Site Mitigation (considering all possible pathways)</b>	<b>Off Site Feature</b>	<b>Off Site Mitigation (considering all possible pathways)</b>
<b>1874</b> Source Map Scale 1: 1 056	Terrace dwellings and gardens	Limited Source	Residential land	Limited Source
<b>1895</b> Source Map Scale 1:1 056				
<b>1875</b> Source Map Scale 1:2 500				
<b>1879</b> Source Map Scale 1:10 560				
<b>1880</b> Source Map Scale 1:10 560				
<b>1896</b> Source Map Scale 1:2 500				
<b>1896</b> Source Map Scale 1:10 560				
<b>1898</b> Source Map Scale 1:10 560				
<b>1916</b> Source Map Scale 1:2 500				
<b>1920</b> Source Map Scale 1:10 560				
<b>1938</b> Source Map Scale 1:10 560				

Table 3a Historic Map Assessment - Continued.....

<b>Date</b>	<b>On Site Feature</b>	<b>On Site Mitigation (considering all possible pathways)</b>	<b>Off Site Feature</b>	<b>Off Site Mitigation (considering all possible pathways)</b>
<b>1940</b> Source Map Scale 1:10 000	Dwellings on site redeveloped	Limited Source	Open land - SW	No Sources
<b>1950</b> Source Map Scale 1:1 250				
<b>1951</b> Source Map Scale 1:2 500				
<b>1954</b> Source Map Scale 1:10 000				
<b>1962</b> Source Map Scale 1:1 250			Open Land - W	No Sources
<b>1962</b> Source Map Scale 1:10 000				
<b>1968</b> Source Map Scale 1:10 000				
<b>1970</b> Source Map Scale 1:1 250	Residential dwellings removed – N	Limited Source	Residential land – SE & W	
<b>1973</b> Source Map Scale 1:1 250	Residential Dwelling removed  School building	Limited Source  Limited Source	Open land - N	No Sources
<b>1975</b> Source Map Scale 1:10 000				
<b>1980</b> Source Map Scale 1:1 250				



**Table 3b**      **Historic Map Assessment - Continued.....**

<b>Date</b>	<b>On Site Feature</b>	<b>On Site Mitigation (considering all possible pathways)</b>	<b>Off Site Feature</b>	<b>Off Site Mitigation (considering all possible pathways)</b>
<b>1981</b> Source Map Scale 1:10 000				
<b>1988</b> Source Map Scale 1:10 000				
<b>1991</b> Source Map Scale 1:1 250				
<b>1975</b> Source Map Scale 1:10 000				
<b>1999</b> Aerial Photo			Park Land – N	No Sources
<b>1995</b> Source Map Scale 1:10 000				
<b>1999</b> Source Map Scale 1:10 000				
<b>2006</b> Source Map Scale 1:10 000				
<b>2019</b> Source Map Scale 1:10 000				

Table 4 Overview of Historic Map Assessment Risk

Identified Risk	Distance & Direction	Year	Is risk in place?	Considering All Pathways		Justification
				Assessment Required.	Method of Assessment	
Terrace dwellings and gardens Redeveloped (possible bomb damage)	On Site	Pre 1874 – 1940 1940 - 1970	✓	Possible Soil, Risk Possible GW Risk Possible Vapour Risk	Recover Soil Samples Install Standpipes GW & Vapour Assessments	Redevelopment of the site in the 1940 suggest that there may have been some damage during the war which could promote increased made ground within the site area.
School	On Site	1973 - Present	✓	Possible Soil, Risk Possible GW Risk Possible Vapour Risk	Recover Soil Samples Install Standpipes GW & Vapour Assessments	Consider ground gases, groundwater and vapour risk limited risk in place from this feature although parking areas may promote a risk
Residential land	Off Site	Pre 1874- Present	X			Limited risk in place from off site residential land
Open Land	Off Site – W Off Site – N	1962 – 1970 1973 – Present	X			No sources of risk in place

## 5 **Details of the Intended Future Use of the Site**

It is proposed to develop residential dwellings within the site area, in the form of terraced dwellings and flats, forming between two and six storeys. Private gardens as well as communal landscaping is also proposed.

## 6 **References of Planning Applications**

No current planning application is in place for the site area.

## 7 **Discussion with Local Authority**

No discussion with the Local Authority has been completed.

## 8 **Consultation with Environment Agency**

Consultation has not been made with the Environment Agency at this time. The information gained from Envirocheck and the EA web site has provided sufficient information at this stage. The assessment of the site should take into account the groundwater regime within the site area and the possible risk from both on site and off site contamination.


Should heavy or persistent contamination be identified within any Phase 2 or intrusive investigation, consultation will be required and will be undertaken.

## 9 **Consultation with Appropriate Bodies/Local Sources**

Limited consultation with the Local Authority has taken place a review of the online planning files has been made.

(<http://bombsight.org/#15/51.5050/-0.0900>)

A review of the Bomb Sight web site notes the following incident in 1941, which would account for the redevelopment of the dwelling within and surrounding the site area shown within the historical mapping. This is likely to promote increased fill within and surrounding the site area. A UXO survey may be required for the site area.



**Description**

**High Explosive Bomb :**

**Source:** Aggregate Night Time Bomb Census 7th October 1940 to 6 June 1941  
Fell between Oct. 7, 1940 and June 6, 1941

**Present-day address**  
Alexis Street, Bermondsey, London Borough of Southwark, SE1 5RP, London

**Further details**  
56 18 NE - comment:

No other local sources of information were available at the time of the walk over. This forms the level of assessments made.

## 10 **Previous Reporting**

No previous reports are known to us at the time of writing this report.

## 11 Environmental Settings

### 11.1 Superficial Deposits and Solid Geology

The ground conditions based on geological maps and BGS information shows the site to be located within an area of Kempton Park Gravel Member within the superficial deposit which over lays Lambeth Group. To the south of the site area, 40m, there is Thanet Formation report in place below the Kempton Park Gravel Member.

### 11.2 BGS Boreholes

Within the centre of the site area a BGS Borehole is recorded in place:-  
TQ37NW1934 — 34 ROVEL PLACE BERMONDSEY 16  
534337,178855 Depth: 11.43m.

This recoded :-

Made ground to 4' (1.22m)

Soft brown silty CLAY to 7' (2.13m)

Very dense light brown angular GRAVEL & SAND to 22' (6.71m)

Very stiff blueish grey silty CLAY with shells to 28' (8.53m)

Stiff mottled greenish blue red and white silty CLAY 37'6" (9.90m)

**Table 5 Geological Information**

<b>Geological Unit</b>	<b>Brief Description</b>	<b>Anticipated thickness, (m)</b>	<b>Aquifer Type</b>
<b>Superficial Deposits/Drift</b>			
<u>On Site</u>			
Filled/Re-worked ground	Made Ground, (Potentially Contaminated Stratum).	0.5-1.00 meters+	Not Classified
Kempton Park Gravel Member	Sand & Gravel	4-6 meters	Secondary A Aquifer
<b>Solid Geology Deposits</b>			
Lambeth Group	Clay, Silt and Sand	6-10m +	Secondary A Aquifer

### 11.2 Hydrology

The nearest surface water feature is recorded as 704 meters to the east of the site which is recorded as a pond within Southwark Park.

No discharge consents are recorded surrounding the site.

A pollution incident to controlled waters is recorded 644 meters to the east of the site which are recorded as Significant Incident from Miscellaneous – Natural in 1997.

### 11.3 Hydrogeology

The published Environment Agency Groundwater Vulnerability Map of the area, (indicates the site to be located within an area classified as a Secondary A Aquifer within both the superficial deposits and the bedrock.

The nearest abstraction well is located 775 meters to the east of the site which is recorded as a Public Administration: Drinking, Cooking, Sanitary, Washing, (Small Garden) and Municipal Grounds: Make-Up or Top Up Water.

Reference : CSG / DTS / 15629

Former Cherry Garden School, Macks Road, Bermondsey, London SE16 3XU

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The site does not lie within a Source Protection Zone.

#### **11.4 Implication of groundwater**

Considering the underlying Secondary A Aquifer, groundwater links are possible and therefore some degree of assessment will be required to classify the extent of risk to a groundwater system, as well as abstraction wells. The distance to the surface water features and lack of source protection zones surrounding the site area risk to these features are reduced.

In accordance with Environment Agency guidance document: -

- Groundwater Protection: Principles and Practice (GP3) Part 5 – Remedial Targets Methodology,

The document confirms :-

- “Selecting compliance points for use in land contamination risk assessments the distance to a set compliance point should not exceed 50 metres for hazardous substances or a maximum of 250 metres for non-hazardous pollutants unless there are specific physical constraints on the ability to use the groundwater resource. Any increases above these specified distances may be justified but must be supported by a sustainability assessment that takes into account environmental, social and economic factors.”

Considering the above, groundwater risk may be in place if significant contamination or a persistent source of contamination are encountered or recorded within the site area, within the information to date risk is considered low.

#### **11.5 Flooding**

The site does not lie within an area which is susceptible to flooding.

#### **11.6 Landfill Sites**

No landfill sites are recorded in place surrounding the site area.

#### **11.7 Environmentally Sensitive Sites**

Surrounding the site area no environmentally sensitive receptors are recorded in place.

**Table 6 Sensitivity of Environmental Receptors in the Vicinity of the Site**

<b>Receptor Type</b>	<b>Receptor(s)</b>	<b>Sensitivity</b>	<b>Comments</b>
<b>Groundwater</b>	Secondary A Aquifer	Moderate	Possible risk to underlying Gravel Deposits
<b>Water Abstraction</b>	Public Administration: Drinking, Cooking, Sanitary, Washing, (Small Garden) and Municipal Grounds: Make-Up or Top Up Water	Medium	The nearest abstraction well is located 775 meters to the east of the site.
<b>Source Protection Zone</b>	NONE		
<b>Surface Water</b>	Pond	Low	The nearest surface water feature is recorded as 704 meters to the east of the site
<b>Flooding</b>	NONE		
<b>Ecological</b>	NONE		

## 12 Site Drainage and Other Potential Man Made Pathways

Drainage is recorded in place, although, the site has not been fully reviewed for drainage routes. A full drainage assessment may aid in the assessment of the site in relation to pathway creation for pollution to migrate.

## 13 Regulatory Data

Information relating to the potential hazards associated with environmental regulatory controls are summarised in Table 7 and 8. This information is recorded in full within the Envirocheck data provided within Appendix 5. The salient points recorded within this data are re-created below.

**Table 7**      **Summary of Regulatory Data - Sources**

<b>Data</b>	<b>On Site</b>	<b>Off Site</b>	<b>Distance from site.</b>	<b>Is potential risk in place?</b>
<b>Sources</b>				
Discharge Consents	None	Discharge Of Other Matter-Surface Water	NW 940m	<b>X</b>
LAPPC	None	Dry Cleaners	SE 8m	<b>X</b>
Pollution Incident to Controlled Waters	None	Significant Incident - Miscellaneous – Natural in 1997	E 644m	<b>X</b>
Historical Landfill Sites	None	Deposited Waste included Inert Waste	S 853m	<b>X</b>
Licensed Waste Management Facilities (Locations)	None	HCI Waste TS + treatment last input 2015	SE 902m	<b>X</b>
Potentially Infilled Land	None	Unknown Filled Ground (Pond, marsh, river, stream, dock etc in 1882	NW 608m	<b>X</b>
Radon Potential - Radon Protection Measures	No radon protective measures are necessary in the construction of new dwellings or extensions			<b>X</b>

**Table 8 Summary of Regulatory Data - Receptors**

<b>Data</b>	<b>On Site</b>	<b>Off Site</b>	<b>Distance from site.</b>	<b>Is potential risk in place?</b>
<b>Receptors</b>				
Nearest Surface Water Feature	None	Pond	E 704m	<b>X</b>
Water Abstractions	None	Public Administration: Drinking, Cooking, Sanitary, Washing, (Small Garden	E 775m	<b>X</b>
OS Water Network Lines	None	None		<b>X</b>
Source Protection Zone	None	None		<b>X</b>

**Table 9 BGS Estimated Chemistry Data**

<b>Chemistry Pollutant</b>	<b>BGS Measured Urban Soil Chemistry</b>	<b>BGS Urban Soil Chemistry Averages (mg / kg)</b>		
	SW 221m	Minimum	Average	Maximum
Arsenic	20.80	1.00	17.00	161.00
Cadmium	0.80	0.10	0.90	165.20
Chromium	50.90	13.00	79.00	2094.00
Lead	419.70	11.00	280.00	10000.00
Nickel	22.40	2.00	28.00	506.00

Considering the background concentrations present, Potential for human health risk is anticipated within this area.



**Table 10 Geological Hazards**

<b>Geological Hazard</b>	<b>Distance &amp; Direction</b>	<b>Feature</b>	<b>Risk Assessment Required</b>
Non Coal Mining Areas of Great Britain	On Site		Negligible
Collapsible Ground	On Site		Very Low
Compressible Ground	On Site		Negligible
Ground Dissolution Features	On Site		Negligible
Landslide	On Site		Very Low
Running Sand	On Site		Very Low
Shrinking or Swelling Clay	On Site		Negligible

**Table 11 Summary of Contemporary Trade Entries**

<b>Trade Name</b>	<b>Trade Use</b>	<b>Distance &amp; Direction from Site</b>	<b>Is potential risk in place?</b>	<b>Comment</b>
Paramount Dry Cleaners	Dry Cleaners	SE 8m	<b>X</b>	LAPPC in place will reduce the risks
Reliable Domestic Appliances Ltd	Washing Machines - Servicing & Repairs	SE 14m	<b>X</b>	Inactive
A M D I Y & Builders Ltd	Hardware	SE 15m	<b>X</b>	Inactive
Copy Copy	Copying & Duplicating Services	SE 15m	<b>X</b>	Inactive

**No other trades are recorded within 50m - Further Trades Extend Away From The Site, (See Envirocheck Data)\***

\*NB The above information is taken from the Envirocheck trade directories

**14 Identification of Potential Contaminants of Concern and Source Areas**

Potential sources of contamination are brought forward for further risk assessment which are detailed in Table 12 :-

**Table 12 Table of Source Risk**

<i>Risk Assessment</i>	<i>Source Risk</i>	<i>Additional Features</i>	<i>Source of Information</i>	<i>Location</i>	<i>Date</i>	<i>Considering Site Specific Pathways</i>	
						<i>Assessment Required.</i>	<i>Method of Assessment</i>
	<i>Features On Site</i>						
<b>A</b>	Parking area		Walk over	On Site - W	1973 - Present	Possible Soil, Risk Possible GW Risk Possible Vapour Risk	Recover Soil Samples Install Standpipes GW & Vapour Assessments
	School		Walk over Historical Maps	Site Wide			
	Terrace dwellings and gardens- Redeveloped (possible bomb damage)		Historical Maps	On Site	1974-Present		
	Made ground		BGS Estimated Chemistry Data	On Site			

## 15 Outline Conceptual Model

What must now be considered is what contamination should be identified as a potential hazard as a result of the use of the site specific areas. In order to undertake this task, the **Contaminated Land Reports, (CLR10)**, has been used which details some trades and potential sources of contamination. In addition to this, the Department of Environment Industry Profiles have been incorporated which detail trade, and also, specific site usage of the trade and contaminant sources.

The information below incorporates a hazard assessment of the features surrounding the site that could potentially impact on the proposed development. This is based on the information below :-

**Table 13 CIRIA Contaminated Land Risk Assessment Table**

		Consequence			
		Severe	Medium	Mild	Minor
Probability	High Likelihood	Very High Risk	High Risk	Moderate Risk	Moderate/Low Risk
	Likely	High Risk	Moderate Risk	Moderate/Low Risk	Low Risk
	Low Likelihood	Moderate Risk	Moderate/Low Risk	Low Risk	Very Low Risk
	Unlikely	Moderate/Low Risk	Low Risk	Very Low Risk	Very Low Risk

Extracted from CIRIA Publication C552 Contaminated Land Risk Assessment

Table 14 Risk Assessment A

Source (Potential Contaminating Use)	Potential Contaminants	Receptors	Pathways	Associated Hazard, [Severity]	Proposed Site Use Risk Assessment			
					Likelihood of occurrence	Potential Risk	Notes	
Features On Site  Parking area–W  School  Terrace dwellings and gardens- Redeveloped (possible bomb damage)  Made ground	TPH's Naphthalene, CO <sub>2</sub> , CH <sub>4</sub> .	Site Users Construction Workers.	Direct contact; Inhalation dust and fibers. Dermal contact	Medium	Likely	Moderate	Possible risk in place	
			Ingestion of home grown produce	Medium	Likely	Moderate	Possible risk in place	
			Ingestion of contaminated water through water main pipework	Medium	Likely	Moderate	Possible risk in place	
			Inhalation of vapours	Medium	Low Likelihood	Moderate / Low	Possible risk in place	
			Inhalation of land Gases	Medium	Low Likelihood	Moderate / Low	Possible risk in place	
			Inhalation of vapours through contaminated ground waters	Medium	Low Likelihood	Moderate / Low	Possible risk in place	
		Adjoining Land Owners	Direct contact; Inhalation dust and fibers. Dermal contact	Medium	Low Likelihood	Moderate / Low	Limited risk in place	
			Ingestion of home grown produce	Medium	Low Likelihood	Moderate / Low	Limited risk in place	
			Ingestion of contaminated water through water main pipework	Medium	Low Likelihood	Moderate / Low	Limited risk in place	
			Inhalation of vapours	Medium	Low Likelihood	Moderate / Low	Limited risk in place	
			Inhalation of vapours through contaminated ground waters	Medium	Low Likelihood	Moderate / Low	Limited risk in place	
			Controlled Surface Water;	Leaching, lateral migration of shallow groundwater to a target receptor.	Medium	Low Likelihood	Moderate / Low	Possible risk in place
		Ground Water; Abstraction Well.	Leaching, migration through fissures / cracks which may migrate to a groundwater receptor.	Medium	Low Likelihood	Moderate / Low	Possible risk in place	
		Flora	Plant Uptake Direct Contact	Medium	Likely	Moderate	Possible risk in place	
		Asbestos	Site Users Construction Workers.	Inhalation dust and fibers (from Asbestos within the building)	Severe	Likely	High	Possible risk in place
				Inhalation dust and fibers (from asbestos within the soil)	Severe	Likely	High	Possible risk in place
		Metals Metalloids PAH's	Site Users Construction Workers.	Direct contact; Inhalation dust and fibers; Dermal contact;	Medium	Likely	Moderate	Possible risk in place
Ingestion of home grown produce	Medium			Likely	Moderate	Possible risk in place		
Controlled Surface Water;	Leaching, lateral migration of shallow groundwater to a target receptor.		Medium	Low Likelihood	Moderate / Low	Possible risk in place		
Ground Water; Abstraction Well.	Leaching, migration through fissures / cracks which may migrate to a groundwater receptor.		Medium	Low Likelihood	Moderate / Low	Possible risk in place		
TPH's Naphthalene,	Buildings; Construction Materials. Services	Direct contact with contaminated soils;	Medium	Likely	Moderate	Possible risk in place		
		Direct contact with contaminated groundwater	Medium	Low Likelihood	Moderate / Low	Possible risk in place		

Table 15 Overview of Risk Assessments - Proposed Site Use

		A
		<b>Features On Site</b>
<b>Receptors</b>	<b>Pathways</b>	Parking area–W
		School
		Terrace dwellings and gardens- Redeveloped (possible bomb damage)
		Made ground
<b>Site Users</b>	Direct Contact, Inhalation of Dust and Fibres, Dermal Contact	✓
	Ingestion of home grown vegetation	✓
	Ingestion of contaminated water through water main pipework	✓
	Inhalation of vapours from soils	✓
<b>Construction Workers</b>	Inhalation of vapour from contaminated ground waters	✓
	Inhalation of land gas vapours	✓
	Inhalation Asbestos dust and fibers (from Asbestos within the building)	✓
	Inhalation Asbestos dust and fibers (from asbestos within the soil)	✓
<b>Adjoining Land Owners</b>	Direct Contact, Inhalation of Dust and Fibres, Dermal Contact	✓
	Ingestion of home grown vegetation	✓
	Ingestion of contaminated water through water main pipework	✓
	Inhalation of vapours from soils	✓
	Inhalation of vapours from contaminated ground waters	✓
<b>Flora</b>	Plant Uptake / Direct Contact	✓
<b>Groundwater; Abstraction Well &amp; Surface Water</b>	Leaching, lateral migration of shallow groundwater to a River or surface water receptor.	✓
	Leaching, lateral migration of shallow groundwater system underlying the site and subsequent abstraction well or SPZ	✓
<b>Buildings</b>	Direct contact with contaminated soils.	✓
	Direct contact with contaminated groundwater	✓

\*NB : Due to Severe Consequence from Asbestos and Explosive Gases, some risk is assessed and potentially in place and therefore highlighted above.

GW Only: Some risks have been assessed as a direct result of potential mobilisation of groundwater contamination that may influence the site. A pictorial conceptual model has been reproduced within this report to confirm the above findings.

Reference : CSG / DTS / 15629

Former Cherry Garden School, Macks Road, Bermondsey, London SE16 3XU

## 16 Discussion on Sources of Contamination

The assessments of the site have drawn conclusions of historical and ongoing land uses which may impact on the proposed development which will be further considered through location, (either on or off site) and nature of risk. These are discussed below:-

**Table 16 Pollutant Risk**

<b>Risk Assessment</b>	<b>Land Use</b>	<b>Pollutant</b>
	<b>Features On Site</b>	<b>Soil, Groundwater &amp; Vapour Risk</b>
<b>Risk Assessment A</b>	Parking area-W	Moisture Content, pH, Electrical Conductivity, Cyanide, (Free), Cyanide, (Total), Organic Matter, Boron, Sulfate, (2:1 water soluble), Chromium, (Hexavalent), Sulfate, (Total), Arsenic, Cadmium, Chromium, Copper, Mercury, Nickel, Lead, Zinc, Speciated PAH's, (EPA Priority 16), Phenols, Asbestos, Total Petroleum Hydrocarbons (aliphatic/ aromatic 8-Band), Naphthalene, CO <sub>2</sub> , CH <sub>4</sub> .
	School	
	Terrace dwellings and gardens- Redeveloped (possible bomb damage)	
	Made ground	<b>Soil Sampling Groundwater &amp; Vapour Assessment</b>
<b>Spatial Sampling, (General Assessment)</b>		Moisture Content, pH, Electrical Conductivity, Cyanide, (Free), Cyanide, (Total), Organic Matter, Boron, Sulfate, (2:1 water soluble), Chromium, (Hexavalent), Sulfate, (Total), Arsenic, Cadmium, Chromium, Copper, Mercury, Nickel, Lead, Zinc, Speciated PAH's, (EPA Priority 16), Phenols.
		Asbestos
		25 meter Centres In accordance with BS10175: 2011+A2:2017.
		5-10 meter Centres In accordance with BS10175: 2011+A2:2017.

## 17 Next Steps

Considering the information gathered to date, we would suggest that an appropriate way forward would be to assess the condition of the subsoil within the site resulting from the historical and former uses of the site as detailed within previous sections of this report. We would suggest that the most viable way of assessing risk will be to consider the following assessment techniques.

The assessment of the site proposed in this report and the following recommendations which are detailed below have been prepared in accordance with key guidance documents as follows:-

- National Planning Policy Framework;
- British Standards 10175:2011+A2:2017
- Contaminated Land Report, (CLR11) 11, 'Model Procedures for the Management of Contaminated Land', (2004);
- DEFRA: Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance, (April 2012);
- Environment Agency, (EA), GP3 'Groundwater Protection: Policy and Practice'.

Based on the site area and size of the site, (approximately 2300 m<sup>2</sup>), we would recommend that the site should be subjected to a sampling density of between 15-20 meter grid pattern for moderate risk pollutants which is broadly in line with that proposed by 10175:2011+A2:2017 and offers a greater density sampling pattern of 10-15 meter grid pattern for high risk pollutant such as Asbestos. As such, we can confirm that a likely 6-8 samples will be required across the site to provide a 'good' spatial density and an additional 12-15 sample locations being tested for Asbestos.

The investigation is proposing to undertake the following at the site :-

- Determine the ground and groundwater conditions;
- Determine if there are any obstructions such as old service and foundations, buried tanks, etc;
- Install gas, vapour and groundwater monitoring well installations and monitor the levels of groundwater, gas and vapours;
- Obtain samples of the made ground, natural soils and groundwater for contamination testing at targeted site specific designed locations. Test soil and groundwater samples for a range of contaminants, as identified in Table 16;
- Obtain samples of soil to test for vapours contaminants, as identified in Table 16;
- Install standpipes to obtain readings of vapour and gas for analysis to be tested for a range of contaminants, as identified in Table 16;
- Visually appraise soils to consider olfactoral or visual presence of contamination factors, risk, vapours or fragments.
- All laboratory testing should be completed to MCERT/UKAS accredited standard.
- All detection limits provided by chemical laboratories must fall below the set screening values

### 17.1 Soil Assessment

Soil sampling will be completed recovering samples in appropriate containers for analysis by the analytical chemist. All sampling will be sent directly to the chemist in cool boxes to retain the integrity of the soil sample.

**Table 17** Soils Assessment - Targeted Sampling

<b><u>Feature</u></b>	<b><u>Contaminant</u></b>	<b><u>Method Of Investigation</u></b>
Parking area	Metals, Semi Metals, PAHs, TPHs, Asbestos	Window Sampler Boreholes Hand Auger Boreholes Trial Pits

**Table 18**      **Soils Assessment – Spatial Sampling**

<b><u>Feature</u></b>	<b><u>Contaminant</u></b>	<b><u>Method Of Investigation</u></b>
School		
Terrace dwellings and gardens- Redeveloped (possible bomb damage)	Metals, Semi Metals, PAHs, TPHs, Asbestos	Window Sampler Boreholes Hand Auger Boreholes Trial Pits
Made ground	Metals, Semi Metals, PAHs, Asbestos	

Upon completion of on-site sampling and the associated chemical analysis, the soil data will be compared against the Generic Assessment Criteria derived by AtRisk Soils which has been purchased as a reviewing standard. This has been prepared by Atkins as Soil Screening Values, (SSV's). Additionally, values will be adopted for screening values using LQM / CIEH – Suitable 4 Use Levels in the absence of Atkins adopted values.

## 17.2 Groundwater Assessment

### **Method of Groundwater Assessment**

In order to gain an understanding of the groundwater system and the level of risk in place, we can confirm that the following works should be completed:-

- The Geology within the site should be confirmed;
- The depth of the Geology within the site should be assessed and if ground water is encountered or has the potential to be in place, some assessment of the risk to groundwater and surface water features should be carried out as well as potential human health risk from vapours;
  - Considering the size and nature of the site, the groundwater elevation may be perched at locations and as such, strikes may be local to lenses or pockets of more permeable ground in order to provide surface water runoff.
  - Standpipes should be installed across the site, in order to orientate the groundwater table to identify groundwater flow direction. Three standpipes should be installed for groundwater assessment such that orientation of the groundwater table can be undertaken;
  - We would recommend that the installation of the boreholes at the site should be completed in order to determine the groundwater elevation. The boreholes should be left for a minimum period of one week in order to allow the groundwater to reach equilibrium at which time, purging of the standpipe well should be completed to consist of a minimum of 3 well volumes removed from the standpipes prior to samples being recovered. Sampling of the groundwater can be completed and retained in appropriate containers dependent upon the analysis proposed. The sample should then be sent to the analytical chemist for assessment in appropriate transport conditions;
  - It is possible that groundwater assessments may require extending the standpipes through into any superficial deposits suggested by the Envirocheck report.
  - Considering the size and nature of the site should ground water risk be recorded within the site area each borehole should be sampled and tested for the range of pollutants as identified within this report. The potential risks should be initially assessed against the UK Drinking Water standard as a Tier 1 assessment Criteria with possible further assessments required where heavy contamination or risk deemed in place. Groundwater samples should be compared against the EQS standards, (Environmental Quality Standards);
  - Risk assessments A, should be tested for so the extent of pollutants can be identified within the groundwater sample.



### 17.3 Land Gas Assessment

Considering the potential for Land Gas risks due to the potential increased depths of made ground within the site area, Land Gas risk assessments must be completed. These will include the potential for contamination migration from on and off site sources which may be present in concentrations where risk is recorded.

Land gas monitoring should be specifically targeting the following land uses.

**Table 19 Land Gas Assessment - Response Zone**

<b>Feature</b>	<b>Targeted Response Zone</b>	<b>Location to Target</b>	<b>Gas risk</b>
Made ground	Made Ground	Site Wide	Land Gases - CO <sub>2</sub> , CH <sub>4</sub> .

Considering the above, we would suggest that soil testing is undertaken to assess the infilled ground its depth and type, and a standpipe should be installed within the site with response zones placed within the upper made ground solely, and the following assessments completed as follows :-

- Install standpipes to allow vapour and Land Gas risk to be considered from the upper made ground.
- Assess vapour risk over a minimum of six monitoring rounds to comply with CIRIA C665 to consider risks to buildings, CLR 11 and R & D Publication 66;
- Monitoring should be completed over falling or low atmospheric pressures or in periods where ground conditions are frozen to provide the worst case scenario for the site, although, the site is laid to hard cover which will restrict natural ventilation of any gases.
- Reporting of land gas and vapour risk/ can be completed assessing soils in situ using a Photo Ionisation Detector for Volatile Organic Compounds, (which include BTEX). Flow rates should also be noted for reporting purposes.

### 17.4 Vapour Risk Assessment

Considering the potential for vapour risk to be in place from various source as noted below, the following risk are in place.

**Table 20 Vapour Risk Assessment - Response Zone**

<b>Feature</b>	<b>Targeted Response Zone</b>	<b>Location to Target</b>	<b>Vapour risk</b>
Parking area		On Site - W	
School		Site wide	
Terrace dwellings and gardens- Redeveloped (possible bomb damage)	Made Ground	Site wide	TPH's, Naphthalene
Made ground		Site wide	

Considering the above, we would suggest that soil testing is undertaken to assess whether contamination that may promote a vapour risk is in place within the site area and the groundwater.

### 17.5 Working Brief

It should be noted that this investigation is undertaken in order to identify the extent of contamination as a result of historic and ongoing use. Should any areas of the site be encountered within the development that appear potentially contaminated through visual or olfactory assessment outside that discussed within this report, consultation with ourselves should be undertaken in order to identify the risk associated with the material.

Table 21 Overview of Works

Receptor	Scope of Investigation Works Required			Proposed Method of Assessment	Proposed Site Works to Complete
	Soils	Assessment of : Vapour and Gas	Ground and Surface Water		
Human Health	✓	✓	✓	Window Sampling - Soil sampling - Install standpipe - Groundwater sampling*	Recover samples of the made ground; Assessment of the underlying natural soils to consider contamination; Leachate testing on elevated samples; Vapour Risk Assessment; Analysis of soil samples for GQRA Assessment; Reporting
Surface Water	X	X	X	No Action	
Ground Water	✓	✓	✓	Window Sampling - Soil sampling - Install standpipe - Groundwater sampling*	Recover samples of the made ground; Assessment of the underlying natural soils to consider contamination; Leachate testing on elevated samples; Vapour Risk Assessment; Analysis of soil samples for GQRA Assessment; Reporting
Services & Building	✓	✓#	X	Window Sampling - Soil sampling	Recover samples of the made ground; Vapour Risk Assessment; Groundwater Assessment; Analysis of soil samples for GQRA Assessment. Reporting
Geotechnical Assessment	✓	N/A	X	Window Sampling	Recover samples of the natural soils for laboratory testing; Assessment of shallow soils for conventional foundation; Consider deeper or piled foundations; Reporting.

NB \* Initial assessments of the site should be undertaken using Leachate Testing and water sampling if required.

# Complete soils testing to assess if vaporous contamination is in place within the site area.

# **APPENDIX ONE**

## **CONCEPTUAL MODEL**

# HERTS & ESSEX SITE INVESTIGATIONS

The Old Post Office, Wellpond Green  
 Standon, Ware, Herts. SG11 1NJ

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Appendix No 1  
 Sheet No 1  
 Job No 15629  
 Date Oct 2019

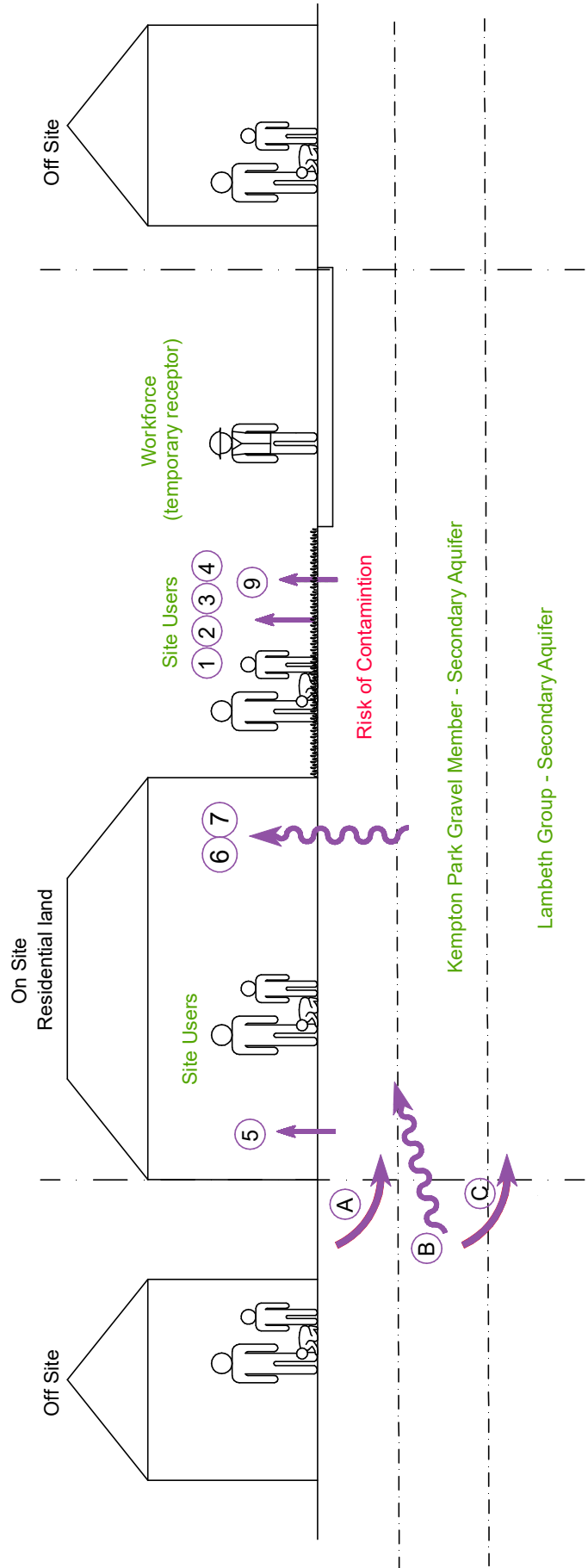
Former Cherry Garden School, Mack's Road, Bermondsey, London SE16 3XU

## Site Specific Source-Pathway-Receptor - Proposed Site Use

Key

Purple = Possible pathways  
 Green = Possible receptors  
 Red = Possible sources

- Potential Pathways
- Human Health
- 1 Direct contact with contaminants in soil/dust or water
  - 2 Inhalation of contaminants through soil/dust/particles
  - 3 Dermal Contact
  - 4 Ingestion of home grown produce
  - 5 Ingestion of contaminated water through water main pipework
  - 6 Inhalation of Land Gas and Vapours
  - 7 Inhalation of Vapours from Groundwater
  - 8 Migration to off site Adjoining Land Owners
- Flora
- 9 Plant Uptake & Direct Contact with soil
- Controlled Surface Water, Ground Water & Abstraction Well
- 10 Leaching, lateral migration of shallow groundwater to a target receptor
- Off Site Sources
- A Migration of contamination to the site area
  - B Migration of land gases/ Vapours to the site area
  - C Migration of contaminated groundwater to the site area



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# **APPENDIX TWO**

## **SITE PLANS**

# HERTS & ESSEX SITE INVESTIGATIONS

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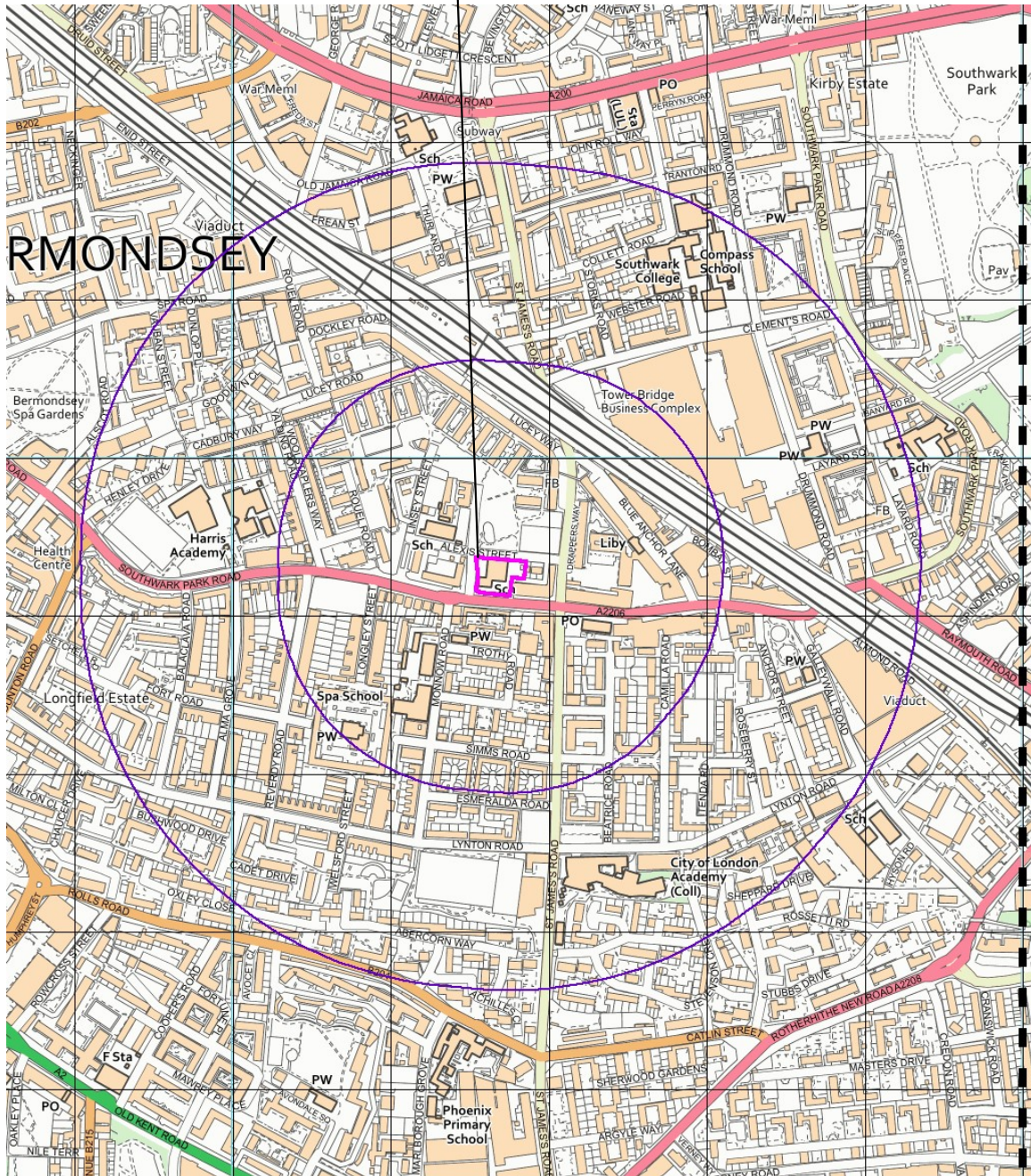
Appendix No 2  
Sheet No 1  
Job No 15629  
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## Location Plan



The Site



Not to Scale  
Sketch No. : DTS / 15629 / 02 / 01

# HERTS & ESSEX SITE INVESTIGATIONS

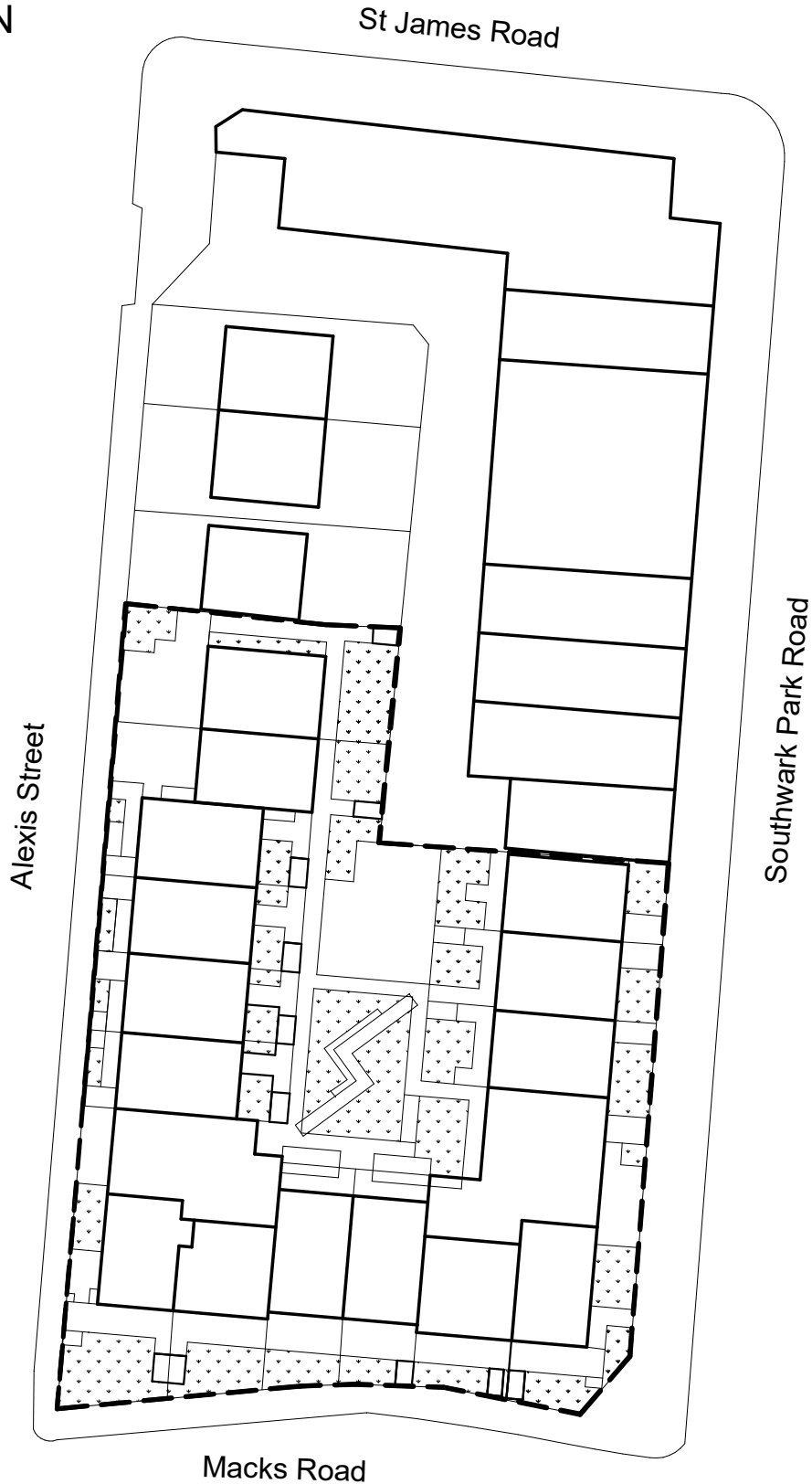
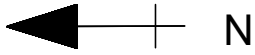
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Proposed Site Plan



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# HERTS & ESSEX SITE INVESTIGATIONS

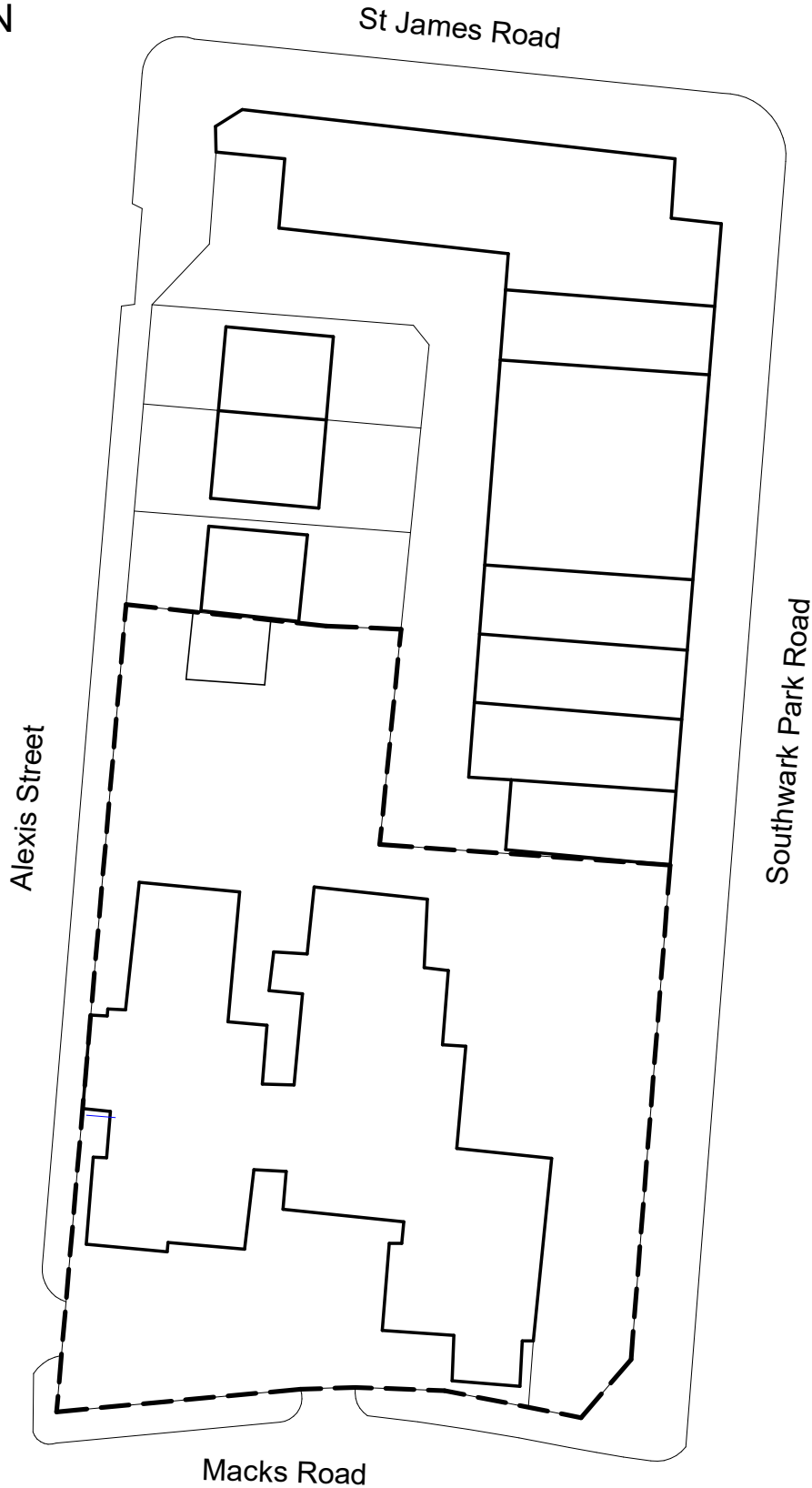
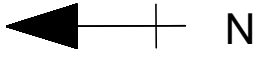
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## Existing Site Plan



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