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GEOTECHNICAL ASSESSMENTS – ENVIRONMENTAL ASSESSMENT - DESKTOP STUDY – CONTAMINATED LAND

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Report For:

Nekton Investments Ltd

Phase I DESK TOP STUDY REPORT

Site location:

72 – 76 Eversholt Street
London
NW1 1BY

March 2021
Report No. 16571

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TABLES AND FIGURES

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 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

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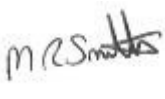
Qualifications

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	***Prepared by:*** Rebecca Chamberlain Signature / Date	***Technical review by:*** Chris Gray Martyn Smith Signature / Date	***Checked By:*** Chris Gray Martyn Smith Signature / Date
1	Final	March 2021			

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.

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 report 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	March 2021
2	The DHaus Company	Electronic Copy	1	March 2021
3				
4				
5				
6				
7				
8				

EXECUTIVE SUMMARY

PHASE 1 DESK TOP STUDY REPORT

Client	Nekton Investments Ltd
Site Location	72 – 76 Eversholt Street London NW1 1BY
Existing Development	Commercial unit and offices with residential units on the upper levels
Proposed Development	Residential units
Site Settings and Previous Uses	The site area is recorded as having buildings in place from the earliest map reference which remain in place to date and are recorded as office and residential units. Surrounding the site area there were buildings and dwelling to the north, east and south of the site. To the west of the site area Euston Station is in place which from 1898 was extended up to 20 meters from the site area, this remains in place to date. To the east of the site area from 1953 until recently there was a garage which was also noted as a Vehicle depot. At the time of the walk over this area formed a school building.
Nearest Surface Water Feature	The nearest surface water feature is recorded as 292 meters to the south of the site which is recorded as a Pond from the maps provided. no controlled waters appear to be located surrounding the site in the immediate vicinity.

	Geology		***Aquifer Classification***
Geological and Hydrological Profile	***Made Ground***	Shallow Made Ground Anticipated	Not Classified
	London Clay	Clay	Unproductive Stratum

Groundwater Abstractions	The nearest abstraction well is located 476 meters to the east of the site which is recorded as Other Industrial/Commercial/Public Services: Heat Pump. No Potable Water Supplies are recorded within 1km of the site area.
Source Protection Zone	The site does not lie within a Source Protection Zone.

Potential Sources of Contamination	***On Site*** • Made ground	***Off Site*** • ***Euston Station*** W 20m • ***Garage*** E 1m
Previous Investigations	No reports relating to contaminated land are known to us at the time of writing this report relating to the site.	

Human Health Risk	We would suggest that there is 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. Potential pathways in place within the site area recorded as : - • Dermal Contact. – possibly for a short term by the workforce • Inhalation of dust and fibres. – possibly for a short term by the workforce • Ingestion of contaminated water through water main pipework. • Inhalation of vapours from soils. • Inhalation Asbestos dust and fibres (from Asbestos within the building); • Inhalation Asbestos dust and fibres (from asbestos within the soil).
Ground Water Risk	Risk to the ground water is reduced due to the London Clay, an Unproductive Strata recorded in place within the site and no abstractions wells are recorded close to the site area. 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.
Surface water Risk	Considering the nature of the feature surrounding the site area and the London Clay risk to the feature is reduced. 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.
Vapour Risk	The feature off site may have promoted some level of vaporous risk to be in place although due to the London Clay within and surrounding the area, this reduces the risks of migration. In addition to the main source of vapours risk would from the former garage in place to the east of the site was have subsequently been redeveloped to form a school building and will therefore have likely removed the sources of risk
Land Gas Risk	No sources of land gases are in place for the site area, should significant made ground or organic matter be encountered within the site area reassessment may be required, although for the information collect to date the risk of this is low.
Recommendations	• Intrusive shallow based excavation using trial pits or hand auger if soils are exposed due the works to assess the geological conditions and recover samples. • Initially assess soils for presence / absence of fuels. • Spatial sampling for use in statistical analysis. • Consideration through the site assessment as to the presence of Asbestos product within the site and subsoil within the site. • Visual observations of the subsoil encountered to make initial assessment of the potential risk from contamination. • Watching brief to record assess and report on unexpected contamination. 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.

PRELIMINARY RISK ASSESSMENT – DESK TOP STUDY - PHASE 1 REPORT

1 Context and Objectives of this report

1.1 Introduction

We have been asked by Nekton Investments Ltd via The DHaus Company 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.

The client is proposing to convert of existing office and commercial spaces into residential units no soft landscaping is proposed. The standard we will use in the derivation of risk has therefore been assigned as a 'Residential Land Use.'

1.2 Reference to the Current Planning Application Details

No current applications are in place for the site area.

1.3 Decision Notice Relating to Contaminated Land

No current conditions are in place.

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 built-up area of London with residential and commercial building in place, 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

Site Address:	72 – 76 Eversholt Street London NW1 1BY
Site assessed under	Site Owners Request - Aid as part of planning and warranties
Current use of land:	Offices and residential units
Previous use of site, (if known)	As above
Grid Reference	NGR 529590, 182860
Site Area	0.04 Hectares
Local Authority	Camden Council
Gradient of the site	The site and the surrounding area form a level area of land.
Proximity of Controlled Waters, (if known)	The nearest surface water feature is recorded as 369 meters to the north of the site area. This looks to form a pond between the ground of a school and a leisure centre.

2.2 Existing Site Use

The site area is formed by a building, which is in use as a commercial unit and offices with residential units on the upper levels.

2.3 Surrounding Land Uses

The surrounding land uses are detailed below: -

- To the north of the site commercial and take away shops and a church are in place.
- To the east of the site area a large building is in place forming Maria Fidelis Catholic School.
- To the south of the site area Drummond Crescent is in place with commercial shops and residential dwelling in place beyond.
- To the west of the site area Eversholt Street is in place with London Euston Train station opposite the site.

2.4 Site Reconnaissance

The site walk over visit was undertaken in March 2020 on which the weather conditions were recorded overcast and raining.

Access

In light of the site area forming the footprint of the building, only pedestrian access to the building in place, with access mainly to the south of the building, to both the ground floor and the lower basement level.

Site Area

The site area forms a five-storey building with loft space as well as a basement level.

Limited access to the building was possible at the time of the walk over. The building is in use as office. With a closed commercial space on the ground floor. Light wells are in place to the south of the building with metal grates and steps leading down from the street.

Vegetation

No vegetation is in place within the site area nor surrounding the area.

Above or below ground fuel or oil storage tanks.

By examination of the site, no above ground tanks were seen in place and no other features are present to suggest that any below ground fuel tanks would be in place within the site area.

Asbestos Containing Materials

No Asbestos containing materials were reviewed within the site area. We recommend that an asbestos survey of the building be carried out, if not done so already, prior to any further demolition or works on site. A full assessment for asbestos within the fill in site will be required in order to fully consider risk from Asbestos.

Surrounding Area

To the north of the site area there are some a larger church building is in place with a possible entrance point adjacent to the site area. Some commercial units are also in place to the north of the site area.

To the east of the site area there is a small gated courtyard are in place, forming part of the school building which extends along Drummond Crescent to the east of the site. The school forms a two storey building.

To the south of the site on the opposite side of the report there are traced buildings in place, these have commercial units on the ground level.

To the west of the site area a large train station is in place London Euston Station. the site area is towards the area of platforms, although the main entrance to the station is recorded some distance to the south of the site area.

Site Levels and Ground Cover

The site and the surrounding area form a level area of land. Within the site a basement level in place.

The site area is formed by the footprint of the building.

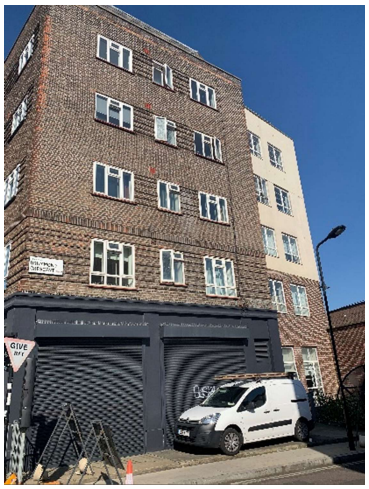
Current site activities

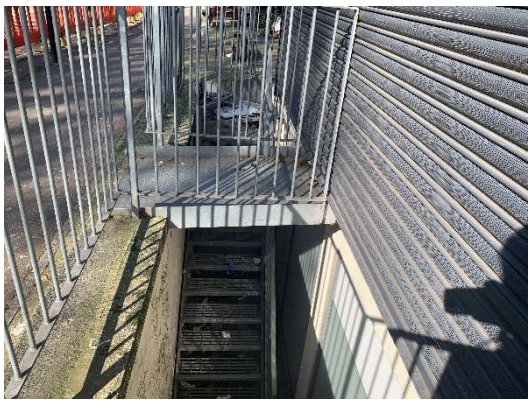
The current site use forms a commercial unit and offices with residential units on the upper levels.

Effluent, Site Drainage and Services

Drainage and services are in place for the new dwelling, although no service search is known to us within the east of the site area, therefore the location condition nor status of these services is known.

2.5 Site Reconnaissance – Photos

Print 1	View of the west of the site area looking to the south along Eversholt	Print 2	View of the southern side of the site area looking to the north from the junction of Eversolt and Drummond Crescent
			

Print 3	View of the west of the site area looking to the south along Eversholt	Print 4	View of the light well and steps in place to the to west of the site area
			

Print 5	View of the southern side of the site area looking to the east

Print 6	View of the southern side of the site area looking to the northwest

Table 2 Walk Over Inspection Risk

Feature	***Location***	***Elevation***	***Is Risk Present?***	***Location to Target***
Commercial units and offices	On and off site	At GL.	X	Limited risks in place
Church	Off site - N	At GL.	X	Limited risks in place
School	Off site - E	At GL.	X	Limited risks in place
Train Station	Off site – W 20m	At and below GL	✓	Possible risk of migration of contamination to eth site area

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 born in mind when assessing the history of the site.

Table 3 Historic Maps Assessment

Date	*On Site Feature*	*On Site Mitigation (considering all possible pathways)*	*Off Site Feature*	*Off Site Mitigation (considering all possible pathways)*
1851 Source Map Scale 1:5 280	*Only street names given*			
1873 Source Map Scale 1:1 056	Buildings (residential)	Limited Source	Buildings (residential) – N, E, S	Limited Source
			Open land – W	No Source
			Euston Station – W 50m	Possible Soil Risk Possible Vapour Risk Possible GW Risk
			School and Nunnery – E 50m	Limited Source
1876 Source Map Scale 1:2 500				
1895 Source Map Scale 1:1 056			Extension to Euston Station – E 20m	Possible Soil Risk Possible Vapour Risk Possible GW Risk
1896 Source Map Scale 1:2 500				
1896 Source Map Scale 1:10 560				
1916 Source Map Scale 1:2 500				
1920 Source Map Scale 1:10 560				
1938 Source Map Scale 1:10 560				
1940 Source Map Scale 1:10 000				

Table 3a Historic Map Assessment - Continued……

Date	*On Site Feature*	*On Site Mitigation (considering all possible pathways)*	*Off Site Feature*	*Off Site Mitigation (considering all possible pathways)*
1953 Source Map Scale 1:1 250	(Regents House)		Public House – N 1m	Limited sources
			Garage – E 1m	Possible Soil Risk Possible Vapour Risk Possible GW Risk
1953 Source Map Scale 1:1 250				
1954 Source Map Scale 1:2 500				
1957 Source Map Scale 1:10 000				
1959 Source Map Scale 1:1 250			Garage recorded as a vehicle Depot	
1966 Source Map Scale 1:10 000				
1970 Source Map Scale 1:2 500				
1972 Source Map Scale 1:10 000				
1973 Source Map Scale 1:1 250				

Table 3a Historic Map Assessment - Continued…….

Date	*On Site Feature*	*On Site Mitigation (considering all possible pathways)*	*Off Site Feature*	*Off Site Mitigation (considering all possible pathways)*
1978 Source Map Scale 1:1 250				
1986 Source Map Scale 1:1 250				
1991 Source Map Scale 1:1 250				
1991 Source Map Scale 1:10 000				
1992 Source Map Scale 1:1 250				
1993 Source Map Scale 1:1 250				
1999 Source Map Scale 1:10 000				
2006 Source Map Scale 1:10,000				
2020 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	
Buildings (residential)	On and Off Site – N, E, S	Pre 1873 - Present	X			Limited Source
Open land	Off Site – W	Pre 1873 – 1895	X			No Source
Euston Station Extension to Euston Station	Off Site – W 50m – E 20m	Pre 1873 - Present 1898 - Present	✓	Possible Soil, Risk Possible GW Risk Possible Vapour Risk	Recover Soil Samples Install Standpipes GW & Vapour Assessments	This feature may promote risk to be in place with the soils which may migrate to the site area.
School and Nunnery	Off Site – E 50m	Pre 1873 – Present	X			Limited Source
Public House	Off Site– N 1m	1953 - Recently	X			Limited Source
Garage *Garage recorded as a vehicle Depot*	Off Site– E 1m	1953 - Recently	✓	Possible Soil, Risk Possible GW Risk Possible Vapour Risk	Recover Soil Samples Install Standpipes GW & Vapour Assessments	This feature may promote risk to be in place with the soils which may migrate to the site area.
School	Off Site– E 1m	Recently	X			Limited Source

5 Details of the Intended Future Use of the Site

It is proposed to convert the existing office and commercial area to form residential dwellings, No additional building work is proposed and no soft landscaping is in place.

6 References of Planning Applications

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

From a review of the Camden Council web site the following applications are recorded for the site area.

Application No: 2010/0514/INVALID
Proposal: Submission of details pursuant to conditions 1 - 7 of pp dated 22/09/2009 (ref no.2008/3555/P) for demolition of basement and ground floor office rear wing, erection of basement and 4 storey high rear extension to provide 6 new self contained flats and new lift; creation of new lightwells facing Eversholt Street and Drummond Crescent.
Decision: Withdrawn Decision

Application No: 2017/2995/P
Proposal : Change of use of part of ground floor and basement from office (B1a) to residential use (C3) to provide 3 x residential flats (GPDO Prior Approval Application)
Decision: Withdrawn Decision

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. No other local sources of information were available at the time if 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 London Clay.

11.2 BGS Boreholes

To the west of the site area BGS Boreholes are reported.

Q28SE2050 — EUSTON STATION RECONSTRUCTION BH22
529550,182850 Depth: 19.35m.

Made ground is noted to 3.66m where clay is recorded in place to 19.2m. Woolwich and Reading Beds are then recorded to the close of the borehole at 23.61m. The water level was recorded as 8.99m in 1961.

TQ28SE1275 — EUSTON STATION DEVELOPMNT BH12
529530,182890 Depth: 43.05m.

Made ground to 3.35m with Clay recorded below this to 27.43m where a dense Sand is recorded in place to the 43m here chalk is noted in place and the borehole was closed.

Table 5 Geological Information

Geological Unit	***Brief Description***	***Anticipated thickness, (m)***	***Aquifer Type***
Superficial Deposits/Drift <u>*On Site*</u>			
Filled/Re-worked ground	Made Ground, (Potentially Contaminated Stratum).	0.5-1.00 meters+	Not Classified
Solid Geology Deposits			
London Clay	Clay	15 - 20m +	Unproductive Stratum

11.2 Hydrology

The nearest surface water feature is recorded as 369 meters to the north of the site which is recorded as a pond.

The nearest discharge consent is recorded 440 meters to the south east of the site, for Trade Discharges - Cooling Water.

No pollution incident to controlled waters are recorded within 800 meters of the site area.

11.3 Hydrogeology

The published Environment Agency Groundwater Vulnerability Map of the area indicates the site to be located within an area classified as an Unproductive Stratum which is formed by London Clay.

The nearest abstraction well is located 476 meters to the east of the site which is recorded as a Other Industrial/Commercial/Public Services: Heat Pump. No Potable Water Supplies are recorded within 1km of the site area.

The site does not lie within a Source Protection Zone.

11.4 Implication of groundwater

Considering the underlying Unproductive Strata, groundwater links are unlikely and therefore risk to the groundwater system, as well as abstraction wells, surface water features and source protections zones surrounding the site area 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

Receptor Type	Receptor(s)	Sensitivity	Comments
Groundwater	Unproductive Stratum	Low	Limited risk of migration to a lower groundwater system
Water Abstraction	Other Industrial/Commercial/Public Services: Heat Pump	Low	The nearest abstraction well is located 476 meters to the east of the site
Source Protection Zone	NONE		
Surface Water	Pond	Low	The nearest surface water feature is recorded as 369 meters to the north of the site.
Flooding	NONE		
Ecological	NONE		

12 Site Drainage and Other Potential Man-Made Pathways

Drainage is recorded in place, although, the site has not been 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 Summery of Regulatory Data - Sources

Data	*On Site*	*Off Site*	*Distance from site.*	*Is potential risk in place?*
Sources				
Discharge Consents	None	Trade Discharges - Cooling Water	SE 440m	X
LAPPC	None	Petrol filling station	NW 45m	X
		Dry Cleaners	NW 99m	X
Pollution Incident to Controlled Waters	None	Miscellaneous – Other Minor Incident	NE 695m	X
Radon Potential - Radon Protection Measures	No radon protective measures are necessary in the construction of new dwellings or extensions			X

Table 8 Summary of Regulatory Data - Receptors

Data	*On Site*	*Off Site*	*Distance from site.*	*Is potential risk in place?*
Receptors				
Nearest Surface Water Feature	None	Pond	N 369m	X
Water Abstractions	None	Other Industrial/Commercial/Public Services: Heat Pump	E 476m	X
OS Water Network Lines	None	Canal	NE 704m	X
Source Protection Zone	None			X

Table 9 BGS Estimated Chemistry Data

BGS Estimated Soil Chemistry Pollutant	***BGS Measured Urban Soil Chemistry***	***BGS Urban Soil Chemistry Averages (mg / kg)***		
	SE 262m	Minimum	Average	Maximum
Arsenic	19.50	1.00	17.00	161.00
Cadmium	0.80	0.10	0.90	165.20
Chromium	66.70	13.00	79.00	2094.00
Lead	246.10	11.00	280.00	10000.00
Nickel	26.70	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

Geological Hazard	***Distance & Direction***	***Feature***	***Risk Assessment Required***
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		Moderate

Table 11 Summary of Contemporary Trade Entries

Trade Name	***Trade Use***	***Distance & Direction from Site***	***Is potential risk in place?***	**Comment**
Trident Scaffolding Uk Ltd	Scaffolding & Work Platforms	On Site	X	Inactive now – formally the office to this company
Euston Alliance	Railways	Off Site W 39m	✓	Possible risk of migration to the site area is pathways are in place.
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

Risk Assess -ment	Source Risk	Additional Features	Source of Information	Location	Date	Considering Site Specific Pathways	
						Assessment Required.	**Method of Assessment**
A	***On Site Features***					Possible Soil, Risk Possible GW Risk Possible Vapour Risk	Recover Soil Samples Install Standpipes GW & Vapour Assessments
	Made ground		Envirocheck Data				
B	***Off Site Features***					Possible Soil, Risk Possible GW Risk Possible Vapour Risk	Recover Soil Samples Install Standpipes GW & Vapour Assessments
	Euston Station		Walk over Historical Maps	Off Site – W 50m	Pre 1873 - Present		
	Extension to Euston Station			W 20m	1898 - Present		
	Garage		Historical Maps	Off Site– E 1m	1953 - Recently		
	Garage recorded as a vehicle Depot						

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*
Made ground	TPH's Naphthalene,	Site Users Construction Workers.	Direct contact. Inhalation dust and fibers. Dermal contact	Medium	Unlikely	Low	No private gardens or soft landscaping are in place within the site
			Ingestion of home-grown produce	Medium	Unlikely	Low	No private gardens are in place within the site
			Ingestion of contaminated water through water main pipework	Medium	Likely	Moderate	Possible risk in place
			Inhalation of vapours	Medium	Low Likelihood	Moderate / Low	Limited risk in place
			Inhalation of land Gases	Medium	Unlikely	Low	Unlikely to be a source of land gases within the site
			Inhalation of vapours through contaminated ground waters	Medium	Unlikely	Low	London clay within and surrounding the site reduces the risk
		Adjoining Landowners	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	Unlikely	Low	London clay within and surrounding the site reduces the risk
		Ground Water. Abstraction Well.	Leaching, migration through fissures / cracks which may migrate to a groundwater receptor.	Medium	Unlikely	Low	London clay within and surrounding the site reduces the risk
		Flora	Plant Uptake Direct Contact	Medium	Unlikely	Low	No private gardens or soft landscaping are in place within the site
	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	Unlikely	Low	No private gardens or soft landscaping are in place within the site
	Metals Metalloids PAH's	Site Users Construction Workers.	Direct contact. Inhalation dust and fibers. Dermal contact;	Medium	Unlikely	Low	No private gardens or soft landscaping are in place within the site
			Ingestion of home-grown produce	Medium	Unlikely	Low	No private gardens are in place within the site
		Controlled Surface Water;	Leaching, lateral migration of shallow groundwater to a target receptor.	Medium	Unlikely	Low	London clay within and surrounding the site reduces the risk
		Ground Water. Abstraction Well.	Leaching, migration through fissures / cracks which may migrate to a groundwater receptor.	Medium	Unlikely	Low	London clay within and surrounding the site reduces the risk
	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	Unlikely	Low	London clay within and surrounding the site reduces the risk

Table 15 *Risk Assessment B*

Source (Potential Contaminating Use)	Potential *Contaminants*	*Receptors*	*Pathways*	*Associated Hazard, [Severity]*	*Proposed Site Use Risk Assessment*		
					Likelihood of occurrence	*Potential Risk*	*Notes*
Euston Station W 20m Pre 1873 - present ***Garage*** E 1m 1953 - Recently	TPH's Naphthalene. VOC's, PCB's	Site Users Construction Workers.	Direct contact. Inhalation dust and fibers. Dermal contact	Medium	Unlikely	Low	Distance from site London Clay and lack of soft landscaping all reduce the risk
			Ingestion of home-grown produce	Medium	Unlikely	Low	
			Ingestion of contaminated water through water main pipework	Medium	Unlikely	Low	
			Inhalation of vapours	Medium	Low Likelihood	Moderate / Low	
			Inhalation of land Gases	Medium	Unlikely	Low	No sources in place
			Inhalation of vapours through contaminated ground waters	Medium	Low Likelihood	Moderate / Low	Possible risk in place although London Clay reduces the migration potential
		Adjoining Landowners	Direct contact. Inhalation dust and fibers. Dermal contact	No liability from third parties			
			Ingestion of home-grown produce				
			Ingestion of contaminated water through water main pipework				
			Inhalation of vapours				
			Inhalation of vapours through contaminated ground waters				
		Controlled Surface Water;	Leaching, lateral migration of shallow groundwater to a target receptor.				
		Ground Water. Abstraction Well.	Leaching, migration through fissures / cracks which may migrate to a groundwater receptor.				
		Flora	Plant Uptake Direct Contact	Medium	Unlikely	Low	No private gardens or soft landscaping are in place within the site
Asbestos		Site Users Construction Workers.	Inhalation dust and fibers (from Asbestos within the building)	Severe	Unlikely	Moderate / Low	No Action - Distance removes risk
			Inhalation dust and fibers (from asbestos within the soil)	Severe	Unlikely	Moderate / Low	No Action - Distance removes risk
Metals Metalloids PAH's		Site Users Construction Workers.	Direct contact. Inhalation dust and fibers. Dermal contact;	Medium	Unlikely	Low	No private gardens or soft landscaping are in place within the site
			Ingestion of home-grown produce	Medium	Unlikely	Low	No private gardens or soft landscaping are in place within the site
		Controlled Surface Water;	Leaching, lateral migration of shallow groundwater to a target receptor.	No liability from third parties			
		Ground Water. Abstraction Well.	Leaching, migration through fissures / cracks which may migrate to a groundwater receptor.				
TPH's Naphthalene. VOC's, PCB's		Buildings. Construction Materials. Services	Direct contact with contaminated soils;	Medium	Unlikely	Low	Distance from site London Clay and lack of soft landscaping all reduce the risk
			Direct contact with contaminated groundwater	Medium	Low Likelihood	Moderate / Low	Possible risk in place although London Clay reduces the migration potential

Table 16 Overview of Risk Assessments - Proposed Site Use

Receptors	*Pathways*	*A*	*B*
		Made Ground	*Euston Station Garage*
Site Users Construction Workers	Direct Contact, Inhalation of Dust and Fibres, Dermal Contact	X	X
	Ingestion of home-grown vegetation	X	X
	Ingestion of contaminated water through water main pipework	X	X
	Inhalation of vapours from soils	✓	X
	Inhalation of vapor from contaminated ground waters	X	X
	Inhalation of land gas vapours	X	X
	Inhalation Asbestos dust and fibers (from Asbestos within the building)	✓	X
	Inhalation Asbestos dust and fibers (from asbestos within the soil)	X	X
Adjoining Land Owners	Direct Contact, Inhalation of Dust and Fibres, Dermal Contact	X	No Liability from third parties
	Ingestion of home-grown vegetation	X	
	Ingestion of contaminated water through water main pipework	X	
	Inhalation of vapours from soils	X	
	Inhalation of vapours from contaminated ground waters	X	
Flora	Plant Uptake / Direct Contact	X	X
Groundwater; Abstraction Well & Surface Water	Leaching, lateral migration of shallow groundwater to a River or surface water receptor.	X	No Liability from third parties
	Leaching, lateral migration of shallow groundwater system underlying the site and subsequent abstraction well or SPZ	X	
Buildings	Direct contact with contaminated soils.	X	X
	Direct contact with contaminated groundwater	X	X

**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

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 17 Pollutant Risk

Risk Assessment	***Land Use***	***Pollutant***	
Risk Assessment A	***Made Ground***	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.	25-meter Centres In accordance with BS10175: 2011+A2:2017.
		Asbestos	5-10-meter Centres In accordance with BS10175: 2011+A2:2017.

17 Next Steps

Considering the information gathered to date, due to the development only forming a conversion of the existing building and there not being any soft landscaping proposed, it is unlikely that the soil within the site will become exposed. Based on the sources of risk and the receptors in place we would suggest that risk of contamination impacting on the site area low.

Should soil be exposed during the development there may be a short term risk to the workforce as noted below and it may be prudent to complete a soils assessment as follow,s 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 400 m²), we would recommend that the site should be subjected to a sampling density of between 15-20 meter grid pattern or 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 1-2 samples will be required across the site to provide a 'good' spatial density and an additional 1-2 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.
- Obtain samples of the made ground, natural soils for contamination testing at targeted site-specific designed locations. Test soil for a range of contaminants, as identified in Table 17.
- Obtain samples of soil to test for vapours contaminants, as identified in Table 17.
- Visually appraise soils to consider olfactorily 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

Due to the small size of the site and the nature of the sources of risk to the site area, targeted sources of risk are not recorded within the site.

Table 18 Soils Assessment - Spatial Sampling

Feature	***Contaminant***	***Method of Investigation***
Made Ground	Metals, Semi Metals, PAHs, TPHs, Asbestos	Window Sampler Boreholes Hand Auger Boreholes Trial Pits

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

Considering the low risk to the ground water and surface water features, due to the London Clay and lack of significant sources 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: -

- Assess the geology and absence or presents of groundwater.
- Groundwater assessments are considered limited at present. If groundwater is encountered within the site an additional assessment should be made and standpipes should be installed. At present, this is not considered unlikely.

17.3 Land Gas Assessment

No sources of land gases are in place for the site area, should significant made ground or organic matter be encountered within the site area reassessment may be required, although for the information collect to date the risk of this is low.

17.4 Vapour Risk Assessment

The feature off site may have promoted some level of vaporous risk to eb in place although due to the London Clay within and surrounding the are this reduces the risks of migration. In addition to the main source of vapours risk would from the former garage in place to the east of the site was have subsequently been redeveloped to form a school building and will therefore have likely removed the sources of risk

17.5 Working Brief

All the workforces should were the appropriate PPE and RPE when on site.

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 19 *Overview of Works*

Receptor	*Scope of Investigation Works Required*			*Proposed Method of Assessment*	*Proposed Site Works to Complete*
	Assessment of:				
	Soils	*Vapour and Gas*	*Ground and Surface Water*		
Human Health	✓	✓	✓	Window Sampling - Soil sampling	Recover samples of the made ground. Assessment of the underlying natural soils to consider contamination. Analysis of soil samples for GQRA Assessment. Reporting
Surface Water	X	X	X	No Action	
Ground Water	X	X	X	No Action	
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
Telephone: 01920 822233
e-mail info@hesi.co.uk

Appendix No 1
Sheet No 1
Job No 16021
Date Feb 2021

Highfield Nursery Wellpond Green Herts SG11 1NL

Site Conceptual Model - Proposed SIte Plan

Potential Pathways

Human Heath

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 Vapours From Soils
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

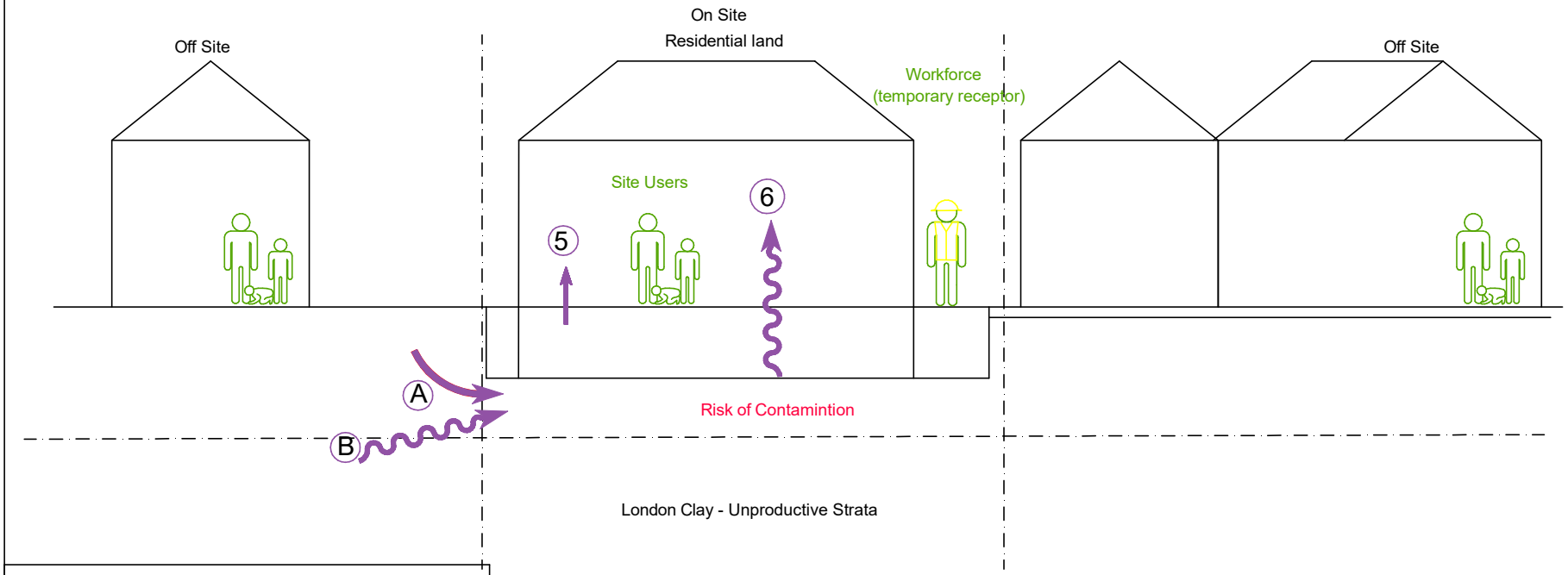
10. Leaching, lateral migration of shallow groundwater to a target receptor

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

Key

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



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APPENDIX TWO

SITE PLANS

HERTS & ESSEX SITE INVESTIGATIONS
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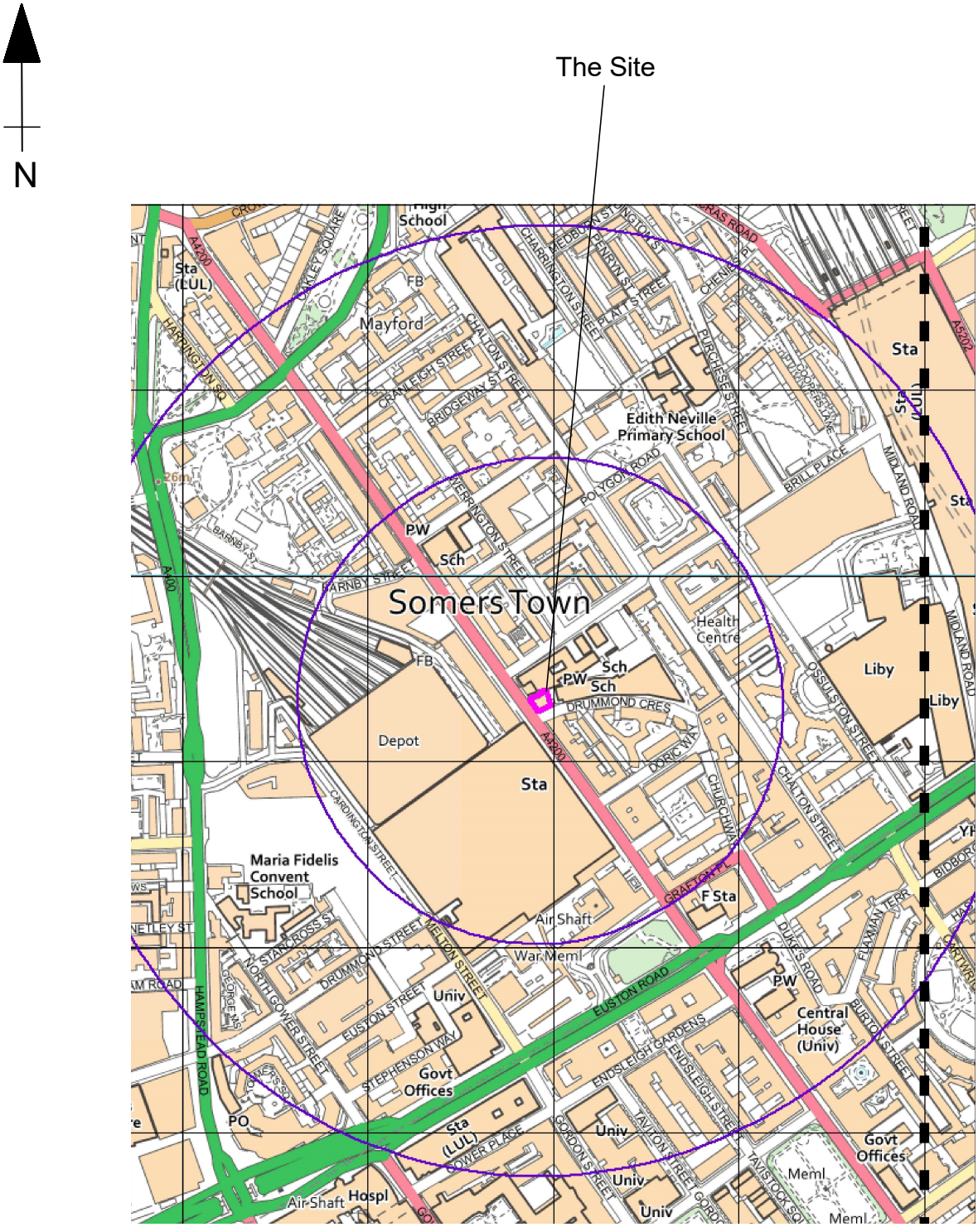
e-mail info@hesi.co.uk

Appendix No	2
Sheet No	1
Job No	16571
Date	March 2021

72 – 76 Eversholt Street London NW1 1BY

Location Plan

N



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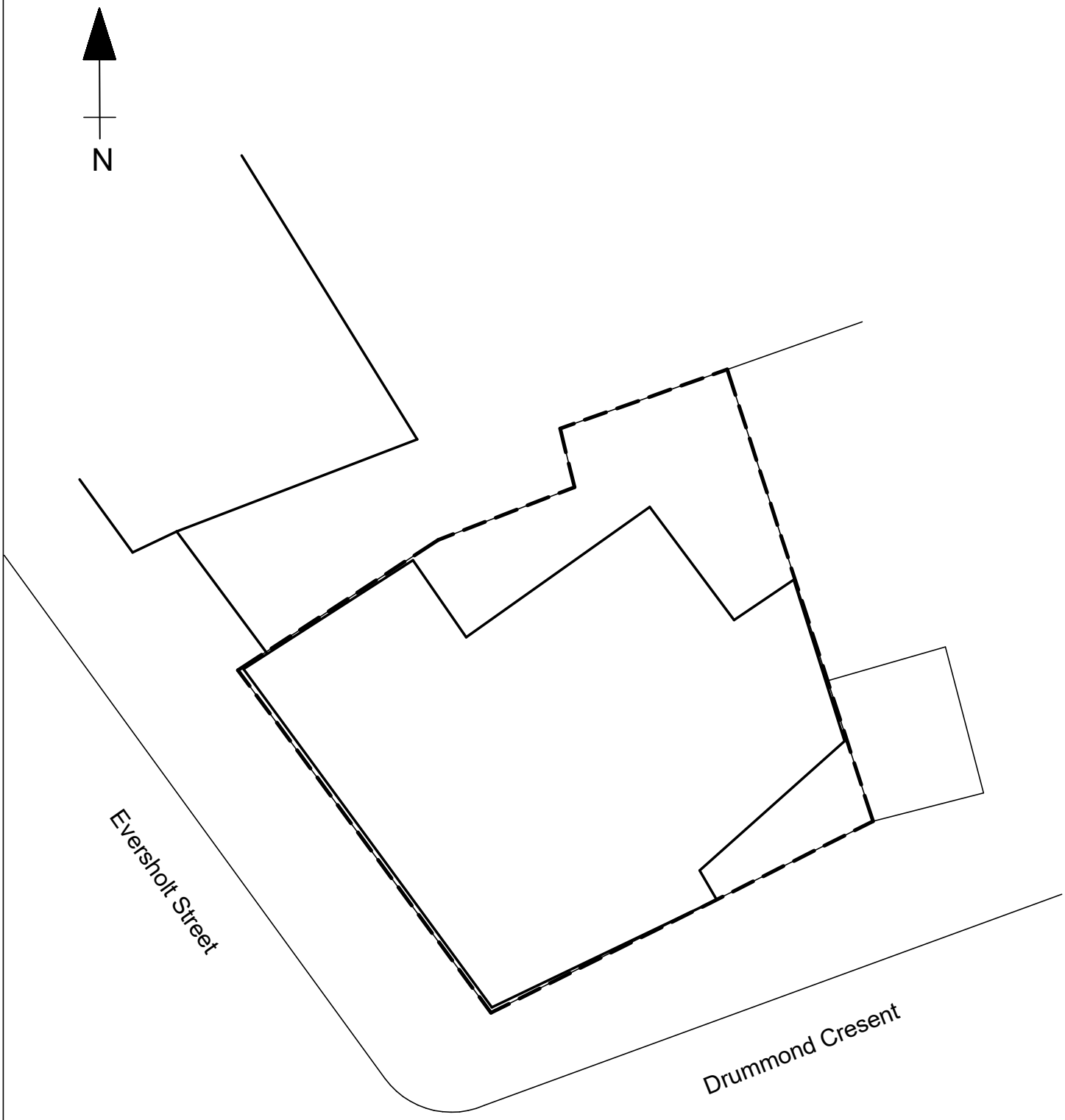
Appendix No	2
Sheet No	2
Job No	16571
Date	March 2021

72 – 76 Eversholt Street London NW1 1BY

Existing Site Plan



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